

**The development of a conceptual framework
and model for Information, Education and
Communication (IEC) to reduce antibiotic
misuse among the Vietnamese population in
Nam Dinh province**

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The development of a conceptual framework and model for Information, Education and Communication (IEC) to reduce antibiotic misuse among the Vietnamese population in Nam Dinh province

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Abstract

The development of a conceptual framework and model for Information, Education and Communication (IEC) to reduce antibiotic misuse among the Vietnamese population in Nam Dinh province

The literature, Vietnamese health statistics reveal problems with the antibiotic use with misunderstanding leading to the irrational and inappropriate use of these drugs resulting in bacterial resistance together with its consequences. In Vietnam the public healthcare service is provided at community level based on a system of communes. Here it is accepted that health centres are located in each rural area but that, public health workers are disadvantaged especially with regard to their education/training, but are still mainly responsible for provision of healthcare including administration of antibiotics.

The main aim of this study was to develop a conceptual framework for an education and training model for public health workers to reduce antibiotic misuse. It was piloted among the population in Myloc district, Nam Dinh province Vietnam but could be transferable to other rural areas in Vietnam. Thus, as a starting point baseline measures were taken using method triangulation in order to evaluate the current situation of antibiotic use in this study location. This survey revealed a very high rate of antibiotic administration (79.8%) of which more than half (54%) were incorrectly prescribed for non-infectious conditions. It also revealed misunderstandings and limited knowledge and perceptions regarding the use of antibiotics, and that staff had received little or basic training and education. These findings provided baseline data for the development of the training programme.

Through reviewing theories of learning, principles of adult learning and teaching, the basic philosophies of experiential learning from the western world were taken into account then adapted to the Vietnamese context, especially to the situation of the commune health workers. The model was developed, based on Kolb's (1984) experiential learning cycle, with modifications to fit with Vietnamese condition. The model named the '**Modified Kolb's Model for Vietnam**' (MKMVN) then was used to design and implement the training programme, taken place in each commune health centre.

The programme, assessed through a time-series questionnaire, using participant observation and focus groups, was found to have led to positive changes in the health workers' knowledge and practical ability regarding the use and administration of antibiotics. The health workers' enthusiasm for ongoing learning was evident in the focus groups held as part of the final evaluation. The overall mean score for correct responses to the questionnaire elevated significantly from 58.43 ± 8.77 points before the programme to 99.25 ± 1.00 points after the completion of the programme and remained comparatively high at 79.76 ± 9.02 points after three months. Considerable improvements were seen in solving patients problems, providing appropriate treatment and administration of medicines and antibiotics in particular. Instructions to patients regarding courses of antibiotics contained greater detail.

The most significant finding from this study is that the model and training programme were accessible, acceptable and appropriate for the commune health workers, and required minimal resourcing. There are clear the possibilities for applying this model (MKMVN) and programme on a larger scale and for applying this approach to other key health issues.

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Table of Contents

CHAPTER 1. INTRODUCTION TO THE STUDY.....	1
The aims and specific objectives of the study	1
Usage of Antibiotics in Vietnam	2
Current Health System and Medical Education of Vietnam	4
A project within a project.....	6
Outline of The Thesis.....	7
CHAPTER 2. THE CONTEXT FOR THE STUDY: AN OVERVIEW OF VIETNAM..	10
Introduction.....	10
Demographics	10
▪ Location	10
▪ Climate and weather	11
▪ People and population.....	12
▪ Languages	13
▪ Religions and beliefs	14
▪ Administrative structure.....	15
▪ Socioeconomic and health indicators	16
Education and Training in Vietnam	17
Health care and development in Vietnam	20
social health insurance in vietnam	26
the commune based health service	27
Conclusion.....	28
CHAPTER 3. SUPPORTING LITERATURE	29
Introduction.....	29
Background	29
Antibiotics	30
Antibiotic resistance.....	31
Problems with antibiotic use	35
▪ Worldwide	35
▪ Vietnam.....	38
Consequences of misuse of antibiotics	41
Containment of antimicrobial resistance	43
Adult learning theory.....	46

▪ Principles of adult learning in the West	46
▪ Experiential learning models	51
▪ Forms in which learning occurs.....	53
▪ Factors contributing to effective learning.....	55
Learning belief for commune health workers in Vietnam.....	57
Implications of the literature for the study design.....	58
▪ Epistemology	58
▪ Quantitative data sets	60
▪ Qualitative data sets	62
▪ Grounded theory.....	62
CHAPTER 4. METHODS SECTION.....	66
Introduction	66
Diagramme and chronology of the study	66
Sample.....	66
Ethical issues, and protecting the participants	67
Data collection and analysis.....	68
The baseline measures	68
Survey by questionnaire: baseline measure: Investigation 1	68
▪ Specific sampling issues for investigation 1	70
▪ Specific ethical issues for investigation 1	70
▪ Data Analysis for investigation 1	70
▪ Reliability and Validity	71
Documentary research: baseline measure: Investigation 2.....	72
▪ Specific sampling issues for investigation 2	72
▪ Specific ethical issues for investigation 2	73
▪ Data Analysis for investigation 2	73
▪ Reliability and Validity	74
Focus groups: baseline measure: Investigation 3.....	74
▪ Specific sampling issues for investigation 3	75
▪ Specific ethical issues for investigation 3	76
▪ Data Analysis for investigation 3	76
▪ Methodological rigour.....	77
Piloting the model.....	78
Assessing the intervention.....	79
Assessment by questionnaire: Investigation 4.....	79
▪ Specific sampling issues for investigation 4	79

▪ Specific ethical issues for investigation 4.....	80
▪ Data analysis for investigation 4.....	80
Assessment by observation: Investigation 5	80
▪ Specific sampling issues for investigation 5.....	81
▪ Specific ethical issues for investigation 5.....	81
▪ Data Analysis for investigation 5.....	82
Assessment by focus groups: Investigation 6	83
▪ Specific sampling issues for investigation 6.....	83
▪ Specific ethical issues for investigation 6.....	83
▪ Data Analysis for investigation 6.....	83
Conclusion.....	83
CHAPTER 5. Establishing the baseline measures	85
Introduction.....	85
Baseline measure 1: measure by questionnaire	85
▪ Demographics of health workers	85
▪ Health workers' basic knowledge of antibiotics.....	89
▪ Current practical experience.....	90
▪ Health workers' actions regarding Misuse of Antibiotics	92
▪ Associations between perception of antibiotics with demographics	93
▪ Concern of health workers about the current situation of antibiotics	95
Baseline measure 2: documentary data.....	97
▪ Age and Gender of patients from the prescriptions assessed.....	97
▪ Diseases/conditions and antibiotics prescribed within CHCs	98
▪ Health insurance and antibiotic prescribing in CHCs	100
▪ Antibiotics and their frequency of prescribing in CHCs	101
▪ Drug indicators of antibiotics prescribed at CHCs.....	102
▪ Selecting antibiotics for prescription	103
▪ Dose of Antibiotics indicated for treatment at CHCs	105
Baseline measure 3: focus groups.....	106
▪ Theme 1: antibiotic use	107
▪ Theme 2: peer and community pressure	109
▪ Theme 3: lack of facilities	113
▪ Theme 4: Multiple roles with inadequate competence	118
▪ Theme 5: Health insurance as a motivation.....	121
Summary	123

CHAPTER 6. DEVELOPMENT AND IMPLEMENTATION THE MODEL AND PROGRAMME	125
Introduction	125
Factors for consideration before developing the model.....	125
▪ Training and education in the Vietnamese context	128
▪ Developing the model and programme for the context of Vietnamese health workers	129
The model for commune health workers.....	134
The content of the programme/curriculum	137
The implementation of the model and programme.....	141
▪ The process of implementation	141
▪ Using triangulation for evaluation	148
▪ The management of the programme	149
Conclusion	150
CHAPTER 7. RESULTS AND DISCUSSION OF THE MODEL AND PROGRAMME	152
Introduction	152
General information of participants.....	152
Evaluation by questionnaire	155
▪ General evaluation by overall band score	155
▪ Changes in the participants' perception and understanding	158
▪ Beliefs in the necessity of antibiotic use	158
▪ Awareness of the recommendations on administration	160
▪ Awareness of the consequences of antibiotic misuse	162
▪ Awareness of the necessity of antibiotics for common diseases	163
▪ Awareness of clinical manifestations(symptoms and signs)	165
▪ Awareness of common bacterial pathogens for infected system of the body.....	166
▪ Awareness of choosing antibiotic for infected system of the body	168
▪ Awareness of essential instructions on antibiotic administration to clients	170
▪ Changes in the participants' practical ability regarding antibiotic use	171
▪ Practical ability to determine the process of rational treatment.....	171
▪ Practical ability to solve the patient's condition following the three first steps of the process of rational treatment.....	174
▪ Practical ability to select an appropriate antibiotic	177

▪ Practical ability to give patients instructions on antibiotic administration	179
Evaluation by observation	181
▪ General information of observed patients	182
▪ Change in the rate of prescribed antibiotics	183
▪ Change in instructing on administration of drugs	184
▪ Time consuming on instructing	184
Evaluation by focus groups	185
▪ Theme 1: satisfaction of the health workers' expectation	186
▪ Theme 2: appropriateness for working circumstance	187
▪ Theme 3: confidence in working	190
▪ Theme 4: Learners perceptions of the new way of learning and working	192
▪ Theme 5: Changing attitudes	197
Summary	200
CHAPTER 8. IMPLICATIONS FOR THE PRACTICE AND POLICY	202
Introduction	202
Implications for education in practice	202
Implications for the policy planners	207
Conclusion	214
CHAPTER 9. CONCLUSION AND RECOMMENDATIONS	216
Introduction	216
Summary of findings and results	216
▪ Key findings from the initial survey	216
▪ Main results from the interventional programme	219
Critique	220
Methodological limitations	223
▪ Sampling	223
▪ Data collection	223
▪ Language	225
Reflections on the PhD programme	226
▪ Improving the capacity of nurses education and training in Vietnam	226
▪ Personal learning experience through carrying out the PhD study	226
Recommendations	228
References	232
Appendices	247

List of Tables

Table 2.1. Types of health workers in Vietnamese health system.....	23
Table 3.1. Summary of comparisons of learning and teaching theories	47
Table 3.2. Summary of learning scenarios.....	49
Table 3.3. Adult learning and approaches to teaching	50
Table 5.1. Education levels and job titles of respondents	86
Table 5.2. Training courses for health workers in CHCs	88
Table 5.3. Health workers' perception and understanding of antibiotics.....	89
Table 5.4. Health workers' practical experience of antibiotics	90
Table 5.5. Actions of health workers regarding misuse of antibiotics	93
Table 5.6. Perception of antibiotic by education levels	94
Table 5.7. Perception of antibiotic by years in career	94
Table 5.8. Comments from health workers regarding antibiotic use.....	96
Table 5.9. Age groups and gender of the studied sample.....	97
Table 5.10. Diseases and percentage of prescribed antibiotics	98
Table 5.11. Extent of antibiotics prescribing by conditions.....	100
Table 5.12. Health insurance and antibiotic prescribing.....	101
Table 5.13. Information on antibiotics indicated.....	103
Table 5.14. Percentage of antibiotic classes given by body system.....	104
Table 5.15. Dose (gram) per day as age groups.....	105
Table 6. Schedule of the training programme	143
Table 7.1. Health workers participated to the training	153
Table 7.2. Variety of scores by education level before the intervention.....	155
Table 7.3. General result by overall score	156
Table 7.4. Mean score by education level and job title before the intervention	157
Table 7.6. Beliefs in the necessity of antibiotics.....	159
Table 7.7. Awareness of the necessity of antibiotic for common diseases	163
Table 7.8. Health workers' ability to solve the patient's illness	175
Table 7.9. Correct Instructions on Antibiotic Administration	180
Table 7.10. Diseases/conditions of observed patients	182
Table 7.11. Antibiotic distribution by system of the body.....	182
Table 7.12. Number of conditions/diseases were prescribed with antibiotic (AB)...	183
Table 7.13. Details of instruction delivered to patients	184
Table 7.14. Average time consuming on instructing administration of drugs.....	185

List of Figures

Figure 2.1. Location of Vietnam	10
Figure 2.2. Agricultural environment of Vietnamese farmer.....	11
Figure 2.3. Average population of Vietnam over periods.....	13
Figure 2.4. Administrative structure of Vietnam.....	15
Figure 2.5. National Education and Training System of Vietnam.....	17
Figure 2.6. Structure of health system in Vietnam.....	20
Figure 2.7. Working conditions in commune health centres	28
Figure 3.2. Multi-drug resistance in Asia: pneumococci resistance	34
Figure 3.3. The rate (%) of resistance of pathogens to common used antibiotics in Vietnam	35
Figure 3.4. Mortality from infectious diseases, worldwide, all ages	36
Figure 3.5. Factors influencing on the use of medicines.....	40
Figure 3.6. The vicious circle of empirical therapy.....	42
Figure 3.7. Cost ratio of alternative drugs to first-line antimicrobials for common acute infections.....	43
Figure 3.8. Kolb's Experiential Learning Cycle.....	52
Figure 3.9. Pfeiffer and Jones's Experiential Learning Model.....	53
Figure 4.1. Diagramme of study work	66
Figure 4.2. Diagramme of measurement.....	79
Figure 5.1. Age and gender of health workers in CHCs	86
Figure 5.2. The extent of self-medication at the local stated by health workers.....	95
Figure 5.3. Antibiotics and their frequency of prescribing	102
Figure 6. Modified Kolb's Model for Vietnam (MKMVN)	135
Figure 7.1a. Age and gender of health workers participated by 2010.....	152
Figure 7.1b. Education levels and job titles of CHC's health workers.....	154
Figure 7.2. Awareness of the recommendations on antibiotic use.....	161
Figure 7.3. Awareness of the consequences of antibiotic misuse	162
Figure 7.4. Awareness of common clinical manifestations	165
Figure 7.5. Awareness of common bacteria on infected system of the body	167
Figure 7.6. Awareness of choosing antibiotic for infected system of the body	169
Figure 7.7. Awareness of essential instructions on antibiotic administration.....	170
Figure 7.8. Health workers' ability to determine the process of rational treatment.	173
Figure 7.9. Health workers' ability to select an appropriate antibiotic	178

List of Abbreviations

ABs: antibiotics
ANSORRP: Asian Network for Surveillance of Resistance Pathogens
ARIs: acute respiratory infections
ASTS: Antibiotic Susceptibility Test Surveillance
CDC: Centre for Disease Control and Prevention
CE: clinical education
CHCs: Commune Health Centres
CME: continuing medical education
CPD: continuing professional development
EARSS: European Antimicrobial Resistance Surveillance System
GDS: General Department of Statistics
GSO: General Statistics Office
HAIs: hospital acquired infections
HPG: Health Partnership Group
HSPI: Health Strategy and Policy Institute
ICD: International Classification of Diseases
MD: medical doctor
MDF: Ministry of Domestic Affairs
MDR: multi-drug resistance
MKMVN: Modified Kolb's Model for Vietnam
MOET: Ministry of Education and Training
MOH: Ministry of Health
MRSA: Multi-resistant Staph. Aureus
NHS: National Health System
NIAID: National Institute of Allergy and Infectious Diseases
PED: Professional Education Department
PPC: Provincial People's Committee
SARS: Severe Acute Respiratory Syndrome
SHI: Social Health Insurance
SIDA: Swedish International Development Cooperation Agency
TVET: Technical and Vocational Education and Training
UNICEF: United Nations Children's Fund
USAID: United States Agency for International Development
WHO: World Health Organization

List of Appendices

Appendix 1	Approvals by Authorities of the Health System	240
Appendix 2	Project information.....	245
Appendix 3	Participant consent form	247
Appendix 4	Questionnaire – phase one.....	248
Appendix 5	Guide and field notes for focus groups – phase one	251
Appendix 6	Questionnaire – phase two	254
Appendix 7	Document for commune health workers.....	258
Appendix 8	Guide for observation and field notes.....	281
Appendix 9	Guide for focus groups and field notes – phase two.....	282
Appendix 10	Published articles regarding the study	284
Appendix 11	Scientific presentations regarding the study.....	287

CHAPTER 1. INTRODUCTION TO THE STUDY

This study is based within Vietnam. Officially the ***Socialist Republic of Vietnam***, with Hanoi as the capital city, it is a country located in the centre of the Southeast Asian region. Now regarded as an emerging economy, Vietnam still has many of the problems of other developing countries, not least of which is the misuse of antibiotics. Since antibiotics were discovered they have been acknowledged as one of the greatest scientific achievements, saving a countless number of lives from death by microbial infections. In Vietnam, it is evident that today non-infectious diseases have increased, while infectious illnesses have remained at high rates. Therefore, antibiotics are still integral drugs used to cure people with infections caused by pathogenic bacteria. However, the increasing resistance caused in part by misadministration, is compromising the health of the community. There have been several programmes designed to reduce misuse, but these have all focused on the acute, or hospital settings. Therefore, this project is unique. It is the first study to address these problems within the rural setting where 70% of the population still reside. It provides a model and programme that engages with the workers, moving them from a passive acceptance of their limited competence, to actively seeking to learn, and to taking responsibility for their own knowledge and expertise. On a broader level it can readily be applied to other key health issues.

The aims and specific objectives of the study

This study project was carried out with the following aims and objectives:

Aims of the study:

- To evaluate the current using of antibiotics in the community in Myloc district, Namdinh province, Vietnam.
- To develop a conceptual framework and education and training model for public health workers to reduce antibiotic misuse among the population in Myloc district, Namdinh province Vietnam that is transferable to other rural areas in Vietnam.
- To make recommendations for the development of policies and practice to reduce antibiotic misuse in rural areas in Vietnam.

Specific Objectives:

- To assess the extent of antibiotic use and misuse in Myloc district, Namdinh province Vietnam

- To review the current education and training of public health workers regarding antibiotic use and misuse.
- To identify the factors that influence antibiotic use in Myloc district, Namdinh province Vietnam.
- To develop a conceptual framework and model for education and training for public health workers to reduce antibiotic misuse.
- To develop and pilot a training programme for public health workers based on the conceptual framework and model.

** Although the model will be developed in Myloc district, it is anticipated that it will be transferable to other rural areas in Vietnam.*

This chapter aims to give the context for the study project. It begins with describing what urged the researcher to initiate a study on the situational use of antibiotics in Vietnam and to carry out this study as a contribution to improving the situation. The chapter continues by providing brief information on the health system and medical education in the current context of Vietnam, which gave the researcher the aspiration to develop a model for training and education, and with the rationale for this study programme as part of a much bigger project. The last section outlines the structure of this thesis.

Usage of Antibiotics in Vietnam

Since antibiotics were discovered, they have been considered wonder medicines that save lives from death from bacterial infections. However, belief in the curative properties of these drugs has led to misunderstanding and misuse of them as curative medicines for most illnesses. As a result bacteria have become resistant to many of existing antibiotics and the problem has become more and more serious affecting levels of health system (Stuart, 2004).

Vietnam is a tropical country where infectious diseases are common and usage of antibiotics has become inevitable. The Report on Infectious Diseases of World Health Organization (WHO, 2000a) on infectious diseases gave warning of the reduced effect of Penicillin and other antibiotics on infectious diseases, (which used to be treated easily), due to antibiotic misuse. Furthermore, they point out that within the developing world, 50% of usage is not appropriate (WHO, 2001a). These findings are representative of the situation in Vietnam, where like many developing

countries in recent years there has been increased access to the use of antibiotics. They can be purchased with or without a prescription, and in many instances the ability to purchase and use antibiotics has not been accompanied by appropriate education. The result of this is that in the community many people using antibiotics do not understand the need to complete courses, keeping tablets to use when they think they need them. Inevitably this means that increasingly bacteria are becoming resistant to antibiotics, and treatment is becoming much more difficult.

In recent years, the consumption of antibiotics has increased annually; the Vietnamese Ministry of Health (MOH, 2000) reported that importing antibiotics accounted for 40-50% of the total foreign medication import with approximately 100 tons of antibiotics imported yearly; and the cost of antibiotics also accounted for 40-50% of the total drug costs. However, they also found that only 20% of people who used antibiotics did so via a prescription, in more than 80% of cases they were bought and used without following prescription guidelines, a situation that continues today. Despite the MOH's regulations and guidelines for the use of antibiotics sales of most antibiotics without a proper prescription is a common practice in Vietnam (Larsson et al, 2000). It is clear that antibiotic use in Vietnam is not properly regulated or controlled. Antibiotics abuse and misuse is a major threat to public health, leading to increased deaths from bacterial resistance to all existing, or available antibiotics. This is not a new problem, since they were first discovered and introduced, there has been a pattern of a new drug and then resistant bacteria - a situation, which is still occurring across the world with more and more infections becoming harder to treat. The problem is not only due to individual misuse, countries too can increase the problem, for example, after the anthrax scares in the US in October 2001, about 10,000 (or more) postal employees were put on antibiotics like ciprofloxacin/doxycycline. Many of these patients were put on these antibiotics for sixty days, not the seven, ten, or fourteen-day course of antibiotics for most infections, as a result, in a year or two it is likely that there will be even more resistance to ciprofloxacin and other fluoroquinolones, just as by 2002 initially around 50% cases revealed methicillin resistance. It is important to note here that although originally resistance grew by a small percentage each year, in the last 20 years it has increased 20 fold (Mebane et al, 2001).

In Vietnam, the findings of the Antibiotic Susceptibility Test Surveillance from ten hospitals indicated that for the first half of the year 2006 five most common infectious pathogens were *Klebsiella* ssp, *Escherichia coli*, *Acinetobacter* ssp,

Pseudomonas aeruginosa and *Staphylococcus aureus*, and that all of these bacteria were multi-resistant to commonly used antimicrobial agents (Vinh et al, 2006). When infections are caused by resistant microbes, illness is prolonged and the risk of death is higher. As infectivity is longer, the number of infected people moving in the community is higher exposing the general population to the risk of contracting a resistant strain of infection. Thus, the consequences of antibiotic misuse have become an international problem (Stuart, 2004). There are numerous factors contributing to this multi-resistant bacterial proliferation, including poor infection control practices, overcrowding and poor sanitation. However, problems with antibiotics do not only occur in Third World countries. In the UK more than 5,000 patients die per year from antibiotic resistant infections (Wyeth, 2006). It has to be a cause for concern that in modern healthcare, hospitals and medical centres appear to be making us more vulnerable to multi-resistant pathogen proliferation than ever before. Not surprisingly, in developing countries, acquired bacterial resistance to antimicrobial agents is common but unlike the Western world spread is more likely from community-acquired infections. In these countries, complex socioeconomic and behavioural factors are associated with increasing antibiotic resistance (particularly regarding diarrhoeal and respiratory pathogens), and include misuse of antibiotics by health professionals, unskilled practitioners, and laypersons; poor drug quality; unhygienic conditions accounting for spread of resistant bacteria; and inadequate surveillance.

The pathway to slowing down and preventing the increased antibiotic resistance and its subsequent results must begin with a change of attitude, a change in action, and hard work. Despite these factors, although in Vietnam there have been many studies on antibiotic use conducted within hospitals and clinics, there have been few studies exploring reasons behind the use and misuse of antibiotics in the community, yet this where most usage takes place. This project therefore aims to explore attitudes and perceptions regarding antibiotic use within the community, and then develop and pilot a conceptual framework for a programme to minimize inappropriate use of antibiotics.

Current Health System and Medical Education of Vietnam

After the re-unification of the country in 1975 the whole country followed the socialist system. After the “*doi moi*” (renovation) policy in 1986 when the concept of the market forces was introduced, the health system also started to change resulting in many improvements in both curative and preventive health care services. The

structure of the health system has currently followed the administrative structure of the country with four levels (central- provincial- district- commune) and vertically consists of four components (1) curative medicine, (2) preventive medicine, (3) training and education, and (4) pharmaceutical and medical equipment. The curative medicine consists of hospitals of different levels: central, provincial, district, specialized institutes and clinics. Preventive medicine is representative of medicine research institutes at central level (such as National Institutes of Nutrition, of Hygiene and Epidemiology, of Malariology, Parasitology and Entomology), and preventive medicine centres at provincial and district levels. The training and education for health professionals includes universities, colleges and secondary schools of medicine, pharmacy, medical technology, nursing and midwifery. The pharmaceuticals and health service provision includes pharmaceutical companies and factories, health facilities and equipment provision being clearly separated at central and provincial levels but integrated in the pharmacy unit at district level.

In commune health centres - the lowest level (also known as the first level), all activities of health care are integrated. Although, coverage is incomplete in all communes, all types of health workers are found in commune health centres: medical/assistant doctor, pharmacist, nurse, midwife. To deliver the health care for the 86 million people, Vietnam being the 3rd most populous country in South East Asia and the 13th most populous country in the world a very large health workforce of well trained health professionals is required.

By the year 2007, the ratios of health professionals within workforce revealed the shortage of a skilled workforce. The numbers of medical doctors, pharmacist, nurses per habitants were very low these were 6.45/10,000; 1.21/10,000; and 7.18/10,000 (respectively); and the ratio of nurse per doctor was only 1.11 (MOH, 2007a). Under the requirement of health care workforce, since the “*doi moi*” policy several new kinds of health workers have been introduced and as staff in all health levels and all activities of health care. This evolution in the human resource for health policy and practice resulted in increased training and education needs. Medical training and education and medical schools have developed considerably. Before 1945 under the French colonial period the country had only the first medical school named Hanoi University of medicine (previously called Indochinese Medical and Pharmaceutical School founded in 1902) with few types of training (medical doctor and pharmaceutical doctor). In terms of training and education providers there are now approximately 150 institutions (MOH, 2007a) and each of them are

permitted to train several types of professionals dependent on the government gradation. The demand for coverage of services by the health workforce and the changes in policy created opportunities for the development of health training and education, and for many more people to be trained and to practice as staff in the health care system.

Increasing the number of training providers to meet the workforce demand also causes challenges and problems in the quality of the human workforce. Most schools were inexperienced about the key activities of human resource development such as motivation, recruitment, appraisal and orienting career. Teaching staff had no experience in developing curricula and lacked the opportunities to be exposed to new and active methods of teaching. Schools' managers were mainly medical doctors who had very little training in education management. Curricula and programmes for a type of training were to some extent different from school to school; little matched to practice with an excess of school subjects containing little practical content.

At the commune health level - the first but lowest level of Vietnamese health system, where most healthcare workers undertaking the main responsibility for the use and administration of medicines in general and of antibiotics in particular, are only educated to secondary level (a two-year training) or even an elementary programme (an one-year training or less) from any medical school. It is clear that there are likely to be problems. What the situation of commune health level was and whether a learning model could underpin health workers of this level was the main motivation for this study.

A project within a project

This study was undertaken as part of a much bigger project 'Improving the capacity of university and college level nurse training', funded by Nuffic, the Dutch Government supported organisation responsible for providing overseas aid to help developing countries improve higher education and training. Nursing had been identified as one of the essential services within the health sector in Vietnam. Strengthening the nursing-midwife capacity, defining an appropriate staffing structure, developing training capacity and curriculum development were all key issues. At the time the project commenced, the ratio of nurses to doctors was well below the WHO recommendations (between 4:1 and 8:1). In addition community nurses and midwives already in practice needed to adapt to both socio-economic

changes and medical advances. Thus, they needed to improve their knowledge, skills, attitudes and clinical techniques. There was, and still is, an expectation that they would be able to develop community-based care services particularly to disadvantaged areas, to work with those with low incomes and who are socially underprivileged. In addition, in response to the growing prevalence of HIV/AIDS and the absence of home care, nurses increasingly need appropriate models of prevention, as well as the skills to provide effective and compassionate care for people and communities living with, and affected by HIV/AIDS. However, raising the quality of nursing care to meet the above targets is, and will remain an ongoing issue. Standards of nursing practice cannot be developed in isolation, they must concur with, and follow all government policies regulating the practices of health professionals.

At the start of the project nurse education and training was offered at four levels: primary, secondary, college and university level. However, the training capacity of universities and colleges was not sufficient to meet the demanded improvements in education and training. Indeed education at university and college levels had only taken place for about 10 years. Therefore as part of overall programme, to enhance the capacity of nurse educators through, supporting the training of eight staff to masters level, and two to PhD level.

Outline of The Thesis

This thesis is organized into nine chapters. As mentioned above this chapter introduces the context within which made the research project was carried out. It introduces the background to antibiotic use in Vietnam and how this became a motivation of the researcher to develop this study.

Chapter Two gives the Vietnamese context with an overview of the geography and demographics, as well as relevant government structures, education and training and healthcare provision.

Chapter Three discusses the actual situation of antibiotic use including some background information to antibiotic use, antibiotic resistance, its consequences, and containment of antibiotic resistance. Because the study aims to develop a model for change, the theory of adult learning and health training system in Vietnam is also given as a theoretical support to the study. The approaches of research methodology applied for this study are also summarised in this chapter.

Chapter Four presents the research methods employed to conduct this study. The study used a triangulation for both the two stages of project. Within the first stage, the survey phase, quantitative and qualitative approaches were combined using the advantages of both paradigms to reveal the real situation of antibiotic use in the studied location and some of the factors affecting administration. In the second stage, the intervention phase, again both quantitative methods and qualitative methods were used. The final assessment included not only formal assessment of the participants knowledge and skills, but also their perceptions of the training programme.

Chapter Five describes the findings of the survey phase and to illustrate the factors affecting influencing the local situation the quantitative data is supported by the qualitative data sets. This met the first aim of the study, and created baseline data that was used in the development and implementation of the training programme in the intervention stage of the study.

Chapter Six describes the process of the development of an intervention programme in which details of the training were critically considered and based on the findings from the first stage that presented in Chapter Five. This chapter also provides an introduction to a conceptual framework for change regarding antibiotic use, using which the model for health workers' learning was developed and implemented.

Chapter Seven presents and discusses the changes in perception and practical ability regarding the use of antibiotics that the health workers in the studied location demonstrated after the intervention. The chapter also presents the reflective thinking of participants about the intervention model. This chapter gives arguments for formalising the integration of the model into health service education and training. In a word, Chapter seven answered the second aim of the study.

Chapter Eight outlines the implications for practice and policy grounded in the study. Therefore this chapter suggests current and future possibilities for the programme and the model of learning developed during the study.

The final chapter, Chapter Nine summarizes the key findings from the first phase (survey) and the main results from the second phase (intervention). The chapter

then gives a critique by the researcher after having completed the study. As with any research, limitations were inevitable and are presented in the third section. Reflections and recommendations with regard to improving the capacity of nurses education and training in Vietnam being raised from this study programme are presented in the final section of this chapter.

CHAPTER 2. THE CONTEXT FOR THE STUDY: AN OVERVIEW OF VIETNAM

INTRODUCTION

To set the scene for the study a brief description of Vietnam, and the key national structures has been included, starting with demographics including the country's location, climate and weather, people and population, language, religions and beliefs, administrative structure and socioeconomic and health indicators. The main points of the current training and education are given followed by an overview of the health care system.

DEMOGRAPHICS

Location

Vietnam, officially the ***Socialist Republic of Vietnam***, capital city Hanoi, is a country located in the centre of the Southeast Asian region. It lies on the eastern part of the Indochina peninsular bordering China to the North, Laos and Cambodia to the West and the East Sea and Gulf of Thailand to the East and South. Vietnam's inland borderline is 3,730 kilometres and its coastline is 3,260 kilometres. Stretching the length of the Indochinese Peninsula, Vietnam has a unique shape of an elongated S (Figure 2.1) with a total area of 329,565 square kilometres equal to 127,246 square miles (GSO, 2006).



Figure 2.1. Location of Vietnam (Cartographic Publishing House)

The country is divided into three regions, North, Central and South Vietnam. North Vietnam is mountainous especially in the north and north western sections while the lowlands consist of the Red River Delta and the coastal plains. Central Vietnam is divided into a narrow coastal strip, a broad plateau and the Annamite Mountain Chain which separates the plateau from the coastal lowlands. The lower one third of South Vietnam including the Mekong River System is a low and marshy flat land.

Vietnam is overall an agricultural country (Figure 2.2) with about three quarters of the population, living in the rural areas, and earning their livelihood mainly from growing a variety of crops both on land and in water (World Bank, 2006a). It is in these areas that 90% of those living in poverty are found, with the living and working environment impacting on the population's physical and health condition.



Figure 2.2. Agricultural environment of Vietnamese farmer (*World Bank, 2006a*)

Climate and weather

Lying entirely within the tropics (located between 9 and 23 degrees north) Vietnam has a tropical climate in the South that ranges to subtropical in the North, while both are dominated by the monsoons. In the North there are four clearly different seasons in a year including Spring, Summer, Autumn, and Winter. Spring lasts from February to April with warm weather, characterized by fine drizzle that helps plants grow fast and flowers bloom. Summer lasts from May to August with hot and showery weather. The sun shines most days, but there are sometimes sudden thundershowers that make summer less hot of humid. Autumn lasts from September to November with cool air, and dry and lightly windy weather, although in this season typhoons threaten both life and agriculture. Winter lasts from November to January with cold and dry weather.

The southern region is predominantly sub-equatorial with two main seasons, a wet rainy season and a dry season. The wet rainy season ranges from April to September. The dry season is from October to March. Although there are varieties of weather across the seasons and regions, overall Vietnam is basically characterized by a hot and wet climate which impacts on health and diseases.

People and population

The government statistics (GSO, 2009) suggest there are up to 54 different ethnic groups inhabiting in Vietnam, of which: the so-called "Viet" or "Kinh" are nearly 73,6 million, accounting for 85.8% of the population. Historical documents suggest the Viet "Kinh" was the first major group to live in Vietnam, with other groups migrating from the South Eastern Asian area, principally China, a few hundred years ago. However, there are still a few ethnic minority groups such as Khmer and Cham, descendents of inhabitants who lived in the central and southern regions before the area became recognised as Vietnam. The other main ethnic minority groups are Muong, Pathen, and Pupeo. The Kinh population is concentrated in the alluvial deltas and coastal plains of the country (including Red River Delta in the North and Mekong Delta in the South). As a homogeneous social and ethnic group, the Kinh are the dominant group exerting political and economic control, throughout the country.

Although Vietnam (in land and resources) is a small country, it is the 3rd most populous country in South East Asia and the 13th most populous country in the world. According the 2009 Census the population of Vietnam is 85,789,573 (GSO, 2009), with, as can be clearly seen in Figure 2.3 a continuous increase in population. The average population density is currently 260 persons per square kilometre, with a higher density in the plains area of the Red River Delta more than 900 persons per square kilometre. The population density of Vietnam at the present is higher than that of the standardized density of other developing countries including China. This is gives Vietnam problems in many areas, including the provision of qualified healthcare services.

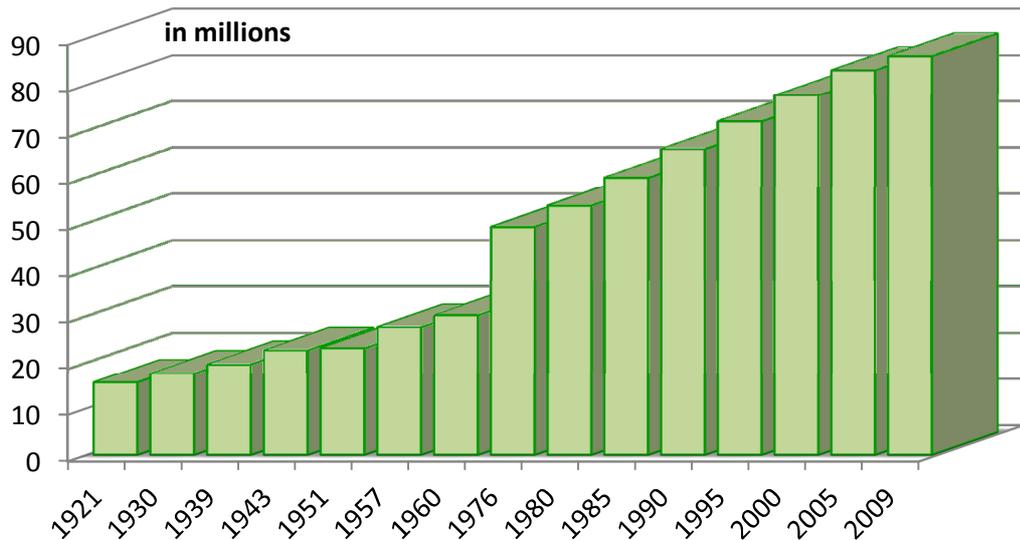


Figure 2.3. Average population of Vietnam over periods (*recapped data GSO 2009*)

Languages

The people of Vietnam speak Vietnamese, as both the mother tongue and the official language. This is a tonal monosyllabic language with each syllable having six different tones that can change the meaning of the word. This makes it difficult for immigrants, and as a result other languages are spoken by several of the minority groups. These have been used and preserved in daily life today all of these groups learn Vietnamese is their second language. Other languages also spoken include Chinese, French, Russian, and English. In recent years, English has become more popular and in many places is the second language with English study obligatory in most schools, although Chinese and Japanese have also become more popular.

The Vietnamese writing system, called “quoc ngu” (national language) in use today is adapted from the Latin alphabet system, with additional diacritics to indicate tones and certain letters. This system was created in the 17th century by a French Catholic missionary, Fr. Alexander De Rhodes to translate the scriptures. When France invaded Vietnam in the late 19th century, French became the official language in education and government thus Vietnamese also adopted many French terms, such as “ga” (train station, from gare), “sơ mi” (shirt, from chemise), “búp bê” (doll, from poupée). These were added to the many Sino-Vietnamese terms for Western ideas that came from the earlier centuries of Chinese domination. From the beginning of the 20th century education became more widespread and a simpler

writing system was developed to facilitate teaching and communication with the general population.

Religions and beliefs

Religions have strongly influenced the cultural life of the people and the Vietnamese concept of life. About 85% of Vietnamese identify with Buddhism, though not all practice on a regular basis. Christians are about 8 per cent of the population and the remainder ascribe to other religions such as Cao Dai and Hoa Hao. However, the beliefs and attitude towards life, death, and the world beyond are strongly based on a combination of Buddhism, Confucianism, and Taoism.

Buddhism introduced into Vietnam under the Chinese domination, in the second century B.C. and remained the state religion through the Ly Dynasty (1010-1214), and the Tran Dynasty (1225-1440). Buddhism in Vietnam preaches that man was born into this world to suffer. The cause of suffering is the craving for wealth, fame, and power that necessarily brings about frustration and disappointment. In order to be free from suffering, man must suppress craving. Although Buddhism has lost the status of a state religion it remains a major cultural force.

Confucianism was introduced into Vietnam as early as the first century, also during the Chinese domination. This is more of a religious and social philosophy than a religion in the accepted meaning of the word. It advocates a code of social behaviour that man ought to observe, these consist of three basic relationships, between sovereign and subject, father and son, and husband and wife. On the national level the basic virtue is loyalty to the sovereign, and on the family level, the basic virtue is filial piety with ancestor worship seen as part of living in harmony with society and attaining happiness in life.

Taoism also introduced into Vietnam during the Chinese domination period has also made a deep imprint on the way of life of the Vietnamese. The founder of Taoism, advocated a philosophy of harmony between man and man, and between man and nature. To achieve this state of harmony, all forms of confrontation should be avoided. The virtues of simplicity, patience, and self-contentment must be observed. Reason and knowledge alone cannot lead man to the right path, it can only be reached by inward probing and quiet meditation.

Administrative structure

According to the re-written Constitution of 1992, Vietnam is a socialist country with a single political party, the Communist Party, which is also the governing part. However the overall intention of this revision was to provide a greater separation of party and State institutions with more power given to the latter. This had to be implemented within the inevitable changes caused by history. Vietnam is now divided into 58 provinces and 5 centrally governed cities that function and are considered to exist at the same level as the provinces. These centrally controlled cities are divided into urban districts and rural districts, which are subdivided into wards. The provinces are divided into districts, provincial cities, and county towns, which in turn, are subdivided into towns or communes. There are four levels of administration (Figure 2.4).

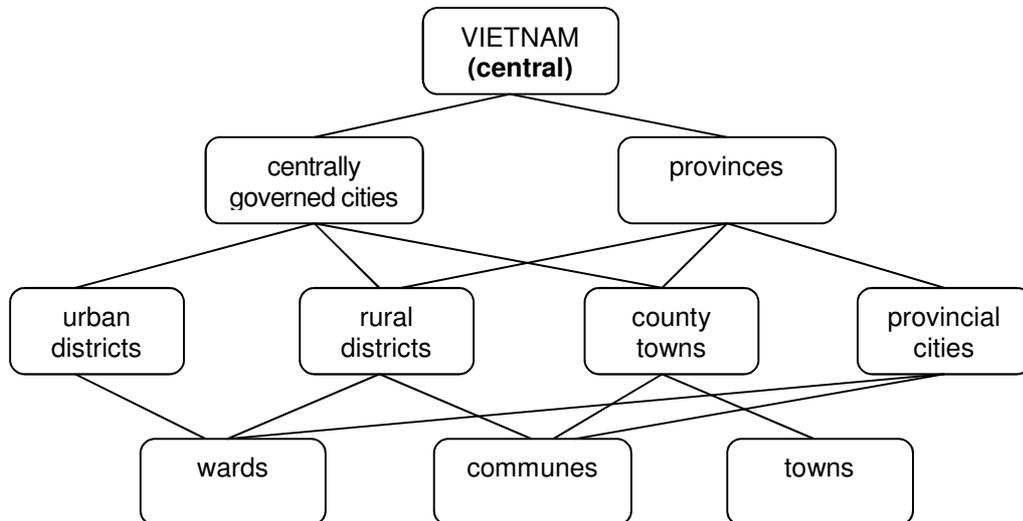


Figure 2.4. Administrative structure of Vietnam (*by Constitution 1992*)

Since “doi moi” (the renovation of government) in 1986, consistent policies on administration reforms have been implemented and these led to considerable changes and rearrangement of functions, tasks, and structural organizations of agencies belonging to the state administration system. This led to better state administration, the reform of administrative procedures and state administration agencies’ and achieved more effective and disciplined government. However, there are still shortcomings and limitations in several areas. These include unclear, overlapping, and incomplete functions and tasks for some units in the administration system. For example, the quality/ educational level of public servants is rather

limited when considered in the light of actual requirements, with the result that there is too much bureaucracy, and corruption, and wastefulness are still serious.

Socioeconomic and health indicators

After “doi moi” there was a strong commitment by the government to achieve development and reach new socio-economic and health goals. As a result, Vietnam in recent years can demonstrate important achievements in major socio-economic and health indicators. According to the GSO’s statistics (2006; 2009; 2010) in terms of US Dollars, the gross domestic product (GDP) per capita rose from \$722 in 2006 to \$1,168 in 2010, while the total expenditure on health per capacity was \$213 in 2009 and the total expenditure on health of GDP was 7.2% in 2009. The economic growth rate has increased rapidly, at an average rate of 7% per year, and the human development index (HDI) has continued to increase from 0.618 in 1990 to 0.709 in 2004, demonstrating that in education, health care and living standard, life expectancy has continually increased. It was to 71.3 years in 2006, and 72.84 years in 2007, with the infant mortality rate (IMR) reduced from 36.7 per 10,000 live births in 2000 to 16.0 per 10,000 live births in 2006.

Despite this significant progress Vietnam has continued to face many health related issues. The country is currently facing a double burden of disease with limited decline in communicable diseases, and increases in non-communicable diseases, accidents and injuries. Some traditional communicable diseases continue to have high prevalence rates in endemic regions such as dengue fever in the Mekong Delta, Malaria in the northern mountains and Central Highlands and tuberculosis which was declining, now increasing again. To cope with the health challenges, the government has implemented major policies aiming to partly decentralize the health sector. The focus is on devolving autonomy and accountability to provincial and district levels in terms of organization, rearrangement of administrative apparatus, and the use of labour and financial resources.

The development of medical science and information technology worldwide, together with the formation of high-tech medical centres and the establishment of in-depth specialities in hospitals have changed the possibilities for service provision. Until recently, healthcare services in Vietnam were completely free of charge. However, to help meet the rising costs of health care in many areas, charges at the point of delivery have had to be introduced. In addition, there has been another significant change in that care is now also becoming available from the private

commercial sector. In recognition of the problems that paying for health care can bring to families, another major initiative is the health fee exemption policy (often referred to as insurance) for those assessed as poor, those living near the poverty line, children aged under 6, the elderly aged over 85 and those diagnosed as HIV/AIDS patients.

EDUCATION AND TRAINING IN VIETNAM

There is little literature regarding education and training in Vietnam formally published or stored in databases. However education and training of Vietnam can be divided into two major periods with The August Revolution 1945 as a milestone. Before 1945, the education reached only the minority and was mainly 'feudalized' education, based on The Four Books and Five Classics (handed down by ancient Chinese about Confucius and used by his followers Shih Shu and Whu Ching) as formal textbooks, hence the philosophy of education was basically Confucianism with moral issues described by the oriental feudal system. Today this period is seen as being characterized by rhetoric, and acted as a form of brainwashing with information committed to memory and no reflection (Thuoc, 2000). Since 1945, Vietnam has undergone several wars, each of which impacted on education and following "doi moi" became structured as seen in Figure 2.5.

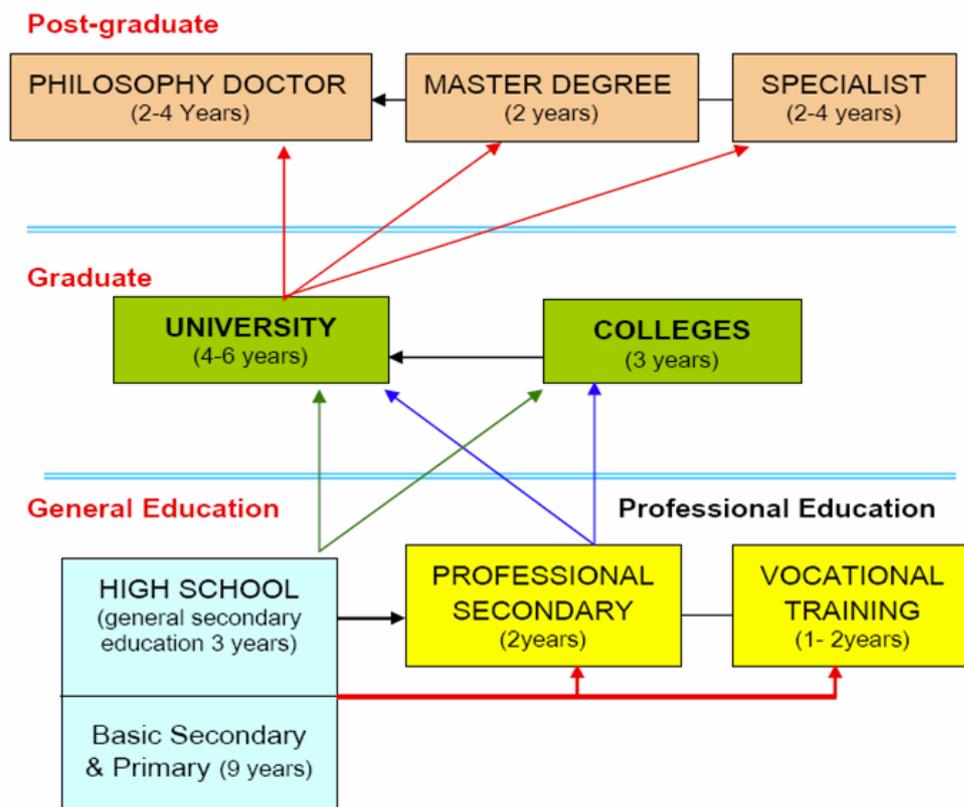


Figure 2.5. National Education and Training System of Vietnam (MOET, 2001)

Within the national education and training system, the importance of human resources development is well recognised and great efforts have been made to improve both education and training. The reform of the Technical and Vocational Education and Training (TVET) sector can be seen in almost all aspects, including curriculum development, teacher retraining, partnership strengthening between business and training institutions, the establishment of qualification frameworks, accreditation, management systems, and co-operation with international TVET institutions. In fact, the TVET system in Vietnam has gained some initial success in recent years but it is evident that there has been a long way to go with many pitfalls and obstacles to overcome. Resolving difficulties and filling gaps takes time, resources and great effort (PED, 2006).

After the re-unification of the country in 1975, education and training across the whole country followed the socialist system. But after “doi moi” in 1986 when the policy of market forces was introduced, training and education started to change. Vietnam has now an extensive, state-controlled network of schools, colleges and universities but, the number of privately run and mixed public and private institutions is also growing. General education in Vietnam has four levels: elementary, secondary, graduate and post-graduate. A large number of public schools have been organized across the country to raise the national literacy rate, which was 90.3% by 2008 (UNICEF, 2010). There are also a large number of specialist colleges, established to develop a diverse and skilled national workforce. Elementary education (from age 6 to 11) is free and mandatory. School enrolment in Vietnam is among the highest in the world and the number of colleges and universities has increased dramatically in recent years, there were 178 in 2000, 299 in 2005 and 379 in 2010.

As a result of the process of “renovation”, training and education in Vietnam have made remarkable achievements. These can be seen in many areas, including the diversification of the different types of training/education settings. There are now both public and non-public, formal and non-formal training possibilities rapidly increasing the number of learners and trainees. The knowledge level and the ability to access new knowledge have increased with training and education, leading to a widespread move towards learning through the whole country (MOET, 2001).

However, there have been unavoidable shortcomings, for instance the growth has tended to be in quantity rather than quality. Review of the real situation of training

and education reveals both advantages and disadvantages in terms of learner-oriented approaches. The training and educational approach receive significant concern from the government and society, but in comparison with other countries it is still perceived by most Vietnamese people to be at a lower level than most other countries. For this reason students who can afford to, tend to go abroad to study. The current shortcomings regarding training and educational shortcomings as summarized by Tuy (2005), Ngoc (2005) and Dang (2005) are given below:

- Studying and curricula are overladen but inefficient, with learners at all levels forced to deal with too much psycho-sociological pressure. The education and training system contains much study that is not related to learners' expectations and needs. This makes it difficult to develop well qualified professionals, whereas in many other developing countries learners study less but are able to meet and satisfy the demands of workforce and economic development.
- In comparison with other developing countries in the same region as well as in the world the education and training system is still backward. Despite many efforts and support to make it become regionally and internationally integrated, this has only occurred to a very small extent.
- The training and education system by itself is unable to motivate learners or to lead to self-learning. The passive way of learning is used by learners to gain socially recognition through diplomas and certificates. However, the knowledge and skills do not match their work needs.
- There have been attempts to use education and training models from other countries, which have been successful in some situations. However, overall the application of these models without critical considerations, prudent analyses of the Vietnamese context or real understanding of the models tends to be less successful.

It is clear that existing problems and their resolution are very complicated. The government and society have for a long time, been concerned to find the best way forward. Frequently asked questions include how to develop an efficient education and training system, which model should be used, which are the most urgent issues in the current situation, and which areas have been addressed. It is recognized that

any system that improves the situation is likely to have significance for the whole country.

HEALTH CARE AND DEVELOPMENT IN VIETNAM

The basis for the current healthcare system in Vietnam was developed in 1945 following independence, reinforced and further developed in the North in 1954, then the remainder of the country in 1975, and finally “reformed” in 1986. The system is now organised and operated in four levels as shown in Figure 2.6 (MOH, 2006e).

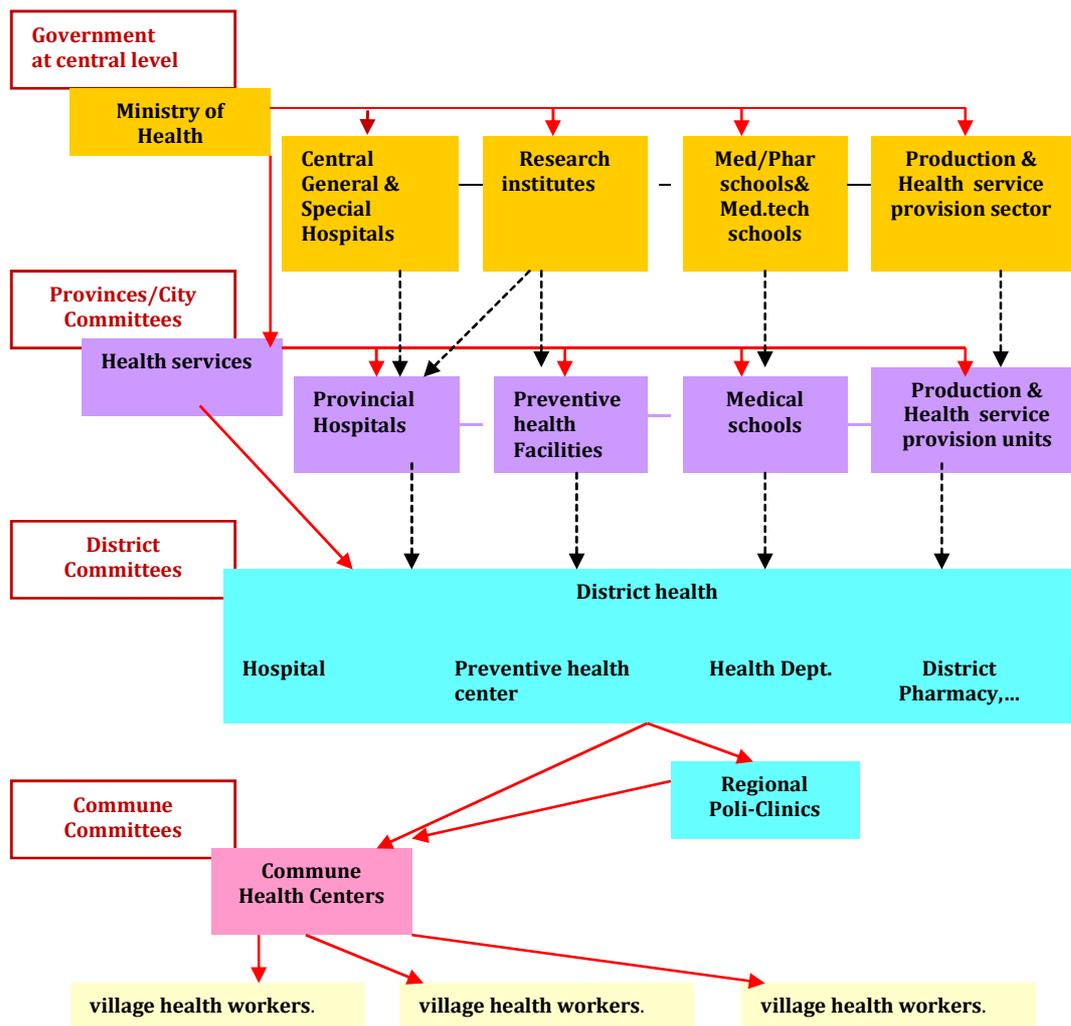


Figure 2.6. Structure of health system in Vietnam

Source: Department of Organization & Manpower (MOH, 2006e)

The Ministry of Health is the government agency responsible for the state management of people’s health. This includes health protection and health promotion, curative and preventive medical care, rehabilitation, pharmaceutical supplies, medical equipments and food safety. The provincial/city health service is

the professional agency that delivers services under the management of the Provincial/City People's Committee (PPC) in each provincial/city. This agency advises the PPC on the management of people's health care, protection and health promotion. It not only performs the tasks and obligations authorised by the PPC but is controlled by the MOH in terms of technical direction, guidance, monitoring and inspection. This similarity of performance tasks and functions is also seen in the other levels (district and commune health levels) meaning they too answer to the People's Committee and the higher level of health system. The level sometime referred to as the "grassroots" is lowest level, and is the commune health centre. This carries out early detection of epidemics, provides care and treatment for common diseases and obstetric care, contraception and teaches preventive hygiene. The health system is recognized as well organized and practical regarding the delivery and local and national coverage of health care, but to some extent it causes problems by having complicated and overlapping management, supervision and performance.

As in many developing countries, a high percentage of the population in Vietnam is very young; over 50% (45 million out of 86 million) are aged between 5 and 19 years (GSO, 2009). This presents a major health challenge for the Vietnamese government which, as the country rapidly develops, is trying to cope with changes in the nature and type of employment, accompanied by rising living standards and the increasing social and health expectations of the population. According to the Ministry of Health of Vietnam (2003), Vietnam is in a transitional period of disease pattern with infections are still a major problem, and other diseases gradually rising, or being increasingly recognised. In response to this since 2001, a series of health policies have been issued, at all levels. These have been supported by international aid from multinational and bilateral donors including the WHO which recognised the diverse issues arising within the domestic health sector and, as a result has become involved in a range of activities and projects.

By 2007, Vietnam had 1003 hospitals and 825 general clinics, this provided 18.1 beds per 10,000 habitants, and child immunisation rates were at 89% (MOH, 2008d). National strategies have been implemented to improve the quality of health services and their effectiveness and efficiency. Preventive medicine has also been promoted by the government with health facilities aiming to focus on surveillance, early detection and the treatment of disease (MOH, 2008a). According to the World Health Organization, Vietnam was the first country to effectively bring the spread of

the Severe Acute Respiratory Syndrome (SARS) under control (WHO, 2003a) but is currently battling with other diseases including the rapid rise of HIV/AIDS that has occurred since the opening of the borders.

Today, Vietnam has people living with HIV/AIDS in all 63 provinces (MOH, 2006c). Until recently the main reason for transmission was intravenous drug use with 65% being infected through the use of shared needles (MOH, 2006e). However, as sexual freedom has increased, in addition to the increasing incidence of Reproductive Tract Infections, sexual contact is becoming a common mode of transmission (MOH, 2006b). The rate of transmission rose so rapidly that, whilst in 1992 there were around 3000 cases in total, there was a predicted figure of 320,000 by 2010 (MOH, 2006a). The majority, 51%, of those with HIV/AIDS are aged between 20 and 29 years of age with almost 10% under 20 years of age (MOH, 2006a). This group, by nature of the disease pattern are likely to need ongoing care including antibiotics and it is essential that those prescribing understand and can assess which drugs to give. Maladministration in these cases can have major consequences (MOH, 2008d).

Community nursing has been identified by the Government as one of the essential services within the health sector (GOSRVN, 2001). Indeed, the development and provision of a well-equipped community nursing workforce plays a very important role in human resources for health. Strengthening the nursing-midwifery capacity, defining an appropriate staffing structure, developing training capacity and curriculum development were and remain, key issues. In 2003 the ratio of nurses to doctors was well below the WHO recommendations (between 4:1 and 8:1). Vietnam had 47,587 doctors; 64,375 nurses and midwives including 472 nurses at university level (0.7%), 47,368 nurses at secondary level (73.6%) and 16,535 nurses at elementary/primary level (25.7%); this gave a ratio of nurses to doctors of 1.3:1 (MOH, 2006e; 2007a). To redress this situation by the end of the decade, it was evident that Vietnam needed some 78,000 additional nurses with 40% (31,000) trained at university and college level (GOSRVN, 2001). At present, the government and specifically the Ministry of Health, has focused on supplying the concrete guidance required and proposing the national and international investment solutions necessary to improve the quality of nursing. However, it has now released funding to increase the numbers of community nurses and healthcare professionals to try to redress the low doctor/ nurse ratio and improve community care.

Professional health education and training in Vietnam is as the above information indicates provided at four levels: primary, secondary, college and university level (Table 2.1). University training takes place in the few Universities, there are around 40 Colleges of Medicine and Pharmacy, with approximately 100 centres training nurses (and other health workers) to secondary level. To continue to improve courses there needs to be increased levels of knowledge and skills amongst educators, specifically nurse educators. The two upper levels have only been in place for about 10 years for nurses (and midwives) with the majority of institutions only training lower level of nurses and health care workers.

Table 2.1. Types of health workers in Vietnamese health system
Source: Department of Science and Training, MOH 2007a

Levels of training and education	Professionals
1. University (4-6 years)	<ul style="list-style-type: none"> • General medical doctor • Odontology doctor • Traditional medicine doctor • Preventive medicine doctor • Bachelor of Science in Nursing • Bachelor of Science in Public Health • Bachelor of Science in Medical Technology • Pharmacist
2. College (3 years)	<ul style="list-style-type: none"> • Nurse • Midwife • Medical technician
3. Secondary (2 years)	<ul style="list-style-type: none"> • Nurse • Midwife • Assistant doctor • Pharmacist
4. Elementary (1 year or less)	<ul style="list-style-type: none"> • Nurse • Midwife • Pharmacist • Village health worker

Increasing the number of training providers to meet the workforce demand has also led to challenges and problems regarding the quality of education provided. Most schools were inexperienced regarding human resource development in areas such as motivation, recruitment, appraisal, and career orientation. Teaching staff had no experience in developing curricula and lacked the opportunity to be exposed to new

and active methods of teaching. School managers were mainly medical doctors who had very little training on education management. As a result curricula and programmes for training vary from school to school, with little well matching to practice needs and an excess of subjects which may or may not contain essential knowledge for practice.

The problem is that in addition to the changes in education and training, nurses and midwives need to adapt to both socio-economic developments and medical advances. Enhanced clinical knowledge, skills, attitudes and techniques are required. There is an expectation that they will develop community-based services particularly in disadvantaged areas, work with the socially underprivileged and those on low incomes. In response to the growing prevalence of HIV/AIDS and the absence of home care, community nurses increasingly need appropriate models for teaching the prevention of transmission, as well as the skills to provide effective and compassionate care for people and communities living with, and affected by HIV/AIDS. It is only through such major changes and initiatives that healthcare workers (mainly community nurses) will be able to contribute to a reduction in morbidity, mortality and disability and, through this, support increases in health equity. However, raising the quality and knowledge level of these workers to achieve these targets is, and will remain an ongoing issue. High standards of practice cannot be developed in isolation; they must fit within government policies regulating the practices of health professionals.

Raising the standard of community nurses may have a second and important social effect. It was noted that, in 2005, 90% of nurses were women (World Bank, 2006b). It is anticipated that promoting nursing as a scientific, knowledge-based profession will not only improve health care, and through that the health of the population, but will also help to advance gender equity in the health sector. However, for this to be possible, policies that contribute to the improved social and economic status of nurses in the health sector and society as a whole are needed. Thus this study with its focus helping nurses increase their knowledge and understanding of antibiotic administration and so on preventing misuse fits well within the government strategy of improving health in the community. Based on data from the MOH's reports (2003, 2006d, 2006e, 2008b) a brief SWOT of education and training indicates:

Strengths: there is a climate of reform at government level, and this favours the development of programmes in health promotion. The government has high

ambitions to reduce poverty and inequality. This is not only a political goal but includes policies for budget allocation, and special programmes to support to those living in poverty through health “insurance”. There are possibilities for local level administrators to formulate individual strategies to implement health services from the national health sector policy framework. There are some good initiatives based on collaboration with international assistance/donors.

Weaknesses: the implementation of the national reform policies has been very limited at local/micro level in spite of the strong commitment at macro level. This reflects the weak coordination between the organizations responsible for the reform process as well as between the different levels in the system. The provision of health services is fragmented because of the various agencies and departments involved. The health system at the lower levels demonstrates weaknesses in information feedback and utilization of opportunities to improve the quality of health services.

Opportunities: the administrative system is uniform, and favourable for the introduction of new features for example national programmes that can have impact on the whole country relatively quickly. There are opportunities for learning from best practices in other countries. Support for new programme in key areas can be given at Ministerial level, so facilitating implementation.

Threats: there is a strong dependence on policy initiatives from other authorities and there is still a passive attitude at some of the higher levels. The decentralization policy together with unrealistic expectations of the outcomes of implementing health insurance have increased inequity and reduced the impact of good policies. There is still insufficient attention to developing new health initiatives and biased resource allocation continues.

The strengths and opportunities are conducive to the introduction of a programme approach for instance a training/educating programme supporting professionals working at the lower levels of the health system. However, in relation to the weaknesses and threats there may have difficulties in retaining the impact of a programme and in transferring any established programme because of an absence of policy support. Thus any programme needs to be developed to stimulate the interest of the health workers and be strongly linked to their own experience.

SOCIAL HEALTH INSURANCE IN VIETNAM

The Social Health Insurance (SHI) has been introduced since the early stage of economic renovation in Vietnam. The SHI was piloted for the first time in 1989, when the government recognized the importance of health care accessibility for those who could not afford user fees at health facilities. The first SHI regulation, i.e. Decree 299/HĐBT dated on 15 August, 1992, marked further changes in health care policies of the government. The current SHI comprises three sub-schemes: the compulsory SHI, the voluntary SHI, and the SHI for the poor. Under the current regulations, compulsory participation is applied to all active workers and retired people in the public sector, as well as salaried workers in the private sector regardless the size of enterprises. In addition, some groups of people, such as foreign students in Vietnam, advanced aged people (90 years old and over), and veterans and dioxin victims, are also included in this scheme. In particular, the poor have also been included to the compulsory scheme since 2005. The regulations of the voluntary SHI were not significantly changed until 2006. The Circular 22/2005/TTLT-BYT-BTC dated on 24 August, 2006 provided crucial requirements on coverage, i.e. the minimum rate of participation. For instance, a household can participate in the scheme only when at least 10% of the number of households in their community has participated in the scheme. This is also the required minimum rate in the voluntary SHI for association-based members, as well as pupils and students.

The benefit packages provided to the participants of the compulsory SHI include inpatient and outpatient services at all health care levels, laboratory exams, x-ray, and other diagnostic imaging procedures. Some expensive high-tech health services, such as open-heart surgery, are also covered by the compulsory SHI. Even though the poor have low contribution, they also have the same benefit packages as other compulsory participants. There is also a list of reimbursable drugs, which is comparable with those in some developed countries (HSPI, 2006). Members of the voluntary SHI are also entitled to both inpatient and outpatient cares at all health care levels. Regarding health facilities, the insured participants are eligible not only for the public health facilities, but also for the private facilities which have contracts with the health insurance agencies.

