CHAPTER III

PROPOSAL

Improving physicians' rational use of antibiotics in children under five years old with acute respiratory infection (ARI) through face-to-face education and implementation of standard treatment guidelines in Ba vi District Hospital, Vietnam

3.1 Introduction

3.1.1 Background

In Vietnam, drug expenses account for 70 % of total health expenditures at household level (Toan, N.V, 1995). The drug expense per capita was USD 3.5 in 1995, while per capita income was USD 250. Public drug expenditure was about 30 % of total health expenditures in 1995 (Do N.T, 1996). Some studies revealed problems such as inappropriate use of antibiotics and overuse of corticoids and vitamins (Chuc N.T.K, 1996; Do N.t,1995). These problems imply unnecessary expenditures.

Irrational prescribing was documented in district hospitals for outpatients (Chuc N.T.K, 1996). The average number of drugs per prescription was 4.2 and 62 % of the prescriptions contained at least one antibiotic. Only 38 % of prescribed drugs were in the national essential drug list.

One of major goals of a national drug policy (NDP) is to improve the rational use of drugs. Vietnam adopted a NDP in 1996. This policy identified the use of an essential drug list and standard treatment guidelines, as well as encouraging the local production of essential drugs, as important interventions for improving the rational use of drugs, especially antibiotics.

In the Bavi District Hospital, a District hospital in rural north-Vietnam , the ARI program was introduced in the late 1988. Standard treatment guidelines of ARI developed by WHO and adapted by national program exist in Bavi District Hospital. The hospital personnel were trained on those guidelines. However, implementation of standard treatment guidelines alone did not change behavior of the prescribers. A study was conducted in the Bavi District Hospital to assess antibiotic prescription : it was found that 84 % of children who had received antibiotic prescriptions indicated a non-bacterial infection. So standard treatment guidelines can produce improvement and perhaps promote rational prescribing only when implemented effectively with other measures.

Therefore, an education program (face-to-face education) is needed to introduce and supervise implementation of standard treatment guidelines as an

important intervention for improving the prescribers' rational use of antibiotics in Bavi District Hospital.

3.1.2 Problem Statement

The effective use of the treatment guidelines may reduce irrational prescribing behavior. In Vietnam, there are some guidelines for the use of essential drugs (Medicins Sans Frontieres, 1994; MoH, 1993), the treatment of diarrhea (CDD program, 1993), and the treatment guideline of acute respiratory infections (ARI program, 1993).The Ministry of Health has issued treatment guidelines for 135 diseases. However, one study using in-depth interviews with clinical doctors at the public district hospital level showed that most doctors did not use the existing guidelines in their prescribing (Chuc N.T.K et al, 1995).

The causes of this irrational prescribing may be due to inadequate knowledge of the standard treatment guidelines. The knowledge comes from informational sources, internally from organizations in the shape of clinical guidelines, and lists of drugs or drug formularies used by the district hospital. The consequences of such irrational prescribing are enormous in terms of patient concern as well as the provider's side. If treated inappropriately, there is a decrease in the quality of drug therapy resulting in prolongation of the disease and suffering, spreading of the diseases, increased chance of developing resistance and adverse reactions, increasing cost of treatment and creating a patient psychology that comes to believe there is " a

pill for every ill ". This psychology might cause an apparent increase in demand for drugs.

3.2 Rationale

3.2.1 Factors Influencing Prescribing Behavior

Sterky et al, 1988, stated that drug use is determined by many factors. To understand it, one must make use of the insight of pharmacology, epidemiology and social sciences. Much research on the social aspects of drug use have focused on factors influencing the prescribing behaviour of physicians (Mapes R, 1980). Hemminki, 1988, classified them into factors that affect prescribing at the macro level (so called conditioning factors) and factors that influence individual physicians. The conditioning factors are:

- Traditions and education of the population, which may mold both expectations of patients and views of physicians
- Medical teaching and professional thinking, which define the concept of health and illness and thus determine the use of physician services.
- The level of distribution of wealth in a country and the ideology and power of the State, since this can affect the organisation, regulation and availability (geographic and financial) of both professional care and drug supply.
- Power and vitality of the pharmaceutical industry

And individual factors are:

- Demand and expectations of pressure groups and society
- Influence of the pharmaceutical industry and research results
- Control measures and regulations imposed by the health authorities