To achieve their ambitious policy aiming at a universal social health insurance by 2010, Vietnam is facing a variety of difficulties in extending voluntary coverage to rural people, who currently account for more than 70% of the total population (GSO,

2009). Among the rural population, farmers and self-employees account for a large proportion. Currently, the number of rural people participating in the voluntary scheme is less than 3% of the total rural population. Evaluations of previous reports indicate that most of the voluntary SHI programs in rural areas are not sustainable in both coverage and financing, because of such reasons as people's lack of knowledge on health insurance, unaffordable payments without assistance from other financial sources, and low quality of services provided by local health facilities.

THE COMMUNE BASED HEALTH SERVICE

The commune health centres are based within local communities and are the first point of contact for those seeking healthcare provision. Their services include public health, health education and the administration of medicine in general and of antibiotics in particular. As with other areas in health service provision, the commune level is also facing recruitment problems. According to the Vietnam National Health Survey 2001-2002 (MOH, 2003) the percentages of communes having doctor fluctuate from approximate 22% to 85% (mostly, one resident doctor per commune health centre). At commune centres, health workers with different qualifications carry the main responsibility for prescriptions and carry out alone most of the work regarding the administration of drugs. Yet health care services in the health communes are mainly provided by doctors' assistants and nurses with low levels of training because there is major shortage of resident doctors.

There are 10,732 communes distributed among 659 districts in the 63 provinces, and most communes have their own commune health centre. In terms of manpower for health, the annual growth of health workers is at a lower rate than the population growth, 1.06 percent compared with 1.40 percent during the period of 2000-2003. Vietnam, therefore continues to face a shortage of health workers. By the year 2007 although the grassroots healthcare network covered had health workers available in 100% of the communes and wards. However, only 55% of commune health centres have met national benchmarks (MOH, 2008d). Beside the manpower shortage conditions for working and accessing information are also limited. Despite the efforts made by national and local authorities to improve the working conditions for commune health centres, as clearly set out in official documents (as well as the considerable financial investment) (MOH, 2002 and 2004c) the equipment of commune health centres currently is still poor. In Nam Dinh Province, recognised as one of the leading localities for developing commune health centres that match the national standards, a survey showed that only 51 items were supplied, and they met

only about 30% of targets expected. Furthermore, most of the existing equipment is old and ineffective, with them only able to carry out simple clinical assessments and treatments (CPVCC, 2011) as illustrated in Figure 2.7.



Figure 2.7. Working conditions in commune health centres

CONCLUSION

Through the process of “doi moi” the country has gained numerous great achievements. However, like other developing countries problems arising from demographics factors, training and education, and health are still major challenges. In an attempt to provide health care to the whole country, commune health centres have been designated as the basic and essential component of the national health system. Regarding the aim of this study, the use and administration of antibiotics was, is, and will be inevitable with the commune health level as the first point for access. Although there is evidence of the problems of antibiotic use and misuse in Vietnam, there is little research evidence available regarding drug administration, the factors that impact on prescribing of antibiotics, their level of expertise or the in-service education and training for this group (MOH, 2004a). Efforts directed at education and training at commune health and aimed at improving the quality of health service provision could have a major impact on practice, and through that on the health of the community.

CHAPTER 3. SUPPORTING LITERATURE

INTRODUCTION

This chapter gives a review of literature that supports the research. Therefore, the chapter firstly presents the background of antibiotics including the nature of antibiotics and antibiotic resistance. The next section of this chapter discusses problems with the use of antibiotics together with connected consequences nationally and worldwide, and the approaches to containment of antimicrobial resistance. In the Vietnamese commune health centres where health workers have the main role for providing healthcare service for their community; staff are disadvantaged in many ways, especially with regard to education and training. As the study aimed to develop a conceptual framework and model for education and training for commune health workers this chapter also addresses the principles of adult learning theory, and models of learning and teaching. The chapter lastly but not least, summarises the methodological approaches supported to the research.

BACKGROUND

The importance of antibiotics has been known for decades. Since their discovery these drugs have saved countless lives (from death caused by bacterial infectious diseases). As a result, they have also been thought of as “wonder” drugs and misuse of these drugs became an inevitable fact. The problems of antibiotic use have arisen from a combination of many cultural and socio-economic factors all of which have strong influences on the use of medications in general as well as on the use of antibiotics in particular (Avorn, 2000). Surveys showed these involve policy makers and healthcare workers. The availability of medicines to the public is being promoted by governments to reduce national expenditure on healthcare, but while this facilitates community access and possession of medicines, the reverse of this is the ever increasing out-of-control use of medicines. In clinical settings, a prescription for an antibiotic is often seen as the quickest way to end the visit of a patient with possible infectious symptoms. In addition, there are increasing numbers of patients who have misconceptions about the effectiveness of antibiotics (Vanden et al, 2003). This is in part because marketing campaigns by pharmaceutical companies have served primarily to persuade people to demand newer, more costly antibiotics in clinical situations in which older, generic, or no antibiotic at all, would often work well.

Antibiotics

Since Benzathin benzylpenicillin (penicillin G), the original beta-lactam antibiotic, was first discovered by Fleming in 1928 and used for the first time in 1941 to treat a staphylococcal infection (WHO, 2001a), many efforts have been made to develop new antibiotics having better properties including better chemical and physical properties, stronger antimicrobial activity, broader spectrum, better pharmacokinetic and pharmacodynamic properties, and less resistance by beta-lactamase. Antibiotics, also known as antimicrobial drugs, fight infections caused by bacteria. Alexander Fleming discovered the first antibiotic, penicillin, in 1927. After the first use of antibiotics in the 1940s, they transformed medical care and dramatically reduced illness and death from infectious diseases.

The term "antibiotic" originally referred to a natural compound produced by a fungus or another microorganism that kills bacteria which cause disease in humans or animals. Some antibiotics may be synthetic compounds (not produced by microorganisms) that can also kill or inhibit the growth of microbes. Technically, the term "antimicrobial agent" refers to both natural and synthetic compounds; however the word "antibiotic" is commonly used to refer to both. The word "antibiotics" comes from the Greek, anti ("against") and bios ("life") (Hornby, 2005). Though definitions of antibiotics exist, they are basically defined as drugs that either destroy bacteria (bactericidal) or prevent their reproduction (bacteriostatic). An antibiotic, in terms of medicine, is a drug used to treat infections caused by bacteria. Originally, an antibiotic was a substance produced by one micro-organism (for example penicillin produced by fungi) that selectively inhibits the growth of another, meanwhile synthetic antibiotics were produced, usually chemically related to natural antibiotics. Antibiotics are purposely used for treatment or prevention of bacterial infections. These definitions of antibiotic have also been acknowledged and pertained to both the academic and practical approach in Vietnam (MOH, 2005; 2009).

There are several schemes of classification of antibiotics, based on bacterial spectrum (broad versus narrow); route of administration (injectable versus oral versus topical) or type of activity (bactericidal versus bacteriostatic). In clinical practice, the classification based on chemical structure is counted as the most useful. Antibiotics within a chemical structural class generally show similar patterns of effectiveness, toxicity, and allergic potentials (Chambers, 2006). Based on chemical structure antibacterial agents include β -Lactam, Aminoglycosides, Quinolones, Glycopeptide, Macrolide and Azalide and Ketolides, Metronidazole and

Clindamycin for Anaerobic infections, Streptogramins and Oxazolidinones, and Tetracyclines (Craig, 2007).

Antibiotics generally exhibit three major patterns of antimicrobial activity. The first pattern is characterized by concentration-dependent bacterial killing. With this pattern, higher drug concentrations result in a greater rate and extent of microbial death. This pattern is observed with specific classes, included aminoglycosides, fluoroquinolones, daptomycin, ketolides, metronidazole, amphotericin B, and the echinocandins. From this pattern, the goal of a dosing regimen for these drugs would be to maximize concentrations (Craig, 2007). The second pattern is characterized by minimal concentration-dependent bacterial killing, also called time-dependent killing. With this pattern the extent of microbial killing is primarily dependent on the duration of antibiotic exposure at minimum inhibitory concentrations, drug concentrations above these values do not kill microbes faster or more extensively. This pattern is observed with beta-lactam antibiotics, macrolides, clindamycin, glycopeptides, tetracyclines, linezolid, and flucytosine (Andes, 2002; Safdar, 2004). Based on this pattern a dosing regimen for these drugs would be to optimize the duration of exposure. The third pattern is also characterized by time-dependent killing, but the duration of the persistent effects is much prolonged. This can prevent any re-growth of microorganisms during the dosing interval. This pattern is observed with azithromycin, macrolides, clindamycin, tetracyclines and glycylicyclines, streptogramins, oxazolidinones, glycopeptides, and triazoles. As a result, a dosing regimen is to optimize the amount of drug administered to ensure that killing occurs for part of the time and there is no re-growth during the remainder of the dosing interval. In clinical practice, the patterns of antimicrobial activity mentioned above are important determinants of optimal dosage regimens involving the dosage, the intervals of administration, and the duration of a full course that an antibiotic is taken.

Antibiotic resistance

Antibiotic resistance is the ability of bacteria to withstand an antibiotic to which they were once sensitive, were inactivated or killed outright. Bacterial resistance can be defined genotypically, which means the bacteria carry certain resistance elements, phenotypically, that is to say the bacteria can survive and grow above a certain level of antibiotic in the laboratory, or clinically, that is namely the bacteria are able to multiply in humans in the presence of drug concentrations achieved during therapy (Anderson, 2004). Bacterial clones with natural and acquired resistance have

constantly been selected as an evolutionary response to the use of antibiotics. Looking back to the process of the production and use of antibiotics, it is clear that the circle of antibiotic development and resistance continues. A example of this is penicillin which was discovered in 1927. While it was available in the European theatre during World War II, it did not become available on the open market until 1944, but by the year 1945, there already were the first penicillin-resistant *Staphylococcus aureus* (PRSA) and that advanced to 25% resistance by 1949, and 50% by 1959. By this time, research had led to the development and release in 1960 of a new drug that was active against PRSA, methicillin (Lewis,1995). The cycle of release of a new drug, the development of resistant bacteria and the consequent need for new drugs that has continued, with more and more infections becoming harder to treat (Cars and Nordberg, 2004).

Over time, bacteria have developed several ways to resist antibiotics. The use of antibiotics has triggered a combination of genetic and biochemical mechanisms within the bacteria to secure their survival (Huitric, 2009). One of the major mechanisms is that bacterial clones with natural and acquired resistance have continuously been selected as an evolutionary response to the use of antibiotics. The other major mechanism is horizontal gene transfer between bacteria both within and between species (Anderson, 2004; Nordberg, 2005). The genetic alterations in bacteria cause resistance to antibiotics in one or more of four principle ways: the target molecules of microbacteria are structurally altered to prevent antibiotic binding; antibiotics are excluded from cell entry; inactivated by degrading enzyme; or pumped out the cell (Figure3.1).

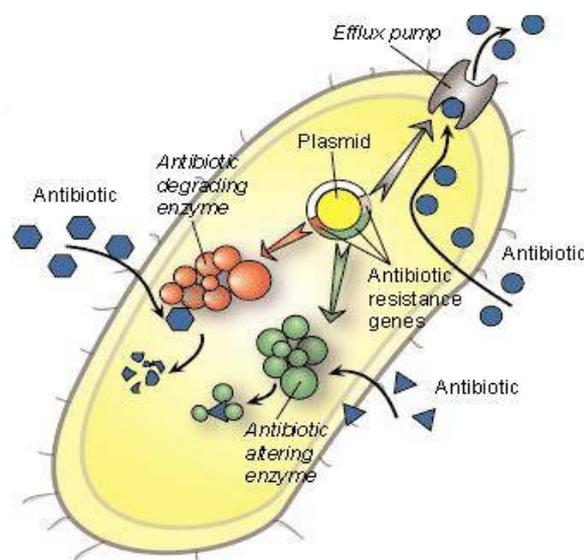


Figure 3.1. Mechanisms of resistance. Source: Uppsala, Sweden Report 2004

The successive introduction of new antibiotics has itself catalysed the accumulation of resistance mechanisms that travel between microbes, creating clones with multi-resistant properties (Anderson, 2003). Today, the pattern of a new antibiotic followed by the development of resistant bacteria can be found all over the world (Cars and Nordberg, 2004). Coupled with microbial genetic adaptation and change, the misuse of antibiotics has become a major determinant of bacterial resistance (Smolinski et al, 2003). Although knowledge of the direct relationship between the quantity of antibiotic used and the frequency of resistance is still lacking, there is consensus amongst different organizations and policy makers that antibiotic misuse is indeed a major cause of bacterial drug resistance (Levy, 2001).

It is recognised that this is a complex issue and that the problem is not simply due to misuse by the individual, but countries too can contribute to this problem. For example, after the anthrax scares in the United States (US) in October 2001, about 10,000 (or more) postal employees were put on antibiotics like ciprofloxacin/doxycycline. Many of these individuals were put on these antibiotics for sixty days, rather than the usual seven, ten or fourteen-day course used for most infections. It is expected that this over prescribing of this antibiotic will result in even more resistance to ciprofloxacin and other fluoroquinolones. This is worrying as by 2002 around 50% of cases revealed methicillin resistance. It is important to note here that although resistance grows by a small percentage each year, in the last 20 years it has increased 20 fold, far more than would be expected (M'ikanatha, 2005).

Reports from Antimicrobial Resistance Surveillance Systems indicate increasing resistance and multi-resistance of common pathogens to commonly used antibiotics (Nweneka, 2009). The Annual Report (2005) by the European Antimicrobial Resistance Surveillance System (EARSS) indicated that this has led to an increased overall threat to European communities with an increasing loss of antimicrobial effectiveness continuing unabated. EARSS's data covers antibiotic resistance in all common infectious pathogens including *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Escherichia coli*, *Enterococcus faecium* and *Enterococcus faecalis* (EARSS, 2005; Nordberg, 2005). In the UK, reports from the National Audit Office for Management and Control of hospital acquired infections (HAIs) showed the number of HAIs is more than 300,000 cases per year with more than 5,000 patients dying per year (Wyeth, 2006). It is interesting that in modern healthcare, hospitals and medical centres appear to be making individuals more

vulnerable to multi-resistant pathogen proliferation than ever before. This is in contrast to developing countries, where acquired bacterial resistance to antimicrobial agents is more likely to arise from community-acquired infections.

The most prominent resistance is in Asia where the rates of resistant pneumococci (one of the common pathogen causing respiratory infections) have become alarming. The statistics from the Asian Network for Surveillance of Resistant Pathogens (ANSORP) revealed high rates of bacterial resistance and increasingly multi-drug resistance (MDR) in this region (Figure 3.2) (Song, 2004). Poor administration factors contributing to this multi-resistant bacterial proliferation include poor infection control practices, overcrowding, poor sanitation, poor drug quality and inadequate surveillance after prescription. In fact, the emergence and spread of antimicrobial resistance are complex problems driven by numerous interconnected factors relating to both patients and prescribers, many of which are related to misuse of antimicrobials (WHO, 2002). This is a problem found in all levels in health care systems (Holloway and Green, 2003) and thus amenable to change.

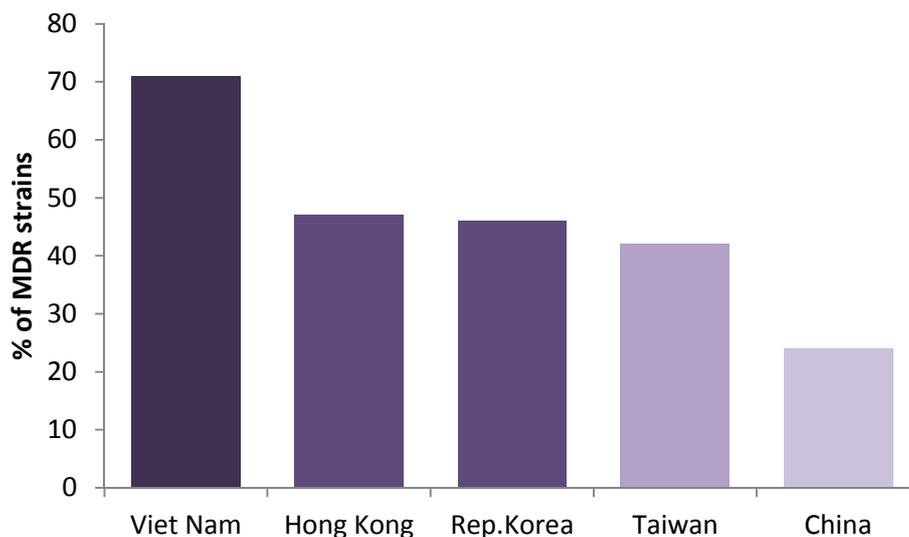


Figure 3.2. Multi-drug resistance in Asia: pneumococci resistance

Source: the ANSORP's report 2004

In recent years, the problem of bacterial resistance in Vietnam has become an increasing concern. The findings of the Antibiotic Susceptibility Test Surveillance (ASTS) conducted in ten large-scale hospitals sponsored by the Swedish International Development Cooperation Agency (SIDA) indicated that five common infectious pathogens (Klebsiellasp, E.coli, Acinetobacterssp, Pseudomonas

aeruginosa and Staphylococcus aureus) were all multi-resistant to commonly used antimicrobial agents (Figure 3.3) (Vinh, 2006).

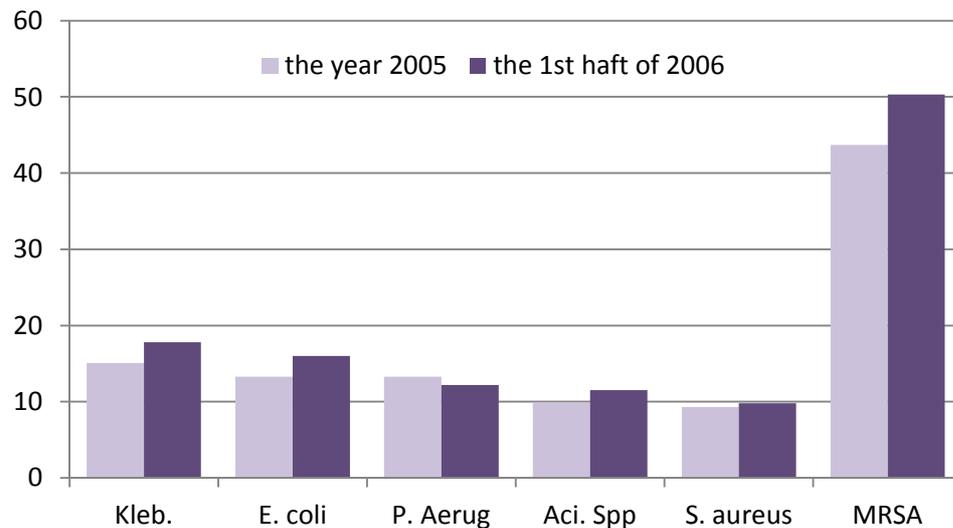


Figure 3.3. The rate (%) of resistance of pathogens to common used antibiotics in Vietnam. *Source: National Report of ASTS 2006*

These findings match previous studies which had also demonstrated multiple resistance to many antibiotics that used to be very effective, including ampicillin, chloramphenicol, tetracycline, trimethoprim-sulfamethoxazole, and streptomycin among shigella isolates in both Thailand and Vietnam (Daniel, 2002).

Problems with antibiotic use

Worldwide

According to the World Health Organization (2009, p.1), rational and safe use of medicines requires that

"patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community."

The WHO also estimates that more than half of all medicines used worldwide are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly. Irrational use of medicines prefers to the overuse, underuse or misuse of medicines. Examples of irrational use of medicines include the use of too many drugs per patient, inappropriate use of antimicrobials such as prescribing an inadequate dosage, and using them for non-bacterial infections. Other examples include the overuse of injections when oral formulations would be more appropriate,

failure to prescribe in accordance with clinical guidelines, inappropriate self-medication, often of medicines that should be prescription-only and non-adherence to dosage regimes. All of these not only result in wastage of medicines but are hazardous to public health.

Antibiotics have confirmed beneficial effects, but this in itself has contributed to the problem of antibiotic resistance. The pressing need for the use of antibiotics to treat infections worldwide, and the emergence of new strains of infectious diseases is an ongoing problem. Human susceptibility to infection, climate and weather, changing ecosystems, economic development and land use, human demographics and behaviour, technology and industry, international travel and commerce, breakdown or absence of public health measures, poverty and social inequality, war and famine all impact on antibiotic use and misuse (Nweneka, 2009). Mortality as a result of infectious diseases is still high and represents one-fifth of deaths worldwide. Deaths from acute respiratory infections, infectious diarrhoeal diseases, measles, AIDS, malaria and tuberculosis account for more than 85% of the mortality from infection across the world, with respiratory infections being the leading cause of death (Figure 3.4) (Nordberg, 2005).

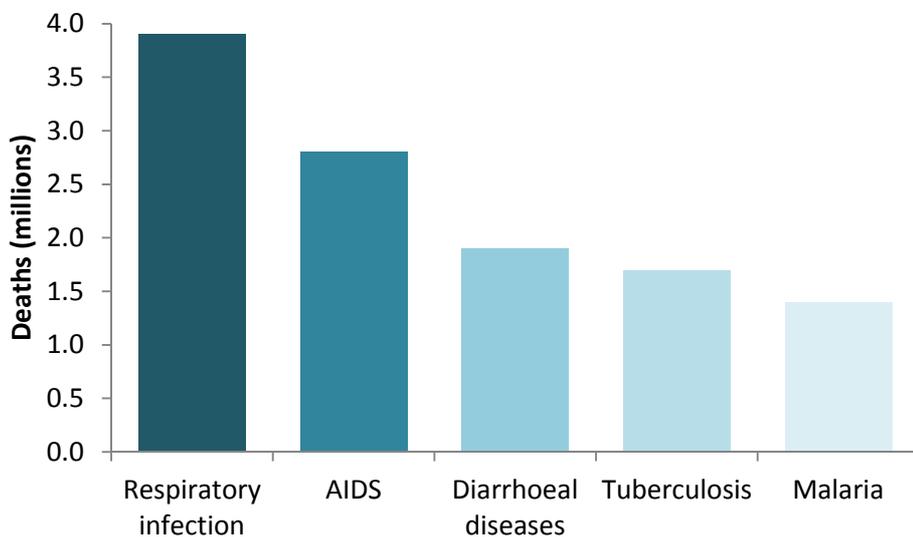


Figure 3.4. Mortality from infectious diseases, worldwide, all ages

Source: WHO's Report 2003

As described above, microbial drug resistance is a natural biological outcome of antibiotic use. The more antibiotics are used, the more the emergence and selection of resistant bacteria are increased, with nationally and globally, the extensive

misuse of antibiotics being a major contributor to the development of resistance (Cornaglia, 2004). In industrialized countries, around 80-90% of antibiotic consumption in humans takes place in the community, with about half of this prescribed and used based on incorrect indicators, for example for non-bacterial or viral infections (Cornaglia, 2004). In developing countries, although the need for other essential medicines has still to be realised, the use of antibiotics appears to be same as in the developed world. Research has indicated that in the developing world too, common problems of antibiotic use include incorrect medical indicators, the unnecessary use of antibiotics (e.g. using antibiotics for most simple ARIs, or using an antibiotic for a common diarrhoea), the use of inappropriate antimicrobial agents, using under dosing and/or too short a treatment duration) (Avorn, 2000; Nordberg, 2005).

Misuse of drugs can be found in both patients and physicians, in all age and genders, nationwide and worldwide (Vanden, 2003). Research into antibiotic use found that common mistakes in patients included using antibiotics as the “best medicine” for infections caused by viruses, stopping taking antibiotics before completion of the recommended course, and saving “spare” antibiotics and using them again at a later time (Kardas, 2005). Tenaiji’s (2008) research with parents in Al-Ain (the United Arab Emirates) found that only 15% of participants knew that antibiotics should only be used to treat bacterial infections, and that 71% did not know about the possibility of antibiotic resistance, those who did know were highly educated. Half of the participants did not know that indiscriminate use of antibiotics for treating fevers could lead to antibiotic resistance, while 48% thought that antibiotics were often needed for common cold symptoms. Some 30% had requested antibiotics and 20% had consulted another doctor to get antibiotics if refused by the first physician, 21% had given their children antibiotics without a doctor’s prescription, 31% admitted not following their doctor’s instructions, with 24% not completing the full course and 21% sharing antibiotics between their children.

Even where prescriptions are necessary, according to an estimate by the WHO (2001b) approximately one third of the 150 million prescriptions for antibiotics dispensed each year are unnecessary. Within the developing world, in Africa, 50% of all out-patients took antibiotics, while in Bangladesh, 67% of in-patients took antibiotics and in these countries 50% of usage was not appropriate. The blame for misuse is often placed on the patients or consumers, with misuse by health workers

receiving much less recognition by themselves as well as in research studies. Of the limited research that has been done, concerns included lack of information, inadequate knowledge, and in developing countries, a lack of clinical tests to diagnose bacteria and the erroneous belief in the universal effectiveness of antibiotics. These factors will have unintentionally furthered the inappropriate use of antibiotics by health workers (Okeke, 1999; Howteerakul, 2004; Parimi, 2004; Gouws, 2004). It is clear that the misuse of antibiotics involves both patients and health workers but the misuse by health workers logically occurs first and must and can be prevented.

Vietnam

Before the 1980s, during the time of the subsidized economy, lack of essential drugs was a pressing concern for the nation (Truyen, 1996). According to SIDA (Valdelin, 1992) during this period yearly expenditure on medication accounted for only 0.5 USD per person. Since the “mo cua” (open door) and “doi moi” (renovation) policies together with the rapid changes in the economy, the pharmacy market has rapidly expanded with more and more private chemists, also private practitioners in medicine and pharmacy have been given permission for health service provision, with the number of non-licenced practitioners including medical doctors, nurses and nonprofessional people being countless (Valdelin, 1992). By contrast, to the years before 1986 with the lack of all medicines, today the problem is a situation of overwhelming uncontrolled pharmaceutical products. The Ministry of Health, Vietnam (2004a) recognises that unsafe, inappropriateness and ineffectiveness of drug usage has serious consequences in many areas including public health, patterns of diseases, waste of the national budget, and increased antimicrobial resistance. In addition to these problems there is concern that the knowledge of physicians, pharmacists and patients are all insufficient. Drug information for prescribing comes mainly from advertisements and leaflets. Such sources of information have limitations including insufficient scientific facts, vagueness regarding side effects and noncompliance with agreed standards of ethics. Research found that about 90% of pharmaceutical representatives had never been aware of ethical standards in their activities (Phan and Chuc, 1995; 1996). In addition, advertisements of medicines intended for the public were especially unclear about contraindications and adverse reactions (Phan and Chuc, 1995; 1996). Although information from the above sources is insufficient, prescribers receive almost no official information from MOH and medical universities.

Surveys on the use of medicine show an uncontrolled situation. In Hanoi, the capital city of Vietnam, among 37 pharmacies from the 4 urban and 5 rural districts observed, antibiotics accounted for 27% of purchases, many were for self-medication as only 19% had prescriptions (Vinh, 1995). Do's,(1994) study also revealed that self-medication occurred with 16% of families reporting that they decided for themselves whether to use antibiotics during illness. Of these households 85% used antibiotics inappropriately. In rural districts the situation was similar. A study of children under five years, revealed that 74% of mothers purchased antibiotics for their children for acute respiratory infections, and in more than 90% of these cases antibiotics were taken for only three days, rather than for a recommended timescale (Hiep et al, 1995). More recently, Dung et al (2000) and the MOH (2009) have shown inappropriate use of drugs, especially within hospitals. They found abuse of antibiotics in all hospitals, including district, provincial and national hospitals. Inappropriateness of antibiotic use included unnecessary use, inadequate dosage, short courses, priority of broad spectrum drugs and use of more than two classes, and inappropriate combinations (Dung et al, 2000).

The uncontrolled utilization of antibiotics has serious consequences. The reports from the Antibiotic Susceptibility Test Surveillance (1996, 2006) have shown worrying levels of pathogenic bacterial resistance. For example, *Shigella flexneri* has become increasingly resistant to cotrimoxazole (an essential drug in Vietnam for years) going from 25% in 1990 to 50% in 1991, 81% in 1992, and 89.7% by 1993. Other pathogenic bacteria surveyed also tended to show increased resistance to almost all common antibiotics (Hong et al, 1996). The widespread use of antibiotics has reduced the effectiveness of antibiotics in controlling infectious diseases in Vietnam, so increasing morbidity and mortality (Dung et al, 2000; Tan, 2004 and MOH, 2006a).

In addition to the geographical features, poverty, overcrowding and inadequate sanitation put the country at risk of outbreaks and spread of infectious diseases, which are becoming harder to treat. In Vietnam today, infectious diseases such as respiratory infections, diarrhoeal diseases, tuberculosis (TB) and HIV/AIDS persist at high rates (Ngoc, 2004). The situation is exacerbated because the population is growing rapidly, it rose from 82 million in 2004 up to around 86 million in 2009, a growth of approximately a million persons per year, the population is young, and use of non-prescribed antibiotics is unacceptably high in young children (MOH, 2006d). In recent years, annual consumption of antibiotics has increased annually

from 0.5 USD per person in 1980 to 4.0 USD per person in 1995, and continues to rise today. According to the Vietnamese Ministry of Health (2006d), antibiotics accounted for 40% - 50% of the total foreign medication imported, with approximately 100 tons of antibiotics imported yearly, and that more than half of all prescriptions were for, or included antibiotics (MOH & GDS, 2003). In addition, in the community 78% of antibiotics used were bought from private pharmacies (without a prescription), and in 67% of cases purchase followed a discussion with a pharmacy assistant, not a pharmacist. It has to be a concern that only 27% of these pharmacy assistants demonstrated correct knowledge regarding antibiotic use and resistance (GARP, 2009). Although the sale of antibiotics occurs across Vietnam, legally they should not be sold without a prescription, the reality indicates clearly a failure to enforce present regulations (Hoa, 2009). From the above, it is evident that the factors that influence the rational use of antibiotics in Vietnam are the same as in other developing countries and Asian countries (WHO, 2006). It is also known that as seen in many countries there are, in Vietnam many factors interplaying to influence the use of medicines and specifically antibiotics (Figure 3.5) (MOH, 2010)

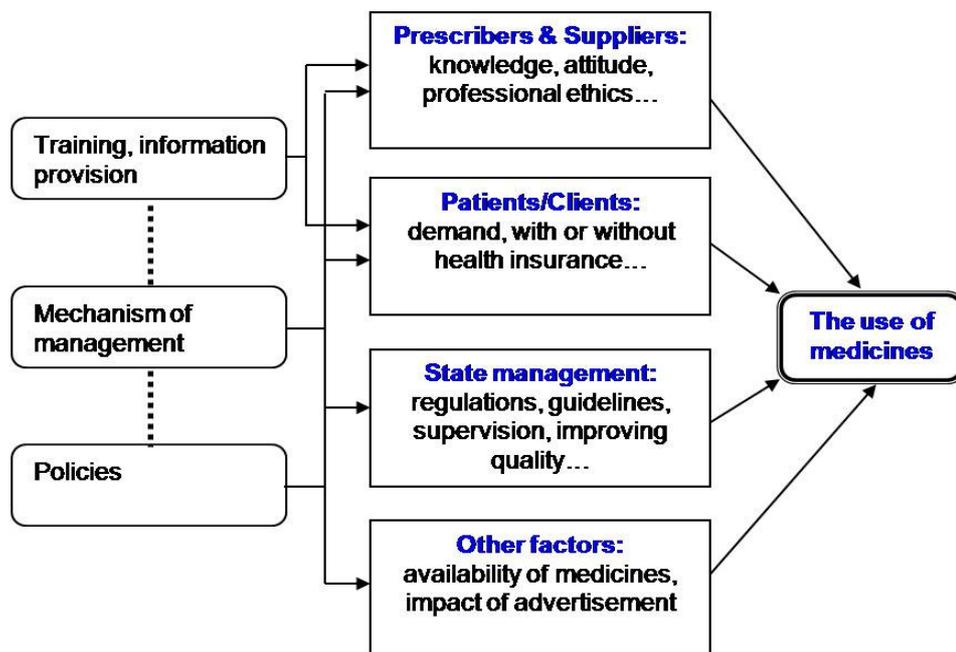


Figure 3.5. Factors influencing on the use of medicines (MOH 2010)

The issues of prescribers' knowledge, attitude and professional ethics hold key roles influencing directly the use of medicines (and antibiotics). However, these depend on the prescribers' process of training and education, ability to access up-to-date information regarding the processes for appropriate treatment and clinical

pharmacology. Not only does training and education differ from country to country, in Vietnam it differs from college to college, as a result the quality of prescribing varies considerably across the country. In addition, these prescribers are often affected directly from sponsorship from pharmaceutical companies.

Besides the prescribers, patients and/or their family exert pressure on healthcare professionals to obtain antibiotics. Many practitioners acknowledged that they prescribed many types of drug in one prescription to please their patients or to meet their patient's need (Quyen, 2005). Quyen, (2005) also found that in Vietnam, those who get free medical services through the government insurance scheme often receive more drugs more than patients without insurance who have to pay directly.

The state management of medicines in Vietnam is manifested through the promulgation regulations, guidelines, drug lists for clinical settings, and regimes for standardized treatment. They also have responsibility for activities such as inspecting, supervising and supporting regional and local authorities. Many efforts have been made to improve the situation regarding the use of medicines. There have been series of actions from macro-scale to micro-scale; from policy to practice with official documents stipulating their production, distribution, management, and use (MOH, 1993; 1997; 2004a; 2004b). However, disappointingly, these have tended to exclude antibiotic use. Currently, the MOH provides training, conferences, workshops, drug information and guidelines, and through these has improved the general administration of medicines (but not antibiotics). However, the changes are most evident in the higher levels of the health system, with medical doctors, specialists, and pharmaceutical doctors receiving the opportunities and advantages. In the communes, there has been little research to formally evaluate the changes needed, and the health workers who have the lowest level of education in the health service have been offered little opportunity to improve their knowledge and skills. Yet these are the workers who have prime responsibility for the wellbeing of their community, and if no changes are made, the misuse of medicines will continue every time the people access the health services.

Consequences of misuse of antibiotics

Infectious diseases are still the second leading cause of deaths in the world. According to the World Health Report (2003) the number of deaths caused by infectious diseases annually is more than 11 million. In Vietnam, the systemic collection of data on deaths resulting from infections caused by resistant bacteria is

not available, but the burden of bacterial infections continues to rise with the changing patterns of microbial aetiology, and the increased numbers of people with impaired immunity (for example those with HIV/AIDS), and the spread of infections through increased travel and urbanization (WHO, 2003). Thus, the disease burden and mortality caused by resistant bacteria are likely to become a more serious threat to public health.

Each time an antibiotic is used, it gives bacteria a chance to develop some resistance, with the result the health services are heading back to the situation experienced before the development of antibiotics where infections are deadly (Levy, 2004). At present, multi-resistant *Staphylococcus aureus* (MRSA) is the clearest example of this, with the mortality from MRSA being double that of infections from non-resistant strains. Failure of antibiotic regimens due to resistant bacteria increases the risk of secondary complications creating dilemmas for clinicians. In many clinical situations a broad-spectrum antibiotic is used as the initial therapy in severe infections and where this is not effective, this pushes patients into a vicious circle where levels of resistance increase, necessitating the use of more potent antibiotics, this then exacerbates the resistance from the original antibiotic and eventually and creates a new situation where effective antibiotics are harder to find (Figure 3.6). As a result, illness is prolonged with the risk of complications and death higher. Failure of treatment means the period of infectivity is longer, and the number of infected people moving in the community is higher, which in turn exposes the general population to the risk of contracting a resistant strain of infection. The cumulative result of bacterial resistance has become an international problem (Levy, 2004).

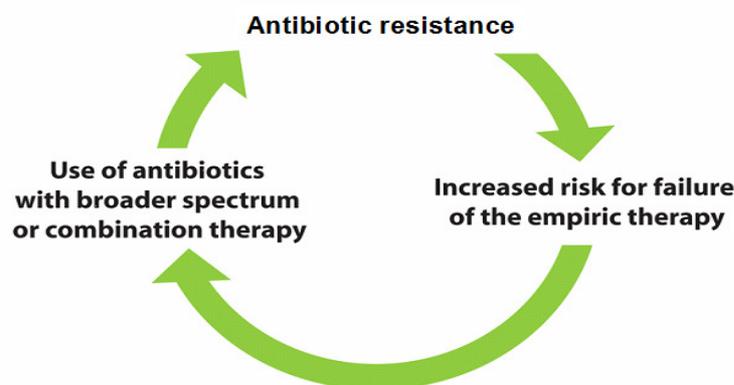


Figure 3.6. The vicious circle of empirical therapy

Accompanying the medical consequences are larger costs to society, with an added burden on healthcare costs. The most concrete example and the easiest to measure is the cost of medication. In situations where bacteria resist the first class of antibiotics, the use of the second; third or fourth classes or combination with another antimicrobial agents necessitated may increase costs 100-fold (Figure 3.7),

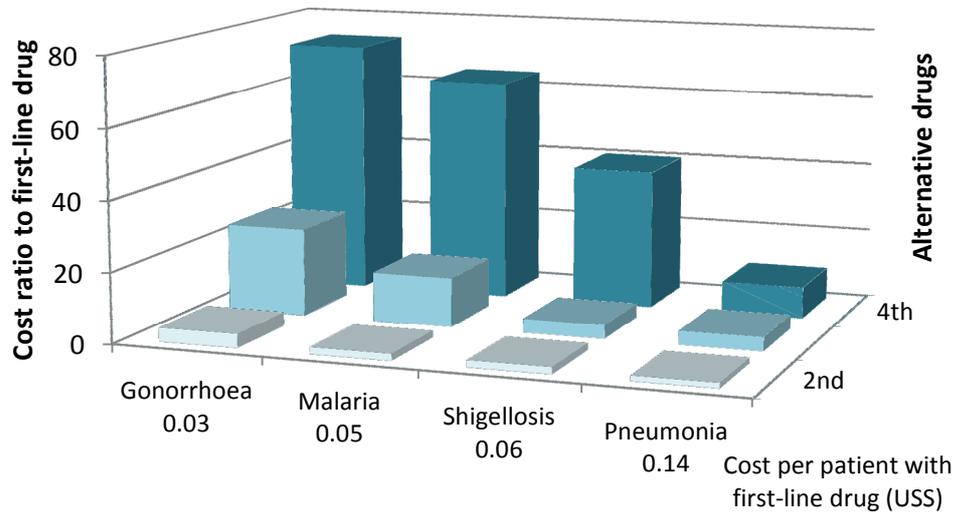


Figure 3.7. Cost ratio of alternative drugs to first-line antimicrobials for common acute infections. Source: *WHO Containment of antimicrobial resistance 2005*

In addition to medication charges, the increased length of hospitalization rises, also leading to higher costs and expenditure for the isolation of patients and in some instances to the testing and treatment of the staff (Carmeli, 1999). According to an estimate in the United Kingdom, more than 15 years ago (in 1995) in a single district general hospital the cost of containing an MRSA outbreak was more than £400,000 and this figure is just limited to health care costs, not the total costs of resistance (Nordberg, 2005). In today’s climate the costs will have increased exponentially, and can be seen as a major concern for healthcare providers. The National Institute of Allergy and Infectious Diseases (NIAID, 2006) concluded that antibiotic resistance is continually putting health care costs up, increasing the severity of disease and the death rates from some infections. In addition, there is a need to continually revise and change empirical and prophylactic regimens, and this too is costly, both in time and resources.

Containment of antimicrobial resistance

In order to contain antimicrobial resistance WHO (2005a) advocates ten core national strategies. They suggest there should be a Mandated multidisciplinary

national task force to coordinate policies and strategies to contain AMR. A national reference microbiology laboratory should be established to coordinate a network of reliable diagnostic microbiology laboratories to help to ensure that antimicrobials are prescribed only when needed. Ideally antibiotics should only be given after appropriate clinical tests. There needs to be a public education campaign on preventing infection and reducing transmission, education on preventive measures can be introduced into school health education and any adult education courses. All healthcare providers (including doctors, pharmacists, nurses, paramedic workers, and pharmacy assistants) need education regarding the diagnosis and management of common infections, antimicrobial use, containment of AMR, disease prevention, infection control.

There also need to be strategies for the agreement of approved medicines, together with mechanisms for updating these essential medicine lists and the clinical guidelines that should accompany them. Infection Control Committees should be established to implement infection control programmes in hospitals, and to promote the appropriate use of medicines. They should be responsible for antimicrobial guidelines and treatment algorithms for infectious diseases that may further aid rational use of antimicrobials. They should be supported by Drug and Therapeutics Committees and antimicrobial subcommittees to promote the safe, effective use of antimicrobials. However, for these strategies to work there needs to be restriction of the availability of antimicrobials, and this includes only granting marketing authorization to pharmaceutical companies that can meet international standards of quality, safety and efficacy. This is essential because poor quality antimicrobials may result in under-dosage, leading to poor patient outcome and increased AMR through the selection of resistant organisms. Finally, the WHO (2005a) advocate the control of the non-human use of antimicrobials.

Following the WHO's (2005a) recommendations a number of national and international programmes however they recognise that the feasibility and achievement of these depend on the context and situation of each nation. Developed countries can act concurrently on both the natural mutation of bacteria, researching and releasing new classes of antimicrobial agents with better properties, and on the control of factors linked to human resources, for example education and training. Whereas, developing countries, particularly low income and transitional countries like Vietnam, fall into a dilemma where the starting point is difficult. As Cars (2008) points out, in many developing countries, there is still a

pressing need for the implementation of effective actions for most of these issues, and Vietnam is no exception, with much work still needing to be done. However, without changes in attitude and practice by both professionals change will be difficult to implement and sustain, and therefore professional education and training, followed by public education are seen as the main priorities (MOH, 2006d).

In recent years Vietnam has worked hard to make progress in improving the health of the nation, and the health indicators are improving and much better than before when compared with other Asian nations. However, despite the reduction in infant mortality and under-five year mortality rates, the vaccination programme and improved reproductive health and policies that have reduced the fertility rate, Vietnam still faces several serious challenges in the health sector. There are unresolved problems with previous policies, disparities in many key health indicators across the different regions, income levels and ethnic groups (MOH & GDS, 2003). These challenges are further compounded by the increased HIV/AIDS incidence which is beginning to move from the most vulnerable groups into the general population (WHO, 2005b), and new pandemics. In recent years these have included *Severe Acute Respiratory Syndrome* (SARS), avian flu, and cholera outbreaks. For these reasons the emphasis of the health sector strategies remains focused on the prevention of infection for public health programmes and the expansion of health insurance cover. Containing antibiotic resistance, still receives little formal attention and there is no coordination between public health programmes.

Nationally there have been several programmes addressing bacterial resistance, but many of these programmes have been financed by overseas funding, and unfortunately when sponsored projects are completed funding stops (MOH and HPG, 2008). As none had been incorporated into the official health care systems, then the programmes also stopped, in this Vietnam is similar to other developing and low income countries, where overseas donors often do not develop their programmes with appropriate mechanisms for sustainability in different (to their own) government systems. For overseas aid to be effective in the long term, more time needs to be spent in the planning stage so that projects can be developed in a format that enables them to be integrated into government systems. The stopping of the overseas programmes into microbial resistance has made it much harder for Vietnam to prevent the problem escalating, and there is an urgent need to develop strategies to enable healthcare professionals to administer antibiotics appropriately and educate the public they serve.

ADULT LEARNING THEORY

Principles of adult learning in the West

Unlike school children, adults choosing to take further education and training are responsible people who seeking to extend their knowledge and skills through learning activities by which their competency is enhanced (Jarvis, 2004). Jarvis (2004) points out that adults have a strong need to be able to successfully apply what they have learned to their job. As a result, education or training may not motivate adults to learn if it is thought to be a waste of time or useless to their work. Quinn& Hughes (2007) points out that over a decade ago, Rogers (1996) compiled a useful list of general characteristics of adult learners. Emerging from these characteristics, is the recognition that adults continuing their education have to be interested in the process of learning offered to them, as well as the outcomes. They come to learning situations with their own experiences and values, with their intentions and expectations, they may have competing interests to the educator and they will have established for themselves, their own patterns of learning (Quinn& Hughes, 2007).

The key components of the differences between adult learners and child learners were summed up by Knowles (1998). He argues that not only will adult learners decide for themselves what is important to be learned, they need to be able to validate the information based on their own beliefs and values, and they expect what they are learning to be immediately useful. Also as they possess substantial experience, they may have fixed viewpoints which are difficult to change. However, the benefit is that with their existing knowledge and expertise they have the ability to serve as a knowledgeable resource for the trainer and for other learners (Jarvis, 2004).

In the West, learning and teaching theories are built from the basic philosophies of how learners 'learn' and teachers 'teach'. There is a wealth of information in this field, but although differences in terminology and perspective exist, a review of the various theories suggested that learning either supports and reinforces the individual's knowledge and expertise their 'being', or changes some aspects of it which could be called their 'becoming'. A summary of some of the theories that were considered for use in this study are given in Table 3.1

Table 3.1. Summary of comparisons of learning and teaching theories

Learning theories	Perspectives
Sensory stimulation (Laird, 1985)	Learning through stimulating the senses especially through seeing. Learning can be enhanced if senses are stimulated especially the visual sense
Reinforcement (Skinner, 1985)	Learning by repeating desired behaviours if positive reinforcement follows the behaviour including verbal reinforcement, tangible rewards and higher promotion. Negative reinforcement also helps to stop or avoid a negative condition
Cognitive-Gestalt (Burns, 1995)	Experience, meaning, problem-solving and the development of insights are important. Individuals have different needs and concerns at different times, people have subjective interpretations in different contexts and at different times
Holistic learning (Laird, 1985)	Learning by activating elements of individual personality this means intellect, emotions, desire, intuition and imagination all require activation for learning to take place
Facilitation (Rogers, 1983)	Learning will occur by the educator acting as a facilitator by establishing a comfortable atmosphere for the learners
Experiential learning (Kolb, 1984)	Learning can begin at any of the four-stage learning process including concrete experience, reflective observation, abstract conceptualization and active experimentation and is continuous

Having considered in detail the characteristics of adult learners, and how these fit within basic theories of learning Jarvis (2004, p.112) summarized existing styles of learning as consisting of opposing categories. These include active versus passive, assimilator versus accommodator, concrete versus abstract, converger versus diverger, field dependence versus field independence, focusing versus scanning, holistic versus serialistic, reflection versus impulsivity, and rigidity versus flexibility. Although these styles differ from each other he suggests that they seem to emphasize the experiential characteristics of adult learners. Thus, he argues the emphasis should be placed on the learners and on the teaching environment, with a high appreciation of the cognitive-level goals which effective learning is designed to help the learner achieve. This raises the question as to whether it is possible to draw universal conclusions in learning, whether these theories can be applied in all cultures for all adult. Unfortunately, while there is a wealth of literature devoted to

the study of learning and teaching in the West, there is relatively little literature based in East Asia (Jarvis and Holford, 2009). There are some instances of East Asian societies such as in Singapore, Malaysia, Thailand and the Philippines, who have been influenced by western colonisation, and have as a result achieved some effectiveness in moving towards a more Western facilitative approach to learning. However, it is acknowledged that 'Confucian-Heritage Cultures' with their origins in Chinese culture have had strong influences on East Asian education (Li, 2003). Following Confucianism, it means that learning refers to listening, then accepting knowledge seen as 'good' and following it. Thus, learning, in Confucian terms, means finding a good teacher and imitating his words and deeds, an approach that for more than two thousand years has impacted on the cultures of China, Korea, Japan and Vietnam. This has resulted in limited questioning of scientific and academic statements. Indeed, it is recognized that in East Asian societies, didactic teaching, rote learning and book-centred learning are preferred to critical thinking. The learners treat their teacher as an unchallengeable authority, education remains teacher-centred and based only on acceptance of theoretical approaches.

Assessment of the ability to reproduce information is by examinations, these are highly competitive and put intense pressure on students and teachers but there is increasing recognition that examination results are not demonstrating the improvements in knowledge and understanding that were anticipated, or are needed (Rao, 2001; Liu & Littlewood, 1997; Jarvis & Holford, 2009). As a result, in recent years many East Asian countries have chosen to embrace new educational policies based on the need for change, innovation and reform. Perhaps one of the clearest successful examples being Singapore, where learning and teaching emphasizes 'holistic learning and linking theory to practice' an approach which originated from Western theories. They have been able to demonstrate increased effectiveness in learning and achieving planned outcomes.

However, educational reform is truly a dilemma and in contrast to Singapore, there are examples where countries have encountered a 'crisis' because of too rapid and widespread use, or misuse of progressive and holistic methods of teaching, resulting in increased extracurricular distractions and a lack of discipline, etc. (Steinberg, 1997; Cu, 2007; Dung, 2004). The result of these varying outcomes, which illustrate the distinct differences between the Western and the East Asian learning and teaching methods, are such that many East Asian countries (including Vietnam) are now carefully considering how to move forward. They are seeking

ways to successfully link with the increasingly dominant western methods, without disputing or damaging current training programmes. In consequence a key element of this study had to be consideration of how the possible learning approaches, could be adapted to meet the education needs of the community healthcare workers, a group educated and trained through traditional didactic methods. To make the changes needed in practice an approach was needed that would motivate and encourage the workers to review and change their own practice. Therefore a participative approach seemed most appropriate and the four scenarios of learning outlined by Jarvis (2004, pp.114-115) see Table 3.2 were seen as a relevant starting point,

Table 3.2. Summary of learning scenarios

<i>Scenarios</i>	<i>Description</i>
Experiential learning in everyday life	People learn often incidentally in everyday life when they treat experience as a lifelong phenomenon. This is a natural way of learning and has become the model for other forms of experiential learning.
Formal classroom education	The classroom context is the primary experience and the information being provided is secondary experience, but the learners also learn experientially and incidentally from the primary and secondary ones.
Student-centred classroom learning	Through varieties of approaches such as problem-based, role-play, group discussions, students' past, recalled, experiences are used and primary and/or artificial experiences are provided from which students may continue to learn.
Workplace learning	Work itself provides potential learning experiences and workplace has become an important site for learning and for new forms of continuing education programmes. There are also initial training courses that provide practical experience, and actual situations where the learners are asked to recall their work experiences, reflect on them and learn from them

Looking at these scenarios of adult learning Jarvis (2004, pp.144-145) suggested that teaching should be developed in accordance with the characteristics of the adult learner group. He also argues that to be successful, an approach should meet certain conditions of adult learning, a brief summary of these teaching approaches can be seen in Table 3.3

Table 3.3. Adult learning and approaches to teaching

<i>Conditions of adult learning</i>	<i>Approaches to teaching</i>
Learning as a basic human need	Teaching must be a facilitation
Learning is motivated when there is a disharmony between an individual's experience and his perception of the world	Process of learning should be structured by teacher and learners and relevant to the experience/problem
Adult learners like to participate in the learning process	Teaching should be facilitative rather than didactic in learning situations
Adult learners bring to the learning situations their own experiences, meaning systems, needs, self-confidence, self-esteem, and self-perception	Teachers should use the learners' possession as a learning resource, try to build on it rather than to be contrary to it, reinforce all correct knowledge and understanding, give learners opportunities to reflect upon incorrect knowledge by themselves if possible, encourage self-assessment rather than teacher-assessment
Adult learners need to feel secure and not threatened in order to learn	Cooperation should be encouraged rather than competition and teachers need to create an ethos in which no adult feels threatened or inhibited
Adult learners need to feel they are treated as adults	Teachers should attempt to create and facilitate a teaching and learning engagement between all the participants
Adult learners have developed their own learning styles	Teachers should recognized different learning styles and encourage learners to develop effective and efficient learning
Adult learners have had different educational biographies so they may learn at different speeds	Teachers should encourage learners to learn at their own pace
Adult learners have developed a clear and fixed intelligence	Teachers should not be influenced by previous academic record from initial education of learners
Adult learners bring different physiological conditions to the learning situation	Teachers should ensure that the physical environment is conducive to learning

Consideration of the variety of learning approaches outlined above demonstrates that each presents both strengths and weaknesses. It is clear that no one theory

can be appropriate for every context, and that those developing programmes must consider carefully the specific cultural context in which it will be delivered. With the emergence of lifelong learning and the changes from pedagogy to andragogy, educationalists have emphasized the need to enable people to become motivated and self-directed. Jarvis, Holford & Griffin (2007) suggest the principles regarding adult learning identify essential factors which any educator needs to be aware of and which provided useful indicators for this study. They argue that educators need to acknowledge the value of the knowledge and experiences that participants bring, and treat them as equals rather than subordinates. Adults entering into any new learning situation already have a self-concept which in the West, includes a belief that they are self-directing and responsible for themselves, which Jarvis (2004) states needs to be recognised by educators both in the planning and delivery of education. In the light of this, it would seem that programmes that involve the participants, with the educator acting as a facilitator who determines the interests of learners before commencing are more likely to be successful.

In addition, adults come to a learning opportunity with a wealth of experience and a great deal to contribute, this too needs to be recognized with participants encouraged to share their prior experiences and knowledge. Then too, adult learners have a need to know the reason why they should learn something before they invest their time in a learning event. This includes knowing the aims of any education, how the information and content will be delivered and why they should participate, thus all educational activities need to be well structured with clear objectives. Jarvis (2005) points out that adult learners have a strong readiness to learn things that will help them in their work or lives, and in healthcare to provide better care. Therefore all objectives need to be clearly related to practice and/or their daily or future activities.

Experiential learning models

Having considered which model is relevant and fits within the planned educational activities a second key question is how it should be applied. Adult learners need to be encouraged to explore their experiences before coming moving into a new learning situation. These experiences form the basis from which the process of change can begin as the learners follow the planned education activities. Experiential learning has been increasingly recognised as a practical way to enable adult learners to use their experiences and past training. Henry (1989: p3) defined 'experiential learning' as

"Experiential learning refers to a spectrum of meanings, practices and ideologies which emerge out of the work and commitments of policy makers, educators, trainers, change agents, and 'ordinary' people all over the world. They see 'experiential learning' - with different meanings - as relevant to the challenges they currently face: in their lives, in education, in institutions, in commerce and industry, in communities, and in society as a whole."

Kolb (1974/1984), well known for his contribution to thinking around organizational behaviour and social change, career development and executive and professional education, also focused on experiential learning. He created a model which was based on four elements (Kolb, 1984), these are concrete experience, observation and reflection, the formation of abstract concepts and testing in new situations (Figure 3.8).

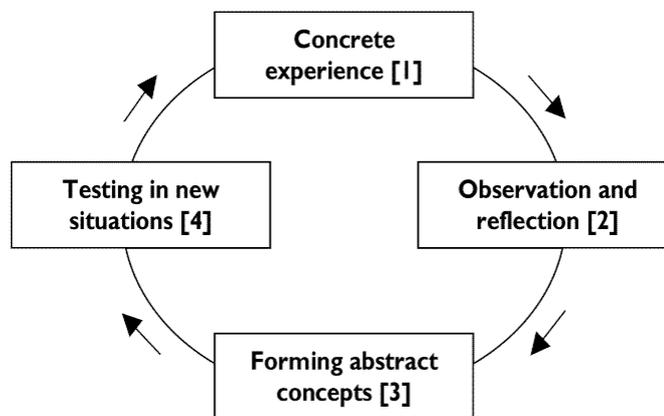


Figure 3.8. Kolb's Experiential Learning Cycle

Although there is still discussion as to which of the four points is the beginning, there is increasing agreement that any one of these elements can be the starting point, and that these elements should really be approached as a continuous spiral. However, it is suggested that the learning process often begins with a person carrying out a particular action and then seeing the effect of the action in a specific situation. Following this, the second step is to understand these effects within the particular circumstance so that if the same action was taken in the same circumstances it would be possible to anticipate the outcomes. Using this cycle, the third step would be trying to understand the general principles under which the particular instance occurs, followed by a fourth step of retesting ideas and concepts. It is recognized that there are strengths and weaknesses associated with this model, particularly when applying it in a professional practice setting (Jarvis, 2004).

An experiential approach often used within training and education regarding the development human resources is that by Pfeiffer and Jones (1983), who developed a 5-stage model, for practice application based on experience and its application in practice.(Figure 3.9)(Pfeiffer, 1983).

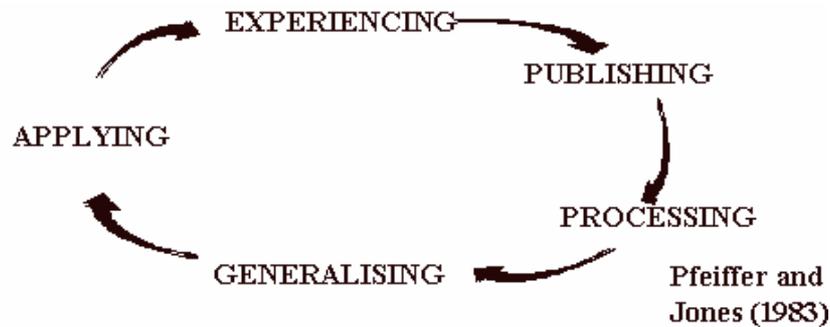


Figure 3.9. Pfeiffer and Jones’s Experiential Learning Model

The first stage of this model stands for the initial experience of individual or group which involves ‘doing’, and may be unfamiliar, pushing the learner to a new level. The second one refers to sharing and creates opportunities for participant to talk about the experience, share reactions and observations and freely discuss feelings generated by the experience. The third step is the process in which learners discuss how the experience was carried out, how the themes, problems and issues were brought out, and how specific problems were addressed. The fourth step is to connect the experience to identified real life principles that surfaced or emerged during the steps one to three. This aims to capture the learning and general trends or ‘common truths’ that exist in practice. The fifth and final stage is the period used for learners to consider and discuss how their new learning can be applied to other situations as well as issues raised can be useful in the future naturally take place. The key difference between this and Kolb’s cycle is that there is a clear starting point. This change arose because of the clear and specific needs of professional education where outcomes have to enable the participant to reach agreed levels of knowledge and competence, rather than just participating in an ongoing educational cycle. However, the aim is that once begun learners will continue to repeat the cycle, so creating a similar continuous circle.

Forms in which learning occurs

It is evident that in practice, there are several existing forms of learning and teaching but their effectiveness is dependent upon specific circumstances and

context. The process of learning also happens through the experiences of everyday life, as people process all actions and activities from everyday life. When people treat experiences, often occurring incidentally, as a conscious behaviour, and review the outcomes as a part of a lifelong phenomenon they gain knowledge. This is a natural form of learning and can become the basis for models of experiential learning (Jarvis, Holford and Griffin, 2007). Together with everyday life the workplace can also be seen as a learning environment. Work provides potential learning experiences with which no artificial context or problem can be compared. In the rapidly changing world of today, according to Jarvis, Holford and Griffin (2007) the workplace has become very important as a site for learning and for new forms of continuing education programmes. Practitioners who participate in a continuing education programme are frequently asked to recall their work experiences, reflect on these experiences and show what they have learned from their experiences. Both Initial and post registration education and training seek to include workplace learning as part of preparation for professional practice.

As the education of adults began to develop such terms as education permanence, lifelong education and recurrent education, professional education and training bodies in developed countries have also recognised the importance of continuing education (CE) and training. However, the term CE created debate in the late 1970s and early 1980s, as different groups used it to cover different activities, some part and some full time, today it encompasses three forms of education, continuous part-time education, both full-time and part-time, and intermittent education after post-initial education. Yet confusion between CE and further education can still occur. According to Jarvis (2004, p.48) further education is not the same as CE for a number of reasons: (a) it may be post-compulsory (after or following a compulsory training) but not necessary post-initial professional education. It tends to imply a specific level of study whereas CE does not; it can be pre-vocational, vocational or academic while CE need not be directed towards any course assessment or award.

For professionals who are working in areas where qualification are very demanding and constantly need updating, CE in some form is essential for any of staff to maintain their professional knowledge and develop their professional competence. The participation in regular learning activities is usually known as continuing professional development (CPD). CPD consists of any educational activity which helps to maintain, develop or increase knowledge, problem-solving, technical skills or professional performance standards all with the goal that physicians can provide

better health care. CPD includes formal activities such as courses, conferences and workshops, as well as self-directed activities such as teaching profession and directed reading (Quinn & Hughes, 2007).

In medicine the approach to continuing professional development because it is focused on the medical field is known as continuing medical education (CME). This is an essential feature of the practice of modern medicine in order to maintain physicians' ability to provide quality patient-care. According to Steeves (1965) this is conceptually of 'life-long learning' and must be actively developed in the curricula for undergraduate medical students, and sustained in the graduate doctors for both practitioners and teachers. Any CME programme has specific standards for both the education providers, including preparatory tasks by the Faculty of Medicine, the medical school/ university, selection of practices and is regulated by the official authority (e.g. Accreditation Council for CME), and the graduate medical doctors who are asked to participate. Other professional groups are following suit in most developed countries, but in Vietnam this concept has yet to be developed, and there is no mandatory updating requirement for nurses or most professional groups.

Factors contributing to effective learning

The aim is for the intended training and education to be effective thus it is worth considering what leads to the effectiveness. It is recognised that learning is a relative permanent change in human behaviour in both observable activities and internal processes including thinking, attitudes and emotions. However, the complexity of the learning process means it may not manifest itself until sometime after the educational programme has taken place.

Sensory stimulation, Laird (1985) suggested that effective learning occurs actually when human senses are stimulated. He found from research that 75% of knowledge held by adults is learned through seeing. Hearing is the next most effective and accounts for 13%, with the other senses accounting for 12% of what adults know. By stimulating the senses, especially the visual sense, learning can be enhanced therefore it should be used in the learning context to help learners gain knowledge.

Learning as a holistic approach, Laird (1985, p. 121) noted that many elements form the personality of an individual, including his/her intellect, emotions, desire, intuition and imagination and all of these factors require consideration when

planning an education programme, and activities need to be developed to enable learners to use all elements of their personality if learning is to be effective.

Reinforcement, Skinner's (1985) research, supported by Laird (1985) and Burns (1995) argues that learned behaviour is a function of the consequences of specific action is useful for educators. The knowledge that desired behaviour will be repeated by the learner if positive reinforcement is used, can be used to encourage learning. Positive reinforcement can include verbal praise given by the educator, or certification on completion of the course. Access to promotion following study is also a form of positive reinforcement. Negative reinforcement can also increase learning. This refers to a situation when a negative condition is stopped or avoided as a sequence of harmful behaviour.

Cognitive-Gestalt, Burns (1995, p.112) notes that problem-solving and the development of learners' insights are the real importance of experience. Different individuals have different needs and concerns at different times. As a result interpretation depends on the different contexts in which actions occur. This implies that learning will be strengthened if the educator recognises appropriately the learners' needs at each specific time and respects relevant interpretations at that time.

Facilitation or the humanist approach, Rogers (1983) and Laird (1985) developed the theory of facilitative learning originated from the basic premise that learning will occur whenever the educator acts as a facilitator. He/she needs to establish an atmosphere in which learners feel comfortable to consider new ideas without feeling threatened by external factors. This approach also involves other characteristics of a humanist approach, willingness to learn is a part of human nature, but giving up what is current, and in some instances comfortable is difficult and may be perceived to have unpleasant consequences, which can lead to resistance. However the most significant learning involves changing people's concept of themselves, and the role of the facilitators is to work with learners, to encourage them to take responsibility for their own learning, and see the advantages of accepting change and moving forwards.

Experiential learning, Kolb (1984) proposed a four-stage learning process through his research in which he suggests that learning occurs through peoples' concrete experience, observation and reflection, abstract conceptualization, and active experimentation. Kolb's model is often referred to in descriptions of experiential

learning, the process can be started at any of the stages and forms a continual cycle of learning. The most significance aspect of this learning process is the belief that with reflection people see different perspectives and can move forwards, where appropriate changing practice to avoid repeating mistakes.

Learning belief for commune health workers in Vietnam

The theories of adult learning mentioned above do seem to have relevance for Vietnam. The link to lifelong learning, new models of pedagogy, and typologies of learning styles need to be utilised to develop a conceptual framework that maximises the effectiveness of the proposed training programme for the commune health workers (Hinchliff, 1998; Jarvis, 2005). According to Quinn and Hughes (2007) lifelong learning is primarily about growth, opportunity and supporting individuals as they obtain new skills, and to make them aware of their potential to change things for the better. In addition, lifelong learning is defined as any planned series of incidents at any time in the lifespan being directed towards the learning and understanding of participants (Jarvis, 2005). Within this context there are a number of learning models that could be used (Piaget & Inhelder, 1969; Levinson, 1986; Kolb, 1984; Quinn & Hughes, 2007). Further assessment of the possible approaches suggests that Kolb's experiential learning model would suit the commune health workers, whereby their concrete experiences would provide a basis for 'observations and reflections'. These 'observations and reflections' would then be assimilated and distilled into 'abstract concepts and generations' producing new implications for their action which could be 'actively tested' in turn creating new experiences (Kolb, 1984).

However, Vietnam has a long established culture developed from different traditions to those in which Kolb worked, therefore a direct transfer of this model is not appropriate. Instead this or any other possible approach needs to be adapted and modified to fit within the context in which it will be used. From this a model of learning will be developed based on the modification needed to support the use of a model such as Kolb's (1984) cycle of learning and piloted in the commune. However, it has to be accepted that once the actual situation in the communes has been assessed, through the gathering of the baseline measures, this may lead to the identification of a more appropriate theory on which to base the model. Following evaluation the model will be modified as necessary and then submitted with the conceptual framework to the MOH for consideration for implementation across Vietnam.

The problems of antibiotic use and misuse are clear. To change the situation in Vietnam education and training are essential. The challenge is to find an approach that will lead to sustainable change. The government is committed to improving the health of the nation, but as yet has made no moves to improve the knowledge and skills of key community workers. A system needs to be found that can be integrated into local and national health system that fits within the Vietnamese context, but is affordable in both terms of time and money. The lack of research in this field in Vietnam means that the developing the framework and the model cannot be based on a certain existing studies, and the baseline measures are therefore an essential aspect of this innovative study. The findings from this initial stage were used to develop the interventional stage of the study.

IMPLICATIONS OF THE LITERATURE FOR THE STUDY DESIGN

Epistemology

As part of any study design the nature of the data required and from this the type of research methods appropriate need to be identified. This includes consideration of the epistemology which governs and guides the paradigms in which research takes place. Accepting that a paradigm can be said to be

‘a coherent system of scientific models and theories, a conceptual framework with which the researcher can be influenced in what he would investigate... how he would investigate ... how the results can be analyzed and interpreted.’ (Bryman, 2004 p.453).

The two most cited paradigms are the positivist or objectivistic, and the interpretivist (Denzin & Lincoln, 1994; Pollit & Beck, 2004; Bryman, 2008;). The positivist paradigm, is based on traditional scientific research methodologies with an underlying set of rules and procedures to collect data. Petit & Beck (2004, p.16) suggest it "is orderly and predictable designed to define". While Denzin & Lincoln (1994, 2002) suggest that in this approach, an understandable reality is accepted as truth, based on fixed natural laws and mechanisms. Research questions are worded such that measurable, numerical units can be formulated for data collection and analysis, and a key aim of this type of research is to develop results that can be generalised. Thus quantitative research emphasizes the collection of measurable data, and is a deductive approach to theory development and research, which focuses on the development of hypotheses and on theory testing (Bryman, 2008).

A strength of quantitative research is the ability to research large study populations in a relatively short period. The testing and development of evidence-based practice is mainly based on quantitative study results (Patton, 2002; Bryman, 2008; Nieswiadomy, 2008). However, there are criticisms of this approach. The objectivity gives little indication of the (dynamic) reality, and, where surveys are used, there can be problems with reliability, as respondents can interpret questions in a way that differs from the original intent, and there is only a small (rigid) connection between the instrument (questionnaire) and the daily reality of the respondent. In addition, results from quantitative research give a static or one point (in time) view of the social interactions and processes, which can be seen to be independent of the individual's life experience (Bryman, 2008).

In contrast, qualitative research can be said to be an approach that collects rich, in-depth data from fieldwork an open-ended interviews, and where appropriate documentation. Qualitative researchers can be said to engage in naturalistic inquiry, to study real-world settings and situations (Patton 2002). Searle (2004) points out that with this approach, time needs to be taken by the investigator to explore the reality of the participants, using open observation techniques (Patton, 2002). This makes it possible, to connect findings with reality and to consider them from various approaches. This characteristic means, according to Searle (2004) that qualitative research (unlike some positivist research) cannot use predetermined protocols, but is cyclical and iterative. Each step can only be taken following reflection on previous processes, and numeric bases are entirely inappropriate.

Reality is seen as a part of a larger whole in which several principles and perspectives may apply (Pollit & Beck, 2004) and interpretation of multi-view personal perspectives is possible. Absolute truth or falsehood can never be determined, and research is seen as an interaction between the researcher and the participants. It is subjective, data and analysis have a strong reliance on text, and all findings are time and place specific. The aim is to gain insights into the key elements or essences of social phenomena and specific groups, not general to the whole population (Pollit and Beck, 2004; Bryman, 2008; Silverman, 2004).

The strength of qualitative research is that it gives meaning to social phenomena, identifying their essence or core aspects (phenomenology and social interactionism), it can provide clarification of the behaviour patterns of the group being studied, and enhances the study of reality and linked theories and concepts

(Glazer & Strauss, 1967; Denzin & Lincoln, 1998; Patton, 2002;). It is said to be inductive, as analysis goes from observations and research to support a theoretical, comparison or formation, rather than relying on deduction from existing theory (Bryman, 2008). As with positivist research, there limitations to, and criticisms of interpretivist research. The subjectivity gives a narrow perspective of the (dynamic) reality, there is a degree of unreliability of measurement as data is text based, with interaction between the researcher and participant. In addition, the results of qualitative research can contain bias from inter-dependence on the researcher's previous experience (Bryman, 2008, p.391). However, these criticisms do not negate the use of qualitative methods, rather they serve as a warning for researchers to choose carefully the most appropriate approach to use, and then to make every effort to minimise bias and be rigorous in their approach to data collection and analysis.

Consideration of the study aims reveal that whilst both paradigms could address some part of the study, alone, neither could provide data to meet the overall aims of the study as a whole, and in consequence more than one method was required. The strength of using more than one method, or triangulation, is that the combination of research methods. Regarding the criticisms of the two paradigms, it is accepted that the quantitative data sets give a snapshot, or one point in time intervention, but this is relevant for this study, as in the first stages the quantitative data is needed to give a baseline measure at a given point in time, and not to generate theory (Greene, 2007). To illustrate and further interpret the quantitative data sets, qualitative data has been used, as in this study the narrowly focused interpretation associated with qualitative research was not seen as a problem. Every effort was made to facilitate discussion and to check that any questions had been clearly understood by each group, thereby minimising the chance of multiple interpretations. Regarding the researchers interactions with participants, this was not seem as a negative as it was essential that the participants felt able to trust and confide in the researcher. Similarly, the researcher's background was not a disadvantage as it provided the expertise to facilitate the discussions in theoretical as well as communication terms.

Quantitative data sets

The initial stage of this study aims to review the current using of antibiotics and influencing factors in the study community (where commune health workers play the main role) then to enable the baseline data for the development of an interventional

programme whereby the situation is likely to be better thus a survey on the situation proved to be suited. 'A survey describes a population; it counts and describes 'what is out there'' (Sapsford, 2007, p.1). It can be defined as a research style that involves systematic descriptive approaches, in general it draws inferences about causation or patterns of influence from systematic co-variation in the resulting data (Sapsford, 2007). For this study, to identify what influence the use of antibiotics in the study community was one of the objectives hence carrying out a quantitative survey showed appropriate. In health research, survey methods can be of different types and are often associated with the use of a questionnaire where data are collected through interview, face-to-face, by telephone, or self-completed. However, a wide range of techniques can be used, e.g. the use of qualitative element in the interview schedule includes both open-ended and semi-structure questions (Calnan, 2007). In the 'survey' a time dimension values in exploring causal influences that are hindered. However, in the context of the study project aiming to develop a training programme to support the community level rather than to detect causal correlations thus a cross-sectional survey was used. The strengths of the survey are provisions of an overview and a general of the studied population, sometimes a superficial picture of the study problem here was antibiotic use in the study location. But there are possible weaknesses and one of these weaknesses is that the meanings and perceptions of social approach and the context of happening problems are not captured in surveys. In this study a part of qualitative methods was also used to fill the gap.

In Vietnam, patient entries are recorded in written documents called health workers' record books on an annual basis, these are stored and kept in the health centres for several years. This type of documents contains official details of patient's attendance, name of patient's disease/condition, drugs given to the patient and any other treatments. Addressing documentary data is not easy, and although phenomenological researchers view all types of documents as sources for research, both positivist and phenomenological researchers criticise the accuracy of documentation. They point out that documents can be subjective and impressionistic, reflecting society's biases and in some instances are simply social constructions of reality (Bowling, 1997). However, it is accepted that official documentation can yield valuable insights into patterns and practices (Bryman 2008), therefore, as part of the initial stage of this study, to review how antibiotics were actually prescribed in the community, an analysis of the official health workers'

record books was carried out. The information was used together with all other data sets to complete the baseline data.

Qualitative data sets

In this study consideration of the various possible qualitative approaches led to rejection of descriptive phenomenology. This approach is discovery oriented and puts no question or issue at a higher ranking than any other, aiming to describe events in a manner that allows the inclusion of any ambiguities, and complexities that arise either during data collection or analysis, it does not prioritise, and it remains firmly based within the evidence gathered, (Giorgi, 1992). However, as Giorgi (1997) goes on to point out, it seeks only to describe the essences of individual experiences with any necessary interpretation based within praxis. In this study, while the process of description was appropriate, it was also seen as important that analysis and some interpretation could occur as the data was collected, enabling later data collection to consider issues raised in earlier interviews or focus groups, and to try to see if consensus between participants was possible. As a result of this decision, a hermeneutic approach was also rejected, this would support interpretation, but the aims of such a study where the intention is to create a dialogue between reader and those interviewed (Silverman, 2005) enabling readers to gain insight into the lived experience of participants was not suitable for this study. Instead a method was sought which would support exploration and discussion of key issues whilst enabling reflections on previous interviews and the priorities of those participants to be included, and therefore grounded theory seemed most appropriate. Although accepting that in this study a full grounded theory approach would not be possible, nevertheless the principles of this approach matched with this study and it was therefore decided that a modified version, in that only the first cycle would be carried out would be used in this study.

Grounded theory

Since its introduction in the 1960's, grounded theory has been progressively developed and is now regarded by many as one of the most comprehensive qualitative research methodologies. With its theoretical underpinnings deriving from, the American pragmatism movement and symbolic interactionism, grounded theory inquiry is now seen as being relevant for problem-solving and is concerned with understanding action from the perspective of the human 'agents' or participants (Strauss & Corbin, 1990). Grounded theory research begins by focusing on an area of study and gathers data from a variety of sources, including interviews and field

observations. Once gathered, the data are analyzed using coding and theoretical sampling procedures. The aim is that this will ultimately lead to theory generation, and that a record of how this process has occurred can be seen and understood.

According to Glaser and Strauss (1967) the general aim of grounded theory research is to construct theories to understand the essence of phenomena. Although it has been developed and principally used within the field of sociology, grounded theory can be successfully used in different areas including education, nursing studies, and political science, and Strauss and Corbin (1997) encourage researchers to use the procedures for their own related purposes. In terms of methodology, grounded theory has received a considerable amount of criticism as it gives signals of simple inductivism. However, proponents argue that grounded theory methodology embodies a conception of scientific process that is far removed from such criticism. They suggest that, suitably grounded theory offers an attractive conception of scientific method concerned with detection and explanation of social phenomena in which theories are generated from robust data patterns, elaborated through the construction of reliable models, and justified in terms of their explanatory coherence.

Glaser and Strauss (1967) and Strauss and Corbin (1990) clearly recognize the importance of understanding method in the context of problem-solving. However, although they offer some thoughts regarding the development of research problems, they do not provide much detail on how to do this, and their writings can be misunderstood. For example, a possible misunderstanding is the belief that problems and methods are separate parts of an inquiry. Strauss (1995) maintains that, because an articulated problem is not prepared in advance of the start of the inquiry, researchers may come to their problems at any point in the research process. But this means that with this approach it is possible to begin an investigation with an ill-structured problem, which in turn may bias the whole study. Care needs to be taken to structure the planning process, whilst accepting that in qualitative research solutions arise from within the data a basic task of scientific inquiry is to structure inquiries recognising and building in the various required constraints.

A related misunderstanding that can arise is the apparent belief that linear thinking in methodological terms can be avoided by insisting that the method comes before the problem. However, this proposal simply points out that the steps constituting a

linear progression need not occur in one fixed order, but accepting that research problems are an integral part of method does not overcome the problems of linear thinking. Problems need to be generated, selected for consideration, developed, and modified. In a very real sense they regulate thinking in the contexts of theory generation, development, and appraisal.

Properly formulated, grounded theory should be seen as grounded in phenomena, not data, with the data serving to illustrate and illuminate the phenomena. Data are recordings or reports that are accessible, so can be said to be observable and open to public inspection. Phenomena are generally not easily observable. The importance of data lies in the fact that they serve as evidence for the phenomena under investigation. Using this interpretation, grounded theory is depicted as a situation in which there are no fixed ideas about how something should develop, which maintains that observations are not theory or concept dependent. Indeed, Glaser and Strauss (1967) explicitly note that reality is not approached by researchers as a tabula rasa but there must have a perspective to see relevant data then identify abstract significant categories. They go on to suggest that researchers need to keep all potentially relevant facts and theories in the background so that possible theories can emerge inductively from within the data source in an approach based on 'constant comparison'.

As a method of discovery, the constant comparative method is a combination of systematic coding, data analysis and theoretical sampling procedures which enable the researcher to make interpretive sense of the diverse patterns in the data by developing theoretical ideas at a higher level of abstraction than the initial data descriptions. Using this, Glaser and Strauss (1967) suggest there is a dynamic perspective to theory construction, and that generating theory from the comparative analysis puts a high emphasis on theory as process and as an ever-developing entity, not a perfected product. Therefore they advise the researcher to search for new perspectives that might help them develop their ideas and eventually theory.

However, Thagard (1992) developed an account of theory evaluation which takes inference to be the best explanation, and to be centrally concerned with establishing explanatory coherence. He suggests that preference should be given to theories that make few special assumptions. Thagard's (1992) theory of explanatory coherence has a number of virtues: it satisfies the demand for justification by appeal to coherence considerations rather than foundations; it takes theory evaluation to be

a comparative matter and one that is centrally concerned with explanation; and it, offers the grounded theorist an integrated account of many of the evaluative criteria deemed important for theory appraisal by Glaser and Strauss (1967).

With the methods for data collection and analysis identified, the process for the study could be formulated.

CHAPTER 4. METHODS SECTION

INTRODUCTION

This chapter presents the methodological framework used in this research project. Although presented as one integrated study, in effect the project could be said to comprise of two stages. The first, consisted of three interlinked investigations, a survey by questionnaire, documentary data analysis and focus groups. The second stage, implemented once the model had been developed, comprised of three further interlinked investigations; these were assessments by questionnaire, by observation and through focus groups. Thus, in total there were six distinct components to the study.

Diagramme and chronology of the study

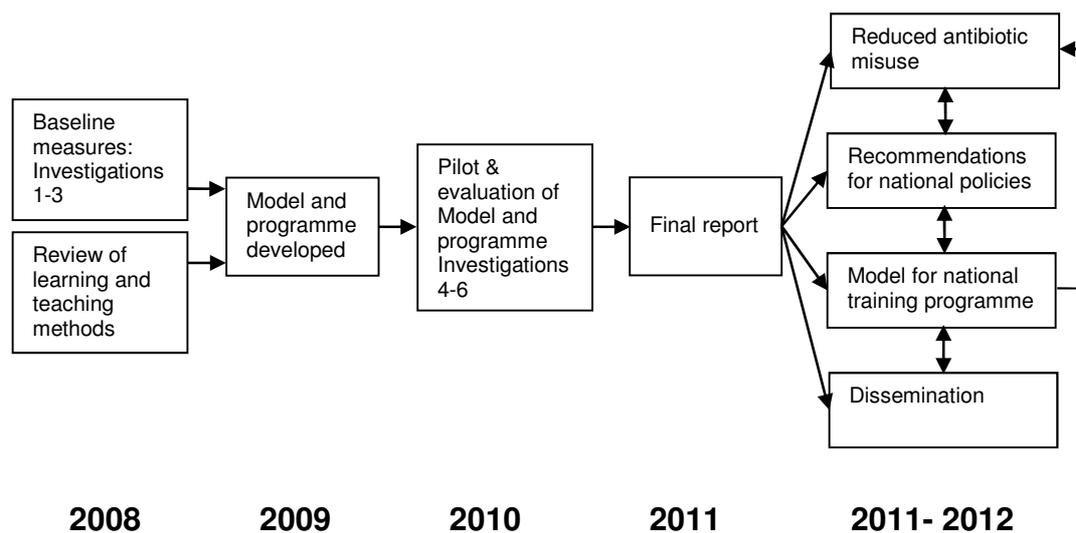


Figure 4.1. Diagramme of study work

Sample

As described previously in Chapter 2 Vietnam is divided into series of provinces which are also subdivided into districts then communes providing health services within areas that correspond to the government administrative structure (Huong, 2006). Healthcare services offered in the health communes is mainly provided by assistant doctors, nurses and other carers with lower levels of training. There is however, little research evidence available about the role and the situation of this group regarding antibiotic administration or of the factors that impact on their prescribing of antibiotics. In view of the aims of project, purposive sampling was

seen as most appropriate, this non-random method of sampling, aims to sample a group of people, or settings, with a particular characteristic (Bowling, 1997) and draws on the participants' experience of the phenomena under study to produce meaningful data (Corbin & Strauss, 2008). For this study it included all health workers of all levels of education working full-time at all commune health centres (hereinafter referred to as CHCs) in one district in Namdinh province, Vietnam. The only exclusion was anyone who did not wish to participate or was unexpectedly absent at the time of survey. The number of possible participants was 56.

The district in Namdinh province was chosen as it has features of geography, demography and a public health system that are representative of other community areas. The health structures in rural areas across Vietnam are dictated by government policy and are all developed and staffed in the same way, and it is anticipated that the findings from this study will be transferable to other rural areas in Northern Vietnam.

In addition to this general description of the sample, specific issues have been addressed for each of the six investigations

Ethical issues, and protecting the participants

The ethical principles of beneficence, non-maleficence, justice and autonomy, as originally described in Seedhouse's (1988) ethical grid cover a wide range of important issues and provide a practical framework for checking the ethical issues in research studies. They encompass data protection, confidentiality, anonymity, the safety of participants, the processes involved in the study and dissemination of the final results.

Although this study does not involve invasive procedures and there is therefore no risk of physical harm to participants, nevertheless, there are aspects of the study that could impact on their working lives, and every care needed to be taken to ensure that their rights were protected. In this study the participants were community health workers, based in local health settings. The aims of the study were such that the main outcome for them was an Information, Education and Communication package delivered to them in their own surroundings. However, whilst they stand to gain from the outcomes of the study, their anonymity needed to be protected. This was particularly important as the results from the baseline measure could and did reveal gaps in knowledge and poor prescribing practice. Given to employers without anonymity this could have adversely affected the

careers of the health workers. It was recognised that the researcher had, a duty of care to the public, however, as all participating staff were given additional education and training, the local authorities accepted that this negated the need to refer poor practice to them.

Approval for the study was gained from the MOH and the Provincial Department of Health, who accepted that no individual would be identified within the study. The researcher had contact with the potential participants prior to the study, they were clearly informed about the goals of the study and that all information was to be securely stored and anonymised. Accessing and obtaining information only occurred once written consent had been obtained from participants. All participants were assured that if they did not wish to participate their decision would be accepted, and that they could withdraw from the study at any stage. They were also reassured that no one in authority would know who participated in the study or who chose to abstain, and that the findings would only be used to inform policy and practice regarding antibiotic usage in the community.

In addition to this description of the overall ethical issues, specific elements have been addressed for each of the six investigations

DATA COLLECTION AND ANALYSIS

The baseline measures

The initial stages of the project were designed to enable baseline data regarding antibiotic use and identify the education needs (if any) of the health workers in the communes. This consisted of three interlinked, but distinct investigations. It involved the analysis of documentary data sources, a review of training programmes and a survey of public health workers in one district of Namdinh province, including records of antibiotic use, diagnoses, misuse of antibiotics, length of treatment, and so on. In addition to the survey, focus groups were held with all participants to enable them to discuss more fully their practices and patterns of antibiotic administration.

Survey by questionnaire: baseline measure: Investigation 1

Among varieties of data-collection methods for surveys self-completion questionnaire shows advantages over the structured interview such as low expense, saving time, asking phrases in the same way for all respondents and no impact of personal reaction (Bryman, 2008; Sapsford, 2007). Together with these were

inevitable limitations of the researcher's condition. For this reason as a self-completion questionnaire was used for the survey. Another issue was taken into consideration was that the health workers who played as the respondents of the study and their working condition. As mentioned in chapter Vietnam under the Vietnamese education system and health system health workers came from several original training/educations which were inconsistent, different from each other and as a general low qualification. Beside this self-completion questionnaire also has disadvantages such as the explanation what questions mean and help the respondents to understand what is required thus simple questions were used with any necessary clear instructions about how to complete the questions provided with each question (Bradburn, Sudman and Wansink, 2004).

Both closed and open questions were used. Closed questions asked for general demographic information including age, gender, job title, highest qualification degree, number of years since graduated, started service. Following this, respondents were asked to identify the length of time they had been working in relation to prescribing and medicine use. Closed questions offer advantages such as the ease of completion and processing answers. However closed questions exhibit certain disadvantages including a loss of spontaneity in respondents' answers and of interesting responses (Bryman, 2008). As a health worker of, and under the Vietnamese health system and health education system the researcher understood clearly that the health workers of the study were trained/educated from different curricula however they were working together in the same conditions within the commune health centres. So it was feasible to explore the reality of the use of antibiotics that the health workers perceived and experienced through their daily work rather than as individual fixed and rigid tests of their level of knowledge and competence of antibiotic use. Open questions although presenting disadvantages as they take respondents longer to answer and also take the researcher longer to analyse can be used to derive themes if carefully coded. The advantage, is that they give more qualitative responses, and insights into the situation as respondents can answer in their own language without being forced to use set responses (Bryman, 2008; Sapsford, 2007). For this reason open questions were then used to ask the health workers for their perceptions and attitudes regarding antibiotics and prescribing these within the community where they worked daily. These questions included patient compliance with treatment and the workers' attitudes to non-compliance when it occurred. They were also asked what they knew about antibiotics, antibiotic misuse and its consequences, and what the most common

infections were in their community. Finally they were asked what basis they use to decide when to give patient antibiotics, to describe any difficulties they experienced with prescribing and details of administration processes. The questionnaire was completed by health workers in their workplace, under the supervision of the researcher.

Specific sampling issues for investigation 1

As mentioned above, a total population sample from one rural district in Nam Dinh Province was chosen. Thus, all commune health workers from all levels of education working full-time in the selected district were invited to participate. The number of possible participants was 56, and in the event all chose to participate. This meant that there was no need to adjust the data analysis to account for non-respondents

Specific ethical issues for investigation 1

In line with all studies in Vietnam, as described above, ethical approval had been gained from varying key individuals and organisations. However, this was at an organisational level. The main ethical issues were therefore that all participants knew what they were agreeing to do, and were confident that their identity would be protected. Participant information had been carefully prepared, and given to the participants on average one week before the actual questionnaire was administered. Nevertheless, before they completed the questionnaire, the researcher checked before that all those present had understood the information that they had been given and were still willing to participate. The questionnaires were numbered but contained no names, and there was no way the researcher could link the number with any individual. All questionnaires were securely stored by the researcher in a locked cabinet at Nam Dinh University of Nursing. Individual communes were identified by only numbers, and no health service or university personnel had access to either the list of numbers, or the raw data. In line with Birmingham City University requirements, the raw data will be stored for five years and then destroyed.

Data Analysis for investigation 1

Data from the questionnaire included demographic indicators including age, sex, qualification, years qualified, training on medicine use and knowledge of antibiotics as well as perception of antibiotic misuse. Descriptive analysis were used to analyse the data sets. Much of the data were nominal and ordinal and therefore only non-

parametric tests for significant difference could be used. Although it is recognised these tests are less sensitive, as the data needed was to establish baseline measures this was not seen as problematic.

However, care needed to be taken with the stage of coding open-ended questions, firstly the responses were listed then grouped by theme. These themes generated from these open-ended questions were identified, coded and analysed using content analysis. The expected answer was defined then pre-coded by the content, different word(s) or phrase(s) to the question but having the same meaning i.e. belonging to a group of certain content were given the same code (Calnan, 2007). For instance, the consequences of antibiotic misused were 'antibiotic resistance', answers such as 'resistance', 'bacterial becomes familiar to the antibiotic', 'antibiotic cannot kill the bacterial', or 'antibiotic has no effect on infection with the bacterial' were given the same code. The final questions asked respondents to give any further information that they felt would be helpful about antibiotic use. It is recognised that this process can limit the insights gained, but data from this part of the analysis was used to provide additional insights into the documentary data, rather than for testing or deducing theoretical concepts. Unlike closed questions that can be pre-coded and attached to the coding frame, open-ended questions require the development of specific codes to accommodate the range of answers. It can be done by identifying the most frequent answer within the sample of responses however the coding categories were refined when new categories emerged as the main body of the questionnaire (Calnan, 2007).

Reliability and Validity

The questionnaire was in the same form and presented in the same format for all respondents. The wording of the questions therefore were carefully considered to be clear, understandable not ambiguous (Bradburn, Sudman & Wansink, 2004). Piloting and checking all stages of coding, data entry, data cleaning and analysis were conducted to minimise data errors. In this study the questions and their layout were pre-piloted on two separate occasions with some colleagues and a commune health centre with similarities outside of the study sample to identify potential problems. The questions were judged to be unambiguous, appropriate and acceptable to the health workers. The questionnaire was also assessed by comparing actual responses with information recorded from the clinical notes. The coding scheme was developed at the beginning to facilitate entering and analysing data and to manage the data in meaningful categories. Enough time was spent on

cleaning the data to identify inconsistencies and nonsensical responses once the data entering was completed using simple cross-tabulations(Gomm, Needham and Bullman, 2000).

Documentary research: baseline measure: Investigation 2

The health communes keep accurate records on attendance and on treatments in general, with all drugs itemised in individual patient records (health workers' record books). These were extracted and used in this study (hereinafter referred to as prescriptions). In Vietnam health statistics indicate that infections vary with the seasons, thus it was essential to review the document for the whole year 2007 (from January to December).

Specific sampling issues for investigation 2

It was not feasible to study all records, and therefore a format had to be used to select prescriptions to be analysed in the study. To be sure all the possible prescriptions has the same chance of being selected and yield an overall extent of antibiotic administration the number of prescriptions was calculated as the formula developed by the WHO (2000b) and based on simple random sampling.

$$n = \frac{z^2_{1-\alpha/2} P(1 - P)N}{d^2(N - 1) + z^2_{1-\alpha/2} P(1 - P)} \quad (\text{WHO, 2000, Sample Size 2.021})$$

n: number of prescriptions required

Z: confidence level (95%)

N: total number of prescriptions (in this study N = 41847)

P: anticipated proportion of prescriptions with/for antibiotics (through piloting 100 prescriptions and equal 0,5)

d: antibiotic solute precision required = 0,03

According to the formula, n = 1041 was adequate and the sampling interval is N/n = 41847/1041, was rounded up to 40. So the number of prescriptions selected in this study was 1047. Categories included the extent of antibiotic usage overall, commonly used types, disease trends, patient data were quantitatively analysed. The criteria used for evaluation of prescriptions and categories regarding antibiotics and antibiotic prescribing were based on guides from the official publications of Vietnam including Vietnamese National Drug Formulary (MOH, 2004b) and Guide to Treatment Common Bacterial Infection Diseases (MOH, 2006a).

Specific ethical issues for investigation 2

As described above, ethical approval had been gained at an organisational level. The main ethical issue was therefore that participants were protected. Assessing individual records could have meant that mal-practice was identified, and indeed, the level and manner of prescribing was revealed by the data collected. Therefore following the pilot of the recording sheet, it was decided that as with the questionnaires, only numbers would be used, and no individuals would be identified as having completed the documentation. Nevertheless, before accessing the records the researcher checked before that all commune workers understood the nature of the data that would be taken from the prescriptions, and the use to which it would be put. All completed sheets were securely stored by the researcher in a locked cabinet at Nam Dinh University of Nursing. Individual communes were identified by only numbers, and no health service or university personnel had access to either the list of numbers, or the raw data. In line with Birmingham City University requirements, the raw data will be stored for five years and then destroyed.

In addition it has to be accepted that all professional researchers have a duty of care to the public, and mal, or poor practice cannot ethically be ignored. However as the study was to provide education and training for all commune workers, it had been agreed with the MOH and district officials that this would be sufficient for them not to be notified of individual prescribing errors. All participants were given this information, and none of them refused access to their documentation.

Data Analysis for investigation 2

Data extracted from the health worker record books were quantitatively analysed after being categorized, coded and entered as variables into a statistical package system file. The categories included the overall extent of antibiotic usage, commonly used types of antibiotics, disease trends, patient data (age, sex, reason for administration, dosage and frequency of usage, type and duration of antibiotic courses, evidence of compliance/non-compliance). Where appropriate tests for statistical associations and significance between variables were carried out using SPSS for windows software. As with the data from the questionnaires, the data sets were such that non-parametric tests were used.

Reliability and Validity

The design of the recording sheet was carefully considered to be clear, understandable not ambiguous (Bradburn, Sudman & Wansink, 2004). Piloting and checking all stages of coding, data entry, data cleaning and analysis were conducted to minimise data errors. In this study the sheet was pre-piloted on two patient records from one commune health centre with. The coding scheme was developed at the beginning to facilitate entering and analysing data and to manage the data in meaningful categories. Enough time was spent on cleaning the data to identify inconsistencies and nonsensical responses once the data entering was completed using simple cross-tabulations (Gomm, Needham and Bullman, 2000).

Focus groups: baseline measure: Investigation 3

The aim of qualitative data collection is for the researcher to gather information from the study population, and to faithfully describe and present it (Maso, 1998). For the modified grounded theory method chosen for this study, interviews were an appropriate method of data collection. Bryman (2008) distinguishes three typical methods of interview; structured -, semi-structured, - and unstructured interview. The structured interview, also called as an standardized interview, has a fixed structure of questions to the validity of the data to obtain protection. The questions have to be answered in 'yes' or 'no', and the interviewer asks the questions exactly in the same order, and data can be quantified. The semi-and unstructured interview, according to Searle (2004), are much more flexible, but to be used effectively the researcher needs to have good interviewing skills. Identifying with the participant is essential in this process, so the interviewer moves (as much as possible) into the world of the participant to give the conversation a natural course. Patton (2002) emphasizes that the interviewer must constantly check clearly the statements of the participant, to make sure that s/he has understood the concepts and meaning being shared. For many interviewers, the semi-structured interview clear advantages, it is based on a short set of topics that can be used as a guideline for the interviews. There is freedom in the order of topics, the participant has can discuss rather than just report, and the interviewer can probe and explore key issues in depth.

Unstructured interviews are much harder to use, as the interviewer has much less control of the direction in which the interview goes. These interviews are based on interactions between the researcher and the participant, but the participant has the lead, and it can take a considerable period of time to cover key issues, if they are covered at all (Bryman, 2008). The study population in this study worked together,

with shared experiences and it therefore seemed appropriate to use a method whereby full discussion could take place, but the interviews needed to be based around key topics, and in consequence, semi structured interviews were seen as appropriate.

When considering how to carry out the interviews, it was decided that as the health workers were unused to this type of research, and although experienced in their own field were relatively junior in the hierarchy of the workforce, they could feel threatened if interviewed alone. Therefore the decision was made to keep to a semi-structured format, but to use focus groups to explore the context in which the health workers worked, and the personal experiences of the individual workers. In the literature, there is often confusion about the difference between focus groups and group interviews. Bryman (2008, p.474) argues that both have the addition of interaction interfaces, certain topics of conversation (topics) and give meaning to the subject. However, in targeted focus groups the selection of participants is based on key criteria, which are strictly adhered to. These can include knowledge of the subject, or a shared background, employment status or experience relating to the topics, such focus groups usually have between four to eight members (Patton, 2002; Maso, 2004; Bloor et al, 2000; Seale, 2004). Besides the shared criteria, the group dynamics support and can influence the normative behaviour of group members (Bloor et al, 2000). It can support them as they consider and discuss their views and perceptions and can provide a dynamic situation in which different opinions develop and are then debated (Bloor et al, 2000). As with individual interviews, this approach still allows for clarification and further explanation (Bryman, 2004, p.473). In this study, this approach enabled the discussion to focus on key issues as perceived by the participants, who were able to probe and debate with each other their individual views and perceptions. This helped identify collective views and the degree of consensus regarding key issues, with the researcher able to minimise the dominance of individual examples and instances (Searle, 2004; Puchta & Potter, 2004).

Specific sampling issues for investigation 3

As, indicated above, all commune health workers from all levels of education working full-time in the selected district had chosen to participate, this meant that with one focus group planned for each commune health centre there were 5-7 members for each session. This number fits well with recommended numbers for focus groups and therefore it was possible for everyone to participate.

Specific ethical issues for investigation 3

The ethical issues for qualitative data differ from those for quantitative data sets. The participants had indicated that they understood the purpose of the study but issues of identification were crucial. The focus groups were taped, and voices can be recognised, therefore before each session, the researcher reassured participants that no-one other than himself would listen to the tapes. The transcripts from the focus groups would not contain their names, and that none of the issues raised would be reported in a manner that identified a specific individual or commune health centre. The tapes and transcripts were numbered but, no health service or university personnel had access to either the list of numbers, or the tapes or transcripts. All data have been securely stored by the researcher in a locked cabinet at Nam Dinh University of Nursing. In line with Birmingham City University requirements, the transcripts will be stored for five years and then destroyed.

Data Analysis for investigation 3

There are two main aims for data analysis in grounded theory, according to Wester (2004). The first aim is collecting and analyzing the data in an iterative manner. The second, long term aim, not to be used in this study is deriving the theory from within the data. However, although a full grounded theory approach was not appropriate the steps used in data analysis were used as the basis for the analysis of data from the focus groups. Glaser and Corbin (in Wester, 2004) and Patton (2002) describe four stages in the Grounded Theory, namely;

1. Exploration.

This includes the development of 'sensitizing concepts' as a starting point. This begins when the researcher begins to collect data, as analysis begins immediately, with findings from each interview impacting on the next. This process often referred to as open coding provided the first answers to the research questions are signed as key concepts.

2. Specification phase.

Data analysis and categorization of concepts (in development) are central activities in this phase. Research literature is needed to categorize the different codes, linked to the literature review. After the preliminary step in analyzing concepts, new questions are formulated. The concepts from the research field are evaluated and treated as variables to produce a preliminary picture of the research setting. These central concepts are starting point for organisation of material.

3. Reduction phase.

Axial coding is used as data from the first two steps are thoroughly analyzed and re-analysed with the links and structures refined to identify repeating and new themes. From these, analysis focuses on identifying themes that can be seen as central, or key to the others, and by studying the extent to which data can be coded and 'reduced' into these newly emerging themes. By this stage the research material is beginning to have an organized structure and can be presented using central concepts, or 'the key themes'.

4. Integration phase.

In this phase, the explanations are sought regarding the relationships between the central theme (concept) and the remaining themes. This process, which is also iterative, begins by focusing on the central themes gradually moving towards those more on the periphery. When this has shown how the relationships between central and more peripheral themes or concepts could have occurred, the analysis continues repeating the steps with the inclusion of newly gathered data based on the first cycle of analysis reviewing and reassessing possible relationships. .

Methodological rigour

The concepts of trustworthiness and authenticity were used to review all steps in data collection and analysis with qualitative data, as in qualitative research the concepts of reliability, validity and replication is difficult. Silverman (2004) describes the impossibility of repeating qualitative research, and prefers therefore to speak of 'virtual repeatability'. He means with this term that the researcher gives a detailed description of the initial implementation of the study, in a format that could be followed. Patton (2002) describes five different quality criteria on which qualitative research can be tested; traditional scientific research criteria, social constructivist criteria, artistic and evocative criteria, critical change criteria and the evaluation standards and principles.

From that view, the research plan has to be seen as a social constructive inquiry with the following criteria; subjectivity acknowledged, trustworthiness, authenticity, triangulation, reflexivity, praxis, particularity, enhanced and deepened understanding and the contribution to dialogue. Patton (2002, p.546) speaks in terms of 'trustworthiness'. This terms he build up from a combination of the terms credibility (an analogue to internal validity), transferability (as an analogue to external validity), dependability (as an analogue to reliability) and conformability (as an analogue to objectivity). In Patton's (2002) opinion 'naturalistic inquiry should be

judged by dependability (a systematic process systematically followed) and at the end of the research, the authenticity (reflective consciousness about one's own perspective, appreciation for the perspectives of others, and fairness in depicting constructions in the values that undergird them). The view of the world is based on social, political and psychological constructions, as opposed to the physical world, and triangulated from multiple perspectives, rather than seeking a singular truth. The subjectivity of the constructivism is the consequence of the searching in complex, specific cases paying attention to praxis and reflexivity, to understand the other in his own thought and his own world.

In this inquiry the researcher followed systematically the steps; creating a research question, looking for an appropriate method to answer the research question, making a schedule to collect the data, determining the research population and contacting them prior to the study so that they could if they chose refuse to participate. The data was recorded, and analysis followed the steps described above. The researcher was aware of the vulnerable position of the participants, and their anonymity was protected by presenting the data using the themes generated as these are content, not person based and ensuring that all quotes used had no identification. The data were digital recorded, so it was possible for other researchers to check that quotes were used within the original context, and that researcher bias and perceptions had not unduly influenced the identification of the themes.

PILOTING THE MODEL

A method to assess the impact of the model was needed, and although initially the processes used in experimental design seemed appropriate, in this context, it was not practical or ethically acceptable to use a true experimental method, with randomised designs. In this instance, this would leave one group still possibly misusing antibiotics, and thereby adversely affecting the health of those they serve. As a result of the difficulties involved with random controlled trials, a range of other analytic methods have been developed as alternatives (Bowling, 1997). Quasi-experimental designs facilitate the research for knowledge and examination of causality in situations in which complete control is not possible (Bryman, 2008). These designs support the control of as many threats to validity as possible in a situation in which at least one of three components (random sampling, control groups, and manipulation of the intervention) is lacking. Because of their own weaknesses, these methods are generally undervalued but have much to offer if

carefully used and interpreted. After consideration of several types of quasi-experimental designs in this study, the One-Group Pretest-Posttest Design (Burns & Groves, 1997; Bryman, 2008) was seen as suitable for the small population of health workers at the commune level. Figure 4.2 presents the diagramme of measurement for the interventional stage of this study.

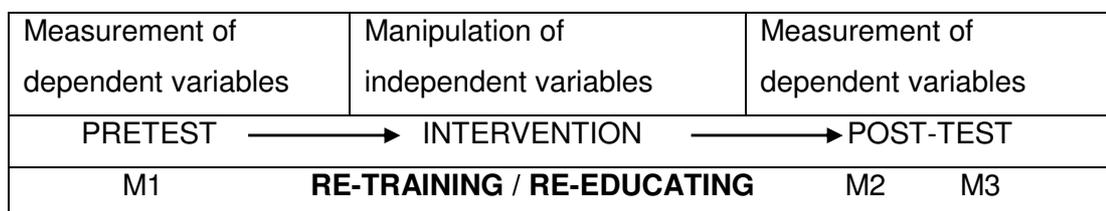


Figure 4.2. Diagramme of measurement

Note: M2 was carried out on completion of the training

M3 was carried out 3 months later

A re-education and training programme for health workers regarding antibiotic use was developed, and piloted with the whole group. An interrupted Time Series was used for measurement of variables related to changes or differences in knowledge, and awareness of standards for prescribing antibiotics. These variables were measured again immediately on completion of the training and then after a three month interval.

ASSESSING THE INTERVENTION

As with the compilation of the baseline measures, the assessment of the model required the use of more than one approach. It consisted of three interlinked assessments,

Assessment by questionnaire: Investigation 4

For this a second questionnaire, a modification of that used for the baseline measures was used. The key difference was that this used only closed questions as comparative quantification was needed and coding of open questions could have led to inaccuracies (Bowling, 1997). It was administered to the participants immediately after their participation in the education programme, and as indicated above it was repeated after three months.

Specific sampling issues for investigation 4

The sampling issues for investigation 4 have been described under investigation 1

Specific ethical issues for investigation 4

The ethical issues for investigation 4 have been described under investigation 1

Data analysis for investigation 4

The differences between pre and post levels and the final assessment were analysed using the same methods as in the pre-assessment measures, and triangulation was used to inform any modification or consolidation of the re-training and re-educating programme perceived to be necessary (Patton, 2002; Burn and Grove, 1997).

As with the baseline measures, analysis of the questionnaire was statistical. Data from the post-intervention assessments will be analysed using ratio comparative statistical verification to analyze 2 variables for related indicators (Kothari, 2005). Depending on the initial analysis further tests may be carried out, but as much of the data will be nominal or ordinal (only drug dosage will be interval) non-parametric tests will be used with some data presented in a tabular or graphical format .

Assessment by observation :Investigation 5

Overall assessment of the intervention needed to consider not only the changes revealed by using the questionnaire but also changes evident from watching and listening to the commune staff working with regard to antibiotic use and administration. A participant observation can give authentic representation of the real action of the group being studied with respect them (Hughes, 2007). For this reason a participant as observer approach was used with each staff group gain explorative data of how the intervention in some extent, impacts on activities of the health workers of the study. Having the proper requirements of conducting an overt observation including the permission to access as well as the awareness of the participants about the aim, nature and necessary confidentiality of the research (Bowling, 1997) the observation was conducted in which the researcher participated in the group work of the health workers as an observer. However, this type of observation presents problems, and researcher's presence can influence discussions (Hughes, 2007). To minimize these problems certain steps for observation were defined and repeated with all groups of health workers. The researcher's role was only that of a health practitioner and a colleague of the health workers. They were fully informed about the project and given an assurance that no comment given during the focus groups would be given to management or their

patients/clients. This was very important because the final state of the observation included seeing how the health workers interacted with their clients.

In addition, in each staff group “case” or patient study observations were conducted before, immediately after and three months after the intervention. The patients’ problem, number of patients/clients prescribed with antibiotic, details of instructions delivered to patients/clients, and time spent on instructing administration of drugs, were all recorded in the same format as field notes. In fact, at the time of the intervention the researcher was known to the participants and the observation went smoothly with all staff groups. It is recognised that observation is difficult technique and requires carefulness (Bowling, 1997; Hughes, 2007). In this study the observation was based on the recording of set categories, and the intended observational categories were clearly defined as variables. It was essential to record consistently and adequately the defined categories from the separate health centres of the study sample. For this reason the field-notes were designed beforehand and organised in chronological order, and presented using a standard format similar to a type of checklist table (see Appendix 8). This process facilitated the recording as well as in the entering data later. To protect the identity of the health workers, a health centre identification system known only to the researcher was used.

Specific sampling issues for investigation 5

For this investigation convenience sampling was used. Each time, the client/ patient observed was the first one to attend the commune health centre on the day chosen. The advantage of this approach was that prior to the session, no individual workers had been chosen to be observed, and therefore they had not spent time preparing for the observation. As a result, their interaction with the client was more likely to follow their normal prescribing practice. It was accepted that the disadvantage of this approach was that it would not give a representative sample, but the aim of this investigation was to provide insights into prescribing practice following the implementation of the training programme. These were then checked against the information that had been given during the training sessions.

Specific ethical issues for investigation 5

The main ethical issue was that participants were protected. Observing individual participants interacting with clients could have meant that mal-practice was identified. The clinical competence and manner of prescribing was revealed by the observations made. Therefore following a pilot of the recording sheet, it was

decided that only numbers would be used, and no individuals would be identified. Nevertheless, before each observation, the researcher checked that the commune worker understood the nature of the data that would be recorded, and the use to which it would be put. All completed sheets were securely stored by the researcher in a locked cabinet at Nam Dinh University of Nursing. Individual commune workers could not be identified and no health service or university personnel had access to any of the completed observation sheets. In line with Birmingham City University requirements, the raw data will be stored for five years and then destroyed.

In addition it has to be accepted that all professional researchers have a duty of care to the public, and mal, or poor practice cannot ethically be ignored. However, following each observation it was possible for the researcher to discuss the data recorded with the individual and through this help them to identify errors in prescribing and avoid these in the future. It had been agreed with the MOH and district officials that this would be sufficient for them not to be notified of individual prescribing errors. All participants were given this information, and none of them refused to be observed. .

These observations involved interactions with clients and therefore their consent too had to be given. However, all communes have a teaching function and clients are always asked if they are willing to be seen by a practitioner who is being observed. As feedback was given to individual practitioners following each observation, the sessions had been classified by those giving ethical approval as fitting within staff assessment sessions. They had therefore agreed that the processes normally used were sufficient for this study, and in accordance with this clients were asked to give their consent before the observation began. Literacy is still an issue in Vietnam and therefore verbal consent is the accepted format for consent in commune health centres. In this study client consent was noted on the observation sheet (see Appendix 8).

Data Analysis for investigation 5

According to Hughes (2007) most analysis data from participant observation studies is based on content, others base on analytic induction or grounded theory. However, as mentioned above section the field notes of observed categories were recorded in the form of quantitative information therefore the analysis of data from the field notes was done quantitatively like those of the questionnaire using SPSS for windows software.

Assessment by focus groups: Investigation 6

With the final assessment focus groups were again included to give qualitative insights into the perceptions of the health works regarding both the format and content included in the training (Searle 2004; Puchta & Potter, 2004). This interpretivist approach was again seen as important as it was essential to ascertain the workers perceptions of the model and programme. As with the baseline measures, a modified grounded theory approach was used as the theoretical framework to inform data collection and analysis, with again, only the first cycle being carried out.

Specific sampling issues for investigation 6

The sampling issues for investigation 6 have been described under investigation 3

Specific ethical issues for investigation 6

The ethical issues for investigation 6 have been described under investigation 3

Data Analysis for investigation 6

The qualitative data were analysed using the processes of open and axial coding as described previously (Strauss & Corbin, 2009) to explore the data sets. Initial findings will be compared within and between individuals and groups then categories will be conceptualized to offer explain the data (Strauss & Corbin, 1997). Themes were then generated by a process of inductive reasoning, in which analytic categories emerge from the data rather than from a pre-existing theory (Braud & Anderson, 1998; Strauss & Corbin, 2009).

CONCLUSION

It was necessary to describe clearly all the procedures that were used in this particular study to make a contribution to research in this field. Both quantitative and qualitative research paradigms contributed to the study. Guba and Lincoln (1994) indicated the chosen research paradigms determine the aims and methods of research because they are bound together. Therefore, as the aim of the study was to understand the situation regarding antibiotic administration at community level, in which health workers have the major responsibility for delivering health services including medicines. Triangulation of quantitative and qualitative was the most appropriate because quantitative methods gave a measurable description of the situation, while the qualitative methods generated richly detailed data based on the reality of the individuals' own experiences and interpretations (Corbin & Strauss,

2008). No single quantitative or qualitative method would have given sufficient information to enable a new model for education and training to be developed, piloted and evaluated (Denzin & Lincoln, 2005).

CHAPTER 5. ESTABLISHING THE BASELINE MEASURES

INTRODUCTION

The aim of the first phase was to establish baseline measures regarding the current use of antibiotics in the community being studied. As indicated in the methods chapter, mixed methods were used for this study, two data sets were quantitative and the third qualitative. The quantitative data sets have been presented first, together with a limited discussion to provide the context of the results, but further discussion has been combined with the findings from the qualitative data set, as this provides a more coherent and integrated discussion.

BASELINE MEASURE 1: measure by questionnaire

This consisted of a detailed questionnaire with both closed and open questions (see Appendix 4). The closed questions have been coded and are presented using descriptive statistics and the open ended questions have been coded using a coding manual and then descriptively analysed. The choice was made to use descriptive statistical analysis rather than inferential test, as the aim was to record and describe the baseline measures not to make inferences (Bryman, 2008).

Demographics of health workers

The total number of health workers who participated in the survey was 56, Figure 5.1 and Table 5.1 give an overview of the backgrounds of the health workers from CHCs who took part in the study.

Within the study sample, at the time of investigation the youngest worker was 27 years old and the oldest was 57 years. As usually seen in professional education in Vietnam, the lower qualified workforce finished general education at the age of 18, undertook 1 or 2 years of a short professional training, then entered the workforce. (see Chapter of Vietnam). The age band 40 - 49 was the highest (44.6%), and perhaps not surprisingly, in this age band, as their qualifications limited their ability to change jobs, the health workers with less education demonstrated a long career history, spent in the CHC working in activities linked to antibiotic administration. However, during these years had not been much ongoing education, supporting Yorke & Londen's (2007) argument that it is difficult for those working in the community in Vietnam to continue their education.

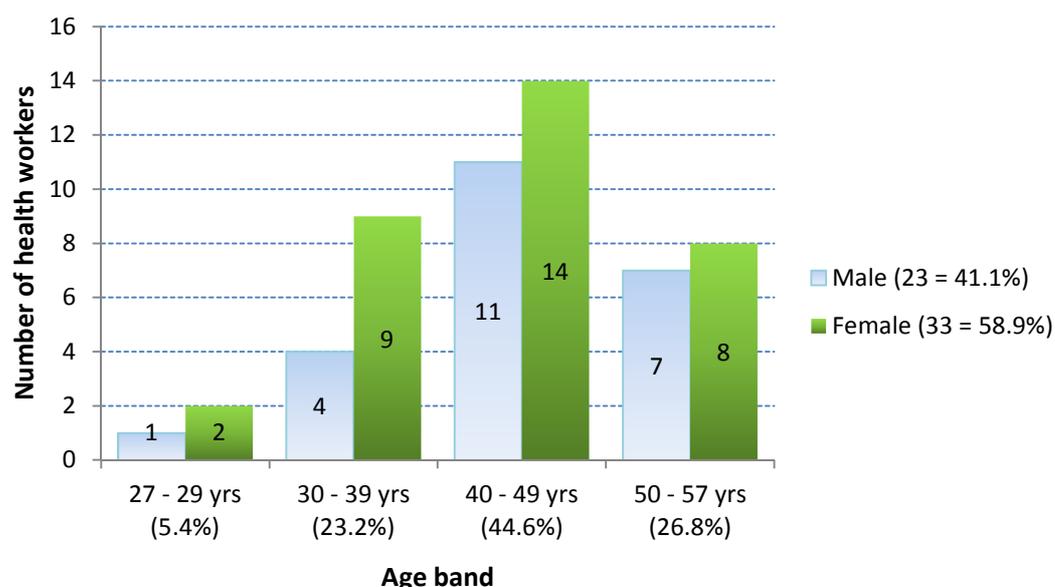


Figure 5.1. Age and gender of health workers in CHCs

It was evident from Figure 5.1 that the percentage of women (58.9%) was higher than that of men (41.1%). These numbers reflect the situation for women in Vietnam, where the inherited responsibilities for their extended family find it difficult to attend a university as that could necessitate leaving home. They therefore settle for the shorter courses delivered in colleges based nearer to their homes accepting the career limitations this will bring. The situation is changing particularly in urban areas, but the vast majority of the population remain in rural areas where there is less possibility for accessing university level training. For this group ongoing education needs to be based within reach of their normal workplace.

Table 5.1. Education levels and job titles of respondents

Category	Health workers	
	N	%
Education level		
University	Total	6 10.7
	Medical Doctor	6 10.7
Secondary	Total	30 53.6
	Assistant Doctor	17 30.4
	Nurse	9 16.1
	Midwife	4 7.1
Elementary	Total	20 35.7
	Nurse	8 14.3
	Midwife	6 10.7
	Pharmacist	6 10.7

Years in career (length of service)	Min	1	
	Max	38	
	1 – 5 yrs	10	17.9
	6 – 15yrs	16	28.6
	16 – 25 yrs	24	42.9
	> 25 yrs	6	10.7

Table 5.1 indicates the current education of Health Workers in CHCs included staff at all three possible levels, for working in the community (as mentioned in Chapter of Vietnam) bachelors, secondary and elementary with seven titles of job, reflecting the structure of professional educational for health in Vietnam. The majority were educated at secondary level (53.6% of the total) in which Assistant Doctors were the majority. A further 35.7% of staff held only elementary level qualifications, and these figures mirror those from Vietnam's National Health Survey 2001-2002 (MOH, 2003), which clearly demonstrated the shortage of a highly qualified health workforce. This report suggested that this could in part be because health workers with higher education are able to find work in health settings with better conditions than the CHCs.

Having recognised the shortage of an adequately trained health workforce, the government has permitted schools and universities to diversify their training and education such that short-term curricula for secondary and elementary levels have been expanded to provide as quickly as possible an increased supply of community health workers for the public. However, there are problems with this approach. Firstly, the rapid development of these courses has meant that programmes and other training facilities are inconsistent and fragmented, which in turn has adversely influenced the training quality outcomes, and the course content often does not match practice requirements (Cu, 2007). Secondly it does not address the problem of migration of qualified staff to better or more attractive work settings. To raise the level of staff in CHCs is therefore not only dependent on education, but also on finding ways to increase retention.

Table 5.2. Training courses for health workers in CHCs

Attendance of courses	Health workers	
	N	%
Never attended any courses in total	19	33.9
Attended at least one course in total	37	66.1
Attendance public health courses		
Total	29	51.8
health care for children	5	8.9
reproductive health care	5	8.9
prevention & control for diseases & epidemic	14	25.0
health education & communication	4	7.1
medical technology	1	1.8
Attendance on pharmaceutical courses		
Total	18	32.1
medicine use	5	8.9
medicine management, ordering and storage	10	17.8
attended but forgot title/content of course	3	5.4

As Table 5.2 indicated, two thirds of health workers (66.1%) within the sample of this study had been sent to some training courses regarding their work, with the titles and contents of these based on of the national health programmes (MOH, 2003). These were designed in response to the emerging public health problems. However, choice of courses seemed to be random, with no particular or mandatory training programme for health workers after graduation. However despite this programme it has to be a cause for concern that about one-third of health workers had not attended any training course since graduation from their original training. Of the 37 health workers who had attended training courses, some of them attended more than one so the number of participations in courses at first glance was 47 (83.9% of the total sample). This illustrates the importance of careful scrutiny of statistical returns as there is a difference in actual terms of 10 (17.8 % of the total sample) which gives a very different picture with in reality only 66.1% having had any further education. However, of the 37, only 5 respondents had attended a course focusing on medicine use (only one time for each person), and none had attended a training courses focused on solely on antibiotics and antibiotic resistance. This has to be a cause for concern as it is recognized that knowledge (without study or revision) reduces over time (Zernike & Henderson, 1998). Thus although antibiotic resistance and the problems arising from irrational and/or inappropriate usage have been recognised nationally and internationally, at a local level there has been little training designed to address this issue.

Health workers' basic knowledge of antibiotics

Assessment of the health workers' knowledge of antibiotics was gained from three groups of questions, the first on perception and understanding, the second on practical experiences and the third on the expected actions arising from specific situations that health workers were likely to encounter in their practice. Table 5.3 gives a general assessment of basic perceptions and understanding of antibiotics.

Table 5.3. Health workers' perception and understanding of antibiotics

Questions and Answers	% of responses (N = 56)
Based on your own understanding, please answer what antibiotics are	
1. medicines used to kill and inhibit bacteria	16.1
2. medicines used to kill bacteria	21.4
3. medicines used to inhibit bacteria	5.4
4. medicines used to treat infection	41.1
5. medicines used to treat inflammation	5.4
6. incorrect answer	10.6
What happens if the patient does not complete the course	
1. make bacteria resistant to antibiotics	73.2
2. other	26.8
What are the results of self-medication...	
1. disease is not cured	42.8
2. may suffer from adverse effects	23.2
3. makes it difficult to diagnosis and treat	28.6
4. incorrect answer	3.6
5. no response	1.8
What is your concept of misuse of antibiotics	
1. used without manifestations of bacterial infection	32.1
2. incorrect type and/or dosage of antibiotics given	23.2
3. both 1 and 2	17.9
4. incorrect answer	25
5 no response	1.8
What are the consequences of antibiotic misuse	
1. poor effect of treatment	17.9
2. make bacteria resistant to antibiotics	25.0
3. both 1 and 2	44.6
4. other consequences (waste, dangerous...)	10.7
5. incorrect answer	1.8

It was seen as important to ascertain whether the health workers actually followed official guidelines in their practice, because as the above table illustrates, although respondents were, to some extent, aware of the use and misuse of antibiotics, and

self-medication (and its consequences), not all answers indicated an adequate level of knowledge underpinning their practice. It can be seen from the questions on knowledge that 46.5% (41.1% and 5.4%) gave incomplete answers, with for example some suggesting that infections can be viral and that inflammation may not be infected, but not differentiating further, or citing key diagnostic factors, therefore, this group may or may not prescribe appropriately.

Current practical experience

Through the use of practical examples or small vignettes, the health workers were asked to give examples of how they judged when and to prescribe antibiotics. Their answers were seen as a key factor in the process of assessing the administrative practice of CHC workers.

Table 5.4. Health workers' practical experience of antibiotics

Questions and Answers	% of responses (N = 56)
What were the symptoms and/or manifestations that you based on to give patients antibiotics	
1. fever & clinical manifestations related to a bacterial infection	41.1
2. fever & clin manifestations unrelated to a bacterial infection	30.4
3. clinical manifestations related to a bacterial infection	7.1
4. only fever	3.6
5. incorrect answer	17.8
When you decide on giving clients antibiotics, the class of antibiotics chosen will be	
1. based on specific disease/infection	42.8
2. based on contraindications	21.4
3. based on both 1 and 2	16.1
4. based on indications of antibiotics	7.1
5. based on experiential therapy	3.6
6. based on common antibiotics available at commune level	3.6
7. incorrect answer	5.4
When you decide on giving clients antibiotics, the dose of antibiotics indicated will be based on	
1. based on severe level of disease/infection	37.5
2. based on physical status of patients	3.6
3. based on both 1 and 2	44.6
4. based on recommended dosage	14.3
A course of antibiotics at least needs to be used to cure a patient is	
3 days	5.4
5 days	50.0
7 days	42.8
10 days	1.8

Sources of information and knowledge for health workers base on to prescribe and administer medicines were

1. from original training	91.1
2. from post qualifying training courses	28.6
3. from guideline books/documents	75.0
4. from leaflets/box covers	73.2
5. from colleagues	33.9
6. combination of sources	7.1

Analysis of the answers from questions on practical experience and decision making showed that antibiotic prescribing had to be mainly based on clinical manifestations because there were no laboratory (known as paraclinical) tests available in the CHCs. Therefore, knowledge of clinical symptoms and the health workers' ability to identify them are of paramount importance in the current working conditions. An indication of the extent of the problem was revealed when respondents were asked what symptoms and/or manifestations the workers used to give patients antibiotics. Of the 56 respondents 30.4% replied that fever and other clinical manifestations unrelated to a bacterial infection were the basis on to give patients antibiotic. While a further small minority (3.6%) gave the simple answer that fever alone was sufficient cause. If respondents are using inappropriate criteria to assess whether or not antibiotics are needed, then it would seem that there may well be inappropriate administration on an ongoing basis. Further problems were noted when the criteria for choosing types and doses of antibiotics were considered, as in this section the responses were inconsistent. Of the 56 respondents 12 (21.4%), 4 (7.1%) and 2 (3.6%) replied that contra-indication, indications (already incorrectly reported) and the common antibiotics readily available at their working place, were respectively, the criteria they used to choose the class of antibiotics they gave. Clearly, this is another example of practice that could lead to inappropriate decisions and prescribing.

Another concern was that although the patients' age is clearly listed on the CHCs' medical record books, no participants stated that dosage would be based on age. In the absence of bacterial tests, choosing the class of antibiotic and deciding the dose following recommended guidelines is essential, but few gave accurate or appropriate answers or demonstrated knowledge of the guidelines. There was further inconsistency regarding duration of a course of antibiotics half thought 5 days was the least period of time for a course. The remainder suggested 7 days (40.6%), 10days (1.8%) as well as 3 days (5.4%). However, these decisions appeared to be generic with none given examples of differences in dose and

duration between the different antibiotics. The variation in these figures clearly illustrated insufficient understanding of the differences between antibiotics, the timescale in which they work and the necessity to maintain the duration of antibiotic existing in the body to eradicate the pathogen completely and prevent recurrent infection.

The source of information and knowledge on which health workers base prescribing and administering medicines in general and antibiotics in particular influences the quality of prescriptions (McGettigan et al, 2001). As seen in Table 5.4 more than 90% of health workers answered it was from their original schooling/training period. It is recognized that ongoing education is the leading factor in maintaining good prescribing practice by medical doctors. However, in countries where continuing education (CM) is not mandatory (such as Vietnam), the problem of knowledge from original training courses having diminishing significance over time, is not addressed. This results in increasing inaccuracy in prescribing and administering drugs over time, even amongst hospital doctors (McGettigan et al, 2001). To reverse this trend, local health workers trained many years ago and mainly at secondary and elementary level, often many years ago, levels of knowledge and prescribing practice urgently need to be reviewed. In addition since in recent years, the knowledge and understanding of antibiotics has dramatically changed, not only will memory impact on their knowledge, but the relevance of their original training needs to be considered. It is accepted that other sources such as guidelines and books/document were given by 75.0% of respondents, as 73.2% also gave the unacceptable response that leaflets/box covers were used as guidance, it is difficult to know to what extent the official guidelines and books were actually used. The responses in this section may be an indication of the difficulty in accessing up to date information experienced by local 'grassroots' health workers, but the use of patient information leaflets by prescribers is not appropriate. Finally, colleagues were cited as a source of expertise and advice by a third of respondents but this may not increase good practice. Fellow workers who can offer, informal support may also have inadequate training and knowledge, so perpetuating poor prescribing practice.

Health workers' actions regarding Misuse of Antibiotics

It has long been recognised in Vietnam (and elsewhere) that self-medication and incompleteness of courses of antibiotics occur frequently in the community (MOH-GDS, 2003; Larsson, 2003; GARP-VNWG, 2010). To find out how health workers'

reacted towards a patient who does not complete the course of antibiotics or who uses self-medication before seeking medical advice, the health workers were asked what they would do. The results are presented in Table 5.5

Table 5.5. Actions of health workers regarding misuse of antibiotics

Questions and Answers	% of responses (N = 56)
What do you do when you meet a patient who has not completed the course	
1. persuade patients to complete the course	83.9
2. re-examination and treatment and persuade patients to complete this course	1.8
3. re-examination and treatment	8.9
4. inappropriate answer	5.4
What do you do when you meet a patient who use self-medication	
1. give patients medical exam and treatment	19.6
2. persuade patients not to treat by themselves	60.7
3. both 1 and 2	14.3
4. inappropriate answer	5.4

As this table indicates, as majority of health workers reported that they had persuaded patients to take antibiotics appropriately. These answers accounted for 83.9% for the former situation and 60.7% for the latter situation. It is a normal response but how and in what way they had contrived to convince the patients was not evident, and in the light of previous answers may be somewhat optimistic. To convince patients, health workers first have to convince themselves, To do that they must have the requisite knowledge, and reviewing Tables 5.3 and 5.4 revealed that the health workers in the sample of this study need to have more knowledge of appropriate antibiotic administration before they can do this well.

Associations between perception of antibiotics with demographics

To identify whether or not a connection between perception of antibiotics varied with levels of education of health workers, their perceptions of antibiotics were narrowed down into two basic categories, firstly definitions of antibiotics and secondly, the criteria or reasons to give patients antibiotics. Responses used to described antibiotics as medicines used to kill and/or inhibit bacteria were acceptable answers for the former category and clinical manifestations related to bacterial infection with/without fever were counted as acceptable answers in the latter category (as presented previously in Table 5.3)

Table 5.6. Perception of antibiotic by education levels

Categories by education levels			Accepted responses		p value (chi-square)
			n	%	
Definition of antibiotic	University (N=6)		6	100.0	
	Secondary (N=30)		13	43.3	p(2;1) = 0.05
	Elementary (N=20)		5	25.0	p(3;1) = 0.05
Criteria for giving patients antibiotic	University (N=6)		6	100.0	
	Secondary (N=30)		14	46.7	p(2;1) = 0.02
	Elementary (N=20)		7	35.0	p(3;1) = 0.02

Table 5.6 shows that although it has to be accepted that there were fewer university level workers in the study it has to be pointed out that from this small number 100% of participants gave appropriate/acceptable responses. However it was also evident that acceptable responses diminished with educational level, and that there was a statistically significant difference in the number of acceptable responses between university level and the other two levels.

It is recognized that prescribing practice is likely to be affected by experience, and therefore the data was re-analysed to consider the duration, or number of years during which health workers had worked as prescribers. Table 5.7 was produced to identify whether or not there was an association between perception of antibiotics with this aspect.

Table 5.7. Perception of antibiotic by years in career

Categories by education levels			Accepted responses		p value (chi-square)
			n	%	
Definition of antibiotic	1 - 5 yrs (N=10)		2	20.0	
	6 - 15 yrs (N=16)		10	62.5	p > 0.05
	16 - 25 yrs (N=24)		11	45.8	
	> 25 yrs (N=6)		1	16.7	
Criteria for giving patients antibiotic	1 - 5 yrs (N=10)		5	50.0	
	6 - 15 yrs (N=16)		5	31.3	
	16 - 25 yrs (N=24)		14	58.3	
	> 25 yrs (N=6)		3	50.0	

Using chi square as this table illustrates there was no significant difference between the those newly qualified and those who had been in practice for many years at CHCs. A finding supported by examination of their responses which revealed that inaccurate and inappropriate answers were given by respondents from all groups.