In addition, factors influencing medical prescribing in Outpatient departments of district hospitals in Vietnam would include (Pham Huy Dung, 1996)

- Personal experiences of physicians working in Outpatient departments of district hospitals
- Leading opinion of respected individual who may be expert or head of department of hospitals (national, provincial and district). Physicians rely on the recommendation of opinion leader and accept their prescribing rules or guidelines.
- Peer experiences from colleges working in the same or in other departments
- Experiences and opinions of the health team (physicians, nurses, pharmacists, managers)
- Information from leading medical journals (national and international)
- Information from medical representatives
- Requests of patients (clients)

As discussion above, there are many causes influencing prescribing behaviour. These factors vary for each person and situation. This study considers main factors

influencing antibiotic prescribing behaviour of physicians in treatment children under five years old with ARI in Bavi District Hospital.

3.2.2 Impact of Treatment Guideline on Prescribing Practice

In order to improve medical prescribing and drug dispensing, it was advised to develop treatment guidelines. Physicians may find treatment guideline recommendations convenient to follow, or may in certain circumstances be obliged to do so. A treatment guideline can have a strong influence on physicians. On the contrary, there are health professions, which conceive treatment guidelines as an artificial and unwelcome interference in the process of free commerce and free choice. There is a vast literature to document this opposed view of the parties concerned (Petrie J.C. & Scott A.K, 1986). In this context, the concept of essential drugs was born in an attempt to solve the supply problems of developing countries (WHO, 1977).

According to Grol (1993), good guidelines for general practice should be:

- *Valid*: they should be based on a sound analysis of the scientific literature and on rigorous exchange of clinical experience.
- *Reliable*: two groups should produce the same guidelines, provided that they have the same information. Also different general practitioners (GPs) should apply the guidelines in the same clinical situations consistently.
- *Applicable and relevant*: the guidelines should be formulated from the perspective of the general practice situation. They should focus on the

crucial questions that GPs have when they are confronted with patient's problems and fit into the problem - solving activities of day-to-day care.

- *Comprehensive and specific*: if guidelines are to be useful for peer review they need to describe clearly the specific situations and patient population to which they apply, and then the exact conditions under which the performance is appropriate or inappropriate. They must also include major relevant factors, such as disease severity or co-morbidity.

A standard treatment guideline for Acute Respiratory Infection (ARI) developed by WHO and adapted by the national program already exists in the Bavi District Hospital setting. The personnel have already trained on standard treatment, and the result of those programs is satisfactory. Standard treatments are now currently used all over the world; in the U.S., Europe, Latin America, Asia, Africa, and Western Pacific. There were specific examples of standard treatment guidelines improving rational prescribing when introduced properly (Ross-Degnan, Laing, Santoso,Ofori-Adjei, Diwan & Lamoureux, 1997)

3.2.4 Acute Respiratory Infection (ARI)

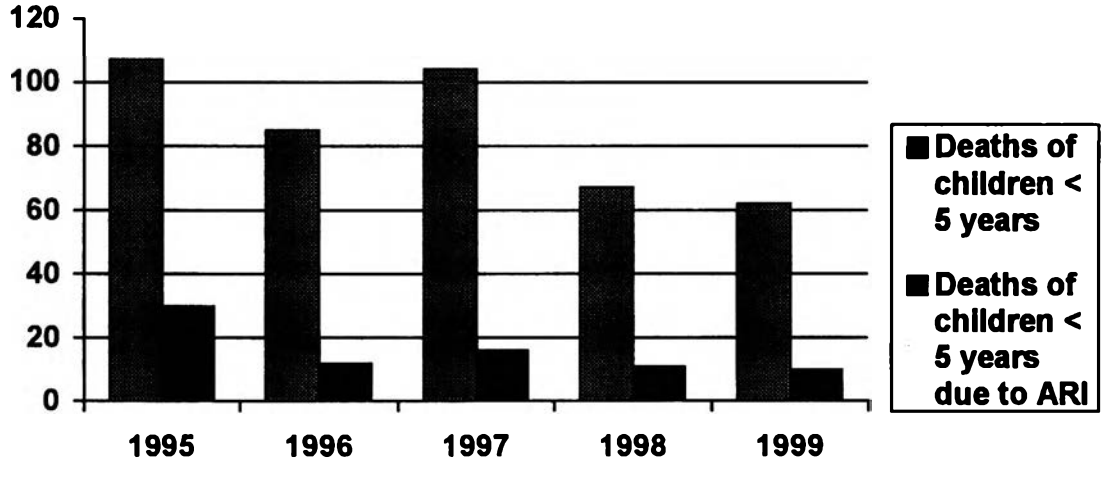
As mentioned above, ARI is the leading cause of morbidity and mortality in children under five years old in both the community and the hospital.