Concern of health workers about the current situation of antibiotics

Health workers in CHCs carry the main responsibility for prescriptions and appeared to be working autonomously regarding the administration of all drugs, including antibiotics. It was therefore important to ascertain not only what they said they did, but what they thought about self medication and compliance amongst their clientele. The results from questions in this area are found in Figure 5.2 and Table 5.8

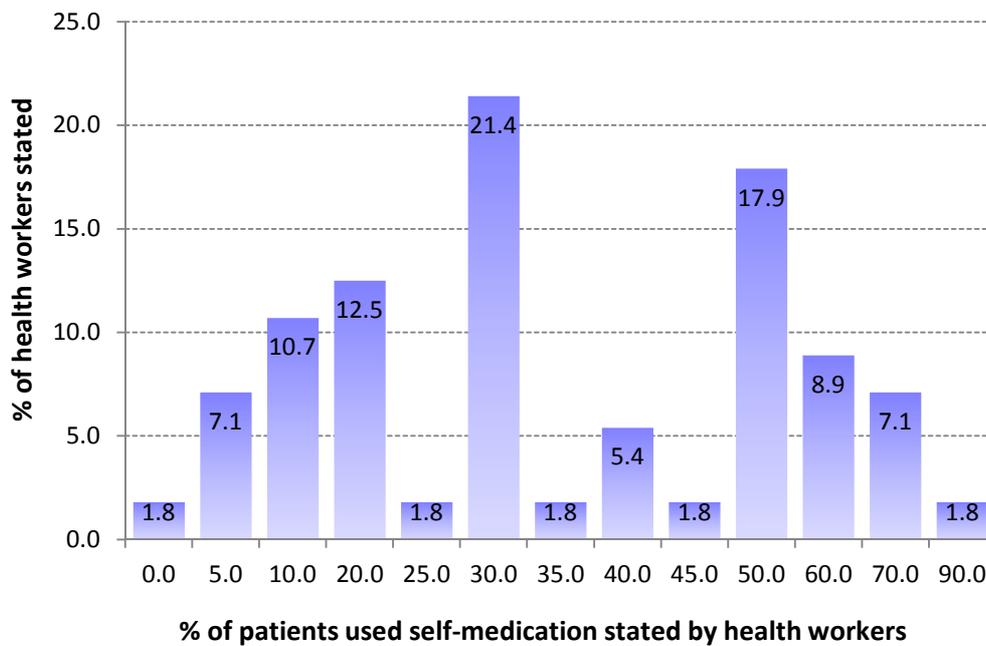


Figure 5.2. The extent of self-medication at the local stated by health workers

When asked what percentage of patients used self-medication before coming to the CHCs, as Figure 5.2 indicates, the answers varied considerably between health workers. One (1.8%) reported no instance amongst the patients that they had seen, whilst in contrast another (1.8%) believed it occurred in 90% of patients. Such variation needs further consideration, and it has to be accepted that some health workers do not, or are not able to recognise when patients self-medicate. As previously described, there is a long history of self-medication in Vietnam, and it is described as any medication taken without professional supervision to alleviate an illness or condition. By medication it means an over-the-counter drug (one not needing a prescription) or preparation. According to a cross-sectional survey at household level conducted by Okumura et al (2002) 40-60% of people in Vietnam depend on self-medication. This survey also found that 96 different antibiotics (in terms of generic type) were kept in 76 households of the surveyed 505 households, these antibiotics were kept mainly for coughs and diarrhoea with the self-medication group was twice as likely to use antibiotics than the other group. There was

insufficient public health education. This is the most likely reason for the divergence in reporting by health workers as Figure 5.2 and point out that self medication is common practice in Vietnam.

Table 5.8. Comments from health workers regarding antibiotic use

Categories and subcategories		Respondents	
		n	%
Difficulties in making decisions on giving antibiotics	non-compliance from locals	9	16.1
	knowledge of prescribing	22	39.3
	lack of facilities	16	28.6
	no difficulty	7	12.5
	Inappropriate answer	1	1.8
	no response	1	1.8
Further comments	abuse of antibiotics exists	8	14.3
	antibiotic resistance exists	3	5.4
	re-training is needed	11	19.6
	misconceptions exist	1	1.8
	no response	33	58.9

When asked what they found difficult, about prescribing, from the 56 respondents, 22 (39.3%) acknowledged that their limited knowledge of antibiotics caused difficulties, while for a further 28.6% the lack of supporting laboratory tests was problematic. This means that over two thirds (67.9%) reported some problems when prescribing antibiotics. However, despite these figure, only 19.6% said they needed further training, and although almost a third did comment on the lack of laboratory testing facilities, non asked for information that could be used in the absence of such tests. The lack of awareness that education could help reduce their problems is perhaps not surprising in view of the fact that so few had been offered the chance of medication based education courses. There is such a strong an acceptance of this lack of available training that staff do not immediately think of courses as a way to help them in practice.

It was interesting to find that although it is locally, nationally and internationally recognised that non-compliance or incomplete antibiotic treatment has greatly increased antibiotic resistance (WHO, 2002; Pechère, 2007) only 16.1% (9 health workers)) reported that this was a problem for them. This low result was surprising in view of the fact that antibiotics are freely bought and there is a wealth of anecdotal and hospital data regarding incompleteness of antibiotic treatment in Vietnam. Not all of these respondents gave further comments, but those that did, revealed some of the concerns that led to this study. For example when asked about dosage the response that

“Three bowls of cooked rice is enough for a meal so three doses of medicine is enough too.”

has to be a cause for concern. The total lack of recognition of the prescribing rules and implications of poor practice is alarming, particularly because although this was a single comment it was not atypical, and it is supported by the quantifiable data regarding dosage (see Table 5.4), where many respondents, showed little theoretical knowledge of either drug dose or duration of treatment. Overall the responses to the open questions in this section showed both ambivalence and inconsistency, a situation that has to be resolved if members of the public are to receive a safe, adequate and appropriate service. Overall it was evident from this data set, that there were some key issues regarding administration and there is clearly an urgent need for education and training to improve the knowledge base of the workforce and through that the administration of antibiotics.

BASELINE MEASURE 2: documentary data

Age and Gender of patients from the prescriptions assessed

In total, using the formula given in methods chapter, 1047 prescriptions were randomly selected from the total 41847 prescriptions available. The age groups and gender of patients who came and received medical examination and treatment at CHCs are given in Table 5.9

Table 5.9. Age groups and gender of the studied sample

Age group	Gender				Total	
	Male		Female		n	%
	n	%	n	%		
≤ 1 year	16	1.5	19	1.8	35	3.3
2 – 6 years	86	8.2	85	8.1	171	16.3
7 – 12 years	20	1.9	20	1.9	40	3.8
13 – 60 years	216	20.6	206	19.7	422	40.3
≥ 60 years	172	16.4	207	19.8	379	36.2
Total	510	48.7	537	51.3	1047	100.0

One of the problems with the documentary data was that following the MOH's guidelines (2004b), all patients in the working age group are put into one category. The decision to use this classification based on the interrelation between pharmacodynamics, pharmacokinetic aspects and the physiological characteristics of age (MOH, 2004b). However, this makes it extremely difficult to extract detailed information about sub groups within this age band. Thus for example, maternal care

after the immediate post partum period is unclear, nor is it easy to find differences between the young adults and those aged 40-60 years. Children and older people are separately classified, and as can be seen from the data, these groups comprise more than 50% of the total. Within the study sample there was no significant difference between the number of male and female patients (48.7% compared with 51.3%) was seen.

Diseases/conditions and antibiotics prescribed within CHCs

The name of diseases found in the prescriptions did not follow the ICD (International Classification of Diseases). The criteria for diagnosis were not recorded either, and it proved impossible to confirm the precision of diagnosis. Diseases it appeared, were accepted and added into groups following the most commonly used names.

Table 5.10. Diseases and percentage of prescribed antibiotics

Diseases/Conditions	Attendance		Treated in CHCs		
	n	%	n	with antibiotic	%
1. acute inflamed ENT	217	20.7	213	213	100.0
2. arthritis	82	7.8	67	39	58.2
3. acute bronchitis	79	7.5	78	78	100.0
4. oesophagus/stomach pain	58	5.5	53	50	94.3
5. dental caries, gingivitis	55	5.3	51	49	96.1
6. pain of nerves	49	4.7	44	2	4.5
7. vestibular disorder, headache	49	4.7	47	3	6.4
8. acute conjunctivitis/red sore eyes	46	4.4	45	42	93.3
9. pneumonia	44	4.2	39	39	100.0
10. acute respiratory infections	34	3.2	34	34	100.0
11. rash/itchy skin conditions	34	3.2	32	16	50.0
12. flu/cold	29	2.8	29	13	44.8
13. acute tonsillitis	28	2.7	28	28	100.0
14. chronic bronchitis	28	2.7	28	28	100.0
15. wounds by accidents	26	2.5	25	24	96.0
16. colitis/enteritis	24	2.3	22	21	95.5
17. acnes/boils/swelling	20	1.9	19	19	100.0
18. hypertension	20	1.9	20	4	20.0
19. malnutrition, asthenic	15	1.4	14	0	0.0
20. tumours, lymph nodes	14	1.3	9	9	100.0
21. trachoma, eye conditions	13	1.2	10	8	80.0
22. bronchial asthma, allergy	12	1.1	11	10	90.9
23. diarrhoea	11	1.1	9	6	66.7
24. surinfected skin inflammation	11	1.1	9	9	100.0
25. acute dysentery	9	0.9	9	9	100.0
26. urinary/genital infections	9	0.9	6	6	100.0
27. inflammation/kidney/gall stones	7	0.7	6	6	100.0

28. tuberculosis	5	0.5	0	0	0.0
29. glomerulonephritis	3	0.3	0	0	0.0
30. epilepsy	2	0.2	0	0	0.0
31. gastric/duodenal ulcers	2	0.2	1	1	100.0
32. mental disorders	2	0.2	2	1	50.0
33. diabetes mellitus	2	0.2	0	0	0.0
34. cancers	2	0.2	1	0	0.0
35. chronic hepatitis	2	0.2	0	0	0.0
36. helminthic conditions	1	0.1	1	1	100.0
37. cerebral stroke	1	0.1	0	0	0.0
38. acute viral hepatitis	1	0.1	1	1	100.0
39. chronic insomnia	1	0.1	1	0	0.0
Total	1047	100.0	964	769	79.8

This table gives a general picture of the wide range of cited diseases and the overall level prescribing of antibiotics. To date in Vietnam there has been no official publication regarding the percentage of antibiotics used at commune level, but this survey shows that there is a surprisingly high percentage of antibiotic (79.8% in overall) administration, with antibiotics seen as the drug of choice for almost all diseases or conditions. This figure shows a clear and direct contrast with the figures international studies, where for example Steinke et al (2000) suggest it is 33% and Wickens (2004) found it to be 35% in the UK. Despite the similarity of these figures, Awad(2006) points out the problems of international antibiotic administration, between 25 - 75% of antibiotics prescribed in teaching hospitals (in both developed and developing countries) were inappropriate in terms of either “indication, selection, dosage, duration, or a combination of these.”

This view of inappropriate administration certainly seemed to apply to the prescriptions studies. The first principle of antibiotic use is that as antibiotics should be used to fight against bacteria thus manifestations of bacterial infections must be evident. However, no confirmation of bacterial infection was apparent in the consideration of rates of prescribed antibiotics and corresponding diseases and/or conditions. This situation needs to be addressed, the disease pattern in Vietnam in recent years shows a trend of increasing non-communicable diseases from 54.2% in 2000 up to over 60% by 2001 (MOH, 2003). Taken in conjunction with the findings from this study, it would seem that a considerable number of patients are given antibiotics without good cause. Indeed as the table above indicates, a marked proportion of the conditions seen had no obvious bacterial infection. Therefore, to formally assess what extent antibiotics were prescribed for non infective conditions,

the classifications recoded into two groups. The result has been presented in Table 5.11

Table 5.11. Extent of antibiotics prescribing by conditions

Diseases/conditions	Prescriptions				Total	
	Without antibiotics		for/with antibiotics		n	%
	n	%	n	%		
Infectious	22	3.8	566	96.2	588	100.0
		11.3		73.6		61.0
Non-infectious	173	46.0	203	54.0	376	100.0
		88.7		26.4		39.0
Total	195	20.2	769	79.8	964	100.0
		100.0		100.0		100.0

An indication of the scale of the problems around antibiotic prescribing was evident with this cross tabulation, it shows that of the total non-infectious conditions 54% were given with antibiotics. The US Centre for Disease Control and Prevention (CDC, 2002) estimates that in Vietnam about one-third of the 150 million outpatient antibiotic prescriptions written each year are unnecessary, However, in this study the situation would appear to be much worse. Although there was no evidence recorded in the documentation to confirm whether an infection was bacterially or virally caused, a number of infectious conditions that were likely to be caused by viruses were treated with antibiotics. If these are added to the previous figures then, it would seem that some of 96.2% of the prescriptions many have been unnecessary.

Health insurance and antibiotic prescribing in CHCs

The outcomes from the “doi moi” policy (1986), included a series of policies applied to the health sector. This led to an increasing numbers of people with personal health insurance, a new phenomenon for Vietnam, and a significant measure of the changing format and expectations of health care services. The benefits of health insurance regarding health promotion have been documented and accepted (Ekman, 2008), and in Vietnam the system changes mean that in addition to those covered by insurance either through their work or through choice, all children aged 6 years and under, now receive all health care free. Table 5.12 was tabulated to identify whether an association between those with health insurance and the numbers prescribed antibiotics exists.

Table 5.12. Health insurance and antibiotic prescribing

Service policy	Prescriptions		Total	p value (chi-square)
	without antibiotics	for/with antibiotics		
Without health insurance	46 4.8%	59 6.1%	105 10.9%	
With health insurance	135 14.0%	531 55.1%	666 69.1%	p(2;1) = 0.001
Children up to 6 years	14 1.5%	179 18.6%	193 20.0%	p(3;1) = 0.001
Total	195 20.2%	769 79.8%	964 100.0%	

Of the selected 1047, 83 patients were transferred to hospital after medical examination so this group, although noted was not included in the detailed analysis. The remaining, 964 patients were divided into groups as seen in Table 5.12. The percentage of prescribed antibiotics in the groups with health insurance and children under 6 years (who receive free treatment) was much higher than that in the group without health insurance. There is a significant statistical difference with p values of 0.001. To date there have been no official statistics on this aspect, but this is clearly something that warrants further study as it is important to monitor how health insurance (which is increasing) impacts on antibiotic use particularly in the light of the finding that there are problems with prescribing practice.

Antibiotics and their frequency of prescribing in CHCs

Amongst the 769 prescriptions for antibiotics almost all were written using their generic name so in table 5.12 they have been grouped accordingly. Figure 5.3 showed that eleven classes of antibiotics were prescribed, in which the ratio of broad-spectrum antibiotics such as Amoxicillin, Cefalexin and Penicillin were 40.2%, 32.4% and 13.3%, respectively.

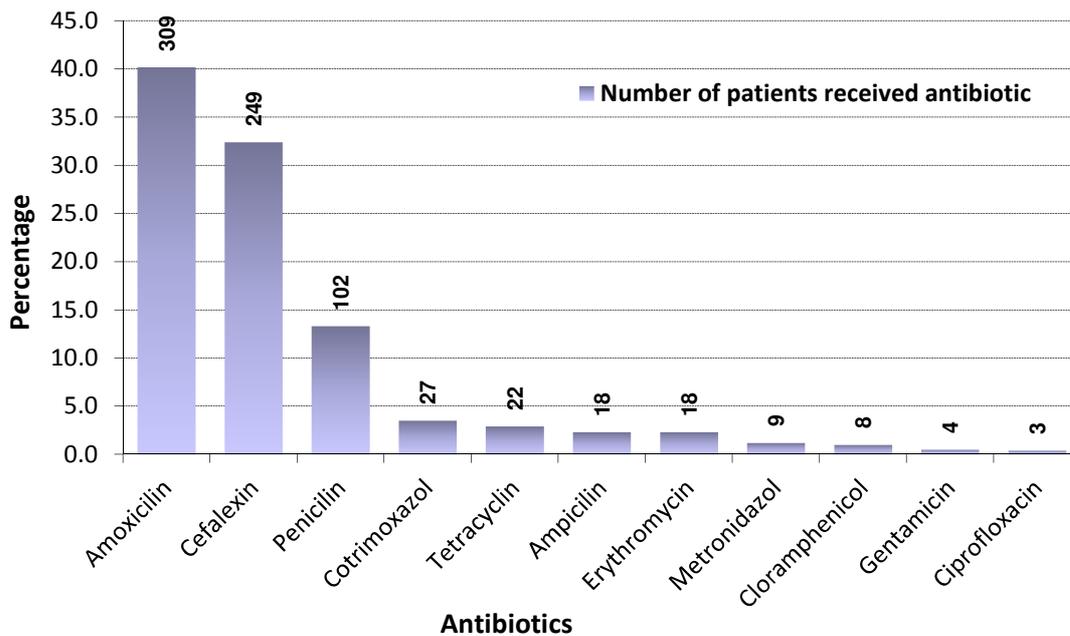


Figure 5.3. Antibiotics and their frequency of prescribing

In principle, prescribing need to be based on the therapeutic effect of the individual drug, but sometimes in this study it appeared to be derived from the assumption that a body organ/system had been infected by susceptible bacteria. There was no evidence to confirm what type of bacterial infection was present and although there is less evidence of resistance to amoxicillin and cephalosporin, it is recognized that the more commonly an antibiotic is used the more the chance of bacteria becoming resistant to the antibiotic (Anderson, 2004). In addition, it has to be noted that selecting broad spectrum antibiotics is easy for health workers but is in fact contrary to the recommended principles of antibiotic prescribing in Vietnam, where a narrow-spectrum antibiotic susceptible to bacteria should be the first choice. This too would appear to be an area where education and training is needed.

Drug indicators of antibiotics prescribed at CHCs

Information on antibiotics from the health record books included only the name of the drug the strength of the tablets/ampoules number of tablets/ampoules given and the number of days for a course. In addition, the dosage per day, how many times per day medication should be taken and the time intervals between doses were not available. So the dosage taken per day was only inferable from calculation by taking the total quantity and dividing by the number of days then multiplying this with the drug strength in the tablets/ampoule.

Table 5.13. Information on antibiotics indicated

Categories of antibiotics	Prescribed		
	Frequency	Percentage	
Presentation	tablet/capsule	700	91.1
	sachet	41	5.3
	ampoule	28	3.6
	Total	769	100.0
Content (gram)	0.25	259	33.7
	0.50	342	44.5
	1.00	103	13.4
	others	65	8.4
	Total	769	100.0
Quantity of usage	5	27	3.5
	10	202	26.3
	15	13	1.7
	20	516	67.1
	30	11	1.4
	Total	769	100.0
A course (days)	5	767	99.7
	7	2	0.3
	Total	769	100.0

Table 5.13 demonstrated that the administration of antibiotics was mainly by tablet and capsule, with these two formats accounting for upwards of 90%. This is a safe route of administration for use in the community. The strength of the drugs were commonly 0.25gram, 0.50gram and 1.00gram. The total number of tablets appeared to be multiples of 5 and ranged from 5 to 30 in which 20 and 10 were predominately given (67.1% and 26.3% of cases, respectively). Five days for a course was seen in 767 of 769 prescriptions. However, no evidence was given as to how these formats had been developed and there was no confirmation as to whether the duration of administration was adequate or not. Government guidelines recommend that the number of days for taking an antibiotic should be dependent on progress of disease and should continue for at least three days after the absence of signs and symptoms (MOH, 2006). In this study, this recommendation appeared to be unknown. There was also no system to monitor clients after prescribing, something that is very important with vulnerable groups such as infants, and the elderly or frail adults.

Selecting antibiotics for prescription

When a condition necessitates antibiotic therapy, the principle of prescribing is that the intended antibiotic(s) has to be effective and be able to destroy the pathogen. Where this cannot be formally established (due to lack of test equipment), an antibiotic should be given to in accordance with official guidelines on which

microorganisms are susceptible to which antibiotics. To help community health workers the MOH (2004b) released updated guidelines regarding which antibiotic(s) are most likely to be effective in which system of the body. For this next analysis the prescriptions that were given for non-infectious problems were discarded as, and indicated above (Table 5.11) this was a large proportion of the prescriptions. Only cases where the given name of the disease seemed to be likely related to an infection (but even so, it was not possible to confirm whether these were bacterial or viral) were considered. Therefore, Table 5.14 was constructed to assess the extent to which the healthcare workers were following the MOH guidelines.

Table 5.14. Percentage of antibiotic classes given by body system

Antibiotic	System of the body				Total
	ENT & ARIs	acute dysentery	urinary tract	skin/soft tissue	
Amoxicillin	42.6%	0.0%	16.7%	27.9%	40.0%
Ampicillin	1.5%	0.0%	16.7%	11.6%	2.7%
Cefalexin	36.9%	0.0%	16.7%	37.2%	35.9%
Cloramphenicol	0.0%	11.1%	0.0%	0.0%	0.2%
Tetracyclin	3.6%	0.0%	0.0%	0.0%	3.1%
Macrolid	3.6%	0.0%	0.0%	4.7%	3.6%
Metronidazol	0.0%	44.4%	0.0%	0.0%	0.9%
Penicillin	10.0%	0.0%	0.0%	18.6%	10.5%
Ciprofloxacin	0.0%	0.0%	50.0%	0.0%	0.7%
Trimazole	1.8%	44.4%	0.0%	0.0%	2.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

In the guidelines from the MOH in Vietnam, all diseases and/or conditions should be grouped into body systems, however, as seen in Table 5.14 these recommendations had not been followed. Overall, only four could be identified, and therefore only these have been included, all others not formally assigned had to be excluded. In addition, it was a concern that as can also be seen in Table 5.14 there were percentages of antibiotics (numbers in bold) given inappropriately to treat infections in body systems where these drugs are not recommended by the MOH (2004b). For example ampicillin, tetracyclin and trimazole were given to treat ENT infections and ARIs, cloramphenicol and metronidazole were used to treat acute dysentery, and ampicillin to treat urinary tract infections, as well as ampicillin and macrolid and metronidazole being used to treat skin/soft tissue problems. These examples are in direct contravention of the MOH guidelines (MOH, 2004b; GARP, 2009) because of their insensitivity or ineffectively and/or their toxicity. Although these account for a small proportion of the total sample of the study, in fact such inappropriate usage is important because the selection process had identified a

representative sample of the total prescriptions. The implication of this finding is that whilst acknowledging that local health workers had little access to new information or updating, the result was that they had or demonstrated an inadequate knowledge of antibiotic administration.

Dose of Antibiotics indicated for treatment at CHCs

Of the eleven antibiotics mentioned in Figure 5.3, three common antibiotics including Amoxicillin (Amo), Cefalexin (Cef) and Penicillin (Pen) were chosen to exam whether the level of dose matched prescribing indicators. There are several basic calculations of dosage for application. Calculation of dose based on patient's body weight and/or on patient's age are commonly used in Vietnam. In situations where body weight is not mentioned but body status is recognized as within normal growth limits, age is usually used. In the study sample, no patients' body weight was recorded and for this reason the assumption was that dosage was given based on age, and therefore, doses in accordance with age groups were reviewed and can be seen in the Table 5.15

Table 5.15. Dose (gram) per day as age groups

Age (years)	Antibiotic	Dose (gram) per day								Total
		0.25	0.50	0.75	1.00	1.50	2.00	3.00	4.00	
≤ 1	Amo	4	9		3					16
	Cef		3							3
	Pen			1		1				2
2 - 6	Amo		37	3	29		1			70
	Cef		17	1	24	1				43
	Pen			2	1	7	7		1	18
7 - 12	Amo		1	2	10		1			14
	Cef		3	1	7		2			13
	Pen						6			6
13 - 60	Amo			1	43	3	76			123
	Cef				34	3	68			105
	Pen				1	2	16		19	38
> 60	Amo				28	2	56			86
	Cef				17	5	63			85
	Pen				1	3	17	2	15	38
Total (number of cases)	Amo	4	47	6	113	5	134			309
	Cef		23	2	82	9	133			249
	Pen			3	3	13	46	2	35	102

As can be seen in Table 5.15 levels of dose were mainly multiples of the content of a tablet and it is probably because this is an easy way to prescribe that health

workers with all levels of training used this approach. In all the drug guidance books/documents available in Vietnam the ranges of dose for these antibiotics are quite broad and usually based on two age groups adults and children. However, this can be problematic as the categories for children are broad, and there is major difference between a two year old and a six year old, so it was not possible to accurately evaluate whether or not the indicated dose was actually appropriate for the particular child for whom it was prescribed. It was a concern that as can also be seen in Table 5.15 the same level of dose was distributed among the different age groups, without any evidence as to why this dose was chosen. In the light of this finding there is an urgent need for a specification indicator of appropriate levels of dose for each common used antibiotic that is used by all health workers.

Although these prescriptions gave valuable information regarding prescribing and it was evident from the findings that education and training were clearly needed, final interpretation of the findings was only possible when they were considered in combination with what the healthcare workers actually said about prescribing antibiotics when in discussion with their peers.

BASELINE MEASURE 3: focus groups

In total, eleven focus groups were conducted, one in each of the eleven CHCs. These were the same participants who completed the questionnaires. As with that data set, participants' identities and name of groups must remain confidential, therefore the findings from these focus groups cannot identify which centre the participant was from, therefore, quotes have been anonymised and presented thematically.

All discussions went well and lasted between 45 - 60 minutes. However, although the healthcare workers are used to discussing key issues amongst themselves, they were not used to sharing their views with anyone else. In addition, as this study involved all workers at each commune there were junior and senior members in each group. In consequence, initially the junior workers spoke only to each other and waited for more senior staff to speak first. It took time in each group for the researcher to foster discussion across these accepted hierarchies, but it was noticeable that by the end of each group discussion the atmosphere was much more relaxed with all participants feeling able to contribute, and to share their experiences and perceptions. The difference between the beginning and end of each discussion can clearly be seen in the transcripts.

Analysis was carried out using the four steps (Patton, 2002) described in chapter 4. In the first step key points from transcripts were identified and gathered. In the second step similar contents were given a code then collections of codes were made that allowed the data to be grouped. In the third step broad groups of similar concepts were shaped that were used to generate a theme, then a collection of explanations that explain the theme was expressed in the fourth step.

The five final themes in order of presentation, were, antibiotic use, peer and community pressure, lack of facilities, multiple roles with limited competence and health insurance as motivation..

Theme 1: antibiotic use

The healthcare workers were clear that the main reason that they used antibiotics was because of the high rates of infection amongst their populations. They were clear that people living in the commune areas had different problems from those in city, some of which were linked to poverty and lack of resources. For most of them the main causes for attendance at the CHC were linked to their lifestyles and home conditions

“ It is because in the countryside, people contact with faeces, water, waste and the hygiene of the environment is different from that of the city. That’s why there exists the infectious disease

When asked to discuss this further it was clear that they saw no problems with the high rates of prescriptions arguing that the need arose from the environmental factors. The problem of high prescribing rates was in their eyes beyond their control

They mainly do agricultural works so it is easy to understand that they use antibiotics when they have inflammation of respiratory tract or parts of the body.”

This belief that all type of infection were common was typical, as the following quotes also indicate

“ The kinds of diseases in here are mainly diseases of infection, respiratory tract, digestion, skin, and bones. That why antibiotics are used the most.”

and

“ The reasons for using much antibiotics are due to some common diseases as: sore throat, respiratory inflammation, rhinitis, otitis as well as diseases of digestive system and intestine.”

Using this categorisation all diseases should have equal incidence of antibiotic use. However, there is some contradiction in what they said and the findings from the baseline survey, which actually showed that whilst the most common diseases were acute respiratory infections, the conditions related closely to unclean water and land such as skin and gut diseases cited by the workers as common, were in reality infrequently diagnosed (Table 5.10).

It was interesting, but a cause for concern that for some, inflammation was seen as sufficient evidence for the administration of antibiotics

“ Rice-growing environment causes so many inflamed diseases such as skin conditions so only using antibiotics can stop.”

There are two problems here. Firstly, inflammation is a term that has polysemous meaning in the Vietnamese language, this is because in this tonal language, what were originally two separate words for inflammation (viem) and infection (nhiem) and tend now to be pronounced as one (viem nhiem) which doesn't differentiate between the two. Thus workers are given a history which isn't clear, so making their job much harder. Their response should have been to probe for much more information, but actually has been to give antibiotics, 'just to make sure' without clarifying whether or not the condition is caused by a virus or bacterium. The second problem is that for this group, when questioned further, inflammation was the only diagnosis, and alone it is not an adequate reason for prescribing antibiotics. It was also evident from the discussions that as they had had some success with skin conditions, this meant that now all such conditions were treated in the same way without further consideration of possible alternative causes. They tended to choose antibiotics over anti-histamines, and where they did give such drugs they tended to give antibiotics as well again 'just to make sure'. Some were equally vague about making diagnoses stating that

“ Patients who come to us often suffer from the infectious diseases so we use antibiotics for all.”

In further discussion, they did not give any further clarification and seemed to agree that most illnesses were infections, and whilst in the past this was the case, MOH

(2003) data clearly indicates that in recent years there has been a fall in infectious diseases with a corresponding and considerable increase in non infectious diseases. Information that from the discussions seems not to have reached the staff in the communes. This is a problem that urgently needs addressing, not only do they need to be able to access new information, but over time they have developed strong views and perceptions of the health needs of their communities. Any educational model needs to include strategies that facilitate attitude change as well as providing the knowledge to enable them to make appropriate clinical decisions.

Theme 2: peer and community pressure

As mentioned in Chapter 3, a real problem for Vietnam is that it is possible to buy antibiotics very easily, and as a result of this a belief has developed that they are suitable for use in most (if not all) cases. Consequently there is a wide spread tendency for self medication. Members of the population see no need to seek expensive, and in their eyes probably unnecessary medical interventions, until they have tried to cure themselves

“ The situation of using much antibiotic is that the inhabitants themselves often buy antibiotics without being examined and prescribed by doctors.”

This situation is exacerbated because in addition to a past where for those without much money, there was limited medical help, there was, and is a fear of illness and its consequences. Although there have been major improvements in health care, there is still limited help for those unable to work through illness. Even those employed by the state, receive less than their normal salary and for poor agricultural or factory workers there is no financial support. It is even possible that in some industrial areas, should they fall ill, they will be replaced during their illness and have no work to come back to. In consequence, someone who is ill, cannot support their family, and knowing this, at the first symptom they rush to find a cure

“ We see that in our communes as soon as people have a cough, they immediately take medicines because they are afraid of illness.”

In addition, attending a CHC means taking time out of work, which also may mean loss of earnings while self medication can be obtained after work. The result of this combination of factors, is that they only attend the CHC when their own attempts

have failed, but here too, they are hoping that they can be given more, or different antibiotics that will effect a cure.

“ They use it by themselves (it is the common situation), and they will come to us if they only if they still don’t feel well.”

And as some pointed out

“ When they don’t feel well, they come to see us but their diseases are more serious by then”

The health worker is put in the difficult position of trying to assess a condition which may well be partly masked by the effects of the previous antibiotic(s), or because incorrect self administration has prevented the antibiotic from being effective. This is a national problem, it is difficult to convince a population used to freely buying and taking antibiotics whenever they feel like it, that further prescribing would not be helpful, and indeed, the healthcare workers often find it impossible to convince them that they do not need a further prescription as the following examples illustrate

“ If you don’t let them use antibiotics they won’t listen to you.”

and

“ If we tell them to use Vietnamese traditional medicines instead of antibiotics, they will answer that only antibiotic helps them to recover from their illness.”

Thus, even where they want to suggest alternatives the healthcare workers find that the majority of the population do not want to listen, and it is perhaps not surprising that in a busy clinic the workers opt for a solution that their client groups find acceptable. Some of the health workers did state that they were concerned when clients demanded antibiotics for minor ailments but as in the previous examples, this group could see no way to avoid prescribing them.

“ They ask for antibiotics when they have a sore throat or they have cough, they just use antibiotics all the time so when they have only a simple hurt like a small pain in the hand, they also use antibiotics.”

For the healthcare workers there is another dilemma, should they refuse to prescribe antibiotics the patient can then buy whichever ones they want over the counter in the same clinic. They reported that as patients order them regardless of the opinion or advice they had been given by the health worker

“ Even if they have a minor headache, they also order to use antibiotic.”

and

“ Even when I answered them that their illness didn't need to use antibiotic, they ordered some antibiotics and explained that they wouldn't recover from their illness with other medications.”

The dilemmas experienced by the health workers are considerable and their points seem to be reasonable but the essence of their discussions definitely revealed the lack of confidence of health workers, and confidence they need only comes from adequate knowledge and skills, gained by being well educated and trained. It is not appropriate to follow the demands of clients and patients without question. The health workers need to look at their practice, what they are doing and how it compares with government recommendations (Marsh & Keating, 2000). Some were aware of the correct way to prescribe, but pointed out the conflicts they experienced when making a decision regarding antibiotic use, they did report that

“ There aren't any reasons that don't relate to the professional decision... when we feel antibiotics are needed for some diseases... if there is no need, we don't have any reasons to prescribe antibiotic...”

and

We don't use antibiotics for the diseases caused by virus.”

However, these were in the minority, most of the others were more realistic, they had accepted the current situation and as some pointed out

“ This happens nationwide..., medications are sold based on patient's demand. Patient explain that they want to buy antibiotic because they have a fever, a pain in their neck, etc...”

After all if it happens everywhere how could they act differently? Amongst the more experienced healthcare workers there were some who understood the problem and were concerned, pointing out that

“ I find out that the use of antibiotics depends on the experience of each person and the diagnosis... however, we still use antibiotics for some diseases that are not necessarily treated with antibiotics for example we used common medication for upper respiratory inflammation. But patients are ready to order us if we don't give them antibiotics.”

However, they too faced the same dilemma, should they not prescribe, the patients could buy an antibiotic of their choice, that the workers feel would be the wrong one, so there is a temptation to see prescribing as the lesser of two evils. Most saw no way to try and change the system, this is “*just how it is*”. They pointed out that patient expectations are deeply entrenched in the community and to change them would be very difficult with the result that as some reported

“ For example, patients feel unhappy if we don't give them some antibiotics when they come for examination or there are two patients who come for examination at the same time and we only give antibiotics to one patient, the patient will be envious... patients always think that they must get medication when they come for examination, and in all the drugs antibiotics are the most important.”

Inevitably, this leads to a situation where, as workers reported

“ In this commune, medications are sold based on patient's demand, not doctor's prescription.”

This is not acceptable, it can only lead to more problems in the future, if a way is not found to bring antibiotic use under control, resistance will continue to increase and treatment of infections will become much more difficult.

Non-pharmacologic or cultural-economic factors that influence physicians' prescribing are inevitable and seen in many countries (Avorn, 2000). However, in this study it was obvious that prescribing antibiotics by the health workers was less than rational, and not dependent on the evidence of medical science (Table 5.4). The beliefs of patients regarding the effect of antibiotics is not professionally based, but relies on anecdotes from friends and family. Unfortunately, the health workers also demonstrated a lack of understanding regarding medicines which comes from their limited professional qualifications. Health centres are located within communes and the relationship between the health workers who supply health service and the locals who receive the service must close, and is one in which conflict can develop. If it does this can affect their willingness to attend the commune and seek professional advice, so it has to be accepted that a balancing act between all aspects of care provision is natural (Henslin, 2005). While this explains in part the decision to give in and prescribe antibiotics, some actually commented on their lack of confidence in making (and keeping) unpopular decisions regarding antibiotic prescribing

“ We see clearly that they [the clients] misuse the medication a lot but do we have to educate them or not? Can we manage it?”

The importance of the inclusion of the focus groups is evident when considering this issue, looking back at the quantitative data, most health workers (83.9%) said they would persuade patients (Table 5.5) but they gave no evidence of how to convince clients and in the discussions they contradicted their written responses. It may be that the group environment enabled them to be more honest and give actual answers rather than responding in the way they think they are expected to, or think they should act. The reflection that the discussions led to were important in planning the type of education and training needed. Any programme should include ways for the health workers to recognise the dilemmas and strategies to help them cope with them and through this gain confidence in their own abilities to treat and guide their patients..

Theme 3: lack of facilities

Within the health system in Vietnam, the communes/CHCs are the first point of contact for the local population to access health services. In recent years there have been many efforts from the government regarding the development and complement of the grass roots health network. The commune health centres in recent years have received and increased health workforce and been supplied with essential facilities such as working rooms, delivery rooms, drugstore and patient's beds. However, the equipment for medical examination and diagnosis are still very limited, and this affects the quality of service offered, as the workers confirmed

“ We have nothing because we are at commune level. We depend on the symptoms of the disease to decide whether we should make a physical examination or we let patients talk about their diseases”

and

“ We diagnose the diseases according to our experience what we know about, clinical symptoms. That's why diagnosing diseases at the local level is not good.”

The quotes above are realistic of the situation in which the commune workers find themselves, and also commonly seen in other clinical settings in Vietnam. In the focus groups the workers, talked with each other trying to reassure themselves about the quality of examinations they did, and the way they choose treatment, including relying on sending them to other medical or 'higher level' services,

“ In case of serious patients we cannot give clear diagnosis, we will send them to the higher level.”

This is a normal way of working, commune workers will always need to send some patients for further medical examinations or tests. However, it appeared that in some instances they were sending patients they should have been able to treat and in some instances this option together with their lack of confidence has led them to develop a relatively passive way of working, it was evident from the quantitative data, that there have been several training courses (Table 5.2) focussing on public health problems as part of the national programmes, but the focus groups confirmed that none of the participants had been offered the chance to attend courses that included antibiotic medication

“ Here, there are only education of vaccination, productivity, and environmental hygiene... yes there are two... HIV/AIDS prevention and family planning... medication use has not mentioned yet.”

Drug use in general and antibiotic use in particular were issues on which they felt they had no practical support or guidance

“ There is almost no guidance from the higher level.”

Although programmes such as preventive health control for Acute Respiratory Infections and acute diarrhoea have been delivered for most of the CHCs (MOH, 2003) the healthcare workers could not remember any content in these programmes about medication. Yet both antibiotics and other drugs are integral aspects of these programmes, including whether or not antibiotics are needed. It is clear that these courses were only partially remembered by participants, and in view of the consistency of the participants' memories questions need to be asked about the format and delivery of the courses. It is accepted that the main target of the programmes was not drug administration, but this is a key element of treatment and ways need to be found to enable workers to not only attend courses, but to retain the knowledge they are given.

Another problem revealed in the discussion was the passive approach to learning, being originally trained by a system that used formal (and on the whole non-participatory) lectures to impart information, the local health workers working did not

seek information for themselves. The CHCs tend to have very limited education materials and these were the only sources quoted,

“ There is only one form that is to read that book. Besides that there are no more forms.”

and

“ There is a book... may be... I read the book whenever I am free... I don't know how often, it may be...”

Where there was only one book, this was what they used. Unfortunately, not only were there limited texts, the participants also pointed out that there were problems in that these books were often not up to date or were of limited use

“ We haven't been provided with any sources of books. There's nothing. These are the remaining documents from previous years.”

due to the limited resources

“ We also rarely buy books we do not receive any information and documents of medicines from the higher level.”

They had looked for accessible other sources of drug information,

“ We ourselves have to look for the information. It means we have to ask for medicine leaflets and covers of medicine boxes”

However, these are not adequate sources of information, they give only the information that the law requires, not the full data that health workers need. A minority did state that

“ We do not update the information at any certain time. If there is any information about new medicine, we will learn it more ourselves.”

They had recognised that central health services were unlikely to supply them with information and were trying to find information for themselves, but this too was not easy. Working in a rural area, accessing appropriate materials involved considerable effort. Interestingly, when informed about the aim of this study to develop education programmes the participants were enthusiastic.

“ It's information from training classes about using antibiotics properly...but those training classes have never been opened before.”

Overall, there was considerable interest in the potential training, and comments like one above were made during most of the focus groups. On the one hand this showed the fact of the working conditions of health workers in CHCs (Figure 2.4), did not include adequate education, but on the other hand these comments also fitted with the previous mentioned passive approach to learning found amongst the health workers. The concept of lifelong learning, or even ongoing education for health workers seemed unfamiliar to the health workers in the communes. These statements together with the quantitative data (Table 5.4) about prescribing information sources again indicates the need for an approach to retraining that encourages participants to develop a more participatory approach to learning.

Another issue that arose in the discussions was supervision. On the whole the workers at grass roots level work alone when they see patients, but as they have a relatively low level of training supervision is important. In Vietnam the public health officers are responsible for overall administration, and from responses it seems that they do carefully monitor the overall output by the healthcare workers,

“ Twice a year the supervision depends on the inspection of early six months... and end of the year. They came here to inspect medical records, the inspection form for commune level follows 100-marks of national health standard and then [they review] prescriptions to see whether we use right medications for right patients or not. Twice a year.”

However, there was no evidence that they provide day to day supervision, so although retrospective checks are made the individual workers have to make their decisions on their own. The whole system or monitoring is based on a scoring system with marks given for meeting approved standards. Interestingly, since the start of insurance, a second set of checks appear to be made

“ Insurance agency often checks unexpectedly. But public health officers checks twice a year.”

It was clear that overall the ‘supervisions’ came from two types of organization but these activities seemed to be a formality, more linked to checking that correct procedures are followed than improving the quality of health service and not designed to improve administration of medicine. As participants pointed out

“ They didn’t assess medication use but they assess in general. After the inspection, there was feedback pointing out that our commune passed the inspection according to mark scale..., you will be considered to pass if you get over 90 marks.”

and

“ They don’t care about what kinds of medications are used a lot and what kinds of medications are used a little... And they never complain or ask why this station used a lot of antibiotics.”

Although there were some check made by the supervision process regarding medicine use and administration these also seemed to be a formality about administration and created less attention for the health workers, for example

“ If any mistakes, they will remind without any disciplines.”

and

“ They only warn and tell us to learn from experience.”

However it did seem that should they detect major problems they could administer a fine, and this would affect their overall score for the year

“ If there is a fine, they will minus our emulative points in a year.”

A few staff expressed their opinion more carefully and perhaps prudently while addressing on this matter,

“ If they find any mistake, we must correct at once without delay, so every year the district health centre assigns staff to the locality twice to see how it is and show the correct way to them about how medicines are issued, antibiotics or other medicines so that they can easy follow the procedures used.”

Again, there was no mention of ongoing supervision to help the workers improve their practice. The workers try hard to meet the needs of their patients, but would benefit from a more supportive mode of supervision. Vietnam is working hard to improve public health and has tried to expand the care offered. However, the same conditions found in the communes can be seen in the health systems of many developing countries, where it is hard to cover monitor and supervise the increasing facilities with the existing staff supervisory staff that they have available. Meanwhile worldwide the emergence of antimicrobial resistance is increasing, and measures need to be taken to prevent community services from increasing the problems. There is a need to fill the gap left in the supervisory process and provide clinical

decision supports for health workers through a training programme focused on antibiotic administration.

Theme 4: Multiple roles with inadequate competence

In the health system of Vietnam, commune health centres are considered to be very important by the Ministry of Health (Huong, 2006). They are the first level of services accessible to the people, and as the first point of contact they have a key responsibility for primary healthcare, public health, health education, the limited screening that is available, and physical examination and treatment, of course including the administration of medicine. As one participant reported

“ At other levels, for example provincial level, each person has their own duties. They are responsible for an aspect and they pay attention on only that aspect. We are working at commune level, besides being responsible for each individual aspect, we have to cover everything... So we need everything.”

and

“ It is often like that... that called multifunctional.”

It is clear that commune health workers have a wide range of work to do, but they only have limited education and training so how they deal with their work regarding antibiotics, can best be summarised by the following quote

“ We only know that they are antibiotics so we don't feel confident when we give prescription to patients. This is called giving the treatment without knowledge. So the effectiveness isn't good.”

Although there was general agreement with this view, some of the health workers gave more detailed answers

“when we studied at school, we knew what kind of antibiotic should we use to treat bacteria Gram(-) more effectively for example this kind of disease should be matched with this kind of antibiotic. However, many years passed and in many cases when we examine, we find we've forgotten it all or it is difficult to choose a suitable antibiotic for that kind of bacteria sensitively.”

An acknowledgement of the problems that arose from their inadequate level qualification and the difficulty of of acquiring the wide range of knowledge they need for their job was freely discussed by health workers. That they were aware of their

need for more knowledge is a good beginning for a training programme, but it has to be remembered that

“ Tell you the truth, if we studied at school, we would ask our teachers or friends. But we work in here, it is difficult to ask anyone as we have a limitation of knowledge. It is true, of course the juniors can ask the seniors.”

Very often with training programmes new or junior staff can ask their senior colleagues, but as the groups acknowledged that this isn't possible any programme needs to take this into account and find ways to support staff at all levels and to develop a mentorships system. The staff were also clearly aware of the implications of their level of knowledge

“ Because we work at grassroots level, if we don't do well it is very dangerous for patients.”

They knew what they needed to know to give the level of service that they wanted to give, and they were aware of the problems of poor prescribing,

“ Firstly we need sound knowledge to give patients the right treatment. Secondly, if we don't treat patients in the right way, patients will get problems, there is the medication resistance of bacteria and there is a cross infection. Thirdly, if we don't know the particular actions and side effects of medications, the life of patients can be threatened .”

However there has been no national or provincial support or focus on medication and concern about this is a reality for all commune health centres,

“ It is the same for all the stations at grassroots level. The knowledge of using medications is very essential, very urgent.”

These findings from the focus groups were not surprising, as the quantitative data showed that the training level of community health workers mainly secondary and elementary (Table 5.1). With this background it was inevitable that they would find it difficult to meet the needs of all their patients, particularly those presenting having tried their own treatments or self medication, so possibly masking some of their symptoms. Patients with complex and long standing health problems are also difficult to diagnose and treat effectively. Their willingness to acknowledge their own shortcomings has to be commended, it is not easy for healthcare workers to admit even to each other that they have insufficient knowledge and skills to provide a high

quality service. Their wish to extend their expertise and their enthusiasm for the opportunity to undergo more education and training augurs well for any programme developed. It was evident from the start of this study that they had had few opportunities to learn and that they had a desire to learn was expressed by health workers in all focus groups,

“ We haven’t had any training for years... we haven’t had training courses since we graduated.”

and

“ We still use knowledge which we were taught in the past and base on our experience during working... so we really want to have training course.”

They had their own ideas as to how often they should have access to training courses, particularly in the light of the current levels of knowledge

“ The medical staff in the primary level should have training course two or three times a year... the knowledge we learned was taught over twenty years ago.”

There had been some courses held for the local health workers but they were mainly public health programmes as confirmed by the information given in the quantitative data analysis (Table 5.2). Health workers themselves were concerned that regardless of inequalities in training they all had to carry out similar tasks

“ In the stations nurses as well as midwives are the same. We have to decide our own way when we do duties alone... we still need to be trained in order to assess the patients... after that we can prescribe the medication.”

Most of the time they worked independently, but when they work night shifts they work alone, so have no one at all to consult if unsure of a diagnosis

“ For example, only one person has to do night shift, so he or she has to examine for every patients, treat all kinds of diseases. General speaking we need training classes.”

They also pointed out, that although theoretically the doctor at the CHC was responsible for treatment there

“ We have only one doctor and he or she cannot stay in the station 24 per 24 hours... so everyone working in the stations should attend classes.”

Beside increasing their knowledge of antibiotic administration health workers also perceived that they needed comprehensive knowledge to improve the quality of service that they offered

“ If we have good understanding of antibiotics, we can treat patients better, and they don't have to keep coming back

The above statements of the local workers expressed not only their difficulties but also their legitimate aspirations for knowledge. However, they also expressed a passive acceptance that such additional training was not possible..

“ Only the chief of the station, who has specialty, goes to training. We have to stay in the station for examination.”

and

“ There used to be a retraining programme from Thaibinh Medical University some years ago... I wish they had retained us about common medicines, especially antibiotics. In addition, if the higher levels have regular information about medicines, we should have information about medicines used at the basic level... we need to know information about essential medicines which are being used at the medical station level.”

It is clear that training courses should be provided for all of health workers while each of them has to deal with same duties those who had attended courses reported that these courses were sometimes difficult to attend as they were in,

“ They were organized in the health prevention centre of district or the hospital... there were lecturers... lectured by using projector.”

To be effective these courses need to be easy to access, and none focused on antibiotics. These statements also indicated that current programmes were often didactic and without real participation. If participants are to remember and understand the information they are offered, methods need to enable them to join in the learning process rather than passively sit and listen.

Theme 5: Health insurance as a motivation.

As mentioned previously, health insurance is a relatively new concept in Vietnam, but seen in Table 5.12 a considerable percentage of patients/clients accessing the

health services provided by the commune health centres had health insurance or were children under 6 years old. However, with insurance, although the treatments are free to the patient, there is a limit on expenditure. Therefore health workers have to calculate which of entitled medications should be delivered while they are assessing and diagnosing the patients as they pointed out

“ The Health Ministry already fixed which kinds of medicine for each level [of insurance]... we only have these medications for commune level.”

and

“ The delivery of medication is controlled by the regulations of the health insurance. There are medications to use with each disease.”

As they went on to point out, the finance that they receive is governed by two things, the province and the numbers of people with insurance

“ I will give you a clear example, the province will adjust money to suburb and health insurance also regulates money for suburb. When money comes, the province will base on insurance cards in each commune to adjust.”

And even once the money is available the calculation was said more detailed, because not only were they trying to prescribe, but also to keep the insurers happy

“ Because of the financial limits of the health insurance, each case is only prescribed at 50% of expenditure. Forced and then... they like us very much if we use up 50% for medications per month.”

In Vietnam, there is an essential drug list issued by Ministry of Health (MOH, 2008a). The stipulation on essential medicines for public health settings is an effort to ensure that there are resources to meet the needs of the health service. There are also now efforts by the government to increase social health insurance (SHI) Another effort is to cover the whole population. The benefit that SHI brings to people is obvious, especially in the light of the low incomes of the majority of the Vietnamese population (Long, 2007). However, as the comments by the health workers indicate, unlike many countries application and exploitation health insurance has it's problems. The regulations governing spending on medical expenditure such as medication, laboratory exams, X-ray... may lead to negativity on prescribing by health workers. In some instances these limits prevented them from supplying the medication that they really wanted to provide, and this too can have serious implications for the patients' recovery

“ We have to consider the medication that is available to us. For example, when patient's wound is infected, we have to prescribe ... 20 tablets for 5 days. But if the money for it is too high, we only prescribe 10 tablets plus alpha and paracetamol...”

At the community level where no laboratory or X-ray exams are available, and there are a limited number of the drugs that receive the payment from insurance agency, most of the drugs are common and inexpensive. Among these drugs antibiotics seem to be most valuable in terms of money, which means they receive priority over other drugs. Considering this together with the findings from the quantitative data analysis (Table 5.10) it showed health insurance was another of reasons that led to high rates of antibiotics prescribed. It could be that diagnoses of and illness related to bacterial infections were made as it was possible to prescribe antibiotics and not other drugs. This form of revert diagnosing to fit prescribing possibilities is not appropriate.

SUMMARY

The quantitative data analysis indicated a very high rate of administration of antibiotics with approximately 80% of patients who received treatment at the community level given antibiotics. The focus groups gave more insight into why this happened, and tended to confirm the review of prescriptions which indicated that antibiotics were not always given appropriately. It was evident that antibiotics were given for most diseases including conditions where antibiotics are unnecessary. The percentage of prescriptions with antibiotics prescribed for non-infectious conditions made up 54% of the total prescriptions and even among conditions perceived infection and related to infection it was certainly possible that a marked number of them were viral caused then an even higher proportion of antibiotics was prescribed unnecessarily. Broad-spectrum antibiotics such as Amoxicillin, Cefalexin and Penicillin were commonly prescribed, with a course of 5 days indicated in almost all cases. The same level of dose was seen to be given in many age groups. The number of prescriptions with antibiotics for patients with health insurance cards and children under 6 years under free health service policy was much higher than that for patients with no health insurance. This is last is a new finding as prior to this study there seems to be no research detailing a similar finding.

Health workers who are carrying out the main responsibility for prescriptions and who have to work alone for the most part were only mainly qualified at secondary

and elementary level. In their long working careers they had received no mandatory in service training or revised programme focused on the administration of drugs in general and of antibiotics in particular. Currently, these health workers at community level are facing socioeconomic pressures, which include lack of facilities, and diagnostics tests, and both of these compound the problems caused by their limited training. In addition to medical/pharmaceutical, cultural-economic factors, the health insurance policy has created another pressure on prescribing practice. Their situation is made worse as the current training and education available used passive lecturers which prevented questioning which could have linked antibiotic prescribing to the education. This together with the lack of education materials in the communes and the passive approach to learning have been influencing the administration of antibiotics within the community level. Reviewing all the findings from quantitative and qualitative data indicated that inadequate training and education as core problem that needs to be urgently addressed.

The findings from the first phase also suggest that based on the context of the health workers, there was a wish to learn more, but a passive acceptance that it was not possible. For any education programme to be successful this attitude needs to change and become more positive with the recognition that they need to play a more active role, in both accessing and using information. These workers possess their own social/organizational characteristics, and in order to facilitate learning any programmes need to recognise this.

CHAPTER 6. DEVELOPMENT AND IMPLEMENTATION THE MODEL AND PROGRAMME

INTRODUCTION

This chapter addresses the whole process of developing the model for application in the final phase of this study. It begins with factors for consideration as the basics of learning and teaching theories together with the relevant approaches of training and education in a Vietnamese context before developing the model. The next part of this chapter is about the development of the model and programme in a context that fits within the Vietnamese system. Finally the process of implementation and the method for evaluating and managing the model and programme are described.

FACTORS FOR CONSIDERATION BEFORE DEVELOPING THE MODEL

Technological and international development in fields such as health care, social work, public services and education has generated a great demand for change in Vietnam. However, there is little available information on how to integrate the desired changes into the Vietnamese context. One of the problems is that new terms and ideas tend to be adopted without formal discussion or description, for instance, the word 'education' has been gradually replaced by the word 'learning' in which 'globalization' has led to the worldwide adoption of lifelong learning and changes in learning theory and practice at different levels. However, as a result of the way these terms have been incorporated into use in Vietnam, they mean different things to different people and this makes developing a coherent and acceptable approach to education more difficult. Then too, there are other factors, the changes in demography, privatization, individualization and the implementation of new government health policies in practice cannot be ignored. The increased international recognition of theories of learning and teaching (Jarvis, Holford & Griffin, 2003) also plays a role, but at present to a great extent in community healthcare education, these are just rhetoric.

In Vietnam the central concept is teaching not learning. In consequence students taking part in a programme or a course at schools or universities, experience only teacher-centred approaches (see Chapter 2). These have been tried and tested over many years and are not easy to change. The government wish to move towards more Western styles of learning means that there is approval for change at national level, however there are few strategies for change at a more local level. In addition, there is an awareness in Vietnam, that the implementation of western teaching

models is not always either effective or sustainable (Cu, 2007; Dung, 2004). The question for this study was how the commune health workers could, or would be able to adapt to learn using new processes and models of learning to improve and enhance the service they offer. To be accepted and ultimately approved at a local level (as well as at national level), this study needed to develop a programme that formed a bridge between traditional Vietnamese teaching and Western approaches to learning. It had to be designed in a format that was clear and easy to follow.

A key activity was the review of theories of learning, change management and health care education and promotion, from the Western traditions followed by a similar review of those from the East, this included, China, Thailand, the Philippines, Singapore and Japan. The findings from these reviews, given in more detail in Chapter 3, were used to support the development of a conceptual framework specifically designed for Vietnam. It was essential that the conceptual framework and model developed for the health workers, which moved from treating them as passive learners, to working with them as active adult learners, was still securely based within the context in which it had to be delivered. In this instance, in addition to the challenge of changing the nature of the education experience, it was important to recognise that the content had to be strongly based within practice. Only then could it enable the health workers to extend and develop their knowledge and skills, so improving their practice within their working environment. It also had to be accepted, that in the current financial climate and healthcare system, it was not feasible to develop a model that was dependent on external study programmes, or on access to technological sources such as virtual libraries.

It is clear that no one theory can be applicable in every context, and that exact replication of a theory or a style of learning in a different system is not appropriate. In the context of the commune health centres of Vietnam, where education is a luxury, and where the health workers are working full-time, the first step had to be gaining their interest, and the acceptance at an official level that education was needed and would be effective. Therefore selecting and combining relevant aspects of the above learning approaches to develop a conceptual framework for this group was not easy. In addition to the wish to use experiential, participatory and non-hierarchical communication techniques, the programme had to meet targets agreed with local health officials.

Within the teacher-centred approach that the participants were used to, their experiences were not normally taken into account, the assumption being that students have no, or little knowledge of a learning issue, and as a result they need to be filled with information from the teachers. This type of post-qualification training, usually classroom-based, works on the belief that initial education and training are 'primary' experiences and as such, the lesson content (prepared and provided by the teacher) is considered as a 'secondary' or add-on experience, that will automatically be accepted and used. There is therefore no need to discuss it. For participants to move from this approach to a more active learning set, they needed to be motivated to change. The proposed new model would be in direct contrast to everything they knew. With student-centred learning every attempt is made to use students' previous experience together with previous primary education and/or simulated experiences as sources of information from which students can continue to learn by themselves. The teacher in this setting does not have a central role, this in itself would be difficult to accept for people educated by the traditional Vietnamese tradition, where respect for the teacher which means not to challenge or discuss facts given, but to reproduce them in practice. A way had to be found for them to accept the teacher as a facilitator before they could move towards approaches such as problem-based learning where the teacher selects and presents an actual problem from real life, and students then work to solve the problem for themselves. They would need support and encouragement to learn that recalling, focusing and sharing their experiences with other students through group discussions was a way of learning. Only then would they be able to begin to develop abstract concepts and generalizations to help them use what they learn in practice.

The study is wholly based within practice, with the initial questions arising from problems with antibiotic administration in the community. In consequence all aspects of the study findings have relevance for, and implications for practice. The initial survey confirmed the need for the project, with the majority of prescriptions not being administered according to the best standards for practice. This was the first survey of Myloc District, but the findings matched those of the larger and more general studies carried out by the MOH, and in consequence there was support for the development of the new model from the province and the MOH. The data gathered in this first phase were not only used to clarify the current situation, and gain recognition for the need for more education training, but as baseline measures that could help identify learning approaches for the later part of the study.

The challenge was to permanently change and improve practice through the development (and piloting) of a model for education and training with a sound theoretical underpinning that would fit within the Vietnamese culture. For this to be possible, there were three main issues that needed to be considered. Firstly, any information regarding previous organised training showed that it was sporadic, developed in response to identified national needs, and subject(not education) based. The focus had been on supplying specific knowledge (facts), not with lifelong or continuing education in mind. Courses tended to be descriptive, rather than intellectually challenging and with the format as describer previously, not designed to encourage participants to seek further education for themselves. Secondly, when reviewing the methods for education and training in the field of health, most of the available documentation regarding health education and health promotion are based on western patterns and practices and therefore in their original format wholly unsuited for the needs of community health workers in rural Vietnam. Adaptation was essential if they were to be used in Vietnam. Thirdly, the initial level of education for this group was below that usual in the West for prescribing drugs, thus those models that seemed most appropriate also had to be adjusted to the initial education and training programmes available in Vietnam.

Training and education in the Vietnamese context

Unlike most health systems in the world, the structure of the health system in Vietnam with its four levels means that with the communes seen as the lowest level, the education level of workers also tends to be at the lower level (basic and primary level). Yet these are the first line services, and these staff, provide key healthcare services covering the whole country. Inevitably, the low levels of professional education have an impact on the quality of health care provision. In addition to the lack of a health workforce with appropriate qualifications, in the commune settings there is an increased population with increasing demands for health services, in turn causing increasing problems. The government has responded by increasing the capacity of training and educating institutions, but this too brings problems. Inconsistencies in curricula among training/educating providers are compounding the difficulties for the health workforce at community level. It is hard to predict the actual knowledge that individuals have gained from their training and this not only makes planning difficult it can lead to a lack of continuity for patients and inconsistencies in prescribing practice. Although the Ministry of Health (2006d; 2006e; 2008c) have made considerable achievements in many areas including the health systems both in policy and practice terms it was evident that these

achievements have barely scratched the surface of care provided by the communes. In this study, the researcher had obtained approval from the province administrative system and that gave the access to commune health centres and workers in a way not previously possible. The relationship that developed between the health workers and researcher was such that those in the workplace trusted that information would be treated with care, that no individuals would be identified and that no official reprisals would follow participation. They were therefore willing to provide insights not previously given and to accept the help and information offered.

Training and education is complicated in any country and/or setting. This study clearly exposed current problems; however, it was essential that any new programme be tailored to resolve identified problems and not create new ones. For example, the health workers differing levels and depth of knowledge in key areas, could have led to some workers feeling superior to others. A way had to be found to use these differences positively, to enable participants to see themselves as a team with different knowledge and expertise that could be combined to provide a higher quality service. Furthermore the baseline measures revealed that despite the presence of a national (albeit limited) upgrading programme for health staff, the commune members had been given little or no mandatory training, or upgrading of their qualifications for years. Thus, the baseline measures were crucial as they gave an insight into what the health workers actually knew about antibiotic administration, about public use and misuse, and how they used that knowledge in current practice

Developing the model and programme for the context of Vietnamese health workers

This study fitted well with the increased focus placed by the Vietnamese government on the importance of community nursing and community care in improving the health of the community, but the baseline measures highlighted the concerns about the current education and training system. Firstly, in developed countries such as the UK, the Netherlands and the USA, the roles carried out by the commune health workers would be at degree level or above, as the level of autonomy and independence needed are associated with higher level skills (McGee, 2009). Looking at the results regarding the knowledge and skills of the commune health workers in the study, it is evident that taking them to a formal higher education level such as that found in universities is not feasible. This is an increasing problem, as Vietnam's government has adopted the ASEAN competencies, and the countries who developed these all have systems for higher

education and training. Nevertheless, a way had to be found to help the commune health workers improve their current knowledge level, and their ability to undertake the many tasks that their multifaceted role demands.

Secondly, in countries where national health systems (NHS) have been well established for decades, programmes such as clinical education (CE), continuing medical education (CME) form the basis of continuing professional development (CPD), and professionals usually have to participate in these schemes if they wish to continue in practice. These processes have become increasingly professionalized, so that today, health professionals whose qualifications are already highly standardized, now follow approved programmes to keep up to date, and to meet the needs of patients, the health service, and their own professional development. In addition, industrialised countries such as Japan are now formalising (at government level) structures for nurse exchanges, and as part of the process nurses will need to demonstrate how they have updated their knowledge and skills. The need for the continuous acquisition of new knowledge, skills, and attitudes to enable competent practice is taken for granted. In contrast, in Vietnam, while aspects of adult learning and experiential learning processes seem to be applied within foreign-owned companies and academic institutions, these new approaches do not appear to have been cascaded into the general education system.

Thirdly, there also needs to be recognition of socio-economic factors. An organisation with employees that have a clear outline of the effects of external societal and economic factors (including the government policy), will be able to work incrementally to meet the changed environment. This allows employees to gradually familiarise themselves with proposed changes and to actively participate, so reducing the risk of resistance. Jarvis (2004) describes this as 'added value'; as the result of this, not only does the organisation gradually move forwards but employees adapt and change too. A crucial factor as resistance to change is a major impediment to successful innovation (Katz and Kahn, 1966; Howell and Boies, 2004; Clegg, 2002). Fear of the unknown and lack of awareness can also play their part amongst employees who feel they were not fully involved in the rationale for change (motives and goals) and who therefore continue to behave as before (Clegg, 2002). In the current health system, official memoranda and other documentation are sent to the communes, but without a background that motivates or stimulates the workforce, these tend to be seen as additional paperwork, rather than helpful information. By ignoring such information, the health workers are

showing a passive resistance to change. If the commune health workers, rather than trying to maintain current practices (with all its identified problems) are to become proactive, anticipate the changing needs of their community and improve the service they offer, they need to change their attitudes to practice. In addition to professional knowledge they need awareness of socio-economic factors and governmental attitudes to health services. They need to understand how social influences, peer pressure and in some cases group inertia can act on them as individuals to inhibit change (Mossholder et al, 2000).

Ideas to reduce resistance, and through that prevent stagnation in organisations, are not new, and the principles described by Kotter (1996), are still seen as appropriate today. He emphasises the need for information sharing from management, and that there needs to be a sense of necessity created by highlighting the current situation, clearly describing the desired change and, detailing how it will benefit both individuals and the organisation as a whole. Aiming for real achievements and results is essential in enticing employees to participate and silencing critics. Communication is key, employees want (and need) to feel valued and involved in the change process from beginning to end. The projected changes need to encompass all organisational layers (from bottom to top), so establishing a strong and dedicated coalition. In addition to top management, the commitment of the 'executive employees' (team leaders, departmental heads, union leaders) is essential in gaining the support of the workforce as a whole (Howell and Boies, 2004; Akgun, 2003). These elements were clearly present in this project, management was committed to change, but wanted their staff to participate and have some ownership of the changes. Therefore a participative approach was chosen for the education and training model as this approach is ideally suited for peer group training programmes but in this study the initial survey revealed the many difficulties and inequities which the commune health workers were confronted with. It also revealed an imperative need as well as an opportunity to deliver supportive training for all health workers who are working in the community health centres (grounded on the participants' focus groups in the initial survey and the approval by the authorities of health system).

Thus the programme had to be flexible enough to adapt to meet individual needs, whilst being strong enough to deliver the knowledge and skills needed for adequate levels of practice for workers with a wide ranging education background knowledge and understanding. It needed to be able to work for those recently qualified and

those who qualified some years ago, no easy combination of learners. In the context of the commune, the learners (herein health workers with various job titles, trained/educated levels and in length of service) needed an approach that would let them sit, closely together to learn together, without any individuals being identified as having inadequate education and training; hence what methods and which content should be included in the programme needed to be carefully considered. For this programme to be effective, in addition to the main focus of antibiotic use, the learners had to be stimulated to think critically, to move from a passive acceptance of knowledge to debate and discuss the evidence and use it to inform their own practice, in a setting where the public also needs to be educated about the problems of antibiotic use, rather than following the current pattern where they expect commune workers to provide what they want rather than what they need medically.

Possibly the best known example of a process that works through facilitation and participation is Lewin's (1952) action research cycle, an approach suitable for this project. He describes three phases in planned organisational change: 'unfreezing', 'moving' and 'refreezing'. 'Unfreezing' is the phase in which an organisation is in an apparent balanced state but the demands of the environment change. The change agent has to 'break' the apparent state of stability to convince the organisation of the necessity of the change. 'Moving' is the phase in which the strategic change is applied throughout the organisation, and the organisation has to adapt itself to the change. In the final phase, 'refreezing', the change is fully implemented and accepted so enabling the organisation to reach a new state of stability. Management's role in this process is to support each step and check that the organisation is, or can be tailored to utilise the change. This model of change appears to be useful for managers to force an organizational change for his/her organization or department, through a process in which the worker feels to be involved, although the agenda is actually management led. However, in this study the aim was for participants to have actual ownership of the process and to develop their own agenda for future learning. A process based on negotiation by each commune with the facilitator and in which management monitor outcomes but want the communes to decide their own learning goals. As with action research, there is a need to achieve organisational targets, but the focus is on self development rather than organisational development. These workers are autonomous and therefore it was important that group objectives did not diminish their sense of professional independence. Moreover, the commune health centres are located separately from

each other and each one functions within their own practice setting. Thus the chosen approach fits better with the service provision given by the communes.

Belasco (1990) takes this further, emphasising the importance of empowerment within change processes. By this he means the change in balance from top management teams to employees. Not all changes can be instigated and supervised by the top management teams, and in addition this gives employees the opportunity to develop themselves. Interestingly in this approach managers may not like, but will still support appropriate changes instigated by employees. Belasco (1990) claims, although this can initially be difficult for management, it does not outweigh the benefits of empowerment. Overcoming management concerns with regard to the release of control is one of the hardest things to achieve in innovation and change.

To be effective this study had to recognise the importance of incorporating empowerment through the use of theories of innovation and change into the conceptual model. Innovation can be defined in many ways, but the various definitions overlap in that they include the following terms: 'a new idea', 'a model or system', 'subjective, experience, acceptation and means'. Globally the definition of Rogers (1983) is often still seen as the most appropriate definition for practice, he argues that innovation is

'an idea, practice or object that is perceived as new by an individual or other unit of adaptation' (Rogers, 1983, p.11)

Changes (or innovations) can be divided into two groups. Planned changes are seen as strategic and linked to the vision of the organisation as a whole, whilst unplanned changes are a gradual process, that are often linked to the stages of growth in an organisation (Phan and Peridis, 2000). Interestingly, when asked, most employers see these as natural changes rather than innovation; however, it is the combination of these with planned changes that can lead to the greatest changes and the most successful innovations. Integral to this approach is knowledge management. Although there are various possibilities for this, in this project the interaction model seemed most appropriate. Here, the knowledge processes consist of different activities which include research, the constituent phases of knowledge processes (creation, analysis, distribution) and design. These activities interact in

feedback loops as well as forward loops, that form a spiral-shaped process or a collection of mutual relations between activities and elements.

The knowledge is assessed and if approved (by participants), communicated within the organisation. Although initiated by management, in practice this is a bottom up approach, and as Phan and Peridis (2000) stress the benefit of this approach is that knowledge developed and owned by staff is more likely to be retained and utilised. Thus, the development of knowledge becomes an intrinsic process, as is the sharing of this knowledge. When communicated throughout the organisation, it helps to bring unambiguous clarity to the organisation and an individually tailored outcome. Supervision and support for such change processes are essential, and a choice needs to be made between internal and external facilitators. The use of internal staff, as advisors, is not always effective for change (Clegg et al 2002). Although there are advantages from using in-house staff in that they are familiar with the organisation, and can start immediately, and are relatively inexpensive. There are also disadvantages. Internal advisors may find it more difficult to bring a wider or external perspective to the changes needed, they are less objective, and may also hesitate to take risks in decision-making as they too are part of the organisation. Also it is not easy to find a facilitator that is acceptable to both management and employees, and this may limit the development of mutual trust, an essential prerequisite if employees are to move into unknown areas of practice. An external advisor is familiar with the phenomenon 'change'; and their specific role is to supervise and support change during a fixed or project period. They work independently and are not linked to the management team; thus for employees, they are relatively neutral agents so making it easier to build a relationships based on trust (there is less fear of reports back to management). They bring with them their experiences in other organisations, so providing a broad perspective on change and factors impacting on the process. For these reasons, in this project the choice was made to use the researcher as an external facilitator to support and aid the professionals.

THE MODEL FOR COMMUNE HEALTH WORKERS

Considering existing experiential learning models such as Pfeiffer & Jones (1983); Kolb (1984); Priest (1990), the cycle of learning as described by Kolb (1984) has much recommendation as it is clearly structured and is one possibility considered for adaption to meet needs of ongoing education of health workers who are under the influence of passive learning and possessed low and unskilled qualifications;

any utilized cycles need to be repeated to maintain learners' knowledge and attitudes in order to achieve practical change. As indicated previously, education post initial qualification is a new concept and therefore the first step has to be the design of a theoretical framework tailored to meet the specific needs of Vietnam. It needs to provide opportunities for commune health workers to change their attitudes regarding professional practice, and accept the need to continually extend their knowledge and skills. Once developed the framework will be used to inform education and training policy on a national level, so providing for the first time in Vietnam, an integrated approach to community health education and training regarding antibiotic administration that is based on theoretical concepts rather than purely on subject lists. Only when this process has been accepted can the concepts underlying continuing professional development (CPD) and continuing medical education (CME) will be incorporated into future education and training programmes.

The model consisted of five steps (see Figure 6) while in Kolb's model there are four steps.

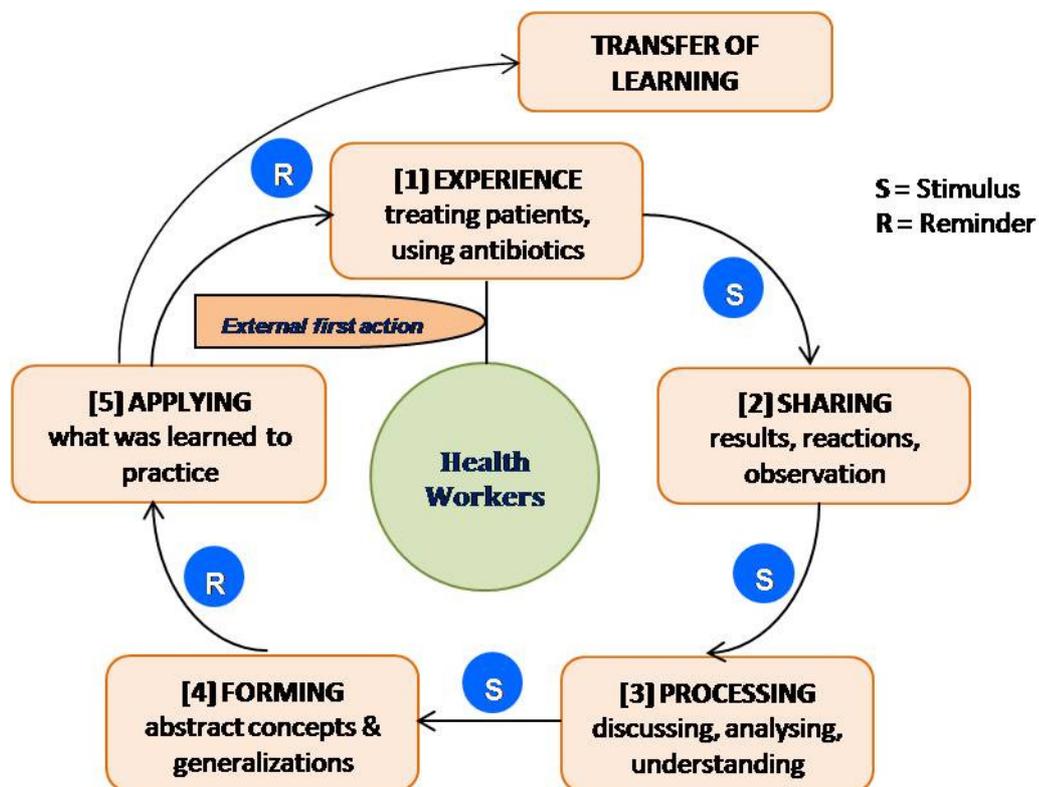


Figure 6. Modified Kolb's Model for Vietnam (MKMVN)

The first step was basically similar to that Kolb's i.e. the experience of individuals [1]EXPERIENCE. But for the commune health workers, it would start with a focus on their experience involving their daily work, e.g. treating patients/clients, using antibiotics and matters regarding antibiotic administration were used as a source of their own learning and continuing to the next stage. These are activities which the health workers are familiar with and responsible for. The second stage of Kolb's model was modified and divided into two specific steps including sharing and processing, this seemed to be easier to facilitate the process of learning. The reasons for dividing this stage into these two steps were grounded on the findings from the initial investigation especially from the commune centres' group discussions. It was evident that the most difficulty for the health workers was to tell by themselves (sharing) what they own (their experience) because of cultural heritage (Gross, 2007) and especially the sense of inferiority (i.e., their poor training and education, working at grassroots level, and fear of being criticized). This step [2]SHARING extremely needs to take place first then other members could feel free to discuss, analyse and understand as shown in step [3]PROCESSING. For the health workers this involved reviewing their current situation of antibiotic use. The fourth step [4]FORMING contained the same features of the Kolb's that refers to understanding the general principle of treatment and use of antibiotics which the health workers follow, and then the last step [5]APPLYING was their application which they perceived and understood therein rational treatment and appropriate use of antibiotic for their patients and clients in new situations, i.e. in similar or different cases.

The difference of this model in comparison with original experiential learning approaches was that it always needed the external facilitators for the majority of the contents of the programme, to start the cycle and to move to every next step. These facilitators (in this study done by the researcher) included the first action, stimulus (S) and reminder (R), played the key role and helped the process of learning to take place.

The first external action was essential to start the cycle of learning for each content/topic because this was the first time for the learners had experienced a non traditional form of learning. It had to be acknowledged that most of health workers (except a few new staff) had many years of working each with their own experiences (of patient's treatment and antibiotic use) however, to tell and discuss their experience with other participants was not easy because of their Asian cultural

heritage (being afraid of speaking in front of group), fear that their example or explanation might be wrong (being judged or criticized), and their poor level of training (they acknowledged in the initial survey). As a result they would choose to keep silent. The first action encouraged the health workers to talk, confirmed the worth of their experiences, reassured them that this was a peer communication, in a confidential environment and that there would be no information sent to management. During this step it was the responsibility of the researcher to protect their psychological safety .

The stimuli were used as a key factors for the 'being' and 'on-going' of each step, as catalysts for chemical' reactions. Firstly, because of cultural influences in which (non-assertiveness, shyness, introversion) hesitation in expression are a major factor and if there was no stimulus the participants would keep silent (Littewood, 1999; Heine, 2001). Secondly, was the didactic and passive way of learning which the health workers were used to, without the stimulus, the participants would just wait for the researcher to give them the required information. Lastly, the model was also a new learning approach and the health workers would need help to accept this new way of learning.

After the learners formed concepts/generalizations, the reminder (R) that took place was to help the health workers connect and apply what they learned to their own practice, (i.e. to remind the health workers to retain the logical, reasoned approach to treatment and the appropriate use of antibiotics in future situations and to continue learning) was crucial. Because of their long period in practice, using traditional approaches to prescribing, if not reminded it would be easy for them to return the old habit for treatment and prescriptions. Therefore, the reminder acted as a reinforcement to maintain what the health worker obtained from their contemporary learning and to continue their learning by repeating the cycle.

THE CONTENT OF THE PROGRAMME/CURRICULUM

The initial survey was used to identify the necessary content for the programme. In the light of the very high level of antibiotic usage in the community that it revealed (approximate 80% in total), further research was needed to ascertain the reasons behind this unacceptable level of prescribing. The questions that needed to be considered included:

- (a) why it occurred?

- (b) to what extent specific antibiotics were inappropriately or correctly used?
- (c) were the staff aware of the implications of misuse?
- (d) did they know how to diagnose correctly?
- (e) what happened if they chose not to prescribe at all?

To address these issues the qualitative focus groups and interviews methods were used and as the previous chapter indicates, yielded surprising insights into the knowledge, skills and attitudes of the health professionals. Their explanations focused on the external factors that formed their perspective, influenced their prescribing, but the quantitative data sets showed a different picture. Although external factors such as health insurance did play a role, lack of knowledge itself was a central issue. The findings also revealed a paradox. Health insurance was designed to enable those living in poverty to access and receive appropriate health care; it actually led to increased, and in some instances, inappropriate prescribing so compounding the problems of the very group it was designed to serve.

Reviewing the original professional training and education from which the health workers graduated it was evident that basically these training programmes addressed only the most common diseases including causes, symptoms and signs. Although treatments, including the use of drugs as well as antibiotics and prevention were included, there was little evidence of links between signs, symptoms and treatments. This problem was exacerbated standardised by the disparate curricula. The programme therefore needed to offer a curriculum that would enable all participants, regardless of their previous study to end with the same level of knowledge and the ability to correctly apply that knowledge in practice. Learning and teaching methods needed to motivate participants to change long established patterns of service provision, something that is not easy, and is only possible when participants embrace the concepts underpinning the curriculum content.

The content had to include a thorough review of common diseases, their signs, symptoms and clear guidelines as to which were suitable for antibiotics and which were not. Issues of drug resistance and factors which increase it had to be included, as did the consequences of inappropriate prescribing, both in terms of disease management and the long term implications of late diagnosis for the patient. A key problem was that there was limited awareness of the consequences of antibiotic misuse, As a starting point, definitions of misuse varied, and unlike some countries, in Vietnam there is no formal documented definition, and no legislative control. As a

result, decisions were individually made, not led by policy or official guidelines. Yet for good standardised practice there needs to be one agreed and accepted definition. In consequence, information in the programme had to be clear and detailed with an emphasis on what constitutes misuse and linked to that, how an easily curable infection becomes an uncured and sometimes undiagnosed disease, ultimately increasing not only morbidity, but also mortality.

To be effective, the curriculum needed to reflect the nature of the client group that the healthcare professionals worked with. For example, upper acute respiratory infections have the highest incidence, and currently in the communes no laboratory tests are available. For this reason it is essential that healthcare professionals have a good working knowledge of the clinical symptoms and signs, and their implications for treatment. Linked to this was recording the results of consultations, In many instances, there was a lack of clarification, or justification for treatments prescribed, making it difficult firstly to assess the appropriateness of the antibiotic prescribed, Secondly, where treatment proved ineffective it, was difficult in subsequent consultations to establish what the presenting symptoms were and how to proceed. A problem in recording that is unique to Vietnam is, was mentioned previously in the baseline measures is the ambiguity of terminology between inflammation and infection, and therefore care was taken to include information on the difference and how to avoid using the wrong term.

However to only consider antibiotic use was not seen as appropriate. If healthcare professionals are not aware of the alternatives, they are unlikely to change their approach to practice; rather they will continue to dispense advice and products (in this case antibiotics) that they are comfortable with. Therefore the content included information on other common non infectious diseases, their signs, symptoms, diagnosis and treatment (see Appendix 7). Although these aspects were likely to be seen as important, with the need for this knowledge recognised by the health workers there was another existing problem. Decisions have to be made regarding which drugs should be given to a patient, based on the existing medicines available at commune health level, meaning that the workers need to be given the skills to make appropriate decisions on specific cases. Such difficulties in making decisions were often seen in other studies concerning prescription practice, and it is generally accepted that dilemmas frequently are often seen in practical settings ,and are not easy to solve (Sahoo et al, 2010). For these workers with minimal education it is even more difficult than it is for their better qualified colleagues as they do not have

an adequate knowledge base on which to rely. If there is no standard protocol or guideline for making decisions the result is that the treatment is likely to be given based on past examples, whether or not these were appropriate. Deciding which antibiotics should be given to which patient requires knowledge, skill, and expertise and it takes time and experience to become proficient. The problem was that, because staff did not have the right level of expertise, and over time had forgotten some of the knowledge they had received, they were skipping some of the steps of the decision making process. For example, by labelling the patient with a disease or a diagnosis, drugs were then prescribed immediately, based on the health workers' view of which medications worked for the disease but took no account of the patients actual condition. For this reason a key content of the programme was the process of rationalising treatment, based on the recommendations from the World Health Organization (1994). In discussion, this seemed new to the commune health workers, but they rapidly recognized its significance. Therefore, the six steps of the process of rational treatment, including (1) Defining the patient's problem, (2) Specify the therapeutic objective(s), (3) Verify the suitability of personal treatment, (4) Start the treatment, (5) Give information, instructions and warnings, and (6) Monitoring and stopping treatment, were introduced and practiced using case studies and vignettes.

Therefore the training programme was facilitated in such a way as to provide the health workers opportunities to gain their own awareness, abstract concepts and generalizations rather than by listening to someone or reading about it. It was also noted that past and present experiences should be used as stimuli in which the former is to gain new insights and the latter is to facilitate learning. It is recognized that small-group learning covers a wide range of strategies and techniques, leaning from and through experience is one of the main ways within this approach, and therefore much of the programme was based on small group work. As defined by Kolb (1894: p.38) "Learning is the process whereby knowledge is created through the transformation of experience", thus together with principles of adult learning, aspects of experiential adult learning were respected. These included the health workers' practical aspects, ideas and feelings, interaction, collaboration and an assurance of autonomy and flexibility.

The programme was designed as a series of learning experiences. In line with the theoretical underpinning of the model, it was accepted that a series of single study days would be more effective for this group than a long study course which would

be impractical (who would see the patients) and which would be more likely to encourage the participants to enjoy the learning process and be keen to learn more. They were able to bring 'live' (real) examples that they had found difficult to deal with, and could see how their peers would have coped, and to resolve such dilemmas in practice. Therefore the provision of this informal training course as an alternative way to learn had advantages for the workers. As analyzed previously, the Kolb's experiential learning model has become readily acceptable because of its simplicity and its foundation for adult learning, and also seems to be the most suitable for the target group of this project. However, for both the commune health workers and the researcher who had also studied under the traditional learning methods, it was a unfamiliar conceptual framework and needed necessary modifications. The model then employed the key points of Kolb's cycle. The aim of the study is to make changes in not only antibiotic use but in the manner the health workers learn afterwards by themselves meaning a health worker-centred model (see Figure 6).

THE IMPLEMENTATION OF THE MODEL AND PROGRAMME

The process of implementation

Vietnam's history from an early age is a national history characterized by uninterrupted struggles against foreign invaders over thousands of years. Consequently it had a different heritage to the theories of learning and teaching. Vietnam also has a long and proud tradition of higher education with one of the oldest universities in the world, based on the theories of Confucius, and in recent centuries this has been the integration to the Western form where most of the modern theories of learning and teaching are derived. However, there has been little possibility to apply these or any theories of learning in the school settings, with the result that teaching is now based mainly on lists of content rather than encouraging learning. The challenge for this study was to develop a conceptual framework that could integrate appropriate theories from the West with the traditions and culture of Vietnam, and be acceptable to commune health workers whose attitudes to learning are characterized by the training they underwent. The main approach was passive, based around a curricula that transferred information, but did not encourage or support interaction between learner and teacher. In addition, they have had no mandatory training since leaving their original health school settings. They need to learn how to use up to date ways of learning, sharing their experiences and decision making and problem solving in order to use the new ideas gained from their experience in practice. The conceptual framework needed to recognize not only the

issues of learning and teaching in formal settings, but to lay a foundation for learners to add to their knowledge as continuing education (Jarvis, 2004).

Unlike the education classes or collective training courses that some of the health workers had attended before, the expectation of this study was a training programme that was approachable (acceptable and accessible), useful and comfortable for all of the learners. The health workers' situation regarding attending study sessions meant that it was difficult and inconvenient for them to be travelling for education sessions. It would have been difficult to find a place that would adequately accommodate members from all communes, but even if it had been possible to bring together a large number of participants who did not know each other, this factors could mitigate against the aim of providing experiential learning, and working with several small groups at once would not have been easy, and individuals needing support could have been missed. Having decided that learning based in the environment of the learners would be more successful as they could then relate the learning experience directly to their work, separate sessions were planned for each commune. Therefore, the learning and teaching was based within each commune health centre hence the participants felt very safe, and the strategy of small-group experiential learning could be utilized as the basis of implementation.

Obviously the size of the group has an effect regarding to the ability of face-to-face interaction between the trainer (the researcher) and the trainees (the health workers) as well between group members. As described previously, groups in this study were about 5 to 7 members, another important advantage for group work. In addition, by placing the course in their own centres, the learners could give the maximum possible time contribution to the learning process (Quinn and Hughes, 2007). In addition with the way the programme was designed around the small-groups, the health workers were at the centre of learning which allowed opportunities for them to exchange their ideas and feelings and to be challenged by other group members' viewpoints. This all helped to expand the health workers' universe of awareness, in order to help them to develop interactive and collaborative approaches and from then to form abstract concepts and generalizations. To the researcher small-groups gave the opportunity for more intimate engagement with the health workers than in traditional teaching sessions.

The training programme was delivered in each commune health centre after another. The schedule was planned as one day for each centre (see Table 6.4); however, any necessary administrative procedures were done in advance. This included obtaining approval from authorities, advanced work with the district centre of health and the heads of commune centres to reach an agreement and a confirmation of the timetable. The materials for training were also carefully planned and prepared, this included a training framework with illustrations, this was in two formats, one for presentation during the session was stored in a laptop (presented by the researcher), and the second was in the form of reference materials for them to keep (see Appendix 7).

Table 6. Schedule of the training programme

	Activities	Duration	Outcomes
Preparation	getting approved to access the location	one week	get official documents for accessing the centres
	planning with centres	one day	schedule confirmed with each centre
	materials for teaching and learning	one week	presentation, handout, writing paper, pens, laptop... completed
The one-day training for each centre	1 st evaluation (observation & questionnaire)	around 25 minutes	get notes and answer sheets
	Conducting the training (the model was applied in each content)	all time of working day	gone through all contents
	2 nd evaluation (observation & questionnaire)	around 25 minutes	get notes and answer sheets
Returning back after 3 months for final assessment	getting contacts with all centres again	around one week	schedule confirmed with each centre
	3 rd evaluation (observation & questionnaire)	around 25 minutes	get notes and answer sheets
	focus group	around 30-45 minutes	get reflective feedback from the participants
	more communication when necessary	around 30	remind, explain if participants ask

For practical reasons the information regarding antibiotic use was produced as a small booklet which would fit in their pockets, and could therefore be readily accessible for daily use. Other learning materials such as pens and flipcharts were also made available, as these could readily be used in the commune buildings. Within each group, the same predetermined contents provided the basis for the course, learning and teaching were reflectively carried out following the major stages of the model. Giving the health workers the opportunity to relate their experiences, without being judged, was new, and they needed the encouragement of the researcher, and the support of their peers in order to fully participate. This would not have been possible in large groups, or if they had been put with strangers. In this study, in the process of learning the health workers firstly were encouraged tolerate their experience by simply describing what happened without judgment. They were next put in touch with their own feelings about the experience in which positive feelings were reinforced, for example the pleasure of making an appropriate decision helps the patient recovered from his/her illness and negative feelings were removed. Then the health workers' experiences with their existing ideas and feelings were linked and tested for consistency. Once all members had completed these steps, then the health workers' experiences as a whole were considered, by asking them to look for associations and differences in practice. Also how they could test for consistency of practice between the members of the group. Finally the health workers identified how they felt about the experiences they had described, whether they could deal better with a future similar situation and what they actually learned from sharing their good and bad experiences of practice. It was recognized that it was not easy to move quickly through all the above stages so each stage was practiced gradually until the health workers felt comfortable with them.

The implementation of the programme was considered carefully. The piloting of the conceptual framework was crucial, as only through this could the relevance and application of a new way of learning for the commune health workers be assessed. For the programme, and hence the model to be acceptable, it had to be delivered in a manner that did not disrupt services and that was acceptable to the workers themselves. For that reason the programme needed to be relatively short. The duration of one day for implementing the programme within one centre was

considered carefully and appeared suitable and acceptable. The experience from working with the health workers in the initial survey revealed the facts that for a long time they had no learning, and bringing them all together in a long course would have been inappropriate. They could well have become discouraged or resentful of the time out of practice, they could well have found it difficult to concentrate, and they may have chosen to discontinue the course. By keeping the course short, the programme contained enough information to stimulate their interest, but not too much, as that could have overwhelmed them, making it difficult to remember anything. The core information was selected from the results of the baseline survey. It included some new and, in some instances, complex information about the principles of prescribing, so it was important to consider this carefully. Only when this had been understood and accepted would improved prescribing occur. Therefore the programme was seen as the first of a rolling programme of updating which would continue, possibly on a six monthly basis. In addition, in practical terms there was an urgent need to update all staff, and with this mode of administration this was possible. Had a longer course been used, only one member per centre would have attended and misuse of antibiotics could have continued. In addition, the training programme was not either a mandatory training course or a course for getting a certificate of higher level, and participants needed to WANT to attend. In addition, a one-day curriculum in each centre, meant eleven days for eleven centres of the whole district, a major commitment for the researcher.

It is crucial that for the programme to be effective and oriented, the goal is consistent from the beginning to the end within each health centre as well as from centre to centre within the whole district. Because the trainer (the researcher) had met and worked with the trainees (the health workers at centres) during the initial survey, it did not take much time for making acquaintances. The main work of programme started and covered with a power point presentation titled '**Rational Use of Antibiotics**' in which the intended contents were introduced slide by slide with focused points and hyperlinks, when necessary, to images, data, and quotes to illustrate visually what bacterial resistance, consequences and other effects from the irrational use of antibiotics are. The presentation was not a lecture; it played as a structured framework for the trainer to embrace, from which each content was presented in a manner of revealing the problem; the participants were then directed to go in the cycle of the model step by step. In the model the trainer played the role as the facilitator who took the first action to start the cycle and stimulated the learners by suggesting, encouraging, and praising the participants to deal with each

step and to come forward next steps (Figure 6). The following presents how the learning process was done with one of learning contents as an example.

While addressing diseases or conditions did or did not need antibiotics to treat, the problem was brought out as the following question,

“ Which diseases or conditions need antibiotics to treat ? ”

Because of the heritage of didactic learning and cultural characteristics of East Asia as mentioned previously, this would be received in silence by the health workers.

[1] EXPERIENCE

External first action *To start the cycle, the researcher had to take an external first action to break out of this situation by giving a confirmation of what the health workers had for years in dealing with in their work. They had encountered and dealt with many patients with a varieties of diseases or conditions. This action created a surprised effect showing in their response that all agreed with the fact that they had dealt with all types of patients, all types of diseases and of course, had given patients enough kinds of drugs.*

At the start the trainer suggested that the trainees give an example of a patient to whom they had prescribed drugs. Most of the health workers acknowledged that not only a single patient but many patients attended with certain conditions; for instance, with a fever and cough. It was thought that such patients could get an infection, for example in the respiratory tract. As a result, some drugs would be given including anti-fever, cough-medicines, and a specific class of antibiotics.

[2] SHARING

Stimulus *To move to the second step the researcher had to give a stimulus by praising the participants and confirming they had*

good experiences to share - for example, how the patients prescribed with antibiotics were after a few days.

There were different responses of the result were shared such as not sure because the patient did not come back; or the patient became well after several days and said thanks to the health worker. Other said that he did not give his patient antibiotics except anti-fever, cough medicines and vitamins and these stopped his patient's cough and fever.

[3] PROCESSING

Stimulus *To continue to the third step, the trainer gave praise to those who expressed their experiences and who questioned the appropriateness of antibiotic prescriptions for certain diseases/conditions. i.e. the trainer had directed the trainees to return to the early question as to which diseases needed antibiotic treatment.*

Discussions about this question, became robust with a variety of opinions. For example, some argued that the results were dependent on specific cases; or in general, antibiotics would work regardless of the type of infection; but others argued that antibiotics were recognized as a medicine used to fight bacteria, so only bacterial infections need antibiotic treatment. The latter was then acknowledged by other trainees and reinforced by the trainer.

[4] FORMING

Stimulus *To move to this step, it had been acknowledged by the trainer and trainees that there had been problems in verifying which diseases did or did not require antibiotic treatment.*

The participants at that time developed further ideas and commented that patients coming to see them may have a non-infectious condition; a viral infection; or a bacterial infection. They came to recognize that antibiotics have no effect on non-infectious diseases, therefore these conditions do not need antibiotic treatment; antibiotics cannot fight viruses, therefore they do not give an antibiotics for a viral infection; and antibiotics are medicines that can fight bacteria; therefore only infections caused by bacteria may need antibiotic treatment.

[5] APPLYING

Reminder *the trainer reinforced that for a patient the health workers meet next time do not give the patient an antibiotic before verifying whether or not the patient's condition is caused by bacteria.*

This reinforced the concept that only bacterial infections need antibiotics to treat them. In practice health workers do not give antibiotics for non-infectious conditions or viral-caused conditions. Whether or not this would be applied in the health worker practice was showed in the changes after the programme.

Within the programme some theoretical contents were delivered as the informative transmission and time was spent on for their recognition such as the global situation of antibiotic resistance, data of antibiotic resistance in Vietnam, national and guidelines for drug usage. Learning other essential information regarding the rational treatment and use of antibiotics that the health workers had experienced, would be responsible for and would have to deal with in the future, was, inline with the process of learning used, facilitated through relevant external actions and stimuli.

Using triangulation for evaluation

The use of triangulation was used for both the initial survey and the evaluation of the programme, proved to be extremely valuable .It enabled both quantifiable

measures and qualitative data sets to be used to assess the effectiveness of the programme and hence its impact on practice. Johnson and Turner (2003, p.299) point out that this approach enables researchers to exploit “complementary strengths and non-overlapping weaknesses. However in order to do this, the strengths and limitations of both approaches needed to be clearly recognised and considered in the planning process. The quantitative design provided numerical and statistical measurement, but it made little allowance for the more interpretivist aspects needed to assess the acceptability (for participants) of the new model and training programme. Nor did it give great detail as to why certain practices were being followed. However, the qualitative methods, based on text and discussion gave insights into these last two aspects, and individual perspectives and understanding, but they did not provide data that could be generalized and thus were insufficient alone to assess the effectiveness of the programmes. By combining approaches from within the two paradigms, although this meant two sets of challenges to overcome regarding reliability and validity, and the alternatives, it provided the data sets needed to address the research questions (Creswell & Plano Clark, 2011). The quantitative methods helped to guide the selection of information for phase two of the study and indicated key areas of concern, while at the same time delineating the educational profiles. The qualitative data sets provided explanations and insights into prescribing practices, the rationales used to support them and revealed the limits to access for education and training. In combination they led to the identification of unexpected and previously unknown or unobserved insights revealing that most practitioners were aware that their knowledge was not adequate and wanted to know more, but did not know how or where to gain the additional information required.

Triangulation occurred not only in the methods of data collection, but also during analysis where the differing data sets were integrated into the discussion of the findings from the quantitative survey, and in the second phase the overall evaluation of effectiveness.

The management of the programme

In order to facilitate the training the physical environment was pleasant and comfortable for the health workers. In this study the very health centres and their working places were used as learning settings and as discussion rooms. Within their workplace they were used to using the rooms for different activities, so using them as a classroom did not cause any additional pressure or fear and this created an

environment for all health workers of a commune health centre to be able to learn with equal participation.

The training taking place in each health centre also provided an ideal psychological environment perceived as a 'learning community' by all health workers with a climate of acceptance, support and trust; each of them acknowledged s/he was still learning and their needs were recognized. In addition, in this study the researcher by acting as facilitator and support was able to monitor the whole process and through this provide psychological safety for the health workers' learning, checking the no element of personal judgment impacted on their thinking and practice. This environment of psychological safety gives an equality for training staff in all respects, where the learners can determine what they want to learn and the way by which they achieved and evaluated their knowledge. The training also created a climate under which members of the health centre trusted each other; thus they could contribute without fear of being ridiculed if their idea seemed to be wrong. Such ideas were therefore seen as creative and from then would lead the group in the right direction. In the safe atmosphere of their centre any idea of the group members were encouraged to try out, their energies on learning were free to concentrate.

To direct the training and to maximise its outcomes the participation of the trainer needed to be considered. The presence of the trainer is likely to influence, to some extent, the group interactions. In this study, the researcher (as the trainer) had to function as the leader of each group, he took the major responsibility for conducting the sessions, facilitating the programme, providing resources and taking on the role as group trainer. A key advantage for the researcher was an engagement between the researcher and the health workers which was made prior to the course thereby making him accepted as a colleague by the group members.

CONCLUSION

In this Chapter the components for the basics of the programme and for the learning model including learning and teaching theories, training and education, existing models of adult learning, conducting training and education were carefully considered. This resulted in the learning model that called the Modified Kolb's Model for Vietnam. Although the model needed external facilitators that included actions to start the cycle, stimuli to move to next steps, and reminders for application and repetition, it ran well and provided advantages in the ease of

manner for the health workers (the learners) to access. It also provided an easy mode of access for the researcher (the trainer) to implement and manage the process. And in overall it created considerable changes that will be presented in the next chapter (Chapter 7).

CHAPTER 7. RESULTS AND DISCUSSION OF THE MODEL AND PROGRAMME

INTRODUCTION

The main purpose of the study was to develop a conceptual framework and model for public health workers to reduce antibiotic misuse among the population in Myloc district, Namdinh Province, that will be transferable to other rural areas in Vietnam. In the second stage of the project, the two objectives are, (a) to develop and pilot for practice a conceptual framework and model for public health workers to reduce the misuse of antibiotics and (b) to develop a training programme for public health workers to support the implementation of the model to reduce antibiotic misuse. The Model and the training Programme were developed, based on the context of educational system of Vietnam and matched with the situation of health workers in the community level (see Chapter 6). This Chapter therefore presents the results and discussion of the model and programme.

GENERAL INFORMATION OF PARTICIPANTS

The demographics of population of the study was obtained from the initial survey of 2008. However, there was a need to see whether there was any change at the time of the intervention by 2010. Figure 7.1, and Table 7.1 show these details.

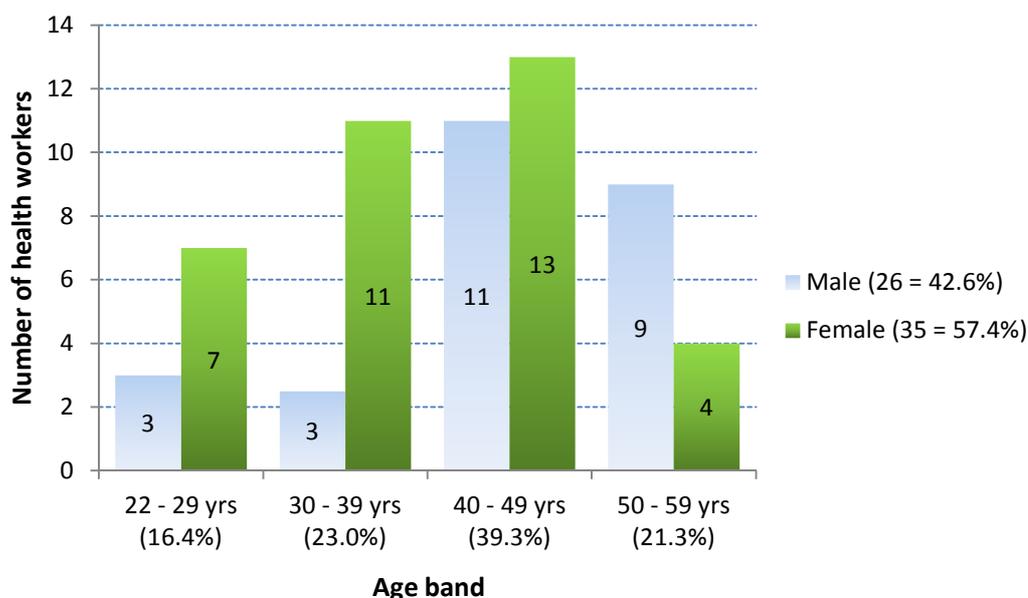


Figure 7.1a. Age and gender of health workers participated by 2010

At the beginning of the intervention there was a slight change in the health workforce of the study population; 61 health workers participated to the study. The mean age \pm SD was 41.2 ± 10 years (range, 22 - 59 years). Meanwhile at the time of the survey in 2008 the numbers of health workers was 56 and the mean age \pm SD was 43.3 ± 7.6 years (range, 27 - 57 years). There were 26 men (42.6%) and 35 women (57.4%). In comparison with the 2008 survey (men and women made up 58.9% and 41.1%, respectively) there was no significant difference in the proportion of studied subjects' gender.

The age band 40 - 49 was still the highest of the study sample (Figure 7.1a). However, the youngest band (≤ 29 years) increased significantly (16.4% compared to 5.4% in 2008). Of these staff there was a number of health workers who had been trained in the health area and subsequently been employed to work for the community centres in recent years. Whether or not there were differences among these workers regarding administration of drugs remain a question?

Table 7.1. Health workers participated to the training

Category	Health workers		
	N	%	
Education level			
University	Total	6	9.8
	Medical Doctor	6	9.8
Secondary			
Secondary	Total	45	73.8
	Assistant MD	17	27.9
	Nurse	12	19.7
	Midwife	8	13.1
	Pharmacist	8	13.1
Elementary			
Elementary	Total	10	16.4
	Nurse	5	8.2
	Midwife	2	3.3
	Pharmacist	3	4.9
Years in career			
Years in career (length of service)	Min	1	
	Max	36	
	1 - 5 yrs	15	24.6
	6 - 15 yrs	11	18.0
	16 - 25 yrs	25	41.0
> 25 yrs	10	16.4	

Table 7.1 shows both changes and the status quo in some demographic data of health workers at the time of the implementing the programme and model compared

with those at the time of the 2008 survey. The number of Medical doctors and Assistant Doctors were unchanged for two years remaining 6 MDs and 17 Asst.MD (see also Figure 7.1b), in the commune level medical doctors are reputedly the highest level and the Overall Plan for Development of Vietnam Health System - period 2010-2020 issued by the Government (2006) stated that to date 2010, 80% of commune health centres in nationally and 100% of commune health centres in rural area have medical doctors yet the situation remained after two years with 6 medical doctors who studied from in-service curricula and attended the 2008 survey.

There have been no newly graduated medical doctors transferred to work for commune health centres. The Ministry of Health has recognized the shortage of qualified health workers, especially at grassroots level, and have sought to improve the situation. One of MOH's outcomes is that health workers with higher levels of qualification have been sent in shifts to assist those at grassroots level, thereby improving the quality of health service. However this has only taken place in hospitals of certain provinces and of some urban districts, and would not be available for the commune level even in the long term. The numbers in Table 7.1 and Figure 7.1b illustrate that assigning health workers with higher education training to the commune level is difficult and is likely to remain so into the near future as stated by the Senior Government Official (Rua, 2010). Otherwise further training and education programmes conducted at the workplace for health workers at this level is necessary.

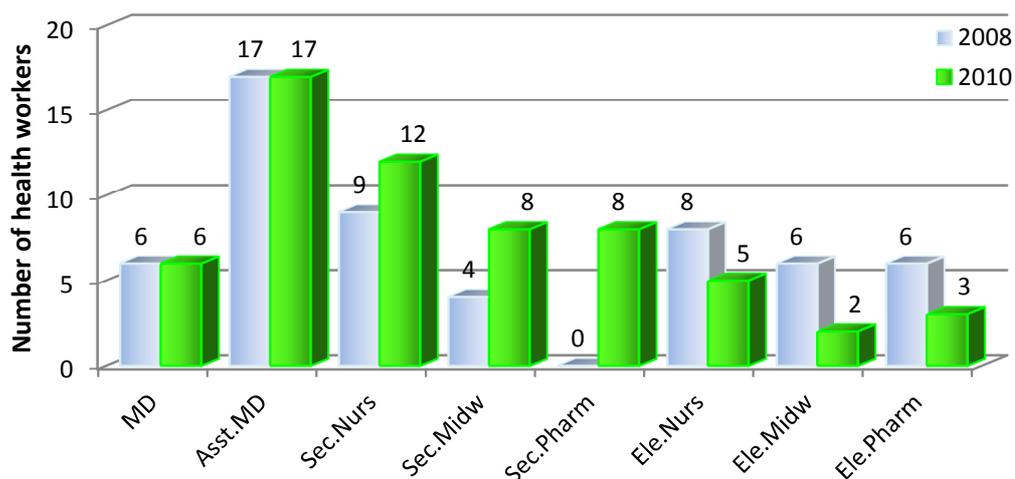


Figure 7.1b. Education levels and job titles of CHC's health workers

Figures 7.1b indicated there were differences in the numbers of elementary and secondary levels between 2008 and 2010. The number of elementary workers went down from around 35% to 16%, and the secondary staff increased from about 53% to approximate 73%. Noticeably, in the 2008 investigation, commune health centres had no secondary pharmacists but at the 2010 intervention there were eight secondary pharmacists. As illustrated in Vietnam educational system (Chapter 2) these staff had been trained in a 2 year-programme, mainly regarding pharmacy, and employed to work for the commune health centres. There was also a considerable change in health workforce structure of community health level. Interestingly, another question is that whether or not there was any improvement on the administration of drugs in general and of antibiotics in particular?

EVALUATION BY QUESTIONNAIRE

General evaluation by overall band score

As mentioned in the Method Chapter, the questionnaire after being piloted and modified was used to evaluate changes in perception, understanding and practical ability of the participants at three different periods of time - these included measure 1 (M1), measure 2 (M2), and measure 3 (M3) refer to the time before, after, and three months later within the interventional programme. However, before addressing the results of the programme it was necessary to appraise whether the questionnaire suited the participants or questions planning to be used were easy or difficult for them to answer. Table 7.2 gives a description of this,

Table 7.2. Variety of scores by education level before the intervention

Score	Number of participants			Total	
	university	secondary	elementary	n	%
40 – 49 points	0	7	4	11	18.0
50 – 59 points	1	20	3	24	39.3
60 – 69 points	3	13	3	19	31.1
70 – 78 points	2	5	0	7	11.5

Obviously health workers regardless qualification levels possess knowledge as well as existing practical experience including those regarding the administration of drugs in general and antibiotics in particular. Before the intervention the score varied from 40 to 78. It is clear to see no participant with university level (Uni) got the lowest score (40 – 49 points) and also no participant with elementary level (Ele) obtained the highest score (70 – 78 points). The range of scores between training levels showed no difference in statistics. One of ways to improve education was to

revise tests on the basis of test scores and the extent to which tests on a questionnaire discriminate between high scores and low scores (Haladyna, 1999). Level of difficulty is defined as the proportion of respondents who answer questions correctly. If tests are answered correctly by more than 90% of the respondents these tests are considered too easy, in contrast by less than 10% they are too difficult. Figures in Table 7.2 advocate the questionnaire used for the participants of the study population in the extent was acceptable (Ebel, 1991).

To get an overview of the result of the programme the mean values of overall scores from three measurements were calculated and any association (using t-test and p value < 0.05) between these values were considered as presented in Table 7.3,

Table 7.3. General result by overall score

Score	Min	Max	Mean .Std	p value (t- test)
M1	40	78	58.43 ± 8.77	
M2	96	100	99.25 ± 1.00	p(2;1) = 0.001
M3	62	96	79.76 ± 9.02	p(3;1) = 0.001

The mean score elevated significantly after the completion of programme (99.25 ± 1.00 points, ranged from 96 to 100 points), and was still high after three months (79.76 ± 9.02 points, ranged from 62 to 96 points) in comparison with before the intervention (58.43 ± 8.77 points, ranged from 40 to 78 points), p values of 0.001. It is recognized that memory or retention of learning content decreased with elapsed time since learning. Ebbinghaus (1913), a German psychologist demonstrated that learners can only remember 75% of what they learned by the end of a learning course, and retained less than 10% of learning after 30 days, this means more than 90% of what was learned was forgotten. Interestingly in this programme, the mean score after 90 days was still about 80 points. The mean score elevation after the completion (M2 – M1) was approximately 40 points. If considered this as 100% of knowledge then the elevation after three months (M3 – M1) was approximately 20 points. In comparison the two elevated levels (20 versus 40) the meaning was that after 90 days the health workers could retain 50% of what they learn from this programme (not 10% after 30 days as mentioned in the Ebbinghaus's work). Otherwise in this study helped the health workers to retain their knowledge far more so than expected. This indicates the effectiveness and sustainability of the programme as well as the appropriateness of the model.

From a different point of view, as mentioned above the structure of the workforce at community level showed a complex arrangement of job titles. These were distributed into three basic levels including university, secondary and elementary. Age and length in career of the participants were very different, as was their experience. A question was set out to determine whether the difficult level of questionnaire and the content of the programme suited all participants. Tables 7.4 and 7.5 reflect this query.

Table 7.4. Mean score by education level and job title before the intervention

Category		n	Mean score	p value (t- test)
Edu. level	University	6	65.50 ± 7.45	p > 0.05
	Secondary	45	58.53 ± 8.31	
	Elementary	10	53.70 ± 9.27	
Job title	MD	6	65.50 ± 7.45	p > 0.05
	Asst. MD	17	57.76 ± 7.91	
	Sec. Nurs	12	62.08 ± 9.64	
	Sec. Midw	8	54.75 ± 7.32	
	Sec. Pharm	8	58.63 ± 7.17	
	Elementary	10	53.70 ± 9.27	

Table 7.5. Mean score by age and seniority before the intervention

Category		n	Mean score	p value (t- test)
Age	≤ 29 yrs	10	57.30 ± 5.96	p > 0.05
	30 - 39 yrs	14	59.71 ± 9.03	
	40 - 49 yrs	24	59.71 ± 9.50	
	≥ 50 yrs	13	55.54 ± 9.00	
Seniority	≤ 5 yrs	15	57.67 ± 7.91	p > 0.05
	6-15 yrs	11	60.27 ± 8.59	
	16-25 yrs	25	58.88 ± 9.99	
	≥ 26 yrs	10	56.40 ± 7.57	

There were no significant differences in overall scores between groups at educational level or in terms of seniority, all gave p values of more than 0.05. It seems to be inappropriate to state that knowledge and practical experience regarding antibiotic administration is not affected by the level of education or by the length of service, but it was true for the participants of this study. The explanation for this is not simple, however findings from analysis of the quantitative data sets from the initial survey, and particularly from focus groups (using grounded theory) showed clearly the factors influencing the participants' knowledge, beliefs and

experiences. Of many influencing factors, working at the health centres based in community, no updating or mandatory training/educating for a long time were key reasons.

These findings together with the scores in M1 also imply that the questionnaire suited all health workers within the study sample. As addressed in the general information of participants, a group of young workers, especially the eight participants who has been trained as secondary pharmacists for recent years and added to the health centres, one pharmacist for a commune health centre, but the mean scores of this group (58.63 ± 7.17) was not different statistically from the other groups. This implied that the health staff who were trained in the two-year programme of pharmacy, when added to the health centres could not help much the situation of drug administration. This is one of the weaknesses seen in the educational system of developing countries, which tend to be characterized by didactic, slow to innovate and unable to respond appropriately to community demands (Dung, 2004). In this study, learners displayed a passive approach to learning, accepting as fact information from most training/educational curricula that they had attended. They had made little attempt to seek new knowledge. Using active learning with specific objectives for health workers had been well received and they were keen to learn more. Continuing education and training after their original education was obviously necessary and from the findings likely to reap sustained effectiveness.

Changes in the participants' perception and understanding

As in many studies the loss of responders or participants until the end time of study is unavoidable. At the time of the third measurement, the assessment taken at three months after the programme, 6 of 61 participants (less than 10% of total participants) were absent because of personal reasons and excluded from the M3 data analysing.

Beliefs in the necessity of antibiotic use

Antibiotics were globally seen as miracle drugs that could save humans from a number of dreaded illnesses since time immemorial. In fact, many common infections are caused by viruses such as common infections of the nose, throat, sinuses, ears, and chest are caused by viruses. Flu-like illnesses are also caused by viruses. Diarrhoea and/or vomiting are often due to a viral infection of the gut. Antibiotics do not kill viruses if humans are normally well, body immune (defence)

system is good at fighting off many types of viral infection. People may feel unwell for several days or more until a viral infection clears and treatment aims to ease symptoms. Also, many bacterial infections do not need antibiotics. These common misconceptions of the public and physicians about antibiotics have much been documented (Cals, 2007; Faber, 2010) including beliefs that most infections need antibiotics to treat and also most acute respiratory tract infections (ARIs) need antibiotic treatment without taking into account the role of human body's immune system or ineffectiveness of antibiotics to fight viral caused diseases.

Belief naturally influences strongly behaviour and vice versa (Macionis & Plummer, 2005), here there was a belief in the necessity of antibiotics and decisions regarding antibiotic administration. Being often prescribed and taken, the health professionals had accepted that antibiotics were a cure for any minor illness. Consequently, there was a "blurred" belief in the necessity of antibiotic to treat almost all diseases and health problems, this led to unnecessary prescribing of antibiotics as seen in the initial survey. Table 7.6 illustrates again their misconceptions regarding the necessity of antibiotics before the intervention and the changes obtained after the programme through the time-series measurements,

Table 7.6. Beliefs in the necessity of antibiotics

Beliefs	Measurements					
	M1		M2		M3	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
most infections need antibiotics to treat	88.5	11.5	0.0	100.0	40.0	60.0
most ARIs need antibiotics to treat	67.2	32.8	0.0	100.0	14.5	85.5
many infections caused by virus & antibiotics do not kill	68.9	31.1	93.4	6.6	76.4	23.6
body's immune system can clear most infections	70.5	29.5	100.0	0.0	78.2	21.8

In this study the health workers' conceptions regarding the necessity for antibiotics varied considerably (M1). A majority of health workers (88.5%) and (67.2%) believed that most infections (an umbrella misconception) and most acute respiratory tract infections (ARIs) needed antibiotics. Around 30% of respondents did not recognize that antibiotics do not kill viruses or the role of body's immune system. This fits with the cross-sectional, internet-based questionnaire study of public beliefs on antibiotic and respiratory tract infections conducted by Cals et al

(2007) where 47.8% of responders believed that antibiotics are effective in treating viral infections. However, the problem was far more obvious than that in this study, where the findings indicated that health workers of commune centres actually possessed some knowledge and understanding of antibiotics but needed positive reinforcement to make changes and use knowledge appropriately (Burns, 1995).

After the programme there were significant changes in their perceptions concerning the necessary use of antibiotics. At the time of completion the programme (M2) 100% of health workers recognized that neither most infections nor most ARIs need antibiotics to treat, 93.4% and 100% of health workers recognized that antibiotics had no effect on viral infections and the ability of self-defence of immune system. Three months after the programme (M3) the numbers of health workers, who retained positive conceptions, were still considerable higher than those before the intervention. These results were because the participants of this study were given facilities in which all participants had opportunities to look thoroughly at their work and what they experienced in a confidential atmosphere (their own workplace) and psychological safety (without being criticized), aiming to identify the issues. Three months later a small number of the health workers had reverted to their original conceptions. This can possibly be explained because despite their training and education within this programme, many factors concerning antibiotic administration have not been resolved. In other words, the figures depicted in Table 7.6 are actually signs of improvement and demonstrate the effectiveness of the programme, although a reduced number of health workers still require further training.

Awareness of the recommendations on administration

Inevitably some cases will need drugs to treat a particular diseases, and for safe prescribing the principles of administration need to be followed, but in this study, in many circumstances these principles could not be fully complied with. The healthcare practitioners usually tried to follow the guidelines in which essential recommendations on administration of drugs in general and of antibiotics in particular are specified. However, as most of them are educated to secondary level they did not fully the reasons behind all the regulations, and they found them irrelevant and in some instances impossible to follow. The essential guidelines for administration of antibiotics provided by the Ministry of Health in recent years (MOH, 2006; 2007) need explanations that all staff can follow. In this study basic recommendations for antibiotic use aiming to restrict drug resistance were introduced giving specific categories: (a) one / more than one class, (b) narrow /

broad- spectrum class should be started when treatment with antibiotics is necessary and (c) a course of antibiotic treatment depends on specific bacterial infection / a 5-day course for all conditions. The correct answers regarding administration should have been given by all workers, but Figure 7.2 show the results before and after the programme,

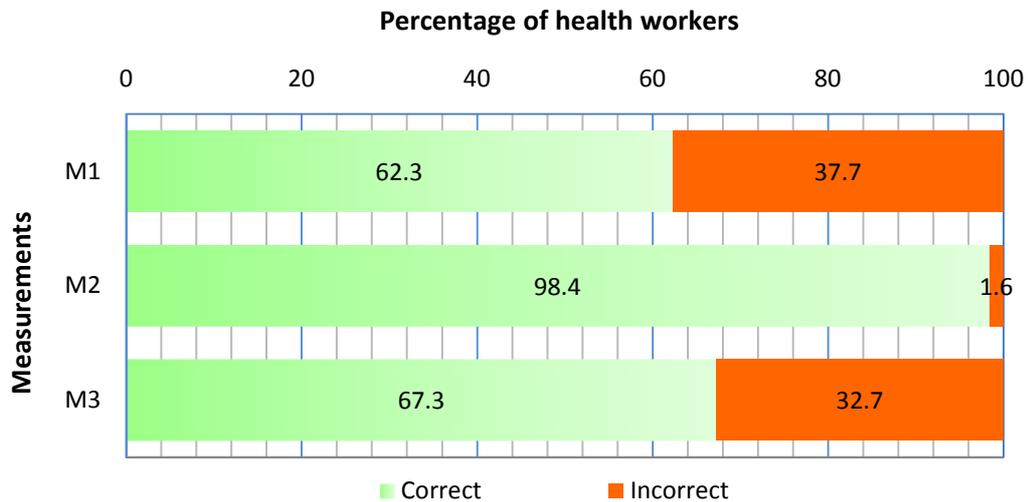


Figure 7.2. Awareness of the recommendations on antibiotic use

The awareness of all three categories were 62.3%, 98.4% and 67.3% of health workers in M1, M2 and M3, respectively. Clearly, before the programme commenced, it was recognized that many participants were aware of these recommendations but chose not to follow them. When looking back at the baseline data from the initial survey, three broad spectrum antibiotics including cefalexin, amoxicillin and penicillin were administered more than any others (Figure 5.3 in Chapter 5) and providing a 5-days course accounted for 99.7% (Table 5.13 in Chapter 5). This can be explained in that there is always a big gap between awareness and a practical approach and are also other influencing factors. In the Vietnamese context this compares to recognition of the traffic law and obeying it when travelling, everyone knows it and no one obeys it. After completion of the programme, the proportion of health workers with correct answers increased considerably to 98.4% but three months later it went down to 67.3% approximate to that level before the programme began. This figure confirmed again the difficulties referred to previously and the necessity of establishing positive reinforcement to the health workers and giving them frequent reminder by the educators of the programme. Although the approach used was effective, it needed to be reinforced by further sessions to further increase the workers overall levels of knowledge, so helping them to understand the need for sustained improvement in prescribing.

Awareness of the consequences of antibiotic misuse

Education on consequences of antibiotic misuse is essential. The World Health Organization, through many of its forums and programmes, has emphasized this problem (WHO, 2001; 2002; 2005). Adequate awareness of the consequences of misuse and overuse of antibiotics contributes to containing the resistance and minimize its sub-consequences including:

- 1) reduced effectiveness of the antibiotics
- 2) failing to cure a condition with existing antibiotics
- 3) increased morbidity and mortality
- 4) prolonged duration of disease/condition
- 5) increased transmission of bacteria in the community
- 6) increased number of people with bacterial infections in the community
- 7) increased risk of unwanted effects such as adverse antibiotic reactions
- 8) increased health care cost
- 9) psychosocial effects, e.g., patients believe that there is “a pill/drug for every ill” or “there is an antibiotic for every infection.”

Following these consequences items were asked (Appendix 6) and the result is illustrated in Figure 7.3,

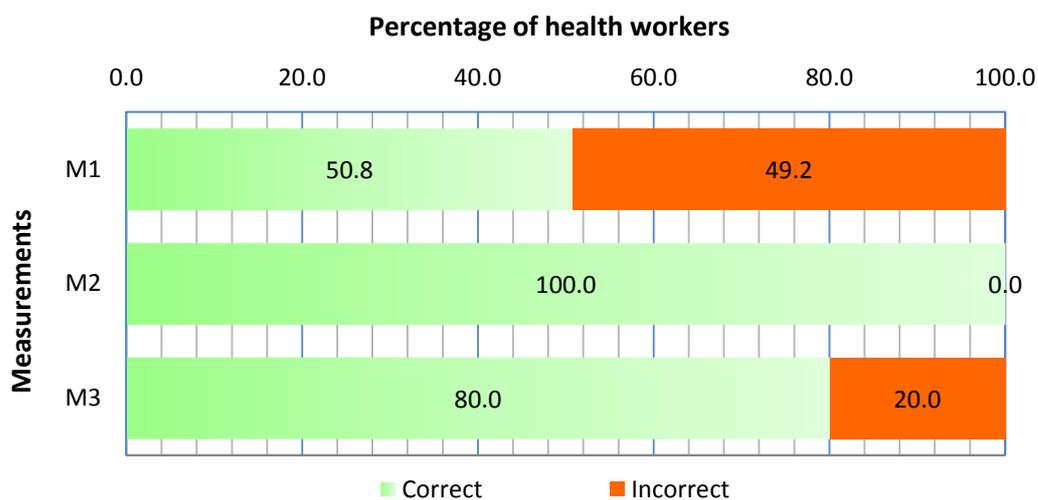


Figure 7.3. Awareness of the consequences of antibiotic misuse

In the initial investigation aimed at establishing baseline data to review the conceptual understanding of commune health workers; the question of the consequences of misuse was open-ended and the responses were diverse with

44.6% of health workers could state 'resistance' but no one could state completely the consequences of antibiotic misuse (Table 5.3 in Chapter 5). One of the purposes of the programme in the interventional phase was to enhance participants' awareness of consequences of antibiotic misuse as a complete warning to health workers to consider carefully before any decision on using of antibiotics. In this phase these consequences were listed in closed questions. The results showed that before the programme (two years since the initial survey with no antibiotic focused programme) only about a half of health workers were aware of all the likely consequences. Immediately after the programme all participants realized the consequences. Three months later the correct responses remained over 29% higher (80% of health workers). The result to a large extent, showed the effectiveness of the programme, but as some of health workers failed to be fully aware of certain consequences, it also indicated that including sessions regarding the consequences of antibiotic misuse is essential, and should be included in every programmes regarding antibiotic administration.

Awareness of the necessity of antibiotics for common diseases

As mentioned previously, in developing countries infectious conditions, respiratory infections and diarrhoeal diseases, are still the leading causes of deaths. However, although there are clear guidelines for diagnosis of these common illnesses, it appeared in this study, from the documentary data sets from the 2008 survey, that illnesses seen in the commune centres were not diagnosed based on the ICD. They were just given a name of a disease by health workers. However, the findings did show the most common conditions with numbers of clients/patients, how often they had attended and treatments given (Table 5.10 in Chapter 5). The health workers need to be clearly aware of the more common diseases/conditions and how to correctly both diagnose and record them. They also need to accept that some of the common diseases and conditions may or may not require systemic antibiotics to treat, Table 6.7 showed the result,

Table 7.7. Awareness of the necessity of antibiotic for common diseases

Agreed with the necessity of prescribing antibiotics	Percentage of health workers		
	M1	M2	M3
1. Acute rhinitis	60.7	0.0	10.0
2. Acute pharyngitis	80.3	0.0	14.5
3. Acute laryngitis	85.2	0.0	21.8
4. Acute bronchitis	96.7	0.0	56.4

5. Red sore eyes	59.0	1.6	38.2
6. Acute diarrhea	26.2	0.0	9.1
7. Functional disorders of colon	9.8	0.0	5.5
8. Urinary tract infections	100.0	100.0	89.1
9. Boils and carbuncles	78.7	100.0	80.0
10. Impetigo	59.0	100.0	65.5

In Vietnam, education and training curricula cover subjects that are not modular-based, thus linking factors and practice are not connected to factual information. In medical training and education programmes, clinical subjects each comprise various separate components. Regarding any specific disease, most teaching elements address relatively adequately aetiology, clinical manifestations and treatment, but these need to be related to actual cases for the role each one plays in practice to be fully understood. There is ample evidence from randomized controlled trials that most respiratory tract infections are viral in origin and self-limiting; thus antibiotics are rarely necessary or effective (Little, 1997; 2005 and Young, 2008). Antibiotics are also not necessary or effective in diarrhoea and functional disorders of colon (WHO/UNICEF, 2004) or may cause antibiotic associated diarrhoea (Barbut, 2002). The official MOH publications of Vietnam, also point out that for these conditions systemic antibiotics are not necessary or effective (MOH, 2004b; 2006a; 2007b).

Before the intervention the first five conditions listed in Table 7.7 attained a high incorrect agreement of giving antibiotics to treat even acute diarrhoea and functional disorders of colon that received incorrect agreement from 26.2% and 9.8% of responses, respectively. Findings supported by the analysis of the prescriptions (Table 5.10 in Chapter 5). As discussed in Chapter 5 there were many factors influencing the prescribing of antibiotics, but from the figures in Table 7.7 it is fair to say that there was a poor understanding of antibiotic usage in the community practice. After completing the programme there was a considerable change in health workers' awareness of the necessity of prescribing antibiotics accurately for these conditions and the result was maintained with significant proportions after three months, with the exception of acute bronchitis, a condition in which dyspnoea is a prominent symptom that makes both health workers and clients fear the seriousness of the condition. This may explain the reason why this disease had the highest number of health workers believing it needs antibiotic treatment at the time of M1 and M3 (96.7% and 56.4%). In this case the educator has to discuss this condition separately with this group of health workers.

Awareness of clinical manifestations(symptoms and signs)

In the context of community health level, the lack of laboratory facilities is one of difficulties for health workers in determining an infection caused by viruses or bacteria. One of the problems of the low levels of education was that knowledge and skills of diagnosis were limited, and may not have been included at all in some training courses not included. This partially explains why in the commune health centres of this study, diagnoses was somewhat inaccurate and did not follow official classifications. Also why the findings from the initial survey of this study showed that, giving clients antibiotics was an automatic response to symptoms and signs could be commonly seen in viral infections or in conditions unrelated to bacteria in origin, or even for fever or a non-productive cough. Manifestations such as fever, cough, runny nose, dyspnoea, watery faeces and other feelings of illness occur naturally in viral infections as well as minor illnesses unrelated to bacterial infections. These need nonspecific therapies e.g. relief of symptoms, rehydration, nutrition etc, instead of antibiotics, except in some rare cases with pus, blood excretion/production (Gorbach, 2004). Educating health workers to understand the fact and be aware as to which one of these clinical manifestations is typical of a bacterial infection from then enables the health workers to decide if they do or do not give antibiotics for clients and patients with these clinical manifestations, in order to reduce unnecessary use of antibiotics. In this study clinical manifestations commonly seen in community level were introduced (Appendix 7) and the results are presented in Figure 7.4,

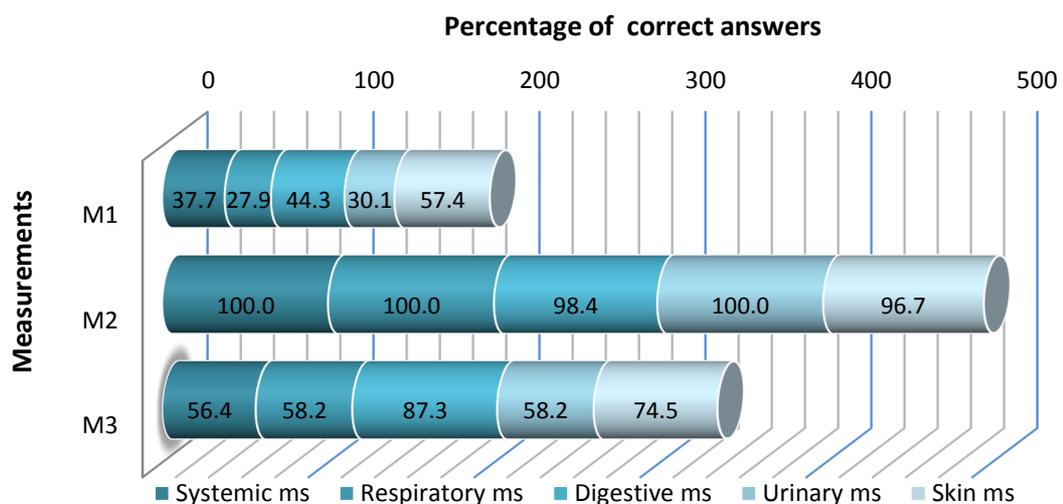


Figure 7.4. Awareness of common clinical manifestations

Clinical manifestations commonly seen in the community health level were grouped into five categories: manifestations (ms) of systemic, respiratory, digestive, urinary and skin conditions. Before the intervention the number of health workers who were aware of all groups of manifestations was quite low, from the lowest the correct answers of clinical manifestations were 37.7%, 27.9%, 44.3%, 30.1% and 57.4% referring to systemic, respiratory, digestive, urinary, and skin, respectively. Unfortunately the correct answers for respiratory conditions were the lowest (27.9%). Meanwhile clinical manifestations regarding respiratory tract and respiratory troubles made up the highest rate as seen in the commune level of the study population (Table 5.10 in Chapter 5). Otherwise these manifestations could be thought bacterial in origin and antibiotics were automatically prescribed and used unnecessarily. Once the programme was completed there were considerable improvements in the numbers of health workers perceiving correctly the clinical manifestations, approximate 100% of participants for all groups of manifestations. After three months these numbers decreased but were still much higher than those before the intervention and stood at 56.4%, 58.2%, 87.3%, 58.2%, and 74.5% in the same order as mentioned above. These numbers indicate the extent of the success of the programme and its sustainability, particularly if it could form the basis of ongoing education and training courses which could then reinforce the information given, as the levels of decrease in M3 show the necessity of repetition and staff reminders.

It is difficult to make a comparison between the effectiveness of this programme as against other such studies as the methods are different in their design and implementation. However a systematic review by Arnold & Straus (2005) of thirty-nine interventional studies emphasized the overuse of antibiotics for viral infections and other conditions. With regards to the administration of antibiotics, results showed that multi-faceted interventions, especially interactive educational meetings, appeared to be more effective than didactic lectures. In this study the intervention followed the model on which the participants and the educator discussed, shared and achieved collective agreements in the appropriate area of the participants' workplace and thereby created these improvements.