- Acute respiratory infection (ARI) kills 1.5 million children under years per year in the world (WHO, 1999)
- Every children under five years old suffer four to seven episodes of ARI per years in rural Vietnam (National ARI program, Vietnam)

- Acute respiratory infection in children under five years old is the cause of 40% of hospital admissions in Vietnam (SIDA; UNICEF Vietnam).
- Deaths due to ARI in children under five years old are among top-ten leading cause of mortality in Vietnam: 1.15/ P.1000 (National ARI program,1993))
- Deaths due to pneumonia is also one of the top-ten leading cause of mortality in children under five in Bavi District Hospital. Figure 6 shows that total deaths of children under five years old as well as deaths caused by ARI of children under five years old are decreasing yearly. But ARI is still main cause of deaths of children under five years old. The percentage of deaths caused by ARI per total deaths of children under five years old is changed little , but increased sometime.(please, look at table 1)

Finger 6 : Deaths of children under five years old due to ARI compared with all deaths of children under five years old.

(Number of cases)



Source : Bavi District ARI Program Report, 1999.

Table 1: Deaths of children under five years old due to ARI compared with total deaths of children under five years old

	1995	1996	1997	1998	1999
Total deaths of children < 5 years	107	85	104	67	62
Deaths of children < 5 years due to ARI	30	12	16	11	10
Percentage	28%	14%	15.3%	16.4%	16.1%

Source: Bavi District ARI Program Report, 1999

Irrational use of antibiotics in children under five years old with acute respiratory infection (ARI) will make the children antibiotic resistance. Consequences of antibiotic resistance in treatment of acute respiratory infection are an increased morbidity rate and mortality rate in children with ARI.

3.3 Objectives

- ***General Objective***

The proposed study would improve rational use of antibiotics by Bavi District Hospital physicians in the treatment acute respiratory infection in children under five years old by an intervention that includes face-to-face education and implementation of standard treatment guidelines.

This study will focus on ARI as model for other conditions that may be addressed in the future.

- ***Specific Objectives***

(1) To describe ARI prescribing behavior of physicians for out-patients in the Bavi District Hospital.

(2) To increase the knowledge and awareness of the physicians of Bavi District Hospital in the treatment of ARI in children under five years old.

(3) Reduce irrational use of antibiotics in the treatment of ARI for outpatients in Bavi District Hospital, specifically:

- Increase the use of recommended antibiotics for moderate and severe ARI
- Increase the use of full dose antibiotics.
- Reduce the use of antibiotics for mild ARI
- Reduce the use of injection drugs for mild and moderate ARI
- Reduce the use of combination antibiotics

3.4 Research Methodology

3.4.1 Study Population

This study will be conducted in Bavi District Hospital, Hatay Province, Vietnam. Characteristics of Hatay Province and Bavi District in terms of population and administrative units are as follows:

Table 2. Population, administrative units and health facilities in Bavi,Hatay

	Ha Tay Province	Bavi District
Population	2,366,600	240,000
Number of districts	14	1
Number of communes	333	32
Number of hospitals	12	1
Number of patient beds	1,140	150

Characteristics in terms of morbidity are as follows:

Table 3. Leading causes of morbidity in Hatay Province

Ha Tay Province		Bavi District	
Diseases	**Hospital records**	**Diseases**	**Hospital records**
1.Pneumonia	6,408	1.Pneumonia	546
2.Darrhoea	4,953	2.Darrhoea	249
3.Acute pharyngitis	4,097	3.Acute pharyngitis	206
4.Injuries	3,196	4.Injuries	92
5.Diseases of the digestive system	2,893	5.Diseases of the digestive system	400
6.Diseases of the respiratory system	2,193	6.Diseases of the respiratory system	525
7.Gastritis	2,073	7.Gastritis	141
8.Diseases of the nervous system	2,018	8.Diseases of the nervous system	111
9.Infectious and parasitic diseases	1,105	9.Infectious and parasitic diseases	172
10.Dental caries	1,094	10.Dental caries	74

3.4.2 Sampling and Sample Size

Bavi District Hospital will be selected purposively from the rural northern area of Vietnam. Purposeful Sampling will be carried out as follows.