Awareness of common bacterial pathogens for infected system of the body

In infections due to bacteria, addressing the pathogens and strains of bacteria in infectious diseases always appeared to be in corresponding medical lectures. Medical documents indicate evidently that some microbial strains are typical

pathogens or frequently caused infection for a certain system of the human body. For example, *Escherichia coli* is the most common pathogen of bacterial infections on digestive and urinary tracts (Gorbach, 2004; MOH, 2006a). However this is an academic approach and this makes it difficult for the health workers in the community level in Vietnam. In this study pathogenic strains of Hemophilus influenza, Escherichia coli, and Staphylococcus aureus known to be common causes of bacterial infections of respiratory, digestive, urinary tracts and skin, respectively in Vietnam (MOH, 2004b; 2006a) were addressed and the awareness of this issue by the health workers was evaluated. Figure 7.5 illustrates the ability of the study health workers to match pathogenic bacterial strains with infected body systems,

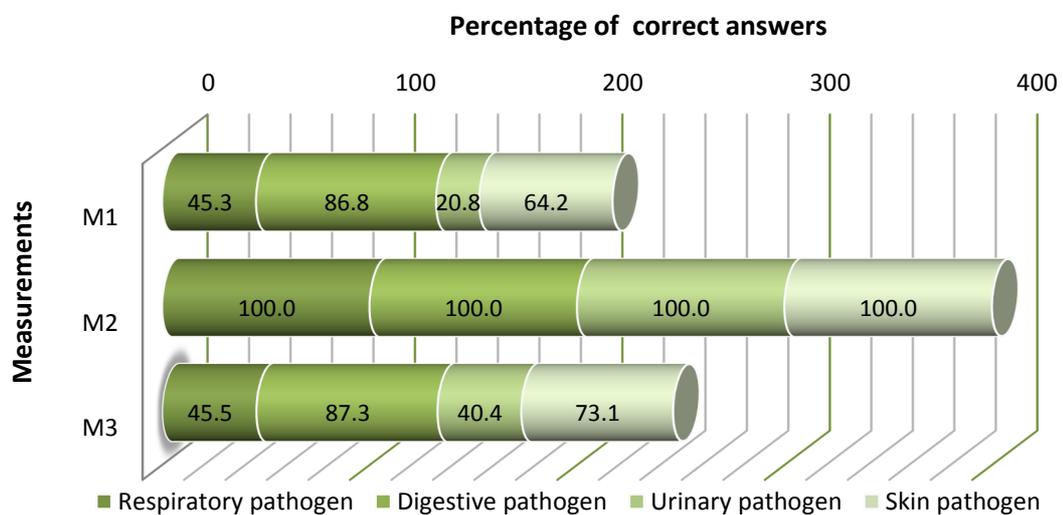


Figure 7.5. Awareness of common bacteria on infected system of the body

100% of the participants could match the pathogens to the body system immediate after the programme. But three months after the completion of the intervention, the percentage of correct answers decreased unexpectedly compared with those immediate after the intervention. For the respiratory and digestive conditions, the correct answers in M3 decreased to approximately those found in M1: 45.5% and 87.3% respectively whilst illness conditions of these two systems are still major. It is a fact that there are difficulties for not only low educated healthcare workers, but for many clinical practitioners, to name or recall the names of pathogenic strains and then to match them with commonly infected systems of the body. As a result, it becomes difficult for commune health workers to retain those details. That they could answer correctly after the programme, but did not retain the knowledge demonstrates the need for repeating education and training at intervals.

Awareness of choosing antibiotic for infected system of the body

When antibiotics are necessary, the gold standard in treating infection is to tailor therapy to the organism grown from the site of infection (system of the body); this is based on bacterial culture detection and antibiotic sensitive map determination. Yet this is not a reality for certain clinical settings particularly at grassroots level in Vietnam; thus knowledge of the typical pathogens of the presumptive site of infection and of the local antibiotic resistance is essential (Wickens & Wade, 2005). Choosing one antibiotic drug from among several antibiotics available in the healthcare setting is critical. Official drug guidelines normally do give recommendations indicating which antibiotic should be chosen for a system/organ of the body and this should become the basic for clinical use of antibiotics (Gorbach, 2004; MOH, 2006a; Marini & Wheeler, 2009). Together with difficulties in detecting and connecting pathogenic bacteria as mentioned above, choosing a presumptive antibiotic (empirical treatment) for an infected system of the body becomes more important for grassroots healthcare workers. As seen in the baseline data (Chapter 5) of eleven antibiotics (with generic names) including amoxicillin, cefalexin and penicillin were most commonly used in the study location. Cotrimoxazole, an effective antibiotic on many strains had been observed in the period of 1970s-1980s but in recent years has been increasingly and rapidly less effective as resistance rises and it is now only recommended for use for digestive tract infections due to susceptible strains for instance cholera or dysentery (MOH, 2004b). Quinolones have shown effectiveness in the nationwide management of major typhoid and cholera epidemics in which ciprofloxacin is an extract (MOH, 2006a; Vinh, 2006) thus ciprofloxacin although the least commonly used antibiotic at the time of the initial survey, by completion of the study there is now a trend for it to be overused. These classes of antibiotics are both allocated to and commonly available in the commune health centres within the study location. Therefore use of these antibiotics thus were introduced and evaluated whether or not there were positive changes in awareness of selecting them corresponding to infected systems and the results show in Figure 7.6,

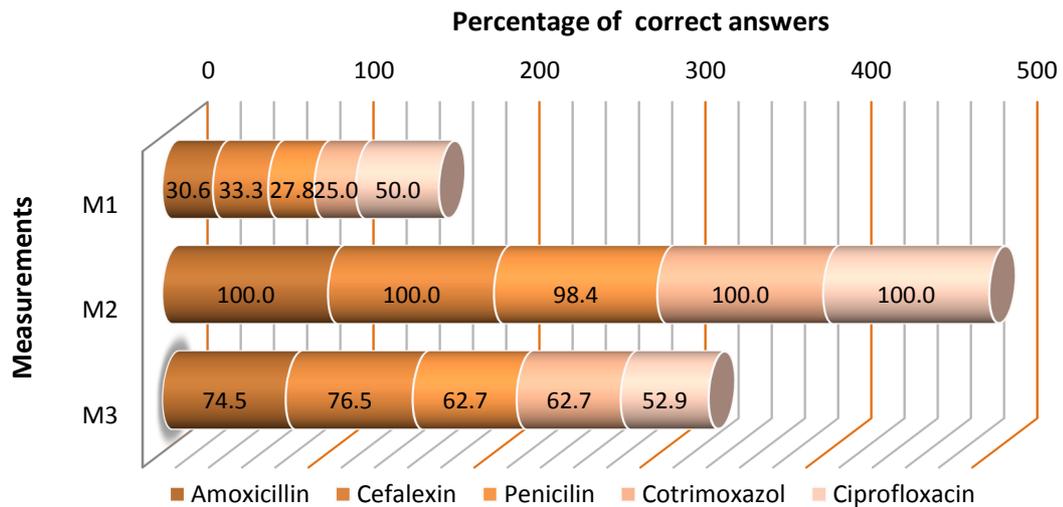


Figure 7.6. Awareness of choosing antibiotic for infected system of the body

Choosing a drug according to the organ or system of the body on which the chosen drug is active and effective is a prudent decision (Leibovici et al, 1999). The percentages of correct answers were low before the intervention regarding even the three most common used antibiotics, amoxicillin, cefalexin and penicillin were only about 30%. There has been no similar research addressing directly this aspect from the literature review to compare the results however the little number of health workers with correct answers appeared to show the the lack of awareness involved in choosing right antibiotic for a system of the body. The lack of availability of laboratory tests and poor awareness of connecting common pathogens to the system (as seen in Figure 7.5) were the causes of choosing inappropriate antibiotics. This gives an additional explanation to the reason why an antibiotic was prescribed to treat infections of any site of the body rather than a specific system (seen in Table 5.14 of Chapter 5). The inference is that the chosen antibiotics, had less or no effectiveness against pathogenic bacteria. Improvement was seen after completing the intervention and the participants retained a high proportions of correct answers after three months, approximate twice as many as those before the programme with the first four antibiotics. However awareness of selecting ciprofloxacin went noticeably down from 100% in M2 to 52.9% in M3, nearly equal to that in M1 (50%). Although no evidence of the used rate of ciprofloxacin was available this antibiotic is now used for many general infections, regardless of a specific infection or a specific site of the body. This leads to the problem that this antibiotic is today effective, but could in the future become ineffective due to inappropriate overuse.

Awareness of essential instructions on antibiotic administration to clients

Even if the correct antibiotic is chosen for a bacterial infection, the next issue is the appropriate use of antibiotics in terms of correct dosages, right dosage intervals, and complete duration of the course. These are proven to produce effective treatment, help patient outcomes and help prevent the emergence and selection of antibiotic-resistance. From the focus group discussions of the study sample in the 2008 survey the inappropriate use of antibiotics was partly blamed on the non-compliance by patients/clients. On the one hand patients tend to stop taking the drug earlier than the expected duration of the course and can make mistakes with the dosage. On the other hand, unclear or inadequate instructions on taking drugs from health workers while prescribing and giving antibiotics are a reality. It was evident that aspects of irrational drug use arising from inadequateness on prescriptions and verbal instructions on communication with patients were widespread (Holloway & Green, 2003). In this study essential instructions on taking antibiotics in particular and drugs in general that health workers should give clients included (a) how many capsules/tablets/sachet for each intake, (b) how many times a day the antibiotic should be taken, (c) the dosage intervals, (d) when the antibiotic should be taken, (e) how many days the antibiotic should be constantly taken, and (f) common unwanted effects, recognizing and dealing. Figure 7.7 shows the adequate and inadequate awareness of these instructions,

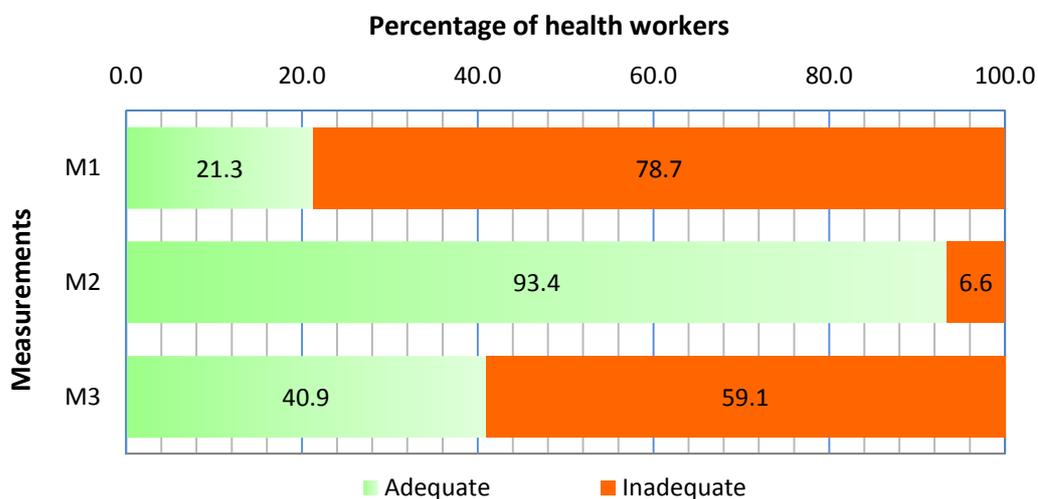


Figure 7.7. Awareness of essential instructions on antibiotic administration

The number of health workers who had adequate awareness of the essential instructions was very low before the intervention (21.3%). This finding fits with studies in other developing countries, for example, a cross-sectional survey of 990 prescriptions from Goa, India indicated that 86.5% and 57.6% of these prescriptions

had unclear instructions and unclear dosage for use, respectively, (Patel et al 2005). Within the commune health centres in this study, there were several causes for this including lack of information, insufficient training and education (as addressed in Chapter 5) with the underlying cause that the health workers themselves had not received adequate instructions of drug use from their original education courses or from further education and training. Consequently, inadequate writing related to use of drugs given to clients/patients, for instance “*Amoxicillin 500mg x 20 tablets for 5 days*” or insufficient communicating with clients/patients, for example “*4 capsules or 2 tablets a day, divided into 2 times*”. This seems to be done easily and quickly as an inherited habit with no perception of what instructions should be delivered to the patients; the significance of their instructions or lack of concerning whether or not patients could understand and follow them.

The styles of giving clients instructions need to be changed. After completing the programme (M2) there was a great improvement of the awareness of essential instructions by health workers (93.4% of participants) that will be communicated with clients/patients. Three months later this proportion dropped to 40.9% (M3) although it was about double than in M1. This again indicates that giving clients or patients adequate instructions on drug use has not yet become a positive habit for the study’s health workers and needs time involving reinforcement and efforts from the educator.

Changes in the participants’ practical ability regarding antibiotic use

Practical ability to determine the process of rational treatment

Ambitions to totally change practice through one project are not possible. Within this study, piloting the programme, supporting the participants to begin to use logical and critical thinking, provided a start for them to make rational decisions then improve their practical ability while using antibiotics in particular and serving the clients/patients.

To promote rational use of medicines patients should receive treatments appropriate to their clinical needs with healthcare providers following the process of rational treatment. Within the commune health centres of the study while discussing on the treatment given by health workers to the patients/clients everyday all participants acknowledged that the treatment is a process. However when asked what was in the process that they used, they admitted that in their experience the

answer was all steps were done quickly and decisively, if not accurately by most health workers including:

- 1) defining the disease
- 2) giving medications in accordance with the disease
- 3) instructing the patient how to use the given medicines.

Many efforts have been made in order to improve problem of the irrational use of drugs, of which the inappropriate use of antibiotics often for non-bacterial infections is but one aspect. Since 1994 the process of rational treatment has disseminated by WHO (1994) aiming to help undergraduate students and clinical practitioners prescribe medicines appropriate to patient's clinical needs. The process includes six specific steps:

- 1) define the patient's problem,
- 2) specify the therapeutic objective,
- 3) verify the suitability of personal treatment (check whether or not the intended drug is effect and safe to the patients),
- 4) start the treatment,
- 5) give information, instructions and warnings,
- 6) monitor (and stop?) treatment.

The process that the health workers of the study have experienced is quite different from that of WHO. Surprisingly, *the three steps* playing by the health workers could be accepted as in comparison with as the steps of WHO's process: *define the disease* = step (1) define the patient's problem, *give the patient medications* = step (4) start the treatment, and *instruct the patient* = step (5) give information, instructions and warnings were done. The other steps of process either were ignored or have never been introduced to the health workers including (2), (3), and (6) in which the step (2) specify the therapeutic objective and the step (3) verify the suitable of treatment were decisive components of the rational use of drugs. Figure 7.8 showed changes in the ability of participants before and after introducing the process of rational treatment adopted from the WHO's recommendation,

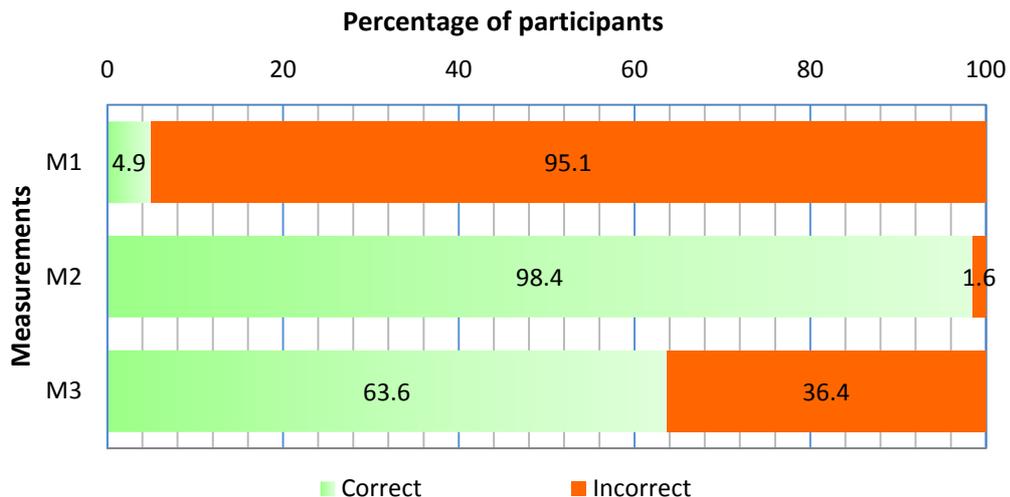


Figure 7.8. Health workers' ability to determine the process of rational treatment

Only 4.9% of health workers (they were two assistant medical doctors and one secondary midwife) could determine the process. This reflected the existing problem of medicine use in general and of antibiotic use in particular in the healthcare level of the study as well as other levels of healthcare system in which prescribing and giving patients drugs are not based on the rational process. Also it provided yet another factor explaining why antibiotics were given so readily in the baseline data (Chapter 5). Reviewing the literature indicates the fault was not deliberate, but the health workers themselves initial training and education concentrated more on theory than on practice. The pharmacological documents were probably 'drug-centred', focused on contra-indications and side effects of different drugs (Hudec et al, 2009), not application in practice. But in clinical practice the reverse approach has to be taken, from the diagnosis to the treatment, from clinical manifestations to the drugs. Within study sample for the health workers whose qualifications were mainly secondary and elementary level, and whose original education consisted of separate subjects, the problem was inevitable, and further progress in clinical practice is needed. After completing the programme 98.4% of participants could demonstrate the process and three months later the number of health workers who maintained the process was 63.6% of the total. About one-third of the health workers could not follow the introduced process and went back to their old habits of prescribing and using medicines. Educators and researchers acknowledge the difficulty of changing existing habits (in this context these are prescribing and using medicines) (Macionis & Plummer, 2005; Macionis, 2010; Henslin, 2005; Quinn & Hughes, 2007; Sharma & Khajuria, 2009; Kuehleln et al, 2010). The result from this programme seen in Figure 7.8 showed the effort of the involved health workers

together with the educator of the studied location. This also indicated, to the extent, the activeness, appropriateness and sustainability of the applied learning model on which the participants were learning by discussing, sharing and doing, rather than by listening to other people or reading about as they used to learn in their earlier education and training.

Practical ability to solve the patient's condition following the three first steps of the process of rational treatment

Once the process of rational treatment was acknowledged, making the process become alive, become a new habit and helping the health workers get used to the activity made a significant difference. This work acted to improve the ability of health workers in critical thinking to define the patient's problem in accordance with appropriate therapeutic objective(s), then give the patient a suitable treatment. Within the programme of this study, examples of real and common diseases/conditions seen in the participants' workplaces (CHCs) were drawn up and introduced as case studies. Tests were taken before the programme, immediately after, and three months later, to evaluate the appropriateness of prescribing and using antibiotic following the process of rational treatment. Because the process mentioned above seemed to be new to the participants of the studied sample, requiring them to deal with the whole process in one case would make complex and difficulties. Otherwise certain steps of the process with slight modifications were introduced in separate examples.

Based on the example of a patient, the participants were required to define the patient's problem, specify the therapeutic objective, then verify the treatment that met the objective (example of patient 1 below),

Example of patient 1

A 48-year old man comes to your health centre, complains of a dry cough and being itchy in his throat, which started two weeks earlier with a cold. He has stopped sneezing and having a runny nose but still has a cough, especially at night. He is a heavy smoker. Further history and physical examination reveal nothing special. One of your colleagues advises the patient to stop smoking, and considers the treatment for this patient.

A persistent dry cough after a cold is common and analyzed thoroughly. Medical evidence indicates this is caused by an irritation of respiratory tract and non-specific treatment is sufficient (Gorbach et al, 2004, pp.468-469). This case is similar to those showed in evidence based medicine. Critical thinking on this case can describe the patient's problem as a dry cough which is persistent and simultaneous with an itchy feeling in the patient's throat. These symptoms matter to the patient. The patient's problem can be translated into a working diagnosis of persistent dry cough for two weeks after a cold. The most common cause is that the mucous membrane of the bronchial tubes is affected by the cold and therefore easily irritated. A secondary bacterial infection is possible but no existing evidence (e.g. no fever, no green or yellowish sputum, no physical signs through the medical examination). Continuous irritation of the mucous membrane is the most likely cause of the cough and vice versa the very persistent cough affect the mucous membrane as an irritation. Therefore the therapeutic objective is likely to stop the irritation by suppressing the cough concurrently with anti-allergy of respiratory tract to enable the membrane to recover and otherwise antibiotic is not necessary for this case. Changes before and after the programme show in Table 7.8,

Table 7.8. Health workers' ability to solve the patient's illness

Determination of patient's illness	Percentage of health workers			
	M1	M2	M3	
define the patient's problem	80.3	100.0	98.2	
specify the therapeutic objective	73.8	98.4	98.2	
verify the treatment	appropriate treatment	4.9	95.1	78.2
	rational interpretation	1.6	83.6	59.1

Before the programme the numbers of health workers who could define correctly the patient's problem and the therapeutic objective were quite high (80.3% and 73.8% respectively), but it rose and stayed higher following the intervention. Clearly, defining the patient's problem and specifying the therapeutic objective(s) of common illnesses are not so difficult for the health workers. However, the question is, why in the baseline data from the survey of 2008 conditions of respiratory tract were most likely defined as respiratory infections or inflammations. The most likely answer is that, before this programme, the process of assessing rational treatment and it's components had not been introduced to the participants in their early

training/education nor in the public health courses on which some of health workers attended before.

In this study, following the progress of the programme on which aspects addressed from the beginning of the programme, including the role of guidelines helped the participants to deal with the case mentioned above, defining the patient's problem and specifying the therapeutic objective. In contrast, the final step of verifying treatment to meet the therapeutic objective remained difficult. In practical training/education, deciding a treatment that meets the therapeutic objective should be considered, but theoretically based education does not make the links with practice, leaving the qualified workers struggling. However, equally important is whether the rationale for the treatment that practitioners use to choose the treatment exists or is appropriate. If it does not exist or is inappropriate failure to decide correctly in future cases or new similar situations is likely to happen. The old habits for choosing a treatment returns, then antibiotics are easily given and used. It was evident in Table 7.8, the numbers of health workers who could verify the appropriate treatment were much smaller. Only 4.9% of health workers could choose the appropriate treatment and only one of them (1.6%) could give the rational interpretation on their chosen treatment. Behind these numbers the meaning is that antibiotics are likely to be chosen for this case in a real situation. This explains again the reason why antibiotics were given in treating most conditions of the respiratory tract.

After completing the intervention the ability of the studied health workers to use rational treatment increased greatly in both the appropriate treatment and the rational interpretation (95.1% and 83.6% of the health workers, respectively). Because this was during a short piloting period, the decreasing level of antibiotic use could not be formally assessed. But the findings suggest that the proportion of persistent dry coughs commonly diagnosed as infections/inflammations of upper respiratory tract (e.g., pharyngitis; rhinosinusitis; or bronchitis...) treated with an antibiotic within the studied population is likely to decrease significantly. Rubin et al (2005) used a multifaceted intervention to improve antimicrobial prescribing for upper respiratory tract infections which resulted in the percentage of patients who received antibiotics was in general 15.6% and in bronchitis 56% less than that compared with the baseline period. Similar results were also seen in several interventional trials such as a multidimensional approach by Gonzales et al (1999); a nonrandomized controlled community intervention by Belongia et al (2001); and a

prospective controlled intervention by Hennessy et al (2002). In this study, three months later the numbers of health worker staying with the rational treatment was still high for both choosing the appropriate treatment and giving the rational interpretation of the chosen treatment (78.2% and 59.1% of health workers, respectively) in comparison with those before the programme but there was a decrease level of the percentage of health workers could give the rational treatment over time, and a return, by some workers to their old prescribing (and using) habits. This again showed that changing existing habits of prescribing and using antibiotics is not easy and needs repeated reinforcement and a timely reminder.

Practical ability to select an appropriate antibiotic

When an antibiotic is necessary in circumstance when no micro-bacterial test is available, selecting an antibiotic appropriate to the infected organ/system of the body from among several antibiotics available in the commune level is very important. This helps the effectiveness of antibiotics since then the limitation of antibiotic resistance. In the other example of patient (example of patient 2), the participants were asked to select an antibiotic from a limited number of antibiotics supposed available in their health centre.

Example of patient 2

A 32-year old female comes to your health centre, complains of appearance of a swelling which started three days ago, growing up with pain in her back. Further history and physical examination reveal nothing special, apart from a boil sized 3 x 3mm in her low back which is red, hard and heating but not gathering pus. One of your colleagues gives this patient paracetamol, advises her to keep the boil undamaged until gathering pus, and to come back to lance her boil. Of course an antibiotic is considered to give this patient but there are only three antibiotics available in your centre include Ciprofloxacin 500mg tablet, Penicillin V 1000mg tablet (equivalent 1,000,000UI) and Erythromycin 250mg tablet.

The requirement is not only selecting the antibiotic (this may be randomly correctly chosen or imitated old prescriptions) but also giving rational interpretation of the selected antibiotic. Changes before and after were presented in Figure 7.9,

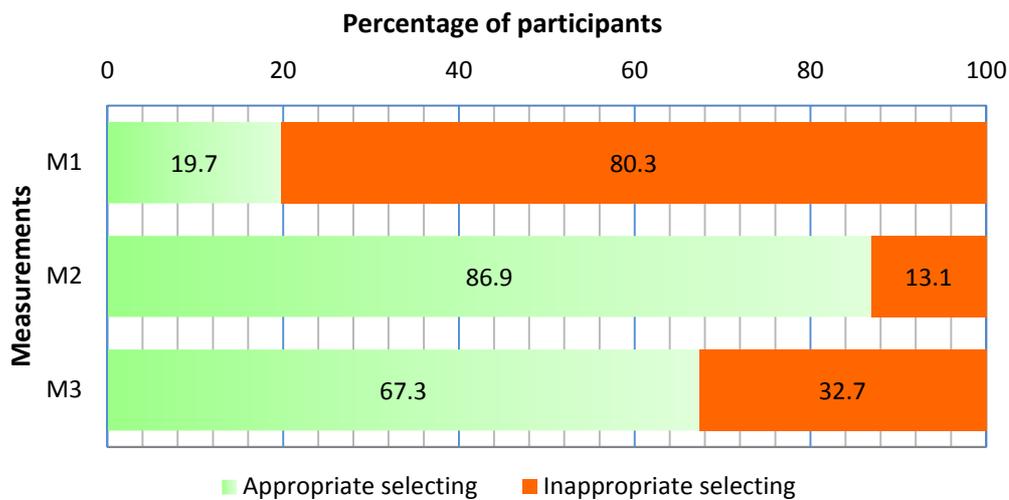


Figure 7.9. Health workers' ability to select an appropriate antibiotic

The fact that there are a limited list of antibiotics available in the community level as showed in the 2008 survey meant limited choice of antibiotic. But it was evident in the baseline data that even with a limited list, selecting an antibiotic appropriate to a specific bacterial infection was not that easy for the commune health workers. In the context of lack information or no exposure of clear national guidelines healthcare workers commonly select an antibiotic by their own choice or preference, regardless of whether it was the most effective and they misunderstood the role of new drugs. This finding fits with other international studies, for example, according to a national 5-year follow-up study in Finland by Rautakorpi et al (2006), despite clear guidelines of no prescribing some antibiotics as first-line treatment for certain infections, non-compliance with the guidelines was continued with the majority incorrectly prescribing. Similarly, Kuehleln et al (2010) conducted a study using observational and focus-group elements showed that although the German guideline recommended Trimethoprim as having good effect for the treatment of uncomplicated lower-urinary-tract infections in primary care, the participating general practitioners strongly rejected the guidelines and prescribed Ciprofloxacin instead of Trimethoprim. This prescribing habit was mainly driven by their former hospital training and what was perceived as common therapy. In the above example of patient 2, Penicillin V should be chosen because the national guideline recommends this antibiotic appears to be effective for the treatment of skin bacterial infections at the commune health level (MOH, 2004b; 2007b). A similar situation was seen before the intervention. Only 19.7% of health workers selected Penicillin with a rational interpretation of the reason why they selected this drug. If this is not

changed it is likely that the participants will select another antibiotic instead of Penicillin. There were significant changes immediately and three months after the programme (86.9% and 67.3% of health workers, respectively). Although this study was not a direct observation of changes in prescribing, the result of this study indicated to some extent the effectiveness of the programme through the learning model, just as Kuehleis (2010) also showed that input at practice level strongly changed opinions in favour of Trimethoprim for treatment of uncomplicated lower-urinary-tract infections (94% of general practitioners).

Practical ability to give patients instructions on antibiotic administration

When an appropriate antibiotic is selected the importance is whether the selected antibiotic is adequately used. This study indicates that even when a correct antibiotic is used but it can be used incorrectly. The incorrect use involves either unclear instructions on administration or non-compliance. Healthcare workers themselves are mainly responsible for the former i.e., instructing patients while prescribing and delivering drugs. Within a piloting programme the first activity should be focused on the health workers to support them in improving their ability to give patients clear, correct and adequate instructions. In the fact that most patients are taking the drugs at their home means instructions on administration of drugs becomes crucial work. In this study Amoxicillin, Cefalexin - the two most commonly used antibiotics with Ciprofloxacin increasingly being used (as seen in the initial survey) were introduced and the participants were asked to give adult patients essential instructions on general administration of these drugs. Current national guidelines include the *Vietnamese National Drug Formulary* (MOH, 2004b), the *Vietnamese National Drug Formulary for grass roots levels* (MOH, 2007b) and the *Guide to Treatment Common Infection Diseases* (MOH, 2006a) all recommend identically common dosage and usage of the three antibiotics as the following,

- *Amoxicillin*
For adults: orally one 500mg capsule, 3 times daily, every 8 hours, before or after meals, continued for at least 7 days.

- *Cefalexin*
For adults: orally one 500mg capsule, 4 times daily, every 6 hours, before or after meals, continued for at least 7 days.

- *Ciprofloxacin*

For adults: orally one 500mg tablet, 2 times daily, every 12 hours, 2 hours after meals, continued for at least 5 days.

The third example was focused on when one of three above antibiotics decided to be used for treatment a bacterial infection of an adult patient with no contraindication. Changes in giving instructions on the administration of these antibiotics before the intervention, immediate after and three months later were showed in Table 7.9,

Table 7.9. Correct Instructions on Antibiotic Administration

Measurements		%age of giving correct instructions				
		Daydose	Dose interval	When taken	Duration	Total correction
Amoxicillin	M1	8.2	32.8	36.1	24.6	1.6
	M2	100.0	100.0	98.4	100.0	98.4
	M3	80.0	89.1	96.4	85.5	72.8
Cefalexin	M1	1.6	37.7	36.1	26.2	0.0
	M2	100.0	100.0	100.0	98.4	98.4
	M3	74.5	43.6	78.2	83.6	34.5
Ciprofloxacin	M1	63.9	14.8	3.3	72.1	0.0
	M2	100.0	96.7	98.4	100.0	95.1
	M3	90.9	41.8	29.1	81.8	23.6

Before the intervention the percentage of health workers giving correct items of administration on all three drugs varied greatly, with the two most commonly used, Amoxicillin and Cefalexin having the lowest rates of correct items (around 30%). Especially regarding the dailydose and the duration of treatment (8.2% and 24.6% for Amoxicillin; 1.6% and 26.2% for Cefalexin). Meanwhile these two items are the key factors to contain resistance if followed correctly. Total correction of the instruction was an alarming indicator, only one of the health workers knew about Amoxicillin, and noneknew of them for Cefalexin or Ciprofloxacin. The reasons might be that the health workers did pay less their attention to what the guideline recommended because these were included in academic publications and they find these difficult to follow, so continue with their old habits of giving the patients instructions as mentioned in chapter 5. The problem is likely to be the same in other levels of health system and countries as Patel et al (2005) foundthat in Goa, from 990 prescriptions 213 of these prescriptions had no details of the duration of treatment. While analysing two hundred prescription slips collected from the patients in rural and urban India Sharma and Khajuria (2009) found that beside taking antimicrobials for viral conditions, inappropriate written instructions for use of drugs,

inadequate dose as well as inadequate duration of drug taken were common. The problem also exists in developed countries, assessing the appropriateness of antimicrobial therapy in Amphia hospital, the Netherlands, Willemsen et al (2007) showed that only 9.4% of the correct antibiotics were used, and some were used incorrectly.

A great change was seen immediately after completing the intervention. The number of health workers giving correct instruction accounted for around 100% by items and by the total instruction. Three months later the proportion of health workers retained with correct instructions for Amoxicillin was still very high and quite equally among items of instruction (about more than 70%). But there were variations among items of instructions for Cefalexin and Ciprofloxacin. For Cefalexin item of dose interval received the corrected rate at 43.6% of health workers meanwhile for Ciprofloxacin items of dose interval and when to take were corrected at 41.8% and 29.1% respectively. These meant the proportion of those totally correct went down considerably for these two drugs. The reason was that frequent using of Cefalexin (4 times a day), using of Ciprofloxacin with long dose interval (12 hours) and 2 hours far from meals as items which could be difficult for the health workers to be familiar. Also some went back to their old habits of easy but insufficient communication with patients as mentioned above "*4 or 2 tablets a day, divided into 2 times*". This is unavoidable in progress of changing habit and reinforces the need for time to be given for continuing education.

EVALUATION BY OBSERVATION

It is recognized that the data generated by interviews reflects the interaction between interviewers and interviewees, and alone may not fully meet the aims of the interview (Gomm, 2008). Direct gathering of information by seeing and hearing helps to understand more what has taken place. However, observation of the whole learning activities and changes within an one-day programme was not feasible, but a micro-observation focusing on particular aspects of change was possible (Bryman, 2004). It was accepted that observation that interferes directly in the process of medical examining and diagnosing by the participants was likely unacceptable and likely to cause offence. Therefore it was decided that the observation would be on how antibiotics were given to patients, whether essential instructions on administration were delivered to the patient and how long health workers spent their time on instructing. In each health centre an overt observation

was done three times: the first patient attended to the health centre before the interventional programme (M1), immediate after (M2) and three months later (M3).

General information of observed patients

There were 11 health centres participating to the programme so 33 cases were observed including 25 male and 8 female clients/patients, aged varied from 6 to 70 years old. These people came to the health centres with conditions/diseases and some of them were received an antibiotic as seen in Tables 7.10 and 7.11,

Table 7.10. Diseases/conditions of observed patients

Diseases/conditions	Number of clients			Total	
	M1	M2	M3	N	%
Upper respiratory infection	8	10	8	26	78.8
Gastrointestinal disorder	1	0	2	3	9.1
Urinary disorder	0	0	1	1	3.0
Arthrosis trouble	1	0	0	1	3.0
Cardiovascular disorder	1	1	0	2	6.1

Although the number of observed patients/clients was small, upper respiratory infections accounted for the highest rate in each point of time and in total (78.8%). In the baseline data from the initial survey the added up number of respiratory infections was also the highest. This confirms again reducing the proportion of antibiotic prescribed unnecessarily for these infections is significant.

Table 7.11. Antibiotic distribution by system of the body

Antibiotic	Respr. tract	Digestive tract	Urinary tract	Joint	Cardio-vascular	Total
Amoxicillin	8	2	0	0	0	10
Cefalexin	7	0	0	0	0	7
Ciprofloxacin	0	0	1	0	0	1
Erythromycin	1	0	0	0	0	1
Penicillin	0	0	0	1	0	1
Trimazol	0	1	0	0	0	1
Total	16	3	1	1	0	21

21 of 33 cases within the observation received an antibiotic and 6 classes of antibiotic were given as seen in Table 7.11. Among these drugs Amoxicillin and Cefalexin were predominant like those seen in the baseline data obtained from the initial survey. This confirms again the first effort focusing on common used antibiotics of the study was reasonable.

Change in the rate of prescribed antibiotics

Assessing how affective individual health workers were at diagnosing was difficult with such a small sample, so instead the focus was on how many cases received an antibiotic were accounted and these numbers before and after the programme were showed in Table 7.12,

Table 7.12.Number of conditions/diseases were prescribed with antibiotic (AB)

Diseases/conditions	M1		M2		M3		Total	
	n	with AB	n	with AB	n	with AB	N	with AB
Upper respiratory infection	8	8	10	4	8	4	26	16
Gastrointestinal disorder	1	1	0	0	2	2	3	3
Urinary disorder	0	0	0	0	1	1	1	1
Arthrosis trouble	1	1	0	0	0	0	1	1
Cardiovascular disorder	1	0	1	0	0	0	2	0
Total	11	10	11	4	11	7	33	21

Totally, 21 of 33 cases (63.6%) received an antibiotic and see mainly in the conditions of respiratory tract 16 of 26 cases (61.5%). The observed number was less than the number (79.8%) drawn from the documentary data of the 2008 survey. The significance here was that the number of antibiotic prescribed for respiratory infections was reduced immediately after the intervention and remained lower three months later when compared with that before the intervention. Before the intervention 8 of 8 clients (100%) with respiratory infections all received an antibiotic. However, immediately after the intervention the number of these conditions receiving an antibiotic was 4 of 10, decreased by 6 cases (60%), and three months later this number was 4 of 8, decreased by 4 cases (50%). Although the result had no significance in statistics because of small sample size, this had a significance in clinical practice. In a 5-year follow-up programme aiming to evaluate the effectiveness of the implementation of national guidelines for 6 common upper respiratory infections, Rautakorpi et al (2006) described although a remarkable effort (used multifaceted intervention including a 6.5 day-training the trainer program) to improve antibiotic use in the Finnish primary health care setting, the intervention was successful on some, but not all with the improvement in performance was 6.4%. another systemic review by Grimshaw et al (2004) showed that in most cases, absolute improvement in performance had been modest to moderate, the median effect ranged from 6.0% to 14.1%.

Change in instructing on administration of drugs

Not only antibiotic but also other medicines need instructions on administration. Obviously, there are so many details of drugs however in the context of conversation between health care workers with the patient while instructing on administration of drugs which of essential instructions including in the communicating of the health worker delivered to the client were counted. The result was showed in Table 7.13,

Table 7.13. Details of instruction delivered to patients

Instruction	M1 (n = 11)	M2 (n = 11)	M3 (n = 11)
Day-dose combined in one	10	0	1
Dose for each time of intake	1	11	10
Frequency of intake	11	11	11
Dose interval	1	8	7
When to take	1	10	7
Duration of treatment	2	8	6
Drug's warning	1	7	7

Before the intervention, the spoken wording of instruction was similar to the written wording, for example *"4 capsules a day, divided into 2 times"* and this way of instructing is common seen in the clinical practice. In terms of dose the information is not wrong but may create a difficulty in case of 3 capsules/tablets are the daily dose, since then leads misuse of the drug for example, giving 2 capsules or 4 capsules is likely to be alternated. Ideally, the instruction should be full detailed that goes through the dose for each time of use to the drug's warning. However this takes time and many efforts to change long-standing habits. Immediate after the intervention non of health workers performed in this way, essential instructions delivered to patients tended to be much detailed although there was a slight decrease after three months as seen in Table 7.13.

Time consuming on instructing

Average consultation time is one of indicators of promoting rational use of medicines (WHO, 2002). In this study the time that health workers spending on instructing patients how to use the given drugs was counted. Table 7.14 showed the results before and after the programme,

Table 7.14. Average time consuming on instructing administration of drugs

Time consuming (minute/case)	Min	Max	Mean	SD	p value (t- test)
M1	4	7	4.73	1.009	
M2	7	10	8.36	1.027	p(2;1) = 0.001
M3	5	8	6.61	0.786	p(3;1) = 0.001

It is impossible to standardise how long should be taken to give instructions to a client/patient. This depends on a certain situation in which communicating between the healthcare worker with the patient. However, there was an obvious change in the average instruction time immediate after the intervention and three months later. Immediate after the programme the observed health workers spent more time on instructing than that before the programme (8.36 minutes compared with 4.73 minutes). Although the time decreased after three months, it was still longer than it was before the programme (6.61 minutes compared with 4.73 minutes). The difference between three points of observation is statistical significant with the p values of 0.001.

EVALUATION BY FOCUS GROUPS

This study was an educational programme, basically using a experiential learning model, provided for commune health workers of the studied location aiming to improve the target subjects' knowledge and practical ability regarding antibiotic use. It is recognized that no one method of assessing and evaluating is enough as a whole or fully objective (Jarvis, 2004; Moon, 2004). An educational programme can create in some extent changes and in this project obvious changes were showed in the quantitative data analyzed above. However the main aim of the study was to develop a conceptual framework and education and training model for public health workers. Moreover it was necessary to know whether motivation for future learning was created by the programme. For these reasons the voice of learners (herein the health workers of the study sample) needed to be listened to.

Again eleven focus groups were conducted, one in each of the eleven health centres. To gain a real feedback on the programme that may include positive and negative opinions given by the health workers, participants' identities and name of groups must remain confidential, therefore the findings from these focus groups cannot identify which centre the participant was from as well anonymous quotes have been presented. All groups had a great advantage because in this phase a majority of health workers and the researcher were familiar with each others as well

with group discussions those conducted in the initial survey. The participants were enthusiastic and willing to say their thoughts. It took around 30 minutes for each discussion and collective agreements were clearly seen in the transcripts. Analysis was done using the four steps as described in Chapter 4 and themes are presented in the below.

Theme 1: satisfaction of the health workers' expectation

Addressing to what the participants think about the purpose of the programme that they attended most of the health workers acknowledged that it satisfied them. This was evident that knowledge and learning focused on antibiotic use had sunk into oblivion

“When this programme came to us it turned out that we are doing our work without notice, being absorbed in working, but forgotten how to do.”

and

“This strengthened our knowledge particularly the using of antibiotics that has been forgotten.”

Other participants confirmed that problems of antibiotic use were ongoing and regretted that they had had no education except the programme

“Nowadays the use of antibiotics has been overused and then this learning met things we need.”

The programme was said to be something that they had all wanted and needed for a long time

“About the grassroots level we wish many things but there has never been.”

and

“This programme should have been carried out earlier, it was too late for now because for many years we have done as usual, just giving patients antibiotics to drink when they get sick.”

As well as the necessity of the programme, they clearly appreciated that it had been delivered in their own workplace, rather than in the traditional large groups in a central location, where they mixed with other and more highly educated staff

“The more better the treatment is done at the commune level the less burden it creates at higher levels.”

Other health workers tended to be careful and gave modest opinions but clearly showed the programme met their needs

“Especially, to the health centres of commune level it has to say that information of antibiotics so that these drugs used appropriately as well as so that no resistance by bacteria is extremely rare.”

and

“It was difficult for the commune level where first contacts to patients taken place but updating information was counted as the latest, nearly ignored.”

As presented in Chapter 5 there had been some public health programmes provided for the health workers in the study location, but the health workers had attended these passively, not being offered the opportunity to actively participate in the sessions. However, it was evident that these had left a gap of education regarding antibiotics, the problems of antibiotic use and antibiotic resistance, and how these become a threat to the public health and the global warnings (WHO, 2002; 2005). These discussions helped the health workers begin to understand the wider picture of antibiotic use and misuse.

Theme 2: appropriateness for working circumstance

An educational programme may be academic and unfocused on specific needs and if so it leads to less effectiveness after completion. When discussing on this, an acknowledgement emerged from all health centres that the programme suited their work in general and their responsibility in particular. Their expression was unanimous as the followings quotes indicate

“Our daily work is exam and treatment diseases of patients in which use of drugs is a routine, so the knowledge that the programme brings to us, applied for treatment patients, to get better.”

and

“In general this programme is practical for our health centres particularly for the situation of antibiotic use, we see it really meets our need.”

and

“This learning programme is very useful for us - commune health workers... not only antibiotic administration but also improvement in the process of exam diseases thus it is suitable community level where we contact firstly with patients.”

As showed in the demographic data there are several job titles and different educational levels however whether the programme needs for most participants. This aspect was represented as the follow

"It is more precisely to say that I am myself a nurse, in principle I have no right to decide the treatment, but in fact in my shifts or night duties, just only me, I have to do... and the programme is really helpful for me."

and

"It is very practical for everyone in our health centre it also fits with our ability to acquire knowledge and to use it."

Among medical doctors, one argued that reflection to what included in the programme depended on person's original education. His argument was

"It would be improper to say about the difference of educational levels in here... about antibiotics I learned all from university, even studied very deeply."

However, he by himself acknowledged that after many years of giving patients antibiotics the programme now played as a recall that make him (and maybe some others who may have the same thinking) had to think again

"There is one thing that is this programme remind us, to refresh our memory. The second thing is that... prescribing antibiotics in many cases is to please patients..., know this is not appropriate but keep doing, from now we have to change..., then persuade patients."

In contrast, an overwhelming agreement was that what included in the programme was close to the situation of community level

"This programme is more practical, situational, at school teachers taught but vague and general, furthermore we are here, level of professional, it is very limited."

It is inevitable that opposite opinions appeared while discussing the programme, and it is likely that no programme can be completely suitable for all participants. However in the context of this study underlying these arguments there was an overwhelming support for the type and content of the programme. This was asserted by most health workers participated to discussions

"Truly, previously we kept doing our work, never heard how it should be done or what should be done."

Looking back to the quantitative data it is clear that patients/clients were given antibiotics with little perception of being rationality and adequateness. In addition there was no significant difference in perception or practical ability regarding

antibiotic use between the group of medical doctors and the group of others with less education before the intervention. Although overall, all joined improvements, and accepted the appropriateness of the programme's content it would be worth considering whether peer based, and hence separate educational programme should be considered in the future.

In the initial survey there had been public health programmes provided to the health workers. However, the health workers who took part these courses reported that they did not satisfy them because not all health workers attended these programmes. Also where learners went to a classroom, it was clearly different from this programme where all health workers participated right in their workplaces. This way of conducting received positive reflections from all participants.

A feeling of safety and confidence was recognized through all discussions and was said

"Sitting in other place make difficult and hesitant, here learning right in our centre we feel easy, pleased and we can ask if something is not clear."

also

"Sitting together in our centre we feel closer to each others like everyday, this is easy to express, easy to acquire and remember too."

and

"Direct learning, direct discussing like this is much better, in a hall it can be paid attention, like this it is easy to talk and listen to each others, get much knowledge and more careful."

also

"Direct talking to each others like this we can reply on each others, each one gets direct information and reflect immediately on, this is really useful and better than gathering in a classroom."

In addition opinions from participants who used to attend the past programmes also confirmed that they preferred difference in venue for the programme

"The fact that I attended training courses several times. It was crowded and noisy and information is unclear, less acquirement and I was sitting there just a formality."

It is clear that each way of conducting and organizing has both advantages and disadvantages. In the context of the commune health workers of the studied

location, an on-site educational programme like this programme appeared to satisfy the participants' desire and was convenient for them.

Theme 3: confidence in working

As showed in the baseline data (Chapter 5) previous courses had had little impact on the health workers practice. In contrast, this programme was specifically aimed to change practice. Three months after completing the programme the feedback on it appeared to be maintaining an effect on the health workers' perception, attitude and working. The impact on the health workers' perception regarding antibiotic use were expressed as

“Before now while learning at medical schools antibiotic was addressed but generally and forgotten, this programme bring us prudent use of antibiotics.”

It is not easy for people to admit their mistakes particularly those regarding the use of medicines. However having experience of this programme the participants appeared to be brave enough to say

“Through this programme it is recognized that there are conditions those do not need antibiotic, and if antibiotics are used for these illness this makes antibiotics to be familiar then had no effect.”

and

“Participating this time we know that in our centre antibiotics had recently been overused and misused, we recognized that many of conditions given antibiotics did not need antibiotic, we get lessons from this, it's time to change.”

The problem was said to be resulted from existing misperception and this said to be

“I thought that illness conditions need antibiotic, through this programme I recognized that many of those conditions do not need antibiotic, there are other way to cure.”

A confirmation of change by health workers themselves was clear

“The programme let us learn from our mistakes, the use of antibiotic has to be rational and appropriate. It needs to be considered... and when an antibiotic is necessary it should be considered how to use it and should be in accordance with the disease in order to use appropriately.”

In the initial survey of this study as well as indicated in many studies there was a fact that prescribing antibiotic maybe influenced by peer and community pressure. This can be a major obstacle. Continuing to please patients/clients may not stop immediately but the participants' attitude to this problem was said as the following

“Before now whenever a local person came to the health centre they ask antibiotic and we give antibiotic, now we see that explanation, persuasion for the locals and how to change their perception of antibiotic use are very important.”

It was clearer in an opinion given by one of health workers that

“Some conditions just need symptom reliefs, when work with a patient with those conditions I will explain him it is not necessary to use antibiotic for his illness.”

The significant change in the attitude of participants was that they agreed that they need to be confident and to persuade themselves first

“Following this programme while working with patients we have to think carefully, especially when we have to decide to use antibiotic. However to change immediately the custom of using antibiotic for ill people is not easy because antibiotic is used everywhere, every levels of health system.”

If some of the health workers seemed to be hesitant, in contrast others confirmed their attitude strongly that

“Indeed, things those the programme provided are not sublime or academic so we don't need waiting we can apply right now while having contacts with patients, right things should be done immediately in our daily work.”

and

“We are likely to apply what we learned from this programme to instruct patients and persuade the locals.”

In the quantitative analysis changes in the practical ability of participants were shown clearly. But behind these change what the health workers said about their action in working was discussed. The way they carry out their medical examinations and treatment was said to be

“Before now although we usually did but it was sometime not... correct... having experience in this programme, when a patient come to the health centre, we apply the steps of the process of rational treatment

from exam the patient to give the patient a treatment and the patient's progress is monitored too."

More precisely this was said that

"Before now we gave quick and cursory instructions. Now we spend more time on giving instructions and explanations to patients."

Interestingly in one group the participants here showed concretely the way they dealt with situations in which they used to give easily the locals antibiotic

"For example before now parents while passing by the health centre from their farming work they asked some antibiotic for their son with fever at home. Now we persuade that they need to bring their child to the centre to get exam then give right way of treatment and appropriate drugs."

As a whole an umbrella acknowledgement was that the programme created changes in their daily working. This was said that

"In general after this programme there have been many changes in our centres, we are coming out, being taken apart from an old tract, from the perception and route we had been in."

Combination the results seen in the quantitative data set with what were said in discussions. It showed clearly there was a good impact on the health workers of the study sample. However to retain this impact it needs reinforcement.

Theme 4: Learners perceptions of the new way of learning and working

It was explained to the participants that it was important that they evaluated both the format of the study day and the content, as this was the pilot for a new training programme. They needed to say honestly what they thought otherwise a programme could be developed that would not meet their needs. They were assured that their comments would be respected, that no information would be reported to outside the group management and that they would not be identifiable in any report. Also, as with the first interviews they could choose not to participate.

As the baseline data had indicated the majority of the health workers in of the study had had experience of attending one or more than one public health course and of course they had all undergone basic training. When asked about this programme they described it as the beginning of a '*new way to learn*'

“It seemed to be like a fish out of water at the first in a moment of participating. You introduced a quite new way of learning and solving, but while going through and get access to the content then it becomes gradually easy and very concrete. This help us to [make] assessment of things in another way, not keeping to the old routine.”

This was a very different approach, with its emphasis on small group learning, and sharing knowledge and expertise

“This way is practical, the first thing is small group learning, the second is that problems are straight accessed and exchanged, the third is having specific lessons on antibiotic administration. In previous time it was absent”

The real difference between this programme and previous courses was encapsulated by the following participant

“You pointed out the way to learn, we can learn from each other, exchange knowledge and share experience. In the previous time when sent somewhere to learn we just sat down and listened, wrote whatever we liked then came back to the centre and forgot. Learning like this the knowledge entered into mind immediately.”

The issue of retention is crucial, as this participant pointed out with learning by rote or a purely lecture system the learner is outside the situation. Information is passively given and there is no engagement between the individual and the subject. In health care situations such as the communes, this is dangerous, on paper the worker has attended an appropriate course, but without involvement and internalization the knowledge is not retained.

Another aim of this programme was to introduce participants to the concept of continuing professional education (CDM) and continuing medical education (CME). These educational approaches which are well known and accepted in many developed countries are new for Vietnam. The approach used to deliver the courses, based on the characteristics of adult learning and experiential learning also seemed to be new to the commune workers who described it as a model where learning was based on sharing, and that each person has to contribute

“Undergoing this programme we realized that it is a model in which knowledge is communicated practically, communicating from this person to other one and vice versa, information is exchanged with each other between someone who has learned with someone who has not learned, is a programme for accessing knowledge based on concrete experiences.”

Interestingly, although they had been given information about the model on which the course was based, they described not in terms of education, but as a practical approach to help them in their work and it was the way in which they learned that appealed to them. They could see the benefits to their own practice,

“In general through this course we learned a model, it is specifically about working with the patient’s condition, from there to decide which patient needs drug, which patient needs no drug and now we feel more self-confident.”

They were pleased with what they had learned and compared it to their basic education

“Although in school teachers gave us lectures but it was theoretical approaches, it is impossible as the life of working, involving many situations, it doesn’t fit with any mould. This programme give us a motivation.”

Previously when they studied they had seen it as something separate from their real world, and that they struggled to relate to their work. The difference with this programme was that for the first time they had been given information that they could easily use. The result of this was that they had felt motivated to join in and complete the course to improve their practice. However perhaps one of the most important outcomes was that as one reported

“It created in us a new habit that is self-learning from each other, tell our thought.”

That they were keen to learn from each other and wanted to keep learning was a crucial change in attitude if antibiotic prescribing is to be improved. They began to appreciate how they could share knowledge to improve their practice .

“This is a first for us - the health workers here, we see easy steps to acquire knowledge, we all get the same knowledge and then agree how to apply it for patients’ examinations and treatment. This likes a spreading-oil stain (vet dau loang), it goes from health worker to patient then from patient to patient.”

The results of this programme were more positive than had been expected. It had been hoped that participants would see the benefits of the course offered, but that they had been so quick to accept the principles behind the approach, was a bonus. It had been thought that once they saw the benefits they would find it helpful, but all

the groups were adamant that they saw this as a way of ongoing education and training. This was, for most of them the first time that they had considered sharing information as part of the learning process

“Yes, really we have an opportunity to able to exchange to each other in our centre, between colleagues about for example a certain patient, or any patient, discussing together, learning experience from success we can even learn from failure, from then we are able to apply [knowledge] to similar cases. This creates a new habit of discussing and sharing.”

In addition, this approach gave the health workers a belief in being able to remember what they had learned and it to their work in the future. Acknowledgement of their previous lack of knowledge and expertise and their wish to provide a better service augurs well for the future of the services offered by the communes. The course has given them a belief in themselves that they had not had previously

“We have a belief and we believe that in the next time we will be able to give a deeper consideration and then transfer this to similar cases, it means when we get more confident we will work this way for patients.”

One of the aims of this type of training is to stimulate participants to seek their own solutions for problems and issues that arise in practice. However, it had been accepted that this was their first experience and that it might take time and repeated experiences with this type of education to bring about this approach. In the event, they grasped this concept very quickly

“This programme raise my mind an idea of how to improve our community especially the locals’ awareness.”

This aspect of raising awareness, and through that changing practice was a welcome example of the aim of the workers to improve the service they provided through partnership with their client group. However, although all the focus groups raised similar points, in each there were also some health workers who shared their worries about the being able to remember all they had learned

“To be honest it is difficult to acquire[the knowledge]completely however we are sure we are gradually improving and hopefully we do better our task of healthcare for the locals than we did before.”

However, whilst acknowledging this, they made it clear that even where they couldn't remember everything, now they had started to learn, they were going to carry on

"Honestly, all things it cannot be learned overnight however when you leave here we can continue by ourselves."

This commitment to independent learning is in direct contradiction to the passivity shown in the initial focus groups, where there was no suggestion of self-directed learning, but instead an acceptance that they did not have the knowledge they need. It was seen as important to explore whether this was just an immediate reaction to the changed approach to learning, or whether the workers felt able to sustain it if no further similar courses were available in the near future.

"If you don't come back in the next time, I think everybody here are still active in acquiring information of drug use."

Although the focus of the course had been on antibiotic administration, as part of this an emphasis was placed on the role of the professional, and the responsibility the role brings with it. The participants had readily accepted this and with it came a commitment to carry on using the format from the programme to provide a basis to continue their learning

"Experiencing this course we recognized that we need to be assertive in gaining knowledge, in professional terms, it gives a premise and foundation to build on to solve problems for the next time, it means we have a framework to follow."

This is a major change, and whilst it was hoped that participants would begin to think about future learning, their response was more positive than expected. It is accepted that they will need support to maintain their motivation and enthusiasm, and one of the best ways to do this is through encouraging them to support each other

"In here it is now we are learning based on direct dialogue, discussions, sharing and getting support and help for each other, that is key achievement. From this we are [all] upgraded in awareness."

The reflective element of the model had helped them to review the way they worked, and they were clear that prior to this course their work had been formulaic..

They tended to use the same antibiotics without thinking about them and without thinking deeply about individual cases. They now saw the importance of considering the evidence before prescribing

“It shaped a new habit that is more scientific working, avoid mistakes, before now working was ... was ... just done, now it is processed.”

That they were willing to be so open and discuss the problems they saw with their practice, is a reflection of the trust they place both with in other and with the researcher. They had accepted the programme, with its participative and supportive approach, and felt safe enough to be honest about the way they had been working. Without such honesty the programme would have been able to provide more information, but the reflection that brings about change would not have been possible. Not only was that the programme accepted by the health workers, but they saw the importance of developing a new, active way to learn and to work with each other.

Theme 5: Changing attitudes

No educational programme can meet or cover all the requirements of the learners within one course and if the effect of this course is to be maintained and their knowledge and skills further extended then it is necessary that further study opportunities are offered. In these, as in this initial programme, the information offered will need to be reviewed and modified with the process of interaction, reflection and review occurring in a continuing cycle. For example in this course, having increased their awareness of the complexity of prescribing, they wanted help and advice on how to respond to a difficulty that they now believed would increasingly occur,

“The difficulty now is consulting a patient when they visit the centre. It is clear that we have given antibiotics very commonly up to now. If we give less antibiotics then patients are likely to complain and be unpleasant, so the firstly it is hard to know how convince them to follow our advice.”

and

“We have reported to you that through this programme we have learned much. But in contrast to our awareness it will be very difficult to persuade patients what it means when we have to tell them, to persuade them that if not needed there will be no antibiotic prescription for him or her. Because this goes opposite to the common trend. We need to know how to make them accept our decisions and leave without causing difficulties and unpleasantness.”

As they pointed out, education about health in the community is limited and few will have any real knowledge or understanding of the dangers of taking antibiotics unnecessarily.

“How to make the local community change their thoughts, their awareness, this is a difficult process.”

It was understandable to hear that they now saw the problem as not coming from themselves, but from the local population. This revealed two things. Firstly, that the health workers now to some extent perceived and believed in the necessity of taking care to prescribe antibiotics with care, and in their ability to prescribe appropriately. However, secondly, they did not believe in their ability to transfer their knowledge and perceptions to their clients/patients. This lack of confidence was reported by most of the participants

“We believe this is good for patients because good things will follow compliance, but changing the awareness of the locals cannot be achieved at once.”

Compliance with taking prescribed drugs is an ongoing problem in Vietnam, particularly with regard to antibiotics. They were clearly concerned that as many people chose to disregard advice on how drugs should be taken advice that did not meet their expectations would not only be disregarded, but over-ruled by the purchase of their own choice of antibiotic. The explanations that they gave for this were the same as were given in the baseline data and had two elements, firstly, the local population

“here the local population mainly belong to rural areas, their understanding is not... not... [good],”

Secondly, they went on to explain the problems with the healthcare system

they expect health workers here just know to give drug after a physical exam. At this level which the higher authorities always say we are working very hard, it is very difficult. When necessary all information from here is taken to the higher[level]... but there is little support given, to say no is not seen as right, we have to say yes. This programme is the first thing that benefits the health workers in the commune centre.”

In contrast, some participants recognized argued that the problem could be solved by the health workers themselves, but that this would take time

“But I think if the treatment get effective it is likely to get their belief.”

and

“ contact with patients where they receive and accept information needs a long period, they have to be repeatedly reminded, so that they understand what are the benefits, and what harm can happen regarding antibiotic use.”

However all the groups also raised another concern, and that was the time needed. They all agreed that explaining their decisions, particularly when they didn't give antibiotics would take much longer to implement than they normally spent with each client/patient

“Before we just did a physical exam then gave some drugs that's all. Now we have to consider more carefully, spend much more time in the consultation process, persuading them why, if we don't give an antibiotic as usual, therefore it takes time. But if we make it work and achieve these things i.e. the patient goes happily home without antibiotics, and gets well again then next time we feel confident.”

While evaluating by observation it was clear that after being involved in the programme the health workers were planning to spend much more time in giving patients instructions more than they did before the programme. This problem with this is that their workload will remain constant and there is a possible implication that time may be so problematic that when busy they will find it more difficult to maintain their position. Under those circumstances they may revert to prescribing antibiotics as the most practical approach to use. In the light of this it appears that the health workers of the study need more knowledge and skills in how to work with clients/patients and a future course should focus on this

“Explanation to patients is a difficult work we need to learn more to meet with the local population”

Some of the health workers suggested that the knowledge they had gained needed to go far beyond themselves

“This should be expanded to the whole system, especially to other grassroots, then to the local population.”

and

“It has to upload to mass media, it has to educate everybody to understand not only patients.”

To contain antibiotic resistance and to improve judicious use of antibiotics multifaceted strategies are necessary (WHO, 2001b; 2005a). The opinions above fit

with large scale national and international strategies and need more powerful resources than are currently available. However the health workers with their responsibility in their health centres where the first contacts taken place can play a crucial role as a channel of communication to pass on knowledge and information to clients/patients.

SUMMARY

The programme worked well within the study location. It received the approval of both leaders of the local health system and the health workers at the commune level. The manpower structure and the educated level of the health workers within the study location at the time of the intervention (in 2010) were very little different to those of the original focus groups in the baseline survey in 2008. The health workers were still mainly educated at the secondary level for professional (73.8% of the total). Perhaps the greatest change was the addition of eight secondary level pharmacists to the healthcare staff. However overall the knowledge and practical ability of staff regarding antibiotic use before the interventional model appeared no different when compared with those seen in the 2008 survey. Assessments taken immediately before conducting the learning model indicated that misunderstandings, misperceptions and inappropriate practice regarding antibiotic use were still in existence among the commune health workers and as in the initial survey these were not dependent on the levels of training/education or the seniority of staff (Tables 7.4 and 7.5).

This interventional programme based on experiential learning with some modifications made to fit the model to the Vietnamese context did lead to considerable improvement regarding knowledge about antibiotic use among the health workers in the community. A follow up assessment revealed that these improvements were not only seen immediately after the learning model but also seen in three months after completion the intervention when the second post course assessment was carried out.

The evaluation from the repeat questionnaires indicated positive changes in both the perception and the practical ability of the health workers regarding antibiotic use in particular and diagnosing the conditions/diseases of patients. The overall mean scores immediate after the intervention and three months later were about 99 and 79 points respectively compared with about 58 points before the learning programme (p values of 0.001). Changes in correct perception and rational use of

antibiotic were varied in different indicators but overall clearly showed an improvement. In addition, as a result of participating in the programme the health workers have learned a different and more appropriate method for professionals to use when examining patients and prescribing appropriate treatment.

Through explorative observation using a time-series evaluation improvements were also seen in prescribing practice. Immediately after the learning programme and three months later, when compared with prescriptions from before the programme, antibiotics given by health workers to patients/clients with respiratory problems decreased in the number (immediately post programme 4 of 11 cases and three months later again 4 of 11 cases compared with 10 of 11 cases in the first observation,) whilst average time spent on giving patients/clients instructions of antibiotic and drug administration increased approximate 8.36 and 6.61 minutes in M2 and M3 compared with 4.73 minutes in M1, respectively. In addition, the instructions given to clients/patients were much more detailed.

Analysis of the group discussions revealed that it appeared that this learning model met the health workers' expectation, was seen as appropriate and made a strong impact on the health workers. The model was acknowledged by the health workers as the starting point for a new way of learning and working and gave them self-confidence for their ongoing development. However, a need for further support also emerged from discussions regarding knowledge and skills in consulting patients/clients.

Combination of the three sets of data proved that this learning model achieved the expected purposes in the appropriateness, the improvements in knowledge and practical ability regarding antibiotic use among the commune health workers of the study, and the ability to transfer to the other commune health centres of local healthcare system.

CHAPTER 8. IMPLICATIONS FOR THE PRACTICE AND POLICY

INTRODUCTION

Reflecting on the study, it is possible to identify some implications for both practice and policy. This study was basically an educational intervention, and did achieve its aims, but as with all such programmes, external and internal factors impacted on the overall effectiveness. In this study, the processes used revealed information that if known in advance would have helped the planning and implementation. This chapter therefore presents possible effects and results, and consists of two parts, the first one is about implications for education in practice and the second one concerns implications for policy planners.

IMPLICATIONS FOR EDUCATION IN PRACTICE

The whole rationale behind this study was to provide a mechanism for sustained improvement of antibiotic use at commune level, and for practice, five key questions needed to be asked. The implications for practice have therefore been presented using these questions.

- (a) who the programme would impact on and if there would be any resistance
- (b) whether or not the programme would get approval from the health authorities
- (c) what the programme would deliver to the target group
- (d) where the programme would take place
- (e) how long the curriculum would last

These questions were not only key to the study, they represented the challenges that the researcher needed to overcome. On reflection, having completed the study, although most of the questions have been positively answered, there are some issues that still need further consideration.

- (a) This study was designed for health workers at the commune level in rural districts. It is not realistic to expect that those for whom the study was intended saw the need for their state of human 'being' or their practice to be affected by the programme. However, these were professionals, and part of the ethics of professional practice is the wish to gain knowledge and skills to improve the care offered. For this to happen, staff need to have access to education and training both in terms of availability and accessibility, something that those in this study had clearly found difficult when compared with their colleagues in urban

settings. In Vietnam, there is another factor, most of the health workers in rural communes accept their state of 'being' as predestined fate, and this has major implications for services. It had to be accepted that for some, including those with a high level of education, for example medical doctors, additional education is not seen as necessary, as they were satisfied with what they had already undergone. Others, did not see how they could (or why they should) change their low level of training. They had been 'given' this place in life, so having finished their early training, and gained employment they expected to stay in the same the job until they retired, with the only change being their salary automatically being raised every three years. There was also the reality that they were used to 'being' known as the sole care workers, working autonomously in the commune for many years.

In recognition of all of these factors, the researcher chose to meet with and be accepted by the commune workers before beginning the study. The strategy proved very effective. For the commune workers, the fact that a university lecturer and doctor had taken the trouble to meet with them and ask what they thought they needed and what would help them, provided a welcome opportunity for them to explore their concerns. The initial survey played a key role, it enabled them to reflect on their own practice, something that most of them had found no time to do in their busy work schedule. Through sharing their experiences with the researcher, and with the emphasis on them as individuals, the focus groups gave them opportunities to raise issues, and supported them as they began to recognize their own problems, helping them to acknowledge their need to be moved to a new positive 'being' state. The result of this was that most staff expressed their desire to learn, and willingly participated in the training. This would therefore seem to be an appropriate starting point for the introduction of new training courses to help prevent or overcome resistance to the need for further education and training, and could be applied to subjects other than antibiotic use and misuse.

- (b) Unlike in many countries, to be allowed to conduct research or carry out a project related to the health sector is not easy. Approval needs to come from different departments. Final decisions rest with the Ministry of Health, but there are various departments within the province and district health authorities who also need to give their agreement. As a Vietnamese doctor, the researcher understood well these prerequisites, and knew that the administrative formalities

were complicated and somewhat tortuous. Knowing the region well, it was possible to initiate contact, and then meetings with the 'right' people in the authorities, and this helped to overcome problems and delays. In addition the researcher kept in direct and regular contact with the team leaders of the provincial health department, district health centre and commune health centre throughout the project. These activities were helpful and resulted in the clear and confirmed acceptance of the schedule for every session of the whole project, and the submission of a report of the outcomes of the study. Maintaining such formal links is important and these steps should be followed in other similar projects, as without them it is likely that initiatives will not be implemented and thereby sustained. It is lack of these steps that can adversely affect the long term acceptance of projects implemented in Vietnam by overseas donors.

- (c) When designing any new education programme, particularly in an area where there has been little or no input there is so much information that needs to be transmitted that care needs to be taken to be realistic on what can be included. In education terms it is recognised that overloading the trainees with information is likely to be unsuccessful, with the participants inability to remember and retain all the information offered causing distress, resentment and ultimately discouraging them from further study. For the commune health workers ,where content needed to be selected from a vast range of materials and research regarding antibiotics the programme was considered carefully. It was evident that majority of the health workers were trained only to secondary level, but a few did have university level education. This meant that the course would have to be delivered simultaneously to workers with very different abilities in terms of knowledge and expertise. They were mainly working separately within their commune and had had no in-service training for a long time, and had multi-functional roles within basic primary healthcare provision. Therefore information had to be seen to be relevant with the contents regarding essential issues of antibiotic used in a format that whilst it was not difficult for them to perceive and understand, did not make those with higher levels of education feel that it was not necessary. It needed to be familiar to the daily work and considered useful, as only then would they be interested in learning. The choice of a workshop approach meant that the mix of levels could be used as a positive factor with all staff working together, rather than as divisive. This was the one of key factors

that helped the programme to achieve the remarkable changes seen in the Chapter 7.

- (d) As all district health centres have large rooms available, initially using these facilities was considered, but while this was realistic for the researcher, the risk was that the health workers would see the course as following the traditional format of learning where everyone sits in large groups and listens to lectures. This would lead to the problems of learning and teaching as mentioned in Chapter 2 (Chapter of Vietnam) and Chapter 6 (Chapter of developing the model). In addition, all the health workers could not attend at the same time as this would be too disruptive to the services provided, and this in turn could discourage them from attending as they would be with strangers, not their peers. The programme therefore needed to take place in each commune health centre because this type of training allows the participants to begin to move towards active learning, part of the rationale behind the choice of approach for the study being the development of a health workers-centred programme. As all commune health centres have a room big for the five to seven staff employed there, the programme was designed so that it could take place in one room. The focus groups with every commune showed clearly the success of this learning approach. However, this did take much more time and effort for the trainer than the traditional approach, and this will need to be factored into any future such courses. This approach will work well within districts, but to cross administrative borders will add to preparation time, time for travelling and the financial expenses, these costs will need to be included in planning.
- (e) When planning the length of the course, again practical considerations played a major role. It had to be accepted that in Vietnam updating courses tend to be one day in length, and therefore for those giving approval and those attending, this programme was seen to fit within normal parameters. In terms of service provision to remove whole cohorts for a longer period would not be seen as appropriate, and not all workers would have been allowed to attend. As it was seen as important to standardise the service offered, all participants needed to have the same information, and to receive it first hand from the trainer. Then too, this type of training was new to the participants, for the majority of the staff, the programme was the first point of contact regarding continuing learning, and to be successful it needed to see realistic to them, if seen as too long they could well have chosen not to participate at all.

There are eleven commune centres, and the programme took place in each commune separately. This meant that eleven separate courses were held. In terms of sustainable training this is possible, but it is time consuming. Although the results demonstrate the effectiveness, it is unlikely that time or finance for more than one a day programme could be found. As it was hoped that this training programme would be first of many similar courses on a range of different topics the course needed to be designed therefore to fit within available systems and funding. The satisfaction of the health workers expressed in the focus groups was sound evidence that the choices made regarding length and content were seen as appropriate.

The core component of the programme was the learning model (MKMVN). This model played the most important role for the learning process within the programme. It was recognised that this mode of learning would be new for the Vietnamese health workers at the commune level and there could be some difficulties in directing, circulating, and controlling the model. Having reviewed the process from the start to the finish, it was evident that the programme generated interest and enthusiasm amongst the health workers. They found the programme interesting and from their responses it did succeed in starting them all on the learning cycle, as illustrated by the focus groups from the final evaluation phase of this project. However, for the researcher, having thoroughly considered all aspects, there were still some basic issues which the researcher needed to consider.

Firstly, although most of the programme contents could well be processed within the programme, for instance, which common illnesses seen in the commune health centres needed or did not need antibiotic treatment; which clinical manifestations related to non-infectious diseases; to viral infections; or to bacterial infections. Similarly, defining the patient's problem; verifying the objective(s) of treatment; checking the suitability of medicines for treatment; providing the essential instructions on usage of medicines; and monitoring treatment also fitted well within the programme. The model chosen goes from the known to the unknown, and as this was an initial education and training course, it needed to start with current practice. The initial survey demonstrated a lack of essential knowledge and expertise, that they had had limited access to information, and no experience of interactive learning. However, there were some issues that could not be addressed, these included the situation of antibiotic resistance worldwide, nationwide, and

locally, this would be suitable for a follow up session, once they had acquired a basic understanding of antibiotic use and misuse. Similarly, which pathogens caused which specific infections, and which were susceptible to which specific antibiotics could also be taught later as they are unable to carry out tests for the different pathogens and where they have to send samples away for testing, there are government/hospital guidelines that state which antibiotic should be given for which pathogen. Thus, although not ideal, the decision was made that in this instance more detailed information could be provided in a later session, as this would not adversely affect prescribing, and the focus had to be on the essential aspects of antibiotic prescribing.

Secondly, as well as being a new concept for the health workers' at the commune level it was also a new teaching method for the researcher. Therefore, time had to be taken in planning and implementation, at all stages of the project from the first conceptualisation to completion. On a practical note, the researcher needed both patience and flexibility to run the programme, particularly in the first focus groups when the participants did not know what was expected of them. In addition, while working with the participants, the researcher took care to use language that was appropriate. The use of academic dialogue or jargon could have left some workers not fully understanding the information and alienated others, the careful preparation and use of language was key in enabling the health workers to feel safe, confident and able to become active participants in the learning process. These all contributed to create better outcomes (Jarvis, 2004; Quinn and Hughes, 2007).

Lastly but not least, this model needed the external facilitation provided by the researcher, this was the key element for starting the cycle and monitoring/controlling the steps within the model. Without facilitation, it is difficult to see how the health workers could move from passive to active learning. For the continuing learning and working by the health workers the question was raised of who should be the facilitator once the study was completed. The answer appears to be that the researcher would continue and develop a train-the-trainers approach, working with senior staff in the community, possibly including the team leaders who could then take on the role of facilitators.

IMPLICATIONS FOR THE POLICY PLANNERS

In recent years the training for medical and nursing staff in Vietnam has been developing steadily, as is evident in the many achievements presented in Chapter 2

discussing the context of education and training in Vietnam. Aimed at improving staff competence, the quality of patients' care and meeting the demand of integration, much effort has been made and there have been major improvements in morbidity and mortality. To achieve the desired changes in the Vietnamese health system, in addition to their own funding Vietnam has also received considerable external support. The project "Improving the quality of Nurse Training at College and University Level in Vietnam", Code No. NPT/VNM/117 Health, supported by the NUFFIC of the Netherlands is a typical example. Sending staff to study at doctoral level in a developed country is part of this project following these aims but the choice of approach is not easy.

Lack of health workforce especially well trained staff is the reality, so sending these staff to another country for the long-term study (e.g. a PhD study that requires at least a full-time of three-year study) could disrupt the organization's task. Also, changes in Vietnam are occurring so rapidly that the student returns to a very different situation to the one they left. Looking back at cases of Vietnamese students who underwent full-time programmes in western universities then returned to work in Vietnam, although there is no official report the reality is that these students are facing difficulties in functioning in their work because of their unfamiliarity with the current Vietnamese context after being away from the country. There can also be resentment amongst other staff if asked to cover the additional workload, for an extended period of time, when the student then returns to take a higher position. Finally, in healthcare it can be difficult to carry out a project based within the home country whilst living in the host country.

For these reasons, in the study cited above a part-time mode of attendance was used. This had the additional benefit of being an equal opportunities approach, as the short time spent in the host country meant applications from those with family responsibilities were possible. The main problem with this approach is that in comparison full-time study gives students more time for their study and especially for their personal development. With a part-time mode, students have around six to eight weeks each year in the studying environment of the developed country. This gives less opportunities for personal development, especially for students who use English as a second language. However, the part-time mode provides many advantages. For health staff, working as part-time students not only can they acquire additional knowledge and expertise, including alternative philosophies during sessions of learning in the western world but they spend their remaining time

in Vietnam, living and working within the changing Vietnamese context. Therefore, these staff understand well what is truly happening and are able to apply what they learn with relevant modifications, continually checking that the project retains relevance and is securely based within their home country. This study based in Birmingham City University with the conceptual framework for education and training for commune health workers for which the learning model (MKMVN) was developed, is evidence of this approach. Staff as students, can spend time throughout the year (except the sessions being abroad) on self-directed learning in their country (an ideal learning approach nowadays), and can in addition, also continue to carry out their responsibilities and institutional tasks as usual, although it has to be accepted that juggling two role is both difficult and tiring. In other words the part-time mode is likely to be the most sustainable for Vietnam, and will work for those who Vietnamese staff who have full time jobs, but wish to develop further. However, for this to be successful, staff who become students do need to be given some relief from their full time work and to supported in developing their English (or whatever language they need). In addition, supervisors need to have access to, and/or understanding of the context in which their students work, supervisory visits are also of great benefit, in the Nuffic project the supervisor was in Vietnam at least twice per year. These factors should be recognised and paid more attention to by the policy and project planners of higher education and training for Vietnam.

In Vietnam, the requirement for changing training and education is well accepted, many strategies have been developed, some have been completed, others are being implemented, and some are still items on the agenda. However, there are still obstacles to the introduction of change in many areas, particular in health training and education. For example Vietnam has signed up to implement the ASEAN competencies, but the isolation of many areas in Vietnam limited training settings, together with the current lack of standards for health staff (at the end-points of training), the low status of public health training and time constraints make this very difficult. There have been attempts to rapidly introduce western models into Vietnam, but as Chapter 3 revealed this brings its own problems. It is essential that pressure to change healthcare services does not damage what is already there, and that new initiatives, such as this one, are set within the Vietnamese context.

Another issue is that making changes requires considerable resources in terms of finance, workforce, time consumption ,and the development of strategies to overcome resistance at all levels. In differing circumstances any of these can

become big obstacles. Looking back over the whole process of this study as well as the development and application the model within the study area, the approach of constant consultation and engagement with relevant officials proved to be effective and it is suggested that it should be used in future such projects.

(a) Resources for this study in terms of the researcher's study and for health workers' training programme were not complex or expensive. However, it is argued that as this study illustrates, in many ways the effectiveness of a training is not dependent on the number of resources used or how much it cost. Even had resources such as mass media, computer-based resources and/or more printed materials been available, it would in this instance not have been any more effective. The participants in this study were health workers used working in groups in each separate health centre, but many have never used a computer, reading academic and/or medical texts is unfamiliar, difficult and generally too time-consuming while they try to fulfil their multi-functional role. This study utilized mainly internal and local factors in which the health workers themselves played the central-role, with the researcher as facilitator. To improve sustainability all participants were given a pocketbook containing essential information presented concisely in a format that was easy to understand, and that could be carried with them in their practice. This small book, enables them to access accurate information easily and quickly and was seen by participants to be a valuable resource or written reminder.

(b) In this study most health workers had accepted that they would never be able to study to gain a higher, or degree level education. They also found it difficult to travel out of their health centre for learning, or to take time from work to consider full-time learning, particularly as they were unlikely to receive training costs. These difficulties are also seen in many other areas (Prasad & Muraleedharan, 2008). This study offered the health workers a training that took place in their own centre. The length of training was not long, the schedule was linked closely to their work sites. The learning activities happened naturally, i.e. the learners could do their work as usual during the process of training. The content of training programme was relevant to individuals (both the researcher and the health workers) with cultural and professional backgrounds. The instruction emphasized the use of practice/ experiential approaches, focused on practical applications, incorporating community case studies rather than theoretical issues, providing individualized attention to the health workers. These all

enabled the health workers to gain confidence to learn and appeared to be acceptable to all health workers. In other words, this mode of training by itself minimized both costs and resistance.

- (c) Efforts were made to use the factors that can impact on training outcomes as advantages rather than disadvantages. In general, there are two main kinds of influential factors, individual and organizational. Individual factors, including characteristics such as age, educational/training background, work experience, self-efficacy, position in workplace, personal commitment to the organisation and job involvement have long been found to be influential on trainees' motivation to learn, on training outcomes and on knowledge transfer to the workplace (Mathieu et al, 1992; Chiaburu and Tekleab, 2005; Chen et al, 2006). In this study, the commune health workers were different from each other in age, levels of original education, job titles but they had been working together with the same responsibilities in the same working environment. The training content of this study provided the essentials of knowledge and practice which served to provide standards for practice for the whole group of community centres rather than being aimed at a specific individual. Organizationally, factors such as support, culture, appraisal, assignment, etc. have been found to be influential on training management. However, the findings and results from this study all showed that in the current context of the community health level, these had less influence on the training. Healthcare service at grassroots level in Vietnam have often been appraised offering a low quality service. However, most health workers wanted their centre to be appreciated and trusted by their community and they were therefore motivated to learn. Furthermore, in the context of the health system where many problems need to be solved, this type of training appeared to fit with organizational attempts to improve the services offered, hence the training has received approval from all relevant authorities in the current health system.

Although it was important to take into account some limitations, the results achieved from the model MKMVN for training health workers enable the following recommendations to for policy to be made.

(a) Consistency of the model with the current policies

Considering the health policies that pertain in Vietnam, in recent years the health sector has received considerable interest from the government being embodied in the many promulgated legal documents (the Government, 2007; Prime Minister, 2007; MOH-MDF, 2008; MOH, 2008c). Under these legal premises, many activities have been implemented. The most well-known of these action programmes starting in 2008, is known as the 'Project 1816' it is being run by the ministry of health based on the Decision No. 1816/QD-BYT (MOH, 2008c) and shows considerable achievements. Under this project, staff rotate from central hospitals to provincial hospitals to raise standards. Medical technologies have been transferred, and training of staff in mountainous and remote areas has been taken place. This has also created more flexible and open conditions for any programme aiming to improve the quality of health/medical service. However, to date it has focused on hospital care, with the community, the main care provider for the bulk of the population not yet included.

In the context of the commune health level it is evident that continuing education and training is very difficult to carry out. For the health workers in the communes, the expansion of health insurance and increase in the number of poor people able to access health/medical services, designed to decrease the overload at central and provincial hospitals has considerably increased their workload. In health training terms, human resource directives to strengthen and upgrade the system of public medical schools and non-public facilities have been issued. But these appear to be aimed at meeting the growing demand for human health workforce (MOH & HPG, 2008), so focus on initial training. There is still a need to solve the problem of educating those who have been in practice for many years. The introduction of the training model developed in this research project can help redress this situation by improving the quality of health services at commune level and narrowing the disparity between what officials want to see delivered and currently what is possible. It fits well within the current policies, and in view of the results it is suggested that it be considered for approval by Myloc District health system planners as part of their long-term and scheduled education and training programmes.

(b) The feasibility of the packet of training and education for delivery in other rural areas

The results suggest that the training is transferable to other rural commune centres, and it is therefore recommended that a further study in a different district be carried

out and evaluated. This training model required minimal materials with the participants themselves as the most important element. There is need for an external facilitator, but this role is suitable for many university lecturers in public health, or senior health staff so could easily be implemented in other areas. It has to be accepted that for the commune health workers, there are great advantages, but the model is unfamiliar to them, and time needs to be taken to help them adapt to a new way of learning. The approach used in this study would seem to be appropriate and facilitators should be trained to work accordingly. Changing habits of learning and working formed over a prolonged time is not easy thus, learning needs to be regularly reinforced, and the model should be implemented as part of an continuing programme, not a once only session. In order to permanently transfer the model, training the trainers must be done. For this, staff with higher level of qualification should be recruited, provided with the skills to be facilitators for learning rather than to be pedagogically based lecturers. This also fits in with the policy of rotating staff from higher levels to lower levels to narrow the gap in the quality of health/medical service as embodied in the Decision No. 1816/QD-BYT (MOH, 2008c). Over time it is anticipated that through repetition the model will become familiar and can be part of a routine training programme based in commune centres. The role of facilitator can then automatically be part of the role of the head of the health centre and/or someone with the highest qualification in the centre.

It is accepted that the current medical curricula with its focus on many subjects has an emphasis on the transfer of knowledge but practical issues and problem solving are less addressed. Subjects such as specific diseases and pharmacy always take major priority in sessions, with much less time spent on the progress of rational treatment and the appropriate use of drugs. The content of this training programme has features that enable students to access these matters. However although the time duration for the content to be introduced was limited, the information offered was accepted easily and enthusiastically by the health workers, who were educated mainly at secondary and elementary levels. It is therefore suggested that it could be adapted for implementation and integration into the curriculum of medical school and nursing courses. This would enable these students to develop active learning patterns and problem solving skills that would then last throughout their careers, as well as providing them with the essentials regarding the use of drugs in general, of antibiotics in particular, and treatment programmes for a range of diseases and disorders.

(c) Further work to transfer the model to other areas

The lack of a highly trained health workforce at grassroots level, especially medical doctors for the commune health centre is the reality. Within the health centres and with varying titles, nurses are carrying out the main responsibility of provision health care in the community. In terms of professionals the use of pharmaceutical products is increasing and needs to be considered in training and education, particularly in terms of the curricula of nursing faculties/school. The rational and appropriate use of medicines in general and antibiotics in particular should be introduced in detail for nurses rather than their being only introduced to the implementation of drug orders as in the existing nursing programme.

Furthermore, in the community to retain the impact that was achieved from this programme and to maintain the health workers' learning, helping them to form a habit of lifelong learning the 'training the trainer' approach should be considered in which health workers such as team leaders will first be trained as facilitators then the MKMVN can be disseminated widely within the health system.

d) Future possibilities

Although as mentioned previously, currently in Vietnam there is no formal requirement or system for continuing education and training, as Hoat (2009) points out this issue is now on the national agenda. As the country moves towards a registration system for all health professionals, the issue of maintaining competence to practice inevitably forms part of the discussion. In many countries, linked to registration is the need to demonstrate the measures taken to maintain and update professional knowledge and expertise. It is the responsibility of the individual worker to keep a record of all continuing professional education undertaken. To facilitate this process, some countries now require all staff to use professional portfolios, where copies of certificates from courses and conference attendance can be compiled. This training programme, once approved could easily be incorporated into any system developed to register or record continuing education, by providing participants with certificates of attendance and content.

CONCLUSION

The programme provides a framework to effectively deliver and transform knowledge and practice regarding antibiotic use. By discussing and analysing

aspects regarding the study, the implications for education in practice and for policy could be discussed. It has also been possible to indicate ways in which the training programme on which the MKMVN can be transferred to other areas and used across the health service as whole. This chapter has therefore summarised the possibilities of applying the programme and its learning model in a larger scale and ways in which the policy planners could consider its use in planning and developing health training. Once approved by the MOH, this model should be clearly presented to provincial health authorities then applied across all community health level.

CHAPTER 9. CONCLUSION AND RECOMMENDATIONS

INTRODUCTION

This chapter is organized into four sections. It begins by reflecting on the key findings from the initial survey (the first stage) and the main results from the interventional programme and model (the second stage) of the study, to consider whether the main aims have been met. The chapter then draws out the critique of the study in the second section and the main limitations of the study in the third section. The chapter finally gives the reflections of the researcher after having completed this study project and the basic recommendations that arise from the study.

SUMMARY OF FINDINGS AND RESULTS

The study was carried out with three aims,

- (1) To evaluate the current using of antibiotics in the community in Myloc district, Namdinh province, Vietnam.

- (2) To develop a conceptual framework and education and training model for public health workers to reduce antibiotic misuse among the population in Myloc district, Namdinh province Vietnam that is transferable to other rural areas in Vietnam.

- (3) To make recommendations for the development of policies and practice to reduce antibiotic misuse in rural areas in Vietnam.

Although there were some limitations to the research, overall, the approach chosen was appropriate, and as the summary below illustrates, the aims have been achieved.

Key findings from the initial survey

The first aim of the research project was the evaluation of the current use of antibiotics in the studied community. At the grassroots health level the community health workers are assigned the main responsibility for providing healthcare services for their local population including most work regarding administration of medicines. This was the first study to systematically explore the situation regarding antibiotic use across a whole district and if typical, then antibiotic resistance is likely to increase unless urgent steps are taken to address the problems raised.

The measurement by questionnaire regarding antibiotic use drew out the basics of the health workers. They had studied at different colleges and schools, all of which had their own curricula but overall with low levels of training/education. The majority of the community staff were educated to secondary level (50%) and primary level (35%), respectively and only 6 of 56 members were medical doctors (presented in Table 5.1 of Chapter 5). However, even though many were officially educated to the same level, the lack of standardised education and training means that these workers all had different levels of knowledge and understanding. The knowledge of antibiotic administration on which the health workers based their daily practice was mainly from their initial training/education, which may or may not have included study of the practical administration of antibiotics in detail. In addition, during their service they had been offered no structured continuing education or training, although they had attended some incidental training courses from the national programmes. However, these courses were not focused on the use of antibiotics or medicines (presented in Table 5.2 of Chapter 5). Inadequate understanding and misconceptions regarding antibiotic administration were clearly revealed (presented in Tables 5.4, 5.6 and 5.7 of Chapter 5) and these were likely to have arisen as a result of the limited level of education of the community health workers. This is a situation that needs addressing if misuse of antibiotics is to be reduced, and the health of the community improved. It has to be accepted that there are two steps that need to be considered. Firstly, the educational curricula for initial training for all professional groups needs standardising and to have an increased focus on antibiotic use and misuse. Secondly, staff already working in healthcare need updating on a regular basis.

The analysis of documentary data revealed alarming signs of problems with current antibiotic prescribing by the community health workers. The number of prescriptions for/with antibiotic was very high, with about 80% of the total client/patient consultations resulting in antibiotics being given by the commune health workers (see Table 5.10 of Chapter 5). Antibiotics were prescribed for most diseases/conditions, regardless of whether they were recommended or effective for the condition diagnosed. As a result, the prescriptions for or with antibiotics for patients and or clients with non-infectious conditions accounted for 54% of the total (presented in Table 5.11 of Chapter 5). This illustrated a second problem, that of the difficulty they found in differentiating between common non-infectious, bacterial and viral diseases. This too, is an issue that needs addressing in both initial and

continuing education. A surprising and worrying phenomenon was that the rate of prescribing antibiotics for clients/patients who did not have to pay for their healthcare services (health insurance card holders and children aged up to six) was much higher than that for clients/patients who had to pay (presented in Table 5.12 of Chapter 5). This may in part be because as the study found, there is a clear expectation from clients that they will be given antibiotics regardless of their problem, and where they did not have to pay themselves they were more likely to pressurise the staff into prescribing. To address this problem, firstly, there needs to be a concerted effort at public re-education regarding what antibiotics can and cannot do. Secondly, the staff need to be empowered and given the confidence to withstand the pressure from their clients. The processes used in the training programme are designed to do that, and as the evaluation showed this did reduce prescribing.

The survey did not attempt to identify directly causal correlations between the health workers and their prescribing practice. However, the insights from analysis of transcripts from the focus group discussions revealed some of the factors impacting on the current use of antibiotics in the studied community. There were key concerns regarding the processes used in deciding whether or not to prescribe. Beside the non-medical/pharmaceutical factors, (i.e. social, cultural and economic) which have been identified in previous research, the health workers themselves conceded that some of their problems arose from their beliefs, their low level of qualifications, and lack of knowledge and competence needed to undertake the multiple roles that they have found themselves carrying out in serving their community. This was the first time they had actually seen proof that the health insurance policy appeared to have led to increased prescribing. This was definitely another of the challenges and difficulties experienced by the commune staff, not least because of the inequalities that arise from a high level of responsibility, with little official recognition of this in terms of education, training, remuneration and career possibilities. They clearly wanted more support, more education and more official recognition. The training programme was welcomed by them, their acceptance of their own limitations and willingness to learn needs to be recognised and utilised by the MOH. Only through more such programmes will the government be able to use the commune workers to improve the morbidity and mortality levels in the community.

Above all, the survey demonstrated the urgent need to improve the use of antibiotics in the community, and that any intervention needed to take into account

the subjective nature of the problems identified in order to develop an intervention to improve the situation.

Main results from the interventional programme

The second aim of this research project was the development of a conceptual framework and education and training model for public health workers to reduce antibiotic misuse in one rural area, and that could be applied in other rural areas in Vietnam. The evaluation of the effectiveness of the intervention was done with two quantitative measurements before (M1), and immediately after (M2), and three months later (M3). A qualitative assessment was seen as important after M3, and therefore the focus groups were repeated. These enabled the researcher to obtain the participants' reflection by themselves on the intervention.

The overall mean scores were raised from about 58 in M1 to about 99 in M2 and remained about 79 in M3, regardless of the level of initial education, job titles, age and service's length of participants (presented in Tables 7.3, 7.4, and 7.5 of Chapter 7). Improvements were seen in both the perception of, and practical ability of the commune health workers to apply the official guidelines for antibiotic prescribing. The positive changes in perception and understanding included awareness of the necessity for appropriate antibiotic use, and recommended systems for administration. Their knowledge of the consequences of misuse, the common diseases and their clinical manifestations in the context of community settings were also improved (presented in Tables 7.6, 7.7 and Figures 7.2, 7.3, 7.4, 7.6, 7.7 of Chapter 7). The health workers' improved professional practice at the community level was demonstrated by the way in which they determined the process of rational treatment, their approach to solving the patient's problems, selecting an appropriate antibiotic when necessary, giving patients correct instructions on common drugs (presented in Figures 7.8, 7.9 and Tables 7.8, 7.9 of Chapter 7). That one training programme could lead to such changes demonstrates the effectiveness of tailor made small-group learning. This relatively low cost approach to continuing education is appropriate in a developing country such as Vietnam.

The mini-observation focusing on some particular aspects took place at the same points of time as the measurement by questionnaire (i.e. M1, M2, and M3). Despite the small number of cases that were observed, the results again indicated the suitability of the training content that was introduced to the participants (presented in Tables 7.10 and 7.11 of Chapter 7). The effect of training could be seen in a

decrease of the number of prescriptions for/with antibiotics. Before the training programme, ten of eleven clients seen (8 were cases of upper respiratory conditions) all received antibiotics. After the training, in M2 only four of eleven patients/clients were prescribed antibiotics (10 of these cases had upper respiratory conditions). In M3 only 4 of 8 cases with upper respiratory conditions received antibiotics (presented in Table 7.12 of Chapter 7). Though this was not significant in statistical terms, (for statistical analysis to show any significance, the study needs to be repeated on a much bigger scale), these numbers do actually show a significant impact on clinical practice (Burns & Grove, 1997). Another important impact on the health workers was seen in their provision of instructions on drug administration for patients/clients. After the interventional programme the essential instructions on drug administration for patients/clients were provided more adequately and in more detail, with a significant increase in the time taken for this task. On average the time doubled from 4.73 minutes in M1 to 8.36 minutes in M2 and remained in M3 at 6.61 minutes (presented in Tables 7.13 and 7.14 of Chapter 7). This is the first step, at a micro level in the re-education of the community, and demonstrated that increased competence (better skills in educating clients) and confidence in their own abilities does improve practice.

From the focus groups, an active reflection on the training model was obtained. It has to be accepted that no training programme is perfect and this research project was no exception. However, the participants were all satisfied, and wanted more such courses. Yet prior to this study they had not been motivated to seek out education and training, and had never before participated in such small group work. The most important outcome from this model came from its aim of empowering the participants, and giving them increased confidence and trust in their own abilities. For the commune health workers this model, which they saw as valuing their individual experience and expertise was a new approach. Their enthusiasm and motivation have to be commended, they work under difficult circumstances, but with support and continuing education want to make and can make positive changes in the health of their communities (seen in the evaluation by focus group).

CRITIQUE

This study addressed the current situation of antibiotic use arising from the problem that the more antibiotics are used, the more antibiotic resistance is developed. It was evident that both patients and prescribers were contributing to the problem with the misuse of these medicines due to misunderstandings and a belief that they are

'wonder' drugs that help people to recover from all illnesses. The problem can be found at every level of the health system, in all circumstances and on a local, national and international scale. At the start of the study, there were already many known factors influencing the misuse of existing antibiotics (see Chapter 3). However, unless steps were taken to improve the use of antibiotics the problem would become worse and worse, with increasing resistance further reducing the likelihood successful antibiotic treatments. This research focused on the key healthcare workers responsible for the administration of medicines, and antibiotics in particular, in the commune level of the health system in Vietnam. The question the study aimed to answer was how, and to what extent, could the commune health workers change their current use of antibiotics into a more rational and appropriate system of prescribing and monitoring these medicines.

The study does appear to have met the expected outcomes (based on the aims). By focusing on all the health workers working at commune centres of a district, this study aimed to review the situation, then develop and pilot a new and systematic approach to education and training for these workers. The aims and specific objectives of the study were defined clearly in advance.

The first aim was 'To evaluate the current using of antibiotics in the community in Myloc district, Namdinh province, Vietnam'. The study expected that the extent of antibiotic use within the studied district would be clearly depicted together with the factors influencing this situation would be identified in which the current education and training of public health workers regarding antibiotic use and misuse would be reviewed. All these expectations were met with the wealth of findings from the initial survey enhanced by using the advantages of triangulation. It was accepted that this study was based in a rural area, and whilst it is suggested that this approach is suitable for other similar areas, the situation may differ in the more urban city settings. However, as in Vietnam over 70% of the population reside in rural areas, the study has relevance for much of the country. It is therefore recommended that this programme be trialled on a large scale in other rural provinces. However, in any future study it is suggested that the perceptions of clients/patients be included. However, these activities would need increased allocation of manpower and financial resources.

The second aim 'To develop a conceptual framework and education and training model for public health workers to reduce antibiotic misuse among the population in

Myloc district, Namdinh province Vietnam that is transferable to other rural areas in Vietnam'. The expectation was that a conceptual framework and model for education and training for public health workers with a training programme for them based on this framework and model would be developed to reduce antibiotic misuse in the commune level. Through the process of reviewing the existing theories of adult learning from both the a western and east Asian perspective ,active learning philosophies were considered. They were then reviewed in the light of the specific context of Vietnam especially of the context of Vietnamese commune health workers from the baseline measurements of the study. From these processes, the conceptual framework and the learning model for these staff were developed. The model was based on Kolb's experiential learning model modified to fit into the Vietnamese health system. This model was then piloted through the implementation of the training programme given to the study' sample. Evaluation using triangulation, included evaluating the knowledge and practical ability by questionnaire, the behaviour by observation, and the attitudes by focus group discussions. Overall the effectiveness of the learning model and the training programme was evident. With any future study it is recommended that an additional evaluation be included, and that the patients/clients be asked whether they noted any changes in practice.

The third aim 'To make recommendations for the development of policies and practice to reduce antibiotic misuse in rural areas in Vietnam'. Although the full findings of the study have not been published, during the project there have been four publications in appropriate Vietnamese journals (the English abstracts are presented in Appendix 10), and one is in preparation for an international journal. The positive changes in the health workers' perception, practical ability and their attitude at the final assessment of the study were evidence of the effectiveness of the programme regarding appropriate use and administration of antibiotics; thereby reducing the misuse of antibiotics; and the suitability and acceptability for the continuing learning of health workers. A copy of the main findings had to be circulated to the provincial health authorities who were keen to see improvements in prescribing. They gave the original approval for the study and results do demonstrate better prescribing practice. The outcomes of the study will also be submitted to the MOH for consideration and a continuing education and training programme in Vietnam.

METHODOLOGICAL LIMITATIONS

All research has some limitations, and the key issues for this study are given below, these included sampling, data collection and research method, and language.

Sampling

The purpose of this study project was to develop and pilot a training model in one rural area, thus from within that rural district all of its community health centres were selected and all health workers of each centre were invited to participate in the study. This type of sampling had great advantages regarding the ease of recruitment, monitoring and follow-up, and obtaining a good response rate. It also had advantages in retention of the sample members and in enabling qualitative insights to be added to the initial quantitative baseline measures. Triangulation meant different data sources complemented and strengthened each other. The documentary data for the baseline measures used random sampling, with the sample size based on a power calculation.

However, there are potential weaknesses, both with a purposive sampling strategy and the sample size used in this study. There are suggestions that this approach might reduce credibility of a study, and information about the representativeness of samples (Bowling, 1997; Burns & Grove, 1997; Creswell, 2007). It is possible to argue that in terms of the country as a whole, the main sample size of 11 commune health centres was small, and that therefore it would be difficult make generalizations across the national context. However, for this study, these issues were not seen as a problem. Firstly, because this was an initial or pilot study. Secondly, because the structure of the healthcare system is the same in all areas of the country, and with 70% of the country still rural it is anticipated that the study will be applicable in other similar areas. In addition, every effort was made to encourage participation, with the greatest respect for the participants' autonomy, self-determination, privacy, anonymity, confidentiality, peer-treatment, and any protection the participants from discomfort and harm. The official approval for the study was at both national and local authority level, so reassuring potential participants that the time needed for participation had been agreed (Appendices 1, 2, and 3).

Data collection

The use of triangulation gave strengths to the study, but also possible limitations. Firstly, the use of self-completion questionnaire for both baseline data in the initial

survey and for measurement in the intervention. Collecting data by self-completion questionnaire has advantages such as ease of getting information, time and cost saving, there is no interviewer effect and it is convenient for respondents. However, this method had itself several limitations, these include the inability to prompt when respondents had difficulty answering a question, and there is no room for respondents to answer in a more detailed way or to provide additional data. Also it was difficult to ask more qualitative types of questions, with some questions, inappropriate responses were given for some kinds of respondent, risk of missing data and lower response rate (Bowling, 1997; Bryman, 2008). In this study, to minimize these limitations the questionnaire was developed and piloted, and discussed with the academic supervisors. All questions were related to the respondents' work and simple answers with clear instructions given on each page. Question and answers were always kept together and there was enough room for answers open-ended questions, and was lots of space at the bottom that enabled the respondents to give further information. The researcher's presence in each group of respondents giving more instructions if asked provided to be helpful. This study was followed-up with focus groups which were complementary to the questionnaire method.

Secondly, as said above, the focus groups were used in both the initial survey and the intervention. Focus groups have the potential for exploring the insights of a topic, this allows participants' perspectives to be revealed. However, they also have limitations, they are difficult to organize, there is less control over proceedings by the researcher, it is more difficult to analyse the data, and they are time consuming to record and to transcribe. To minimise the limitations, care was taken when two or more participants spoke at the same time, to encourage a reticent participant or limit a dominant speaker, and to keep the group discussing the main topics (Bryman, 2008). In this study, clear information of the research topic was given and there was a comprehensive introduction of the research to the participants, a clear form of guides and questions for discussion were used. Notes taken during discussions were added to the tape-recordings, and the relevance of medical practice between the researcher and the participants (Appendices 5 and 9) also helped. Above all the researcher received support from supervisors who have expertise in this approach.

This study used series of mini-observations of a small number of cases in each health centre (seeing how the health workers were working with their patients). A clear form of structure for observation and field notes were designed in advance and

the researcher had previously had prolonged engagement with the participants. No interference and no comments were made on the participants' activities during any contacts between the health workers and their clients/patients. These all helped the participants' activities to take place as usual. However, it was accepted that to some degree the presence of the researcher may have altered the interactions between patient and worker (Bowling, 1997; Bryman, 2008), although the staff themselves and the patients reported that it was not a problem for the researcher to be present. Prior to the observations there was some concern that in an 'observer as participant' role (Bryman 2008), the researcher might encounter a situation which left him no choice but to participate (for example if poor prescribing practice had been seen), however, no such problems occurred. Addressing the problem of researcher influence, Hughes (2007, p.99) from his experience, points that "*Once the researcher has become familiar to them, subjects may be surprisingly open in discussing sensitive and potentially problematic issues.*" In this study the researcher's presence and time spending with the health workers during the initial survey brought this advantage.

Language

The approaches of research methodology, learning theory, presenting and writing up work were studied in English whilst the activities with the community health workers were carried out and recorded in Vietnamese with translation. There is unavoidably a gap in the meaning of research work or a loss of meaning from the origin. It is evident that working with the first language and translating is difficult and likely to lead to problems. For example where translators were used, the translated work was not seen as adequate and had to be redone by the researcher, in some circumstances it felt that as Wong & Poon (2010) suggest no translation is best. However, the communication between the researcher and the health workers in Vietnamese had a great advantage, as it gave the researcher the ability to understand thoroughly the participants' circumstances. The meaning was obtained firstly in Vietnamese then translated into English, this led to the researcher's prolonged involvement in using English, helped to reflect on and generate ideas from the focus groups, all of which not only improved the analysis of the data, but helped narrow the gap between Vietnamese and English supervisors.

REFLECTIONS ON THE PHD PROGRAMME

Improving the capacity of nurses education and training in Vietnam

As part of a big national study, behind the remit for this study was the need to increase the capacity of nurse education leaders. In those terms, the aim was for the study to provide a learning opportunity for the researcher to develop an in depth understanding of research and learning/teaching methods that could be cascaded to other colleagues involved in nurse education. In practice the process of developing and implementing the study offered a range of different learning opportunities, to the extent that on reflection, in a word, the researcher is now different.

Personal learning experience through carrying out the PhD study

Before this study, although a graduate from a famous medical university in Vietnam and having obtained a master degree in medicine, the researcher had had little input regarding research or learning/teaching approaches. Completing this PhD study has led to a strengthened and deepened understanding of both areas. The skills of critical analysis, synthesis and conceptualisation of relevant literature, not only helped in designing and developing the framework and training programme, but will be invaluable assets that the researcher can use in education in Vietnam. The processes of accessing literature resources then identifying new insights from each piece of relevant information are skills needed by all healthcare professionals, and can be included in both staff and student education and training. The development of the literature review in this study has led to a more comprehensive understanding on the research topic (antibiotics) as well as providing the ability to identify problems in other healthcare approaches and find ideas for solving them. Again a necessary aspect of professional practice that will be cascaded to students and colleagues.

The engagement at PhD study level led to the researcher gaining in knowledge and ability regarding the application of research methods. Before this study his choice would have been for a simple quantitative approach. With an understanding of the epistemology of research, and the different research paradigms, it was possible to accept and utilise opposing standpoints of the main positivist and interpretivist paradigms. Both paradigms have philosophical and/or ideological stances that help individuals to understand the nature of the world and how knowledge is produced. In many contexts of research, but especially in healthcare and social work, a relevant combination of these approaches provides rich data and understanding that can help solve problems and find new and relevant solutions (Broom and Willis, 2007). Vietnam, as a rapidly developing country needs healthcare professionals who can

help their colleagues adapt to the increasingly western approaches being implemented, for example the adoption of the ASEAN competences is moving healthcare to a western model.

As a senior academic in the university, the researcher has a lead role in the design and implementation of teaching programmes. Currently, in Vietnam, there is little overall expertise in research and qualitative research methods are very new. It is recognised that research methods are complicated and not easy to understand comprehensively, with some research students seeing approaches to research methods as experiencing a nightmare. The researcher is now in a position to take the lead developing a research programme that demystifies research methods and helps begin to lay the foundations for evidence based practice. The use of both quantitative and qualitative methods in this study based in Vietnam, provides a practical demonstration for colleagues of the implementation of research into practice. This includes using different sources for research, collecting and analysing data from documentary sources, using questionnaires, overt observation techniques and focus group interviews in medical and nursing practice. It is the researcher's intention that the study will form the basis for publications in both education and health based journals in Vietnam.

Having completed this study and thesis the researcher has also improved other skills that can be translated back into education and training in Vietnam. For example learning to present at international scientific congresses, this includes how to write an abstract, develop a poster and give oral presentations. It will be possible to teach both students and colleagues how to produce and give confident and good presentations, in terms of both content and delivery. Other practical skills include academic writing, and the use of statistical packages such as SPSS software for analysing, transforming and expressing data.

Above all, the experience from working with the community health workers and from using the principles of experiential learning has emphasised for the researcher, the need for educators to link with practice. This cooperation not only gives professionals access to education and training, for the educator it provides the opportunity to stay in touch with the realities of health care in the current context. The Vietnamese modes of teacher-centred learning in university and doctor-centred learning in hospitals are top down approaches that do not empower and increase the expertise of those who either are studying to improve their work, or are working

in health care. The study provides a good example of how to use the alternative student centred approach and why it is so effective. Only through the increasing generation of data bases of examples of successful learning approaches and practice based research will healthcare professionals be able to develop the knowledge and skills to meet the needs of both students and client groups.

This study was the first challenge for the researcher in terms of PhD level of research, but it forms the starting point of learning in the future for the researcher, the commune health workers, and professional colleagues and students.

RECOMMENDATIONS

The microbial resistance to antibiotics and the consequences that arise from multi-resistant bacterial infections are now a global problem and in developing countries such as Vietnam are becoming a serious threat to public health. The increasing use of, and access to antibiotics are compounding the difficulties faced by health care professionals trying to find antibiotics to successfully treat their patients. The problem is now so great that as Mudur (2011) points out at the First Global Forum on Bacterial infections has called on India and other developing countries to intensify action to reduce irrational and irresponsible use of antibiotics. However, in Vietnam, while nationally this is seen as a problem, and although Vietnam has made great strides in improving health, it is recognised that for the 70% who remain in poverty, health care services have not reached the level that the government is aiming for. In the master plan for nursing 2020 developed by NPT 117 Health the need to improve community nursing has been clearly stated, in line with this strategy and in the light of the findings, the following recommendations have been made:

The survey identified that among a number of influencing factors, two problems with the initial education and training of health workers. Firstly all colleges have different curricula regarding drug use and administration. Secondly, the level of knowledge offered was very limited and not linked to the practice. **There needs to be a national review of basic education and training, and a standardised curriculum for all community staff should be developed that incorporates drug administration, and links theory to practice.**

The baseline measures of the health workers' knowledge and practice regarding antibiotic use, revealed gaps in all key areas of antibiotic administration. This study

found little awareness of the gravity of the situation, or the long term implications of their prescribing practices. In addition, the health workers in the community level were assigned a multifunctional task with no mandatory updating. **In the light of the rapidly advancing medical changes and advances in medication, consideration needs to be given to developing a formal system of continuing education for these workers.**

Vietnam as a country has major rural areas with limited infrastructure and access to transport. In consequence, the commune health workers based in these areas find it very difficult to access the limited updating that is available. The time needed because of the distances and transport problems means that each commune can at best afford to free up one or two workers to attend any centrally held courses. The structure and format of the programme developed in this study takes the training to the workforce. Only one person (the facilitator) is required to travel and all staff can attend. **It is therefore suggested that until rural infrastructures that include either transport or access to technology are developed, there is a cost effective way to upgrade community staff, and the Modified Kolb's Model for Vietnam (MKMVN) developed in this study should be considered by local and national authorities for permanent implementation.**

The study found that the commune health workers accepted the limitations of their education and training as normal, but for successful continuing education in their remote setting, a high level of motivation is needed. Programmes offered have to move the commune workers from passive participants to active learners. The evaluation of the **Modified Kolb's Model for Vietnam (MKMVN)** developed in this study, clearly showed its appropriateness, acceptability and accessibility for the workers. It also demonstrated both effectiveness and sustainability. **It is therefore recommended that this model should be considered for use in other areas such as diabetes, hypertension, cerebral vascular accidents (CVA) and Chronic Obstructive Pulmonary Disease (COPD)**

The appreciation shown by the participants of the supportive learning environment which facilitations engenders was evident in all the focus groups. **It is therefore recommended that the role of facilitator be included in all future programmes developed.**

The researcher kept in direct and regular contact with the team leaders of provincial health department, district health centre and commune health centre throughout the project. These activities removed possible delays and institutional barriers **Maintaining formal links is important and these steps should be followed in other similar projects,**

The choice of a workshop approach meant that the differently educated workforce (in terms of level and content) was a positive factor with all staff working together, rather than being divisive. **The sharing of practical experience was the one of key factors that helped the programme to achieve the remarkable changes seen in the study and should be used in future such programmes.**

The model chosen goes from the known to the unknown, the decision was made that in this instance practical experience should be used to lead the participants into critical analysis and reflection of their own knowledge and understanding. **This important change in thinking which enables participants to move towards using evidence to underpin practice is important and should be included in all future programmes.**

Lack of a well trained workforce in healthcare in Vietnam is the reality, so sending staff to another country for higher education will be needed for some years to come. However, care needs to be taken that introducing western models into Vietnam, does not adversely affect existing structures. **There is a need to work within the cultural context of the home country and recognise issues such as equal opportunities and mode of study to maximise the benefits to participant, organisation and country.**

Supervisors need to have access to, and/or understanding of the context in which their students work, supervisory visits are also of great benefit, in this study the supervisor was regularly in Vietnam. **The need for supervisory access to, and understanding of the context of a project should be recognised and included into policy and project planning for training in Vietnam.**

Applying this learning model can strengthen commune health workers' knowledge and help them in providing service for their patients/clients with a range of conditions (including diabetes, hypertension, Cerebral vascular accidents (CVA) and Chronic Obstructive Pulmonary Disease (COPD)). **It is therefore recommended that this**

model be considered by policy planners as a basis for beginning to develop continuing education and training for commune health workers.

It has to be accepted that this study was based in a rural area, and whilst it is suggested that this approach is suitable for other similar areas, the situation may differ in the more urban city settings. However, as in Vietnam over 70% of the population reside in rural areas, the study has relevance for much of the country. **It is therefore recommended that as a first step in implementing the above recommendations the Modified Kolb's Model for Vietnam (MKMVN) be trialled on a large scale in other rural provinces.**

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Appendices

APPENDIX 1: APPROVALS TO THE STUDY PROJECT

Ministry of Health of Vietnam
Department of Science and Training

Add : 138A Giang Vo, Ba Dinh, Ha Noi, Vietnam

Tel : 84-4-273 2273 ext 1413 Fax : 84-4-273 2243

Birmingham City University
Faculty of Health
Franchise Street
Perry Barr, Birmingham B42 2SU
United Kingdom

31 March, 2008

Dear Sir or Madam:

I am writing this letter on behalf of Department of Science and Training, a functioning division of the Ministry of Health of Vietnam (MOH) responsible for education and training administration of the health sector, to approve Mr. Ngo Huy Hoang, a lecturer from Namdinh University of Nursing, for his PhD, research project.

The title of research project is "The development of a model for Information, Education and Communication to reduce antibiotic misuse among the Vietnamese population in Namdinh Province."

The main purposes of the research are:

- To evaluate the current using of antibiotics in the community in Myloc district, Namdinh province, Vietnam;
- To develop a model for public health workers to reduce antibiotic misuse among the population in Myloc district, Namdinh province of Vietnam and then it will be transferable to other rural areas in Vietnam.

The research will last from 2008 to 2010. The methods applied will be surveys, interventions, assessments and evaluations regarding to antibiotic use in the community in Vietnam. The research will be involved the participants who are public health workers at the commune health stations in Myloc Namdinh, Vietnam with their consent. The participants will be required to answer questions, give their opinions, show health record books, attend training or education courses, apply programmes to obtain knowledge then change their attitude and action regarding to antibiotic use from which to reduce antibiotic misuse in the community.

The findings of the research, related articles and dissertation will be permitted to present or publish nationally and internationally after identified and approved by supervisors/project implementation board/Ministry of Health and director of studies.

The finance for the research project is granted by NUFFIC project VNM/117, Saxion.

Thank you very much for your cooperation. Please do not hesitate to contact me if you have any further enquires.

Sincerely,

Truong Viet Dung, MD., PhD.
Director of the Department of Science and Training

Ministry of Health of Vietnam



Do Dinh Xuan, MD, PhD
Rector of Nam Dinh University of Nursing
257 Han Thuyen St, Nam Dinh City
Vietnam

To

Professor R Ashford
Director of Post Graduate Research
Faculty of Health
Baker Building
City North Campus
Birmingham City University
Franchise Street
Perry Barr
B42 2SU
UK

Dear Professor Ashford

This is to confirm that Dr NGO HUY HOANG is employed at Nam Dinh University of Nursing and has been selected by the Netherland Project for Strengthening Nurse Education (funded by Nuffic) to apply to study for an MPhil/PhD at Birmingham City University.

I confirm that I am happy to work in collaboration with BCU for the duration of his study period. I will support reduction in his work commitments to enable him to study and will release him from his work duties so that he can attend BCU for the required number of weeks each year.

Yours sincerely

Do Dinh Xuan

Hanoi University of Pharmacy
13 - 15 Le Thanh Tong Str, Hoankiem Distric
Hanoi, Vietnam
Associate Professor Hoang Thi Kim Huyen, Pharm D, PhD
Head of Clinical Pharmacy Department
Tel: + 84 4 8 465151 (Home)
+ 84 4 9 330771 (Office)

20.02.2008

Dear professor Ashford

Regarding the Application of Ngo Huy Hoang for admission to a PhD Study programme at Birmingham City University (BCU).

I have known Dr Hoang for his work and qualifications that he has gained. Dr Ngo Huy Hoang was born on 19.07.1964 in Namdinh, Vietnam. He graduated and has recognized the title of general medical doctor at Hanoi Medical University. He has been working as a lecturer in medical nursing care at Namdinh University of Nursing where his work needs a high standard.

In addition, he has gained an Master's degree in Medical Disease Medicine from Hanoi Military Academy of Medicine and also has worked hard to reach the required level of English, and I have no doubts that given this opportunity he will be able to reach the required academic level and complete his PhD programme.

I have considered his proposed study with title: 'The development of a model for Information, Education and Communication (IEC) to reduce antibiotic misuse among the Vietnamese population in Nam Dinh Province'. I recognize that this project is interesting and feasible. He will be successful in his study programme if he work hard and recieve all necessary help.

This is to confirm that I support Dr Hoang's application for study at BCU. He is well motivated, hard working and highly committed to advancing his academic study. Should you require further information please contact me again.

Yours sincerely

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Namdinh University of Nursing
257 Hanthuyen Str, Namdinh City
Namdinh Province, Vietnam

Do Dinh Xuan, MD, PhD
Rector of NUN
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Direct Line: + 84 350 3 641463
Fax: + 84 350 3 642 669

20.02.2008

Dear professor Ashford

Regarding the Application of Ngo Huy Hoang for admission to a PhD Study programme at Birmingham City University (BCU).

I have, as an employer, known Dr Hoang for his personal details, work and qualifications that he has gained. Dr Ngo Huy Hoang was born on 19.07.1964 in Namdinh, Vietnam. He graduated and has recognised the title of general Medical Doctor at Hanoi Medical University, one of the most famous universities for training in medicine in Vietnam founded in 1902. At Namdinh University of Nursing where I have managed, Dr Hoang has been working as a lecturer in medical nursing care and has been appointed as Head of Medical Nursing Department since 2003 due to his efforts and capacity.

In his process of working at Nam Dinh University of Nursing Dr Hoang always manifests himself in the capacity of studying and his desire to study more. He has taken part in science research activities and contribute to our achievements. I have read his proposed study titled 'The development of a model for Information, Education and Communication (IEC) to reduce antibiotic misuse among the Vietnamese population in Nam Dinh Province' and recognized that this is significant and feasible. Although this is a new area to Dr Hoang, I believe that if he work hard and recieve all help from advisers, supervisors he will be successful in his study programme.

This is to confirm that I support Dr Hoang's application for study at BCU. He is well motivated, hard working and highly committed to advancing his academic study. He is employed at Nam Dinh University of Nursing as a lecturer, where his work is of a high standard and evaluates well especially in the future.

Academically in addition to his initial medical qualifications, he has gained an Master's degree in Medical Disease Medicine from Hanoi Military Academy of Medicine. He has worked hard to reach the required level of English, and I have no doubts that given this opportunity he will be able to reach the required academic level and complete his PhD.

Should you require further information please contact me again.

Yours sincerely

Do Dinh Xuan
Direct Line: + 84 350 3 641463
Fax: + 84 350 3 642 669
Email: xuan180252@hotmail.com

APPENDIX 2. PROJECT INFORMATION

PHASE ONE

Dear all

The study is about the develop of a model for public health workers to reduce antibiotic misuse in the community based on evaluation the current using of antibiotics in Myloc distric Namdinh province then it will be also transfered to other rural areas in Vietnam.

The study is being done because the misuse of antibiotics is a major threat to the public health, where first and most usage of antibiotics takes place in the community yet there have been few studies exploring reasons behind the use of antibiotics and few effective interventions to slow down and prevent the threat.

We have had the approvals from the Ministry of Health, the Namdinh Department of Health and the Myloc Bureau of Health. In order to be able to develop an appropriate programme that will support for your location later the study first needs a survey on the current using of antibiotics.

On this survey each of you will be asked to fill in a questionnaire. The questions are simple regarding your education, knowledge and understanding of antibiotic use. Then a comprehensive discussion will take place on site in which the extent of antibiotic use, factors that contribute to using of antibiotics, problems or difficulties you are facing, your requirement of training and so on will be mentioned. Also your health record books within the year 2007 will be reviewed or copied.

The answers from your sheets, information from discussions and record books will be encoded to enter a computer. These are only used for study's goal this means to develop a model supporting you in using rationally antibiotics from then to reduce antibiotic misuse in the community.

Please accurately fill in the form given following without your name. Note that all data is collected anonymously and there is no link to your organisation or location.

Thank you for your collaboration.

PHASE TWO

Dear all

Having continued the survey in the year 2008 and the approvals from the Namdinh Department of Health and the Myloc Centre of Health, we would like to invite you to participate a training programme regarding antibiotic use. The programme aims to improve the current situation of antibiotics, as a part of national and international efforts to contain the bacterial resistance.

Before and after the programme you will be asked to fill in a questionnaire with simple questions of your knowledge and practical experience regarding antibiotic use. A mini-observation of your work during the course will be taken place. After the course we would like you all to participate a thirty-minutes session of discussion in order to give your own feedback on the programme.

The answers from your sheets, your opinions from discussions will be encoded to enter a computer. These are only used for study's goal this means to complete a training model for the commune level to use prudently antibiotics that will be transferable to other areas of our level as well as to make recommendations for the policies and practice in our country.

Please accurately fill in the form given following without your name. Note that all data again is collected anonymously and there is no link to your organisation or location.

Thank you for your participation.

APPENDIX 3. PARTICIPANT'S CONSENT FORM

Having been clearly informed of the purpose and requirements of the study project and I understand that

- All my questions have been answered to my satisfaction and I am free to request further information at any point of time
- I am perfectly willing to take part in all discussions and observations and I also agree to be audio-taped
- My participation is entirely voluntary and I am free to withdraw from the programme if any disadvantage with me
- My personal identification is not appeared on any report or publication and the raw data on which the results of the study depend will be retained in secure storage

By signing my name in the below I do consent to participate this study project.

(Signature of participant) (Date) / /

APPENDIX 4. QUESTIONNAIRE – PHASE ONE

QUESTIONNAIRE FOR COMMUNE HEALTH WORKERS REGARDING ANTIBIOTIC USE

Date / /

Commune health centre No:

Sheet No

Please complete the questions below. Do not write your name

Q1. Date of Birth: / /

Q2. Sex: Male Female

Q3. Highest qualification gained (please tick a box as appropriate)

- Graduate nurse
- College nurse
- Secondary nurse
- Primary nurse
- Graduate midwife
- College midwife
- Secondary midwife
- Primary midwife
- Medical doctor
- Undergraduated physician
- Graduate pharmacist
- Secondary pharmacist
- Primary pharmacist
- Medical technician
- Other (specify)

Q4. Certificated/graduated Year of highest qualification:.....write the year in number

Q5. Number of years in profession: years, write in number of years

Q6. Have you attended training courses of health for the last 3 years?

- No if No, go to Q7
- Yes if Yes, please list the attended courses on the table below:

No	Title/content of course	Attended Date	Organizer
1	 / /	
2	 / /	
3	 / /	
4	 / /	
5	 / /	

Q7. Have you been attended any training course of medicine use since your graduation?

- No if No, go to Q8
- Yes if Yes, please complete Q7.1, Q7.2 and Q7.3

Q7.1. Title/content of course (write your answer on the space below)

.....

Q7.2. How many times attended: times, write in number of times

Q7.3. The last time attended was on the date: / /

Q8. Based on your own understanding, please answer what antibiotics are (write your answer on the space below)

.....

Q9. Which kind of the infections following can be treated with antibiotics? Please tick box as appropriate:

- Virus infections
- Bacterial infections

Q10. What happens if the patient does not complete the course? (write your answer on the space below)

.....
.....

Q11. What are the results of self-medication? (write your answer on the space below)

.....
.....

Q12. What is your concept of misuse of antibiotics? (write your answer on the space below)

.....
.....

Q13. What are the consequences of antibiotic misuse? (write your answer on the space below)

.....
.....

Q14. Within 12 months of the year 2007, common infectious diseases at your commune were (write your answer on the space below)

.....
.....

Q15. Within the infection diseases you mentioned above, what were the symptoms and/or manifestations that you based on to give patients antibiotics? (write your answer on the space below)

.....
.....

Q16. When you decide on giving clients antibiotics, the class of antibiotics chosen will be based on (write your answer on the space below)

.....
.....

Q17. When you decide on giving clients antibiotics, the dose of antibiotics indicated will be based on (write your answer on the space below)

.....
.....

Q18. When you decide on giving clients antibiotics, the number of days for a course of antibiotic use will be based on (write your answer on the space below)

.....
.....

Q19. A course of antibiotics at least needs to be used to cure a patient is days? Please complete the gap with an appropriate number.

Q20. Sources of information and knowledge of drug/antibiotic use that you based on to prescribe and administer medicines daily were from. Please tick one or more than one box as appropriate

- Q20.1. student time
- Q20.2. training courses
- Q20.3. drug guide books
- Q20.4. append guide leaflet
- Q20.5. information on cover
- Q20.6. colleagues
- Q20.7. other

sources

.....
Q21. What do you do when you meet a patient who has not completed the course?
(write your answer on the space below)

.....
.....

.....
Q22. How many % of your patients used self-medication before seeing you? (write your answer on the space below)

.....
Q23. What do you do when you meet a patient who use self-medication? (write your answer on the space below)

.....
.....

.....
Q24. How many years have you given clients physical exams and medicines (write in number of years) ?

Q25. Difficulties that you have while making decisions on giving clients antibiotics (write your answer on the space below)

.....
.....
.....
.....

.....
Q26. Please give other comments/information about antibiotic using (write your answer on the space below)

.....
.....
.....
.....

Thank you for your answer.

APPENDIX 5. GUIDE FOR FOCUS GROUPS – PHASE ONE

Goal:

- to assess the extent of antibiotic use within the location
- to identify the factors that influence antibiotic use
- to identify the requirements of education and training regarding antibiotic use

Subjects: the public health workers at commune health stations in Myloc district

Duration: 45-60 minutes

Contents Guidelines:

Dear all

We are planning to develop a training model for public health workers to use rationally antibiotics. In order to obtain objective information that will be used as a database of development the model we would like to receive your cooperation in giving objectively and honestly about the following. Please note that all of your opinions will be only used for development the model.

Please tell us

- What type of medicines is the most commonly used at your location.
- What types of antibiotics are commonly used at your location.
- Explain the reasons why these antibiotics are commonly used at your location.
- When making decisions on giving clients antibiotics, should there are other reasons in addition to the medical reason. Please tell what they are.
- If there is any supervision on using antibiotics at your location, who supervise, how often a supervision is taken place and in what way.
- If there is any punishment for an irrational prescribing of medicines in general and of antibiotics in particular.
- The current health education and training programmes, oriented subjects, organized form and which of them is most effective and the reason why it is effective.
- In the process of working at your location, please tell if information on medicines and use of medicines are updated, how often and in what way. Please tell which way is appropriate and effective for you.
- If there are documents related to antibiotic and drug guide, if it is useful for your working daily and why it is useful.
- Difficulties that you get while prescribing clients antibiotics.
- What conditions are necessary to indicate rationally antibiotics to clients.
- Should updating knowledge of antibiotic use is your necessary requirement. If there is a support available what way is suitable for you while working at your location.
- Is there anything else that you think we should discuss or that you think I should know.

Thank you for joining us.

Notes from focus group – Phase One

Health centre No:

Date: / /

Participants

- Chairperson (facilitate & control)
- Secretary (takes brief notes)
- Health workers at the location (give opinions)

Opinions from health workers

(a sound recorder will also be used to record opinions from the beginning to the end)

- **Extent of antibiotic use:**

- Type of medicines most common used at the location:

.....

.....

- Types of antibiotics common used at the location:

.....

.....

- The reasons why these antibiotics are common used:

.....

.....

- **Nonmedical factors contribute to antibiotic use:**

- belong to clients and their relatives:

.....

.....

- belong to public health workers:

.....

.....

- belong to managers/organizations:

.....

.....

- Others:

.....

.....

- **Current management and supervision:**

- supervisors/organization:

.....

.....

- ways to manage and supervise:

.....

.....

- Frequency of supervision:

- Types of punishment for an irrational prescribing of medicines/antibiotics:

- **Current health education and training programmes for the health workers at the location:**

- Title/content, oriented subjects:

- Main methods of the programmes:

- The programme appreciated most effective and the reasons why:

- **Facilities for knowledge and understanding of antibiotic use in the process of working:**

- Current sources of information on antibiotic use:

- The most useful source regarding to antibiotic use and why:

- Difficulties of health workers in decision on giving patients antibiotics:

- Essential conditions for rational use of medicines/antibiotics:

- Needs of health workers for improvement and maintenance of knowlege and understanding about antibiotic use:

- Ways, methods that are likely to appropriate for public health workers while working at the location:

- Further opinions:

Secretary

Chairperson

APPENDIX 6. QUESTIONNAIRE – PHASE TWO

QUESTIONNAIRE ON ANTIBIOTIC USE FOR COMMUNE HEALTH WORKERS

[Health Centre No:]

[Participant No:]

Date / ... /

Please complete the questions below. Do not write your name.

Brief personal information (Please tick a box or write numbers as appropriate)

- Gender: Male Female
- Date of birth: 19.....
- Your highest qualification:
 - Medical doctor
 - Assistant doctor
 - Nurse: Bachelor College Secondary Elementary
 - Midwife: Bachelor College Secondary Elementary
 - Pharmacist: Bachelor College Secondary Elementary
- Number of years in career: years; or the year for beginning your career: 19.....

Q1. Do you agree or disagree with the statements below?

(Circle 'Yes' or 'No' as appropriate from the number 1 to 10)

- Yes / No 1. Most infections need antibiotics to treat
- Yes / No 2. Most acute respiratory tract infections (ARIs) need antibiotics to treat
- Yes / No 3. Many infections are caused by viruses and antibiotics do not kill viruses
- Yes / No 4. The immune system of the body can clear most infections include bacterial infections
- Yes / No 5. When the treatment with antibiotic is necessary, it should be started with one class of antibiotics
- Yes / No 6. When the treatment with antibiotic is necessary, it should be started with more than one class of antibiotics
- Yes / No 7. When an antibiotic is chosen, it should be started with a narrow-spectrum antibiotic
- Yes / No 8. When an antibiotic is chosen, it should be started with a broad-spectrum antibiotic
- Yes / No 9. The number of days for a course of antibiotic use depends on specific bacterial infections
- Yes / No 10. A 5-day course of antibiotic use is enough for all bacterial infections

Q2. Do you agree or disagree with the statements below?

(Circle 'Yes' or 'No' as appropriate from the number 11 to 20)

Misuse of antibiotics

- Yes / No 11. increases bacterial resistance
- Yes / No 12. increases morbidity and mortality
- Yes / No 13. reduces the effect of antibiotics on bacteria
- Yes / No 14. makes bacterial infections uncured with existing antibiotics
- Yes / No 15. makes the duration of disease/condition become longer
- Yes / No 16. increases the transmission of bacteria in the community
- Yes / No 17. increases the number of people with bacterial infections in the community
- Yes / No 18. increases the risk of unwanted effects such as adverse antibiotic

reactions

- Yes / No 19. increases the health care cost
Yes / No 20. creates psychosocial effects, e.g., patients believe that there is “a pill/drug for every ill” or “there is an antibiotic for every infection”

Q3. Among the diseases/conditions below, which one needs or does not need a systemic antibiotic use: (Circle ‘Yes’ if it needs or ‘No’ if it does not need from the number 21 to 30)

- Yes / No 21. Acute Rhinitis
Yes / No 22. Acute Pharyngitis
Yes / No 23. Acute Laryngitis
Yes / No 24. Acute Bronchitis
Yes / No 25. Conjunctivitis (red sore eyes)
Yes / No 26. Acute Diarrhoea
Yes / No 27. Functional disorders of colon
Yes / No 28. Urinary tract infections
Yes / No 29. Boils and Carbuncles
Yes / No 30. Impetigo

Q4. Among the clinical manifestations below, which one is typical of a bacterial infection (Circle T “true” or F “false” from the number 31 to 50)

- T / F 31. fever
T / F 32. chills
T / F 33. fatigue
T / F 34. cough
T / F 35. runny nose
T / F 36. nose discharge with pus, yellow or green
T / F 37. expectoration of pus or green/yellow sputum
T / F 38. dyspnea
T / F 39. hoarse voice
T / F 40. ear discharge with pus
T / F 41. abdominal pain
T / F 42. nausea, vomiting
T / F 43. watery faeces
T / F 44. blood mixed with faeces or bloody diarrhoea
T / F 45. strangury, frequent and urgent passing urine
T / F 46. stinging urinating, dirty and pus urine
T / F 47. boils, carbuncles
T / F 48. pus discharge from lesions of skin
T / F 49. rashes
T / F 50. itching scratches

Q5. The following are common bacteria and body organs which are commonly infected with them, match the bacterium with the infected organ: (Write the corresponding letter on the space provided from the number 51 to 54)

- A. Escheria coli (a Gram-negative bacillus)
B. Hemophilus influenza (a Gram-negative bacillus)
C. Staphylococcus aureus (a Gram-positive coccus)
- _____ 51. commonly causes disease in respiratory tract
_____ 52. commonly causes disease in digestive tract
_____ 53. commonly causes disease in urinary tract
_____ 54. commonly causes disease in skin and soft tissue

Q6. The following are antibiotics recommended to use for susceptible bacteria in body organs, match an antibiotic with infected organ(s): (Circle one or more than one corresponding letter for each antibiotic from the number 55 to 59)

- A. Infections due to susceptible bacteria in respiratory tract
B. Infections due to susceptible bacteria in digestive tract
C. Infections due to susceptible bacteria in urinary tract

D. Infections due to susceptible bacteria in skin and soft tissue

- 55. Amoxicillin used for A / B / C / D
- 56. Cefalexin used for A / B / C / D
- 57. Penicillin used for A / B / C / D
- 58. Cotrimoxazol used for A / B / C / D
- 59. Ciprofloxacin used for A / B / C / D

Q7. When an antibiotic is given, which one of the instructions below needs to be provided for patients to get an optimal effectiveness of treatment: (Circle 'Yes' if it needs or 'No' if it does not need from the number 60 to 69)

- Yes / No 60. how to read the name of antibiotic
- Yes / No 61. the effect of antibiotic on bacteria
- Yes / No 62. how many capsules/tablets/sachets/...for each intake
- Yes / No 63. how many times a day the antibiotic should be taken
- Yes / No 64. the dosage intervals
- Yes / No 65. when the antibiotic should be taken
- Yes / No 66. how many days the antibiotic should be taken
- Yes / No 67. common unwanted effects, how to recognize and solve
- Yes / No 68. where the antibiotic is manufactured
- Yes / No 69. the price of the antibiotic

Q8. The process of rational treatment includes certain steps and needs to be followed step-by-step order, match the phrases given with the steps: (Write the corresponding letter on the space provided from the number 70 to 75)

- 70. Step 1: ____ A. Start the treatment
- 71. Step 2: ____ B. Specify the therapeutic objective(s)
- 72. Step 3: ____ C. Define the patient's problem
- 73. Step 4: ____ D. Verify the suitability of treatment (check effectiveness & safety)
- 74. Step 5: ____ E. Monitor (and stop?) treatment
- 75. Step 6: ____ F. Give information, instructions and warnings

Q9. Consider the example of patient 1

A 48-year old man comes to your health centre, complains of a dry cough and being itchy in his throat which started two weeks earlier with a cold. He has stopped sneezing and runny nose but still has a cough, especially at night. He is a heavy smoker. Further history and physical examination reveal nothing special. One of your colleagues advises the patient to stop smoking, and considers the treatment for this patient,

- Please help your colleague to define the patient's problem. Circle the corresponding letter that best answer the question.

- 76. The patient's problem is
 - A. Acute Pharyngitis
 - B. Acute Bronchitis
 - C. Cough due to irritated respiratory tract

- Please help your colleague to specify the therapeutic objective. Circle the corresponding letter that best answer the question)

- 77. The therapeutic objective for this patient is
 - A. Anti-inflammation of respiratory tract
 - B. Anti-irritation of respiratory tract
 - C. Anti- bacterial infection of respiratory tract

- Please help your colleague to indicate which one of the treatments below should or should not apply to this patient (circle 'Yes' or 'No' as appropriate), and then explain the reason for your choice (write briefly your answer in the given blank)

- Yes / No 78. Antibiotic
- 79. because
- Yes / No 80. Cough suppression
- 81. because

Yes / No 82. Anti-allergy of respiratory tract
83. because

Q10. Consider the example of patient 2

A 32-year old female comes to your health centre, complains of appearance of a swelling which started three days ago, growing up with pain in her back. Further history and physical examination reveal nothing special, apart from a boil sized 3 x 3mm in her low back which is red, hard and heating but not gathering pus. One of your colleagues gives this patient paracetamol, advises her to keep the boil undamaged until gathering pus, and to come back to lance her boil. Of course an antibiotic is considered to give this patient but there are only three antibiotics available in your centre include ciprofloxacin 500mg tablet, penicillin V 1000mg tablet (equivalent 1,000,000UI) and erythromycin 250mg tablet.

- Please help your colleague choose an appropriate antibiotic among these antibiotics: (Circle the corresponding letter)
84. Antibiotic that should be given to this patient is
 A. ciprofloxacin 500mg tablet
 B. penicillin V 1000mg tablet
 C. erythromycin 250mg tablet
- Explain the reason why you choose this antibiotic (write concisely the reason in the space provided below)
85.

Q11. The survey conducted within 11 health centres showed that Amoxicillin and Cefalexin were most commonly used, and Ciprofloxacin was less commonly used. When the use of these antibiotics are necessary, please provide patients (adult) with the given instructions: (Write numbers or words on the given blanks to complete the instructions)

▪ **Amoxicillin 500mg tablet**

- 86. take tablet(s) each time
- 87. time(s) a day,
- 88. every hour(s),
- 89. at meal(s)
- 90. for days.

▪ **Cefalexin 500mg tablet**

- 91. take tablet(s) each time
- 92. time(s) a day,
- 93. every hour(s),
- 94. at meal(s)
- 95. for days.

▪ **Ciprofloxacin 500mg tablet**

- 96. take tablet(s) each time
- 97. time(s) a day,
- 98. every hour(s),
- 99. at meal(s)
- 100. for days.

Thank you for your answer ./.

APPENDIX 7. DOCUMENT FOR COMMUNE HEALTH WORKERS

A. ANTIBIOTIC RESISTANCE IN VIETNAM

- The reports on "Monitoring of antibiotic resistance of common pathogenic bacteria in Vietnam" namely Antibiotic Susceptibility Test Surveillance-ASTS conducted in 10 hospitals representing for three regions of Vietnam North-Central-South showed:
 - In 2005, five types of common pathogenic bacteria including *Klebsiella spp*, *E.Coli*, *P.Aeruginosa*, *Acinetobacter spp* and *S.aureus* all resisted to multiple antibiotics at high levels which were 15.1%, 13.3%, 13.3%, 9.9%, and 9.3%, respectively. Especially the rate of MRSA (Methicillin-Resistant Staphylococcus aureus) nationwide increased up to 43.7% in 2005 compared with 38.1% in 2004.
 - In 2006, only during the first six months, the rates of antibiotic resistance of above five common bacteria were 17.8%, 16.0%, 12.2%, 11.5% and 9.8%, respectively. It was really concerned with the effect of cefotaxim on *E.Coli*, an antibiotic used preferably to treat this pathogen was resisted at 50.3%.
- According to experts, the phenomenon of bacteria resistance to pharmacodynamic effects of antibiotics have been increasing constantly. The first thing easily seen is that the abuse of antibiotics, misuse of the purposes of anti-bacterial substance. Drug abuse are also increasing. Under pressure from patients, healthcare settings release many prescriptions in types of surrounding with incorrect dosage and time, inconsistency with pathogenic bacteria. These have created new pathogens characterized by resistance to multiple antibiotics.
- To limit the phenomenon of bacterial resistance to antibiotics, it is necessary to identify cause of a disease, to understand the effect of antibiotics, and antibiotics have to be used prudently.

B. BASIC NOTES REGARDING ANTIBIOTIC USE

When an antibiotic is necessary

- Antibiotics are basically defined as drugs that either destroy bacteria (bactericidal) or prevent their reproduction (bacteriostatic). Otherwise antibiotics are drugs only used to treat infections caused by bacteria.
- In fact, both infectious diseases and non-infectious diseases exist and it is evident that non-infectious diseases are increasing in contrast, infectious diseases are decreasing.
- Infectious diseases may be caused by viruses; bacteria; or parasites among infections acute infectious conditions of respiratory and digestive tract are the commonest which are mainly viral causes and need no antibiotic.
- Only conditions caused by bacteria may need antibiotic(s) to treat but not all. There is a fact that most people get well again after mild infections because our body's immune system can clear most infections.

Common problems of antibiotic use

- The use of antibiotics when no antibiotic is indicated, e.g., using antibiotics for most simple ARIs, or use an antibiotic for a common diarrhoea that needs have had rehydration
- The use of wrong antibiotic for a specific bacterial infection, e.g., using an antibiotic less/not susceptible to a pathogenic bacterium
- The use of multiple antibiotics for one condition, e.g., using several antibiotics for a simple bacterial infection
- A course of antibiotic for some specific bacterial infections are shorter than a normal course recommended, e.g., 5 days instead of 7; 10 or 14 days
- The dose/strength is not enough or inappropriate, e.g., low dose intaken each time, the number of times to take is less than the required and the interval between doses is not appropriate

Misuse of antibiotic leads to many consequences

- Increased bacterial resistance
- Increased morbidity and mortality due to avoidable treatment failures
- Bacterial infections are uncured with existing antibiotics
- The duration of disease/condition becomes longer
- Increased transmission of bacterial infections in the community
- Increased number of people with bacterial infections in the community
- Increased risk of unwanted effects such as adverse antibiotic reactions
- Psychosocial effects: patients/the locals believe that there is “a pill/drug for every ill” and then “there is an antibiotic for every infection”
- Increased health care cost

Why no antibiotic for many infections

- Many common infections are caused by viruses and antibiotics do not kill viruses. And also, many bacterial infections do not need systemic antibiotics
- The immune system of the body can clear most infections include bacterial infections
- Use of Antibiotics may cause adverse-effects such as diarrhoea, rashes, feeling sick, etc...
- Unnecessary use of antibiotics has led to bacteria becoming resistant to antibiotics

Common diseases/conditions can be treated without systemic antibiotic in the community level

- Acute Rhinitis or common Cold
- Acute Pharyngitis (sore throat except strep.)
- Acute Laryngitis
- Acute Bronchitis
- Conjunctivitis (topical eye drops not a systemic antibiotic)
- Acute Diarrhoea (common)
- Functional colon disorders

Clinical manifestations suggest bacterial infections

- Nose discharge with pus; green/yellow
- Expectoration of pus or green/yellow sputum
- Ear discharge with pus; green/yellow colour
- Swelling eardrum in whitish or yellow colour
- Blood mixed with feces or bloody diarrhoea
- Dysuria, strangury, frequent and urgent pass urine, dirty and dark urine
- Boils, carbuncles
- Pus discharge from lesions of skin

A process of rational treatment includes these steps below

- Step 1: Define the patient's problem
- Step 2: Specify the therapeutic objective(s)
- Step 3: Verify the suitability of your personal treatment
(check the effectiveness and safety of drugs)
- Step 4: Start the treatment
- Step 5: Give information, instructions and warnings
- Step 6: Monitor (and stop?) treatment

To minimize antibiotic assistance, as a health care worker you should

- Consider whether or not an antibiotic is necessary, identify clinical manifestations or laboratory tests (if available) that indicate a bacterial infection

- When the use of antibiotic is needed
 - Do not immediately give patients multiple drugs or mixed drugs
 - Ask about antibiotics and their effects that a patient taken in the past or before coming to get optimal effects for the current treatment
 - Where no bacterial test is available, choose an antibiotic which recommended being high susceptible to a specific infection by an official drug guides, not by a trade advertisement
 - Write name of antibiotic clearly, a generic/original name first, then a trade mark name in the brackets, e.g., Phenoxymethyl penicillin (Penicilin V); (Ospen)...
 - Instruct patients as in detail as possible include the amount to take each time, when to take, how many times a day, the interval between times to take, how long to continue the treatment, how to take, how to store
 - Inform patients unwanted effects of an antibiotic, how to recognize, how to deal with and report to health care workers
 - Monitor effectiveness of treatment, making an appointment with the patient to re-exam
 - When a patient comes back because of his/her condition is unimproved, try to find out the reason such as the ineffectiveness of antibiotic; intolerance to the antibiotic due to adverse reactions

**C. COMMON DISEASES/CONDITIONS IN THE COMMUNITY LEVEL
(cause, clinical manifestation, treatment and prevention)**

1. Acute Rhinitis
2. Acute Sinusitis
3. Acute Pharyngitis (sore throat)
4. Acute Laryngitis
5. Acute Bronchitis
6. Acquired Pneumonia in community
7. Acute Otitis Media
8. Acute Conjunctivitis (red sore eyes)
9. Acute Diarrhoea (common)
10. Bacillary Dysentery
11. Chronic functional disorders of Colon
12. Acute Urethritis (non-gonococcal)
13. Acute Cystitis
14. Acute Pyelonephritis
15. Boils and Carbuncles
16. Impetigo (bacterial infected/infested dermatitis)

1. ACUTE RHINITIS

Cause

- a cold is the most common cause
- allergies
- triggers
- virus

Clinical manifestations

common manifestations:

- sneezing
- blocked/congested nose
- runny nose/ watery discharge
- itchy nose both nostrils at the same time

possible, less common manifestations: itchy throat, loss of smell, headache, itchy-watery-red eyes, tired body

Treatment

- usually not treating (**no antibiotic**)
- symptomatic treatment (when necessary):
 - rest, keep body warm in cold weather
 - antipyretic, analgesic: acetaminophen (paracetamol)
 - anti-congested nose: ephedrine drop (1% for children, 3% for adults)
 - anti-runny nose: argyrol drop (1% for children, 3% for adults)
 - anti-allergy: chlorpheniramine; fexofenadine (telfast)
 - if the cause is a cold, a herbal remedy may be effective, e.g., a warm vapour steamer with some attar oiled-herb such as eucalyptus, balm-mint, marjoram, lemon

Prevention

- keep nose clean, keep body warm especially in winter
- avoiding cold, wet places or places with draught
- avoiding the cause of allergy; triggers such as dust, smoke...
- protecting from contact with patients who are getting a cold and rhinitis

2. ACUTE SINUSITIS

Cause

- Most are caused by viruses, after a cold, flu, rhinitis, complications of prolonged untreated acute, some bacteria (*Streptococcus pneumoniae*; other streptococci)
- Other causes: buccal infections, allergy, nasal polyps, nasal foreign object (in children), trauma or surgery on jaws and facial areas, immunodeficiency, smoking ...

Clinical manifestations

Acute sinusitis:

- unusually prolonged persistence of cold symptoms
- facial pain or pressure (often positional)
- nasal congestion, nasal discharge, bacterial sinusitis characterized by frequent purulent or postnasal yellow or green discharge
- other manifestations: fever, headache, coughing, difficult to breathe and tired, children may struggle stimulation, mouth breathing, snoring breathing

Chronic sinusitis: a persistent sinus inflammation characterized by congestion and discharge but rarely fever survival over 12 weeks

Treatment

- symptomatic treatment:
 - analgesic, antipyretic: acetaminophen (paracetamol)
 - clean nostrils: saline 0.9% instilled nostrils several times daily
 - anti-congested nose: naphazolin 1%
 - expectorants: acetylcysteine (mucomyst; exomuc; muxystyne...)
 - antihistamine: chlorpheniramine, fexofenadine (telfast...)
- drink enough water, keep the body warm, apply a warm compress on sinus area
- an antibiotic for 7 days in some cases if discharge with purulent; green or yellow production, symptoms persist or don't reduce within 1 week: amoxicillin; penicillin V; cefuroxime (zinnat); or doxycycline; or amoxicillin + clavulanic acid (augmentin; moxclav; amoclavix ...)
- transfer the patient to hospital: treatment without improvement, clinical manifestations get severe or appearance of complications

Prevention

- same ways as in acute rhinitis
- early and proper treatment of acute upper respiratory acute.
- intensive treatment of acute sinusitis
- detect and resolve underlying causes such as allergies, buccal infections
- sinus drainage to avoid prolonged into chronic sinusitis.

3. ACUTE PHARYNGITIS

Cause

- viruses, cold are the most common causes
- sometimes a contamination of bacteria may occur with common bacteria, e.g., *Haemophilus influenzae*; *Streptococcus pneumoniae*; *Streptococcus pyogenes*...

Clinical manifestations

- sore throat is common and may be a unique symptom with erythema, exudates, and edema
- soreness gets worse over 2-3 days then usually gradually goes within a week
- possible symptoms: hoarse voice, cough, fever, headache, feel sick or tired, the glands in the neck may swell, be painful to swallow, blocked nose if accompanied with rhinitis
- tonsillitis: manifestations are similar to a sore throat, but may be more severe. appearance of pus which looks like white spots may be seen on the enlarged red tonsils

Treatment

- usually not treating (**no antibiotic**, except cases identified to be caused by bacteria)
- symptomatic treatment:
 - antipyretic, analgesic: acetaminophen (paracetamol)
 - drink a lot of water, especially appearance of fever
 - gargling with some gargles such as aspirin solution (dissolve an aspirin tablet 100mg in 100ml drinking water and gargle for 3-4 minutes, every 6-8 hours)
 - rest, keep body warm in cold weather
- transfer the patient to hospital if the patient shows serious bacterial infection; or abscesses in the throat, accompanied with other complicated diseases such as dyspnea...

Prevention

- avoid cold, damp places
- no smoking
- keep mouth and throat clean
- improving physical status

4. ACUTE LARYNGITIS

Cause

- viruses are the most common cause
- less common causes: allergies, bacteria, too much talking, gastric reflux, smoking, inhaled irritants, chemicals

Clinical manifestations

- hoarse voice
- possible soreness in throat
- possible manifestations: fever, cough, headache, body aches, flu-like fatigue, enlarged lymph nodes in the neck, running nose
- some cases may get a shortness of breath due to laryngeal swelling
- symptoms usually get serious for 2-3 days and often reduce or end in a week, but hoarse voice may last longer

Treatment

- airway control (**no antibiotic**)
- symptomatic treatment:
 - reduce laryngeal swelling: prednisolon
 - analgesic, antipyretic: acetaminophen (paracetamol)
 - antitussive and anti-irritant: alimemazine (theralene; vallergan...)
 - drink a lot of water, especially appearance of fever
 - abstain from talking, avoid cold, have relaxation, improve physical status
- transfer the patient to hospital when appearance of dyspnea, the condition does not ease or becomes severe after three days of treatment

Prevention

- improving physical status
- avoid cold, drink enough water, do not talk too much to prevent recurrence
- no smoking and avoid exposure to irritants or chemicals
- early and intensive treatment of rhinopharyngitis to prevent spread down to larynx

5. ACUTE BRONCHITIS

Cause

- most cases are caused by viruses, commonly seen in the winter-spring
- less common causes: inhaling toxic vapors (chlorine gas, SO₂, ammonia, industrial solvents), bacteria

Clinical manifestations

- bronchitis due to viruses typically begins with exudated inflammatory manifestations of upper respiratory tract: sneezing, runny nose, raspy throat, mild fever
- dry or productive cough, productive cough due to viruses characterized by white or clear mucoid, due to bacteria characterized by yellow or green or bloody sputum
- burning chest posterior to the sternum, possible hoarse voice
- mild shortness of breath, become worse in severe cases with rapid breathing, wheezing sound, bluish color around lips or nails
- other possible symptoms: fever, headache, body pain, fatigue

- clinical symptoms usually increase gradually in 2 - 3 days, then gradually reduce and disappear in 7 - 10 days.
- **Note:** in some cases, cough may last 2 - 3 weeks due to increased reactivity and irritability of bronchial tree results from uncomplete healing of the bronchial mucous membrane

Treatment

treatment simple bronchitis includes

- **no antibiotic**
- symptomatic treatment:
 - antipyretic, analgesic: acetaminophen (paracetamol)
 - antitussive: dextromethophan, anti-irritants: alimemazine (theralene, ...)
 - expectorants: acetylcysteine (mucomyst; exomuc; muxystyne...)
 - drink a lot of water, especially appearance of fever
 - bronchodilators when dyspnea appears: salbutamol (ventolin) or bricanyl inhaling
 - rest, improving physical status, avoid stimulants such as smoke, dust environment

- transfer the patient to hospital:
 - severe cases, purulent sputum lasts more than 7 days, patients with chronic obstructive pulmonary disease, concomited infections of other body parts
 - infants with respiratory insufficiency, severe dyspnea, electrolyte-hydration imbalance

Prevention

- no smoking
- avoid smoke and dust areas, clean accommodation and workplace
- improving physical status, keep body warm in cold weather
- intensive treatment of infections in ear-nose-throat

6. ACQUIRED PNEUMONIA IN COMMUNITY

Cause

- usually caused by bacteria (exclude tuberculose)
 - “typical” pneumonia is most commonly caused by *Streptococcus pneumoniae* and *Hemophilus influenzae*
 - “atypical” pneumonia is caused by *Legionella pneumoniae*, *Mycoplasma pneumoniae* and *Chlamydiae pneumoniae*
- possible causes: viruses, fungi, parasites, rarely inhaling toxic chemicals

Clinical manifestations

“Typical” pneumonia:

- sudden onset of high fever, chills, chest pain, dry cough the cough with condensed, rust colored or yellow or green sputum
- pleuritic chest pain in one side, common related to the damaged lung lobe accompanied with signs of pulmonary lobe consolidation (increased lung vibration, dull percussion, decreased lung sound, cracked rales, pleural rubbing sound)
- shortness of breath, more difficult to breathe in severe cases
- possible clinical manifestations: abdominal pain, bloating, vomiting, children may get convulsions, the elderly or alcoholics may get confusion.

“Atypical” pneumonia: more gradual onset, often a dry cough, headache, malaise, myalgias, sore throat, gastrointestinal distress, and minimal signs on physical exam (other than rales)

Treatment

mild pneumonia in people with healthy body status before the illness

- bed rest, drinking plenty of water (fresh juice drink), a B vitamin supplement
- typical pneumonia, antibiotics are used for 7-10 days:
 - cefuroxime (zinnat); or amoxicillin + clavulanic acid (augmentin ...)
- atypical pneumonia, antibiotics are used for 7-10 days:
 - erythromycin; or clarithromycin
- symptomatic treatment:
 - antipyretic, analgesic: acetaminophen (paracetamol)
 - expectorants: acetylcysteine (mucomyst; exomuc; muxystyne...)
 - drink a lot of water, especially in appearance of fever

transfer the patient to hospital:

- appearance of severe signs: breathing rate > 25bpm; heart rate > 140bpm; systolic blood pressure < 90mmHg; body temperature > 40°C or < 35°C; conscious disorders
- infants, weak children, elderly people, physical exhaustion, alcoholism, immuno deficiency, other accompanied diseases
- patients who do not improve rapidly after three days of antibiotic administration

Prevention

- keep body warm in winter
- intensive treatment of infectious foci in ear-nose-throat
- remove risk factors, no smoking, no alcohol abuse
- vaccination if possible, especially people with heart failure, chronic lung disease, elderly, splenectomy

7. ACUTE OTITIS MEDIA

Cause

- often preceded or accompanied by contamination or infections of adjacent parts of the Eustachian tube
 - common bacteria are *Streptococcus pneumoniae*, *Hemophilus influenzae* and *Moraxella catarrhalis*.
 - viruses can also cause acute otitis media
- most commonly in children 1-2 years old, but can occur in any age

Clinical manifestations

- pain, hearing loss, children may show irritable, crying
- high fever, children may show convulsion, diarrhea
- otoscopy for direct viewing of the tympanic membrane, signs dependent on stages of otitis media:
 - congestive eardrum stage: eardrum membrane in red congestion
 - pus retention stage: bulging eardrum membrane colored light yellow or pale
 - burst membrane stage: dull retracted membrane, perforated eardrum
 - , or perforated eardrum with fluid or pus discharge on the external ear canal when perforated eardrum

Treatment

congestive eardrum stage:

- symptomatic treatment:
 - ear drop: Argyrol solution 1% for children, 3% for adults
 - antipyretic, analgesic: acetaminophen (paracetamol)
 - rehydration and electrolytes, improve physical status, keeping rest
- antibiotics for 10 days, consider for children under 2 years old; show serious a bacterial infection; symptoms do not decrease within 2-3 days, pus discharge: amoxicillin or amoxicillin + clavulanic acid (augmentin) or cefuroxim (zinnat)

pus retention stage:

- pus drainage with a slit in the low anterior corner of tympanic membrane

burst membrane stage: clean ear and pus drainage

- ear drop with hydrogen peroxide 10 volume, 3-5 drops, gently wipe or vacuum, 2 times a day
- ear drop with rifamycin solution (otofa) 3-5 drops, 2 times a day after cleaning with hydrogen peroxide

Prevention

- management and intensive treatment for infections in nose and throat
- do not blow nose by suppressing both nostrils
- regular checking ears

8. ACUTE CONJUNCTIVITIS (red sore eyes)

Cause

- Bacteria:
 - Gram-positive bacteria: Staphylococcus aureus, Streptococcus pyogenes (group A), Streptococcus pneumoniae.
 - Gram negative bacteria: Hemophilus influenzae, Pseudomonas aeruginosa, Neisseria gonorrhoeae
- Other causes: allergies, chemical exposure, virus

Clinical manifestations

- possible one but usually both of eyes:
 - red congestion, sore eyes like a foreign object or dust in eyes, much tearing
 - swelling of eyelids, adhesive eyelids and eyelashes, especially after getting up in the morning
- normal eyesight, possible blurred slightly due to eye discharge but more clear again after blinking eyes

Treatment

- **no systemic antibiotic**
- clean eyes with saline 0.9%, eye drop many times a day
- topical antibiotic eye drop 8-10 times a day:
 - chloramphenicol solution 0.4%
 - or tetracycline cream 1%
- transfer the patient to hospital if unrecovers after 7-10 days of treatment or gets worse

Prevention

- personal body and environment clean
- protect eyes with glasses, avoid direct contact with people being on progress of conjunctivitis

9. COMMON ACUTE DIARRHOEA

Cause

- infections: pathogens can be from contaminated food, water, contact with sick people
 - virus cause: rotavirus, ...
 - bacterial cause: Salmonella; E. coli, Campylobacter, ...
 - parasites: amoebic dysentery, giardia, pinworm...
- non-infection: chemicals in food, drink a lot of alcohol, side effects of some drugs, anxiety, and food intolerance

Clinical manifestations

- mainly repeated diarrhoea, watery faeces
- signs of dehydration (dependent on level of dehydration):
 - dry mouth, thirsty, sunken eyes, less urine
 - fatigue, lethargy, headache, dizziness, muscle cramps
 - rapid pulse, low blood pressure
- other manifestations: abdominal pain, vomiting, fever...

Treatment

most common cases of diarrhoea can be recovered without specific treatment

- **no antibiotic**
- treatment are mainly rehydration and electrolyte replacement:
 - orally: Oresol solution or alternative solutions for cases of mild dehydration
 - IV infusion: NaCl solution 0.9% or ringer lactate solution for cases of moderate dehydration or ineffectiveness of oral rehydration (previous recommended regimens) or failure of oral rehydration
- binders of osmotically active substances: smecta 2gr sachet, 2-4 times a day or actapulgit 2gr sachet, 2-4 times a day
- continue feeding, breast feeding (infants), light meals (children and adults) and return to normal diet as soon as effective rehydration
- critically consider an antibiotic for cases with bloody mucous faeces, immunodeficiency condition:
 - bacterial causes: ciprofloxacin (ciproxacin, ciprofloxacin, ciprofloxacin) for 3-5 days; or ofloxacin (ofloxacine) for 3-5 days
 - parasiticides dependent on etiology: tinidazole 2gr per day for 3 days or metronidazole 750mgr per day for 5 days in cases of amip/giardia; or mebendazole 100mgr, 2 times a day for 3 days in cases of pinworm

Prevention

- personal hygiene, fresh water, sanitize carefully after every bowel
- well cooked food, avoid stale, rancid, outdated food, well hand washing before eating and food processing
- eliminate habits of unhygienic eating

10. BACILLARY DYSENTERY

Cause

- caused by *Shigella typhi*
- pathogen can be transmitted from secretion of patients on recovering progress or from healthy pathogen carrier

Clinical manifestations

- acute dysentery syndrome:
 - frequently bowels (uncountable in some cases)
 - faeces with bloody liquid secretion looks like water of red meat washing
 - abdominal gripes before each toilet, defecating feeling without faeces in sometimes
 - possible nausea or vomiting
- high fever, may show convulsion in children due to high body temperature
- chills, body pain, anorexia, fatigue, haggard appearance

Treatment

- rehydration and electrolyte replacement:
 - orally: Oresol solution or alternative solutions for cases of mild dehydration
 - IV infusion: NaCl solution 0.9% or ringer lactate solution for cases of moderate dehydration or uneffectiveness of oral rehydration (previous recommended regimens) or failure of oral rehydration
- antipyretic: acetaminophen (paracetamol)
- antibiotic used for 5 days:
 - Ciprofloxacin (Ciproxacin; Ciprobay, Ciflox ...)
 - or Trimethoprim+Sulfamethoxazol (co-trimoxazol, biseptol, bactrim)
- binders of osmotically active substances: smecta sachet 2gr, 2-4 times a day or actapulgit sachet 2gr, 2-4 times a day
- transfer the patient to hospital: persistent fever and bloody faeces

Prevention

- ensure food safety, clean water, well hand washing before eating and food processing
- properly process waste water
- regularly kill flies
- early screening and detecting people with dysentery, isolation and proper treatment, properly process patient's secretion, monitoring discharged patients

11. CHRONIC FUNCTIONAL DISORDERS OF BOWEL

Cause

- after prolonged bowel infections without proper treatment
- toxic contamination: chemicals, heavy metals, alcohol abuse, side effects of some drugs, anxiety, and food intolerance
- unknown causes

Clinical manifestations

- dull pain or crisis pain in abdomen
- bowel disorders:
 - increased bowel spasms characterized by crisis of abdominal pain, constipation alternated with diarrhea
 - dysfunction of mucous secretion characterized by defecating feces covered or mixed by mucus layer
 - imbalance of colon bacteria characterized by abdominal pain, loose and much foamed faeces or undigestive food mixed in faeces

Note: in practice, chronic functional disorders are usually misdiagnosed as chronic colitis, and antibiotics are often used to treat unnecessarily

Treatment

- **no antibiotic**
- symptomatic treatment:
 - diarrheal conditions: binders of osmotically active substances: smecta sachet 2gr, 2-4 times a day; or activated carbon chewing and swallowing 2-4 tablets, 2-4 times a day for several days until normal defecating
 - constipation conditions: sorbitol 1 sachet 2gram, dissolved and drink 1-2 sachets a day for several days; or parafin oil until normal defecating, enough drinking, intake laxative food
 - analgesis, anti-spasm: atropine sulphate, papaverin, sedatives
- diet adjustment:
 - avoid irritable foods, rich cellulose or fermented foods for diarrheal conditions, spicy foods for constipation
 - drinking enough if constipation, electrolyte rehydration if diarrhea
 - avoid alcohol drink, no smoking

Prevention

- proper treatment for acute infections of digestive tract
- proper and hygiene eating

12. ACUTE URETHRITIS (non-gonococcal)

Cause

- parasites: Chlamydia; Trichomonas, Candida albicans
- bacteria: E. coli; Staphylococcus ...
- virus: Herpes virus
- injuries and surgeries in urethra
- unknown causes

Clinical manifestations

- urethral fluid or pus discharge
- stinging or burning whenever urinating
- after having sex several days or weeks

Treatment

- treatment for both patient and his/her sexual partner
- an antimicrobial appropriate to suspected pathogen:
 - if caused by Chlamydia are suspected: doxycyclin for 7 days; or ofloxacin for 7 days; or erythromycin for 7 days
 - if caused by Trichomonas are suspected: metronidazole (klion, flagyl...) for 7 days.
 - if caused by Candida albicans are suspected: ketoconazole (nizoral) for 5 days; or fluconazole (diflucan, mycosyst...) single dose 150mg, repeated prophylactic 150mg monthly, for 6-12 months
 - if caused by common bacteria: trimethoprim + sulfamethoxazole (Co-trimoxazol; Trimazol; Biseptol; Bactrim) for 5 days; or ciprofloxacin for 5 days

Prevention

- regularly clean external genitalia
- treatment for the patient's sexual partner

13. ACUTE CYSTITIS

Cause

- 90% caused by Gram-negative bacteria in which frequently by E.coli (70-80%)
- risk factors include enlarged prostate, pregnant women, bladder stones, bladder tumors, diabetes, urinary catheter

Clinical manifestations

- stinging urinating, dysuria, dark urine
- possible hematuria or pus urine in ending of urinating
- suprapubic pain sign
- possible mild fever

Treatment

For simple acute cystitis

- antibiotic:
 - trimethoprim + sulfamethoxazole (Co-trimoxazol; Trimazol; Biseptol; Bactrim) for 5 days.
 - or amoxicillin for 5 days; or cephalexin for 5 days
- drink enough water to ensure 2 litres of urine volume per 24 hours
- transfer the patient to hospital if unimprovement after 3 days of treatment or stinging urinating, dysuria, dark urine are continued

Prevention

- regularly clean external genitalia
- drink enough water to urinate about 1.5 litres a day
- develop a habit of urinating every 4-5 hours
- remove or treat risk factors

14. ACUTE PYELONEPHRITIS

Cause

- frequently caused by Gram-negative bacteria (90%) such as E. coli, Klebsiella, Proteus, Enterobacter ...
- risk factors:
 - urinary tract obstruction: stones, tumors, pyelonephritis narrowing, periods of pregnancy
 - inflammations of bladder, rectum, prostatitis, gynaecological conditions
 - ascent of bacteria after procedures such as uriter-cystoscopy
 - after surgeries of urinary tract

Clinical manifestations

- signs of septic syndrome: high fever with chills, dry lips, dirty tongue, headache, fatigue... possible septic shock happened if no timely treatment
- signs of acute cystitis syndrome: stinging urinating, frequent and dysuria, dark urine, hematuria, pus urine
- low back pain, possible colicky pain in cases of nephrolithiasis

Treatment

- Oral antibiotic for 7 - 14 days:
 - ciprofloxacin;
 - or ofloxacin
 - or amoxicillin;
 - or amoxicillin + acid clavulanic (augmentin);
 - or cefuroxim (zinnat);
- symptomatic treatment:
 - analgesis, anti-spasm: drotaverin HCl (no-spa), or alverin citrate (spasmaverin)
 - antipyretic: acetaminophen (paracetamol)
- drink plenty of water or IV infusion to ensure 1.5 - 2 litres of urine a day
- transfer the patient if unimprovement after 3 – 5 days of treatment or septic syndrome continues marked

Prevention

- keep hygiene especially genital part
- proper treatment infections of contiguous organs
- remove causes of mechanical presses
- drink plenty of water daily

15. BOILS & CARBUNCLES

Cause

- bacteria: mainly caused by *Staphylococcus aureus*
- risk factors: alcoholism, diabetes, malnutrition, immune deficiency...

Clinical manifestations

- solid, red, painful clots localized in hair follicles characterized by white spots (canals) usually appear in areas of rubbing or sweating such as neck, armpits, buttocks
- accompanied fever or no fever
- after a few days boils becomes soft, break out and pus drained from canals, reducing pain and redness
- lesions may be clusters of boils forming multiple ulcers, inflammatory lesions spread and depth, usually in the neck, back, thighs
- small boils surrounding mouth: localized in bearded area easily leads to inflammation of venous sinus and septicemia

Treatment

- topical treatment:
 - do not squeeze immature boils/pimples (have not developed into pus)
 - clean lesions with an antiseptic solution several times daily: chlorhexidin; or hexamidin; or iodine
 - apply antibiotic cream several times: clortetracyclin; or bacitracin-neomycin
- systemic antibiotic for 7-10 days: penicillin V; or amoxicillin
- lance boils and drainage pus when completed pus gathering

Prevention

- body clean: bathing with antiseptic soap and avoid skin abrasions, scratching
- wear commodious and clean clothing, do not share clothing and towels
- when have boils, wash personal clothing with sterilization soap and hot water
- remove and proper treat risk factors such as treatment of diabetes, malnutrition, eating enough protein, vitamins A & C

16. IMPETIGO (bacterial infection of skin)

Cause

- Staphylococcus aureus or Streptococcus pyogenes but usually a combination of both pathogens
- transferable and frequently occurs in kindergarten age however can occur in any age group

Clinical manifestations

- commonly seen in head skin, surrounding natural cavities, large folds, hands and feet but in some cases lesions can be scattered throughout the body
- major lesions are wrinkled vesicles of clear fluid, each sized from a green pea or a corn kernel
- after 2-3 hours lesions become turbid, turn into yellow pus deposit in the lower part of vesicles
- after 1-2 days, vesicles get self-broken, leaving scabs colored like harney yellow

Treatment

- mild and uncomplicated conditions:
 - flake exudate scales off with solutions of potassium permanganate or soft saline
 - when flaked scales, apply an antiseptic solution 1-2 times a day: blue methylene; or eosin; or milian; or neomycin cream; or gentamicin cream; or fucidin cream
- severe conditions consider a systemic antibiotic for 7-10 days:
 - erythromycin; or penicillin V; or cephalixin

Prevention

- prevent from spread:
 - personal hygien
 - do not scratch or rub skin
 - eating enough nutrients and vitamin A, C
- prevent from complications of glomerulonephritis:
 - proper use of systemic antibiotics when necessary

D. DOSAGE OF DRUGS FOR TREATMENT COMMON DISEASES IN COMMUNITY

Name	Dose	Interval	Cautions
<i>Pain and fever relief</i>			
Acetaminophen (paracetamol) Analgesis and Antipyretic	Adults: 500mg PO Children: 15mg/kg body weight PO or rectal route	Every 6-8 hours	side effects uncommon
Drotaverine hydrochloride (No-spa) Anti-spasmodic	Tablet 40mg Adults: 2 tables PO Children age over 6 years: 1 tablet PO Children age 1 to 6 years: ½ tablet PO	3 times a day	rarely vertigo, blood pressure may drop rapidly
Alverine citrate (spasmaverine) Anti-spasmodic	Tablet 40mg; Amp 40mg/2ml for IM or slowly IV injection Average dose: 1 amp; or 1-2 table(s)	repeat several times a day if necessary	rarely vertigo, blood pressure may drop rapidly
<i>Anti-allergy (antihistamine)</i>			
Chlorpheniramine maleate	Adults and children age 12 and older: 4mg PO Children age 6 to 11: 2mg PO Children age 2 to 5: 1mg PO	Every 12 hours	drowsiness
Fexofenadine hydrochloride (telfast)	Adults and children age 12 and older: 60mg PO Not given to children under 12	Every 12 hours	less drowsiness
Alimemazine (theralene)	Adults: 10-40mg PO daily Children: 1mg/kg daily Not to be used for children age under 2 years	Divided into 2 -4 doses	drowsiness
<i>Decongestion</i>			
Ephedrine sulfate (vasoconstrictor)	1% solution for children 3% solution for adults 1-2 drops instilled in	Every 6-8 hours	occasional palpitations

	each nostril		
Argyrols (antiseptic solution)	1% solution for children 3% solution for adults 1-2 drops instilled in each nostril	Every 12 hours	No reports of side effect
Naphazoline hydrochloride (vasoconstrictor)	1% solution for adults and children age 12 and older: 1-2 drops instilled in each nostril	Every 3-6 hours, not to be used longer than 5 days	not to be used in infants, breast feeding; pregnant women and patients with cardiovascular diseases
Expectorants			
Acetylcysteine (mucomyst, mitux)	Adults and children age upper 7: 200mg PO	Every 8 hours	nausea, vomiting
dissolve powder of drug in some drinking water	Children age 2 to 6: 200mg PO Children under 2: 100mg (1/2 sachet)	Every 12 hours Every 12 hours	
Antitussive			
Dextromethophan hydrobromide	Adults & children age 12 and older: 30mg PO Children age 6 to 12: 10mg PO Children age 2 to 6: 5mg PO	Every 6 hours	drowsiness, dizziness (not to be used for children under 2)
Bronchodilator			
Salbutamol sulfate (ventolin) aerosol	Inhalations use for cases of dyspnea	Onset of dyspnea, administered 3-4 times a day	No important side effects
Anti-inflammatory steroid			
Prednisolon	0.5 mg/kg body weigh/24 hours	divided into 2 doses, gradually withdraw	gastric ulcers
Available antibiotics in the location			
Amoxicillin (amoxil, clamoxyl)	Adults & children age from 11: 500mg PO Children age up to 10: 250mg PO Children weighted lower than 20kg: 10mg/kg	Every 8 hours	rashes, itchy, nausea, vomiting, diarrhea

Amoxicillin/clavulanate (augmentin, clavudin)	1 tablet (500/125)mg Adults & children weighing over 40kg: 1 tablet PO Children weighing under 40kg: 20mg/kg amoxicillin daily PO	Every 8 hours Divided into 3 doses	rashes, itchy nausea, vomiting anorexia, diarrhea
Cephalexin hydrochloride (cefalexin, oracef)	Adults: 500mg PO Children: 25mg/kg PO	Every 6 hours Divided into 4 doses	nausea, anorexia, diarrhea
Cefuroxime axetil (zinnat, zinacef)	Adults & children age 12 and older: 500mg PO Children: 10mg/kg PO	Every 12 hours	diarrhea, rashes
Phenoxymethyl penicillin (penicillin V; ospen)	Adults: 500mg PO Children: 10mg/kg PO	Every 6 hours	rashes, itchy, nausea, vomiting, diarrhea
Erythromycin stearate (erythrocin)	Adults & children age 12 and older: 500mg PO Children age older 8: 50mg/kg/daily PO Children age 2 to 8: 1gr daily PO Children age under 2: 500mg daily PO	Every 6 hours Divided into 4 doses	nausea, vomiting
Clarithromycin	Adults: 500mg PO Children: 15mg/kg PO	Every 12 hours Divided into 2 doses	Adverse gastrointestinal less prominent than erythromycin
Doxycyclin (doxylin, vibramycin...)	Adults & children weighing over 45kg: 100mg PO Children age over 8 & weighing under 45kg: 4-5mg PO daily	Every 12 hours on first day, then 100mg once daily Divided into 2 doses, then a half of dose daily	epigastric distress, nausea, diarrhea
Ciprofloxacin (cipro, ciprobay)	Adults and children age 15 and older: 500mg PO (not to be used for children age under 15 and pregnancy)	Every 12 hours	nausea, diarrhea, vomiting

Ofloxacin (oflozet)	Adults and children age 15 and older: 200mg PO (not to be used for children age under 15 and pregnancy)	Every 12 hours	nausea, diarrhea
Trimethoprim + sulfamethoxazole (co-trimoxazole, trimazol, bactrim, biseptol)	1 tablet (80/400)mg Adults: 2 tablets PO Children age 2 months and older: 20mg/kh trimethoprim daily PO	Every 12 hours divided into 2 doses	rashes, nausea, vomiting, diarrhea
Methronidazole hydrochloride (flagyl, klion)	Adults: 500mg PO Children: 35-50mg daily PO	Every 8 hours Divided into 3 doses	Nausea, vomiting headache

- ❖ This document was extracted and adapted from
 - Ministry of Health of Vietnam. *Vietnamese National Drug Formulary*. Hanoi: MOH (2004)
 - Ministry of Health of Vietnam. *Guide to Treatment Common Infection Diseases*. Hanoi: Medical Publishing House (2006)
 - Ministry of Health of Vietnam. *Vietnamese National Drug Formulary for grass roots levels*. Hanoi: Medical Publishing House (2007)
 - World Health Organization. *Guide to good prescribing: a practical manual. Action Programme on Essential Drugs*. Geneva: WHO/DAP/94.11 General (1994)

APPENDIX 9. GUIDE FOR FOCUS GROUPS AND FIELD NOTES – PHASE TWO

Health centre No:

Date: / /

Members:

- Chairperson : state questions for the discussion and control the discussion
- Secretary: take brief notes the opinions from the participants
- Commune Health workers: give opinions, comments, argument and work out the agreement

Duration: 30 – 45 minutes

Dear all

You have participated the training programme, now would you please give your own opinions about the very programme based on the questions as follows. Please note that all of your opinions will be only used for the study purpose.

Knowledge and learning

1. What do you think about the aim of the programme that you attended? Did the purpose of the programme meet your work?

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2. Did you learn anything new? Will it improve your ability to the administration of antibiotics? If so, how?

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3. Do you think the programme covered everything you had expected it to? Or is there anything the programme should have covered? If so, what?

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Applying the Learning:

- 4. Will you use the information, knowledge and ideas that you have had from the programme for your work? If so, how?

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Effect on Work Performance:

- 5. Do you believe that what you have learned from the programme will improve your performance regarding the administration of antibiotics? If so, how would it change your practice?

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Practicalities:

- 6. Do you think the programme was conducted well, e.g. the delivery, the length of programme, the provider, the venue and so on?

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- 7. Tell us what the programme benefits you?

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8. Tell us any difficulties you had when you attended the programme? If any, what should have been done to solve?

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9. Please give any other comments ?

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Thank you for your participation

Secretary

Chairperson

APPENDIX 10. PUBLISHED ARTICLES REGARDING THE STUDY

PAPER 1

Title :

A review on the prescriptions by health professionals regarding antibiotics within the year 2007 in the commune health centres of Myloc district (NamDinh province)

Publication :

Pharmaceutical Journal. Hanoi: MOH

Date and Issue :

2009 Vol. 49, No. 394, pp. 2-7

Summary

This report presents a review on the prescription by health professionals regarding antibiotics within the year 2007 in the commune health centres of MyLoc district (NamDinh province). The extent of antibiotic prescribing was very high. The prescriptions for an antibiotic alone and with other medicines made up 70 %. Especially, antibiotics were predominantly prescribed for health-insurance card holders and children aged 6 years and younger, up to 79.5% and 92.7%, respectively. Three broad spectrum antibiotics (Amoxicillin, Cefalexin and Penicillin) were so commonly prescribed, accounting for 39.9%, 32.9% and 13.5% respectively. However, several inappropriate antibiotic indications were made irrationally such as classes of antibiotic and diseases, inadequacy in dosage and patient's age. A high rate of infections or diseases with infection were diagnosed, of which the commonest were acute infections of ear-nose-throat, respiratory tract and others.

PAPER 2

Title :

A survey on the perception and knowledge of commune health workers regarding antibiotic use in Myloc district (NamDinh province)

Publication :

Pharmaceutical Journal. Hanoi: MOH

Date and Issue :

2009 Vol. 49, No. 395, pp. 8-13

Summary

To assess the variety in perception of health workers regarding antibiotic use and identify the factors that influence antibiotic prescribing in the community in MyLoc district, NamDinh province, an interview of 56 subjects was conducted.

- The qualification of health workers was quite low: those of bachelor degree accounted for 10.7%, secondary and elementary degree were 53.6% and 35.7% respectively.

- Health workers aged above 40 years were 67.9%, as the seniority in medicine use: 6 - 15 years and 16 - 25 years was 28.6% for the former and 42.9% for the latter.

- One third of the health workers have not attended any relevant training courses. The training programmes for the commune health workers were mainly on public health; no programme focusing on antibiotic has been conducted.

- To the question of when and where the knowledge of medicine use came from, 91.1% of responses were "undergraduation study time".

- There were differences in the perception of antibiotics and antibiotic prescribing between commune health workers of different qualification levels and time in service.

It is no doubt that programmes to support commune health workers on antibiotics and antibiotic prescribing are substantially necessary. But, the programmes should be adequate for individual level of the commune health workers.

PAPER 3

Title :

Preliminary success in improvement of practicing ability for commune medical workers regarding the rational use of antibiotics by an active interventional model - a training programme conducted in Myloc district (NamDinh province)

Publication :

Pharmaceutical Journal. Hanoi: MOH

Date and Issue :

2010 Vol. 50, No. 413, pp. 34-38

Summary

To assess the effectiveness of the training programme aiming to increase the practical ability of commune health workers to reduce the irrational use of antibiotics then to obtain recommendations for the development of a training programme that will be applicable to the community level to support the implementation of the model to reduce antibiotic misuse. The same participants who had been trained in the part of improving their knowledge regarding antibiotic use were continued to be trained in strengthening their ability of practice regarding using antibiotics. The training model was followed the Kolb's experiential learning cycle and the pre-test and post-test evaluation were directly conducted in the workplaces of participants the results showed clearly improvements:

- 98.4% of participants were able to apply the process of rational treatment to their implementing medical examination and treatment for patients.

- The %age of health workers whose ability to define the patient's problem, specify the therapeutic objective(s) and verify the suitability of personal treatment after the programme were 100%, 98.4% and 83.6%, respectively.

- The rate of health workers whose ability of selecting a corresponding antibiotic to patient's condition increased from 19.7% before the programme to 86.9% after the programme.

- The numbers of health workers being able to give correct instructions on using amoxicillin, cefalexin and ciprofloxacin were 98.4%, 98.4% and 95.1%, respectively.

Although the results showed great improvements, it is necessary to conduct a final assessment to gain indicators of the sustainability and the perception of the health workers of the training programme.

PAPER 4

Title :

Assessment of the effectiveness of the training programme for reduction of antibiotic misuse in Myloc district (NamDinh province)

Publication :

Pharmaceutical Journal. Hanoi: MOH

Date and Issue :

2010 Vol. 50, No. 414, pp. 5-9

Summary

To assess the effectiveness of the training programme aiming to enhance the perception and understanding of commune health workers to

reduce the irrational use of antibiotics then to obtain recommendations for the development of a training programme that will be transferable to the community level to support the implementation of the model to reduce antibiotic misuse. All health workers who are working in the commune health centers in MyLoc district (n=61), were invited to participate in a training programme which was designed based on the Kolb's adult learning model combined with the local situation and implemented directly in the workplaces of participants. Pre-test and post-test with the same questionnaire were done. The results showed obviously improvements in the health workers' perceptions and understanding regarding antibiotic use.

- The mean score after the programme was 99.25 (before the programme it was 58.43), the elevated level was 40.82 ($p < 0.001$).

- There were great changes in the view, belief and understanding after the programme: 100% of participants changed their view on the necessity of antibiotics to treat infections, 100% of participants perceived the unnecessary of giving antibiotics to patients with common acute diseases and 100% of participants recognized clinical manifestations supporting their decision on giving drugs. On the selecting an antibiotic corresponding to infected organ/body system, 98.4% to 100% of participants answered correctly.

- The essential instructions that need to provide for patients to take antibiotics was acknowledged by 93.4% of participants.

A reassessment needs to be carried out at least three months later with the same questionnaire combined with focus group discussions to gain indicators of the sustainability, the appropriateness and more qualitative insight into the perceptions of the health workers of the training programme.

APPENDIX 11. SCIENTIFIC PRESENTATIONS REGARDING THE STUDY

Faculty of Health
Research Students' Seminar Day
Wednesday, 4th June, 2008
City North Campus - Baker 507

An assessment the role of healthcare professionals in the current use and misuse of antibiotics in Myloc district, Namdinh province, Vietnam.

NGO HUY Hoang
Work undertaken to date

Introduction: This study grew out of a growing concern that antibiotic resistant bacteria are an increasing and major threat to public health. Much of the administration of antibiotics in Vietnam occurs in the community, with healthcare workers in the communes (local community clinics) carrying the main responsibility for prescriptions. In addition, as in many developing countries, antibiotics can be freely purchased and taken without any medical advice. It is therefore crucial that education and drug administration programmes for healthcare workers in the community in Vietnam can be integrated into the overall strategy for the Containment of Antimicrobial Resistance. Although such programmes are available they tend to have been developed outside Vietnam, and to be successful a model/ education programme for drug administration must be based on the local situation.

Aim: To assess the current use of antibiotics in the community in Myloc district, Nam Dinh Province, Vietnam.

Method: The study proposes to carry out a cross-sectional survey of all health workers who are working at the commune health stations in Myloc district, Nam Dinh Province Vietnam. This district has been selected as the organisation of community health services is typical of that in all other provinces.

This survey will gather both qualitative and quantitative data regarding antibiotic use and misuse in the community level. Data collection will involve both interviews and documentation review. All the public health workers in Myloc district Namdinh province will be asked to complete questionnaires regarding their education and training, level of knowledge and attitude regarding prescribing antibiotics. Focus group discussions will then be used to explore factors influencing antibiotic administration. In addition the medical records will be reviewed to assess the extent of antibiotic use and any available data regarding misuse.

The findings from the study will then be used to make recommendations for the development a model for education, training and practice for the administration of antibiotics in Vietnam.

Key words/Subject of abstracts: antibiotics; use and misuse; medical/non-medical factors; community

**Birmingham City University
Centre for Health and Social Care Research
5th Annual Faculty Research Conference
Friday, 20th November, 2009
Venue: Seacole, City South Campus**

ABSTRACT D02

**Health care workers in the current use
and misuse of antibiotics in Myloc district, NamDinh province, Vietnam**

NGO Huy Hoang^a, HOANG Thi Kim Huyen^b, Rober L. ASHFORD^a

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^bHanoi University of Pharmacy - VN

Introduction: Increasing use and misuse of existing antibiotics lead to the development of resistant bacteria, a major threat to the public health. This problem involves both clients and health care workers in all levels of health care system. Health care workers in commune health centers, the first point of contact for healthcare services in Vietnam, were the target subjects in this study.

Aim: To review the extent of antibiotics prescribed by health care workers and identify factors influencing antibiotic prescribing in the community in Myloc district, Nam Dinh province, Vietnam.

Method: A survey combined quantitative and qualitative paradigms, analysing includes 56 self-completed questionnaires, 1047 individual patient records of itemization of antibiotics, randomized selected from a total of 41847 using documentation of the whole year 2007, and transcriptions from 11 focus groups using grounded theory.

Results/Findings: Health care workers were mainly trained at secondary and elementary levels: 53.6% and 35.7%, respectively. Mean age of health workers was 43.27 ± 7.6 . Mean number of years as prescribers was 15.41 ± 8.4 and during this time no training or revision on antibiotic administration was delivered. Misunderstanding of antibiotic was actual, for instance, antibiotics are medicines used to treat infection (41.1% of responses), or even to treat inflammation (5.4% of responses). In this context, 79.8% of clients were prescribed antibiotics and antibiotics were prescribed in almost all of diseases/conditions. In many conditions, 100% of clients were prescribed an antibiotic. Health insurance card holders and children up to 6 years prescribed antibiotics at predominant higher rates compared with clients with no health insurance. A negativity of health insurance policy was dawn from focus groups that may, in some what, affect the prescribing.

Discussion/Conclusion: The survey showed the high rate of antibiotic prescribed by health workers at commune level who are facing both internal and external difficulties. In addition to known factors, health insurance policy emerged as a new one.

Key words/Subject of abstract: antibiotics; prescribe; health care workers, commune level, Myloc, Vietnam.

**Birmingham City University
Centre for Health and Social Care Research
5th Annual Faculty Research Conference
Friday, 20th November, 2009
Venue: Seacole, City South Campus**

POSTER ABSTRACT ST11

**Health care workers in the current use
and misuse of antibiotics in Myloc district, NamDinh province, Vietnam**

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^bHanoi University of Pharmacy, Vietnam

Background: Continuous use of antibiotics as “*wonderful drugs*” leads to the development of resistant bacteria, a major threat to the public health. One part of the problem comes from increasing use, and misuse, of existing antibiotics that involve both clients and health care workers in all levels of health care system. Health care workers in commune health centers, the first point of contact for healthcare services in Vietnam, were the target subjects in this study.

Aim: To review the extent of antibiotics prescribed by health care workers and identify factors influencing antibiotic prescribing in the community in Myloc district, NamDinh province, Vietnam.

Methods: A survey combined quantitative and qualitative paradigms, analysing includes 56 self-completed questionnaires, 1047 individual patient records of itemization of antibiotics, randomized selected from a total of 41847 using documentation of the whole year 2007, and transcriptions from 11 focus groups using grounded theory.

Results: Health care workers were mainly trained at secondary and elementary levels: 53.6% and 35.7%, respectively. Mean age of health workers was 43.27 ± 7.6 . Mean number of years as prescribers was 15.41 ± 8.4 and during this time no training or revision on antibiotic administration was delivered. Misunderstanding of antibiotic was actual, for instance, antibiotics are medicines used to treat infection (41.1% of responses), or even to treat inflammation (5.4% of responses). In this context, 79.8% of clients were prescribed antibiotics and antibiotics were prescribed in almost all of diseases/conditions. In many conditions, 100% of clients were prescribed an antibiotic. Health insurance card holders and children up to 6 years prescribed antibiotics at predominant higher rates compared with clients with no health insurance.

Implications: A high rate of antibiotics was being prescribed by health workers at commune level who meet with both internal and external difficulties. In addition to known factors, health insurance policy may, in somewhat, affect their prescribing.

Key words: antibiotics; prescribe; health care workers, commune level, Myloc, Vietnam

Research Students' Presentation Day
Wednesday, 16th June, 2010 9.00 a.m. – 5.00 p.m.
City South Campus – Seacole 325

NGO Huy Hoang
Proposed Thesis Title: The development of a model for Information, Education and Communication (IEC) to reduce antibiotic misuse among the Vietnamese population in NamDinh Province
Work to date Background: the first phase of this study revealed some key concerns regarding antibiotic use: <ul style="list-style-type: none">• problems with antibiotic administration exist• levels of knowledge of antibiotics were inadequate• few workers had any updateing in prescribing• learning / studying available materials were not appropriate• no formal training programme is available• the few courses available are academic and not linked to practice• the possibility of travelling for study courses is extremely limited• limited framework for staff development• motivation was present for learning• public expectations are that antibiotics will be freely available (whether necessary or not) Aim: To develop a model for public health workers to reduce antibiotic misuse among the population in Myloc district, Namdinh province Vietnam that will be transferable to other rural areas in Vietnam. Objectives: <ul style="list-style-type: none">• To develop and pilot for practice a model for public health workers to reduce the misuse of antibiotics.• To develop a training programme for public health workers to support the implementation of the model to reduce antibiotic misuse. Results: Considering the adult learning theory, learning models and the local context, a format of mini-training programme was worked out and provided for the health workers at their own work place, commune health centres in Myloc distric NamDinh province. The assessment by pre and post tests was also done. The project has not completed but the preliminary outcomes showed convincingly the programme to be effective and appropriate in its certain extent: the overall level of improvement in beliefs of the necessity of antibiotics (attitude), knowledge and practice regarding the use of antibiotics was round about 70 % and a significant change in the mean score of tests before and after the training (99.25 compared with 58.46. $p= 0.001$). Discussion/conclusion: To gain indications of the sustainability of the training, the appropriateness of the format, more qualitative insight into the perceptions of the health workers and overall framework for training, a final assessment needs to carry out at least three months after the training.
References: Adult learning theory (Quinn, 2007) The theory & practice of learning (Javis, 2003) Containing antimicrobial resistance (WHO, 2005) Vietnamese National Drug Formulary (MOH, 2004)
Key words: adult learning, learning model, antibiotics, use and misuse, health workers, commune level.

**European Association for Cancer Education
23rd Annual Scientific Meeting
Conference: 23-25 June 2010
Saxion Hogescholen, the Netherlands**

Abstract 12

Addressing the situation of antibiotic administration for patients with cancers in Vietnam

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Vietnam has only had a cancer register for 5 years. Since this time many attempts have been made to estimate cancer problems, but hospital statistics are not always complete and there is still no true estimate of cancer incidence. However, it is accepted that cancer of the lung, stomach, liver, colon-rectum and nasopharynx are the most frequent in males and cancer of the breast, cervix, uteri, stomach, colon-rectum and lung are the most frequent in females.

Vietnam is a tropical country where infectious diseases are common and usage of antibiotics has become inevitable. The annual report of World Health Organization on infectious diseases gave warning of the reduced effect of Penicillin and other antibiotics on infectious disease, (which used to be treated easily), due to antibiotic misuse. Furthermore they pointed out that within the developing world, 50% of usage is not appropriate (WHO, 2001). These findings are representative of the situation in Vietnam, where like many developing countries in recent years there have been increased access to the use of antibiotics. However, antibiotics can be purchased with or without a prescription, and in many instances the ability to purchase and use antibiotics has not been accompanied by appropriate education. The result of this is that in the community many people using antibiotics do not understand the need to complete courses, keeping tablets to use when they think they need them. Inevitably this means that increasingly bacteria are becoming resistant to antibiotics, and treatment is becoming much more difficult.

In recent years, the consumption of antibiotics has increased annually. The Vietnamese Ministry of Health (MOH, 1999) reported that importing antibiotics accounted for 40% - 50% of the total foreign medication import with approximately 100 tons of antibiotics imported yearly. However, they also found that only 20% people who used antibiotics did so via a prescription, in more than 80% of cases they were bought and used without following prescription guidelines, a situation that continues today.

For patients with cancer, there are additional problems when taking antibiotics, firstly, there is the cost, additional medication may prove to be too expensive, and therefore not considered. Then, there is limited information about how to assist patients to cope with or to ease unpleasant feelings, disorders that patients can arise for patients undergoing cancer therapies and antibiotic treatment simultaneously. As a result patients may decide to purchase an alternative antibiotic without knowing if it is appropriate, or discontinue the treatment, and show resignation or a 'let-it-be' attitude to the progress of the disease, which in turn makes treatment more difficult in the long term as infections can gain a greater hold and resistance is increased.

Poster Abstract

Student's Name: Ngo Huy HOANG																				
Proposed Thesis Title: The development of a conceptual framework and model for Information, Education and Communication (IEC) to reduce antibiotic misuse among the Vietnamese population in NamDinh province																				
Description of work undertaken to date																				
<p>Background:The initial survey and evaluation before the intervention (M1) of this study revealed key concerns regarding antibiotic use in the commune health centres where local residents firstly contact and get healthcare services but no help to improve.</p> <p>Aim: To develop a conceptual framework and education and training model for public health workers to reduce antibiotic misuse among the population in Myloc district, Namdinh province Vietnam that is transferable to other rural areas in Vietnam.</p> <p>Objectives:</p> <ul style="list-style-type: none"> ▪ To develop and pilot in practice a conceptual framework and model for education and training for public health workers, ▪ To develop a training programme for public health workers to support the implementation of the model to reduce antibiotic misuse. <p>Results: Considerable improvements in the health workers' perception and practical ability regarding antibiotic administration were seen immediately after the model (M2) and three months later (M3). The general result was presented in the table below,</p>																				
Table 6.3. General result by overall score																				
<table border="1"> <thead> <tr> <th>Score</th> <th>Min</th> <th>Max</th> <th>Mean .Std</th> <th>p value (t- test)</th> </tr> </thead> <tbody> <tr> <td>M1</td> <td>40</td> <td>78</td> <td>58.43 ± 8.77</td> <td></td> </tr> <tr> <td>M2</td> <td>96</td> <td>100</td> <td>99.25 ± 1.00</td> <td>p(2;1) < 0.001</td> </tr> <tr> <td>M3</td> <td>62</td> <td>96</td> <td>79.76 ± 9.02</td> <td>p(3;1) < 0.001</td> </tr> </tbody> </table>	Score	Min	Max	Mean .Std	p value (t- test)	M1	40	78	58.43 ± 8.77		M2	96	100	99.25 ± 1.00	p(2;1) < 0.001	M3	62	96	79.76 ± 9.02	p(3;1) < 0.001
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<p>Discussion/conclusion: The programme was run well and created good impacts on the participants. Modifications are needed to make the model more suitable and sustainable. The piloting of the model indicated the ability to transfer to other similar areas of Vietnam.</p> <p>References:</p> <ul style="list-style-type: none"> ▪ Adult education & lifelong learning (Jarvis, 2004). ▪ Containing antibiotic resistance (WHO, 2005) <p>Key words: adult learning, learning model, antibiotic, misuse, community level, health workers</p>																				