A baseline survey will be conducted at the out-patient ward and 3 inter-commune polyclinics of Bavi District Hospital. All doctors who treat ARI at Bavi District Hospital will answer the questionnaire .One FGD will be carried out at Bavi District Hospital.

According to WHO, 1993, there should be at least 600 encounters for any survey describing current treatment practices. This study requires 150 encounters per out-patient ward or 40 encounters per prescriber in a study out-patient ward. There is 1 out-patient ward and 3 inter-commune polyclinic of Bavi District Hospital or 12 -16 prescribers (each ward has 3-4 prescribers) in the study. The total number of encounters for each evaluation consequently would be : 600, according to calculation below:

150 encounter/ Ward x 4 ward = 600 encounters or,

40 encounters/ Prescriber x 15 prescribers = 600 encounters.

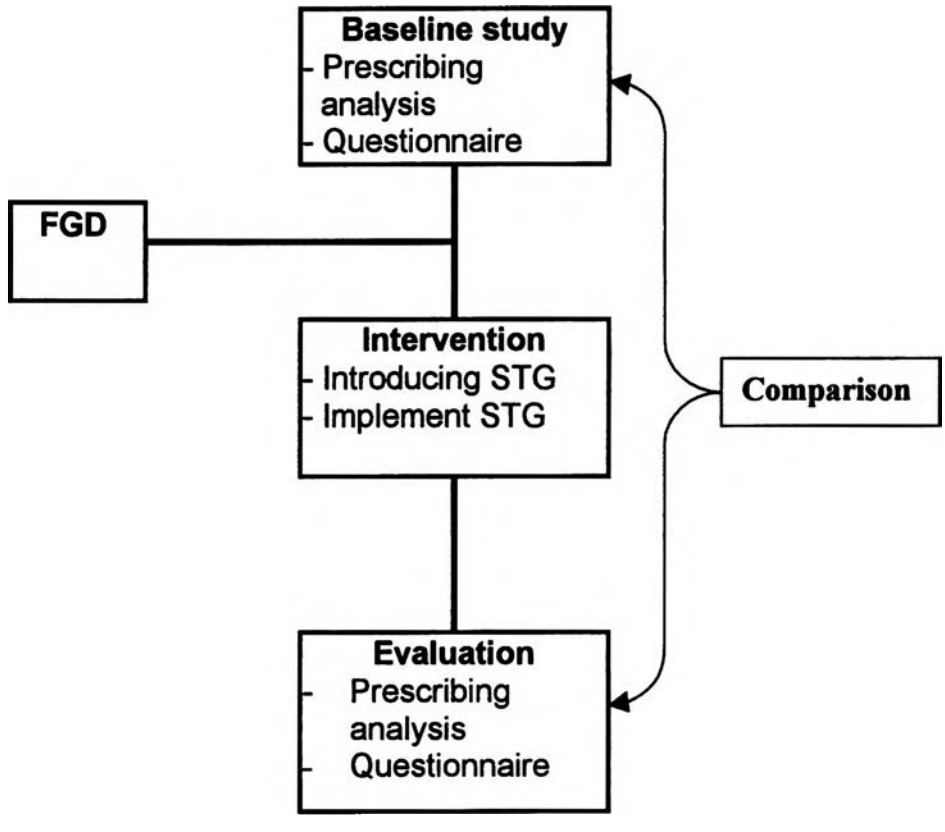
3.4.3 Study Design

This is an intervention pre – post study design.

The intervention aims at changing medical prescriber's behavior in Bavi District Hospital out-patient wards to improve the treatment of ARI by a package which includes (1) Introducing standard treatment guideline of ARI (2) Supervision/Audit implementation of STG through face-to-face education.

The effect of intervention would be evaluated on indicators of rational prescription. Encounters of prescription should be collected prospectively before and after the intervention for evaluation. One hundred and fifty encounters per ward or 40 encounters per prescriber are needed. It is expected that such quantity of encounters could be collected within a period of 2 months. There would be 2 evaluation studies; comparison between the first evaluation before and the second evaluation after the intervention

Figure 7: The Progress of the Study Design

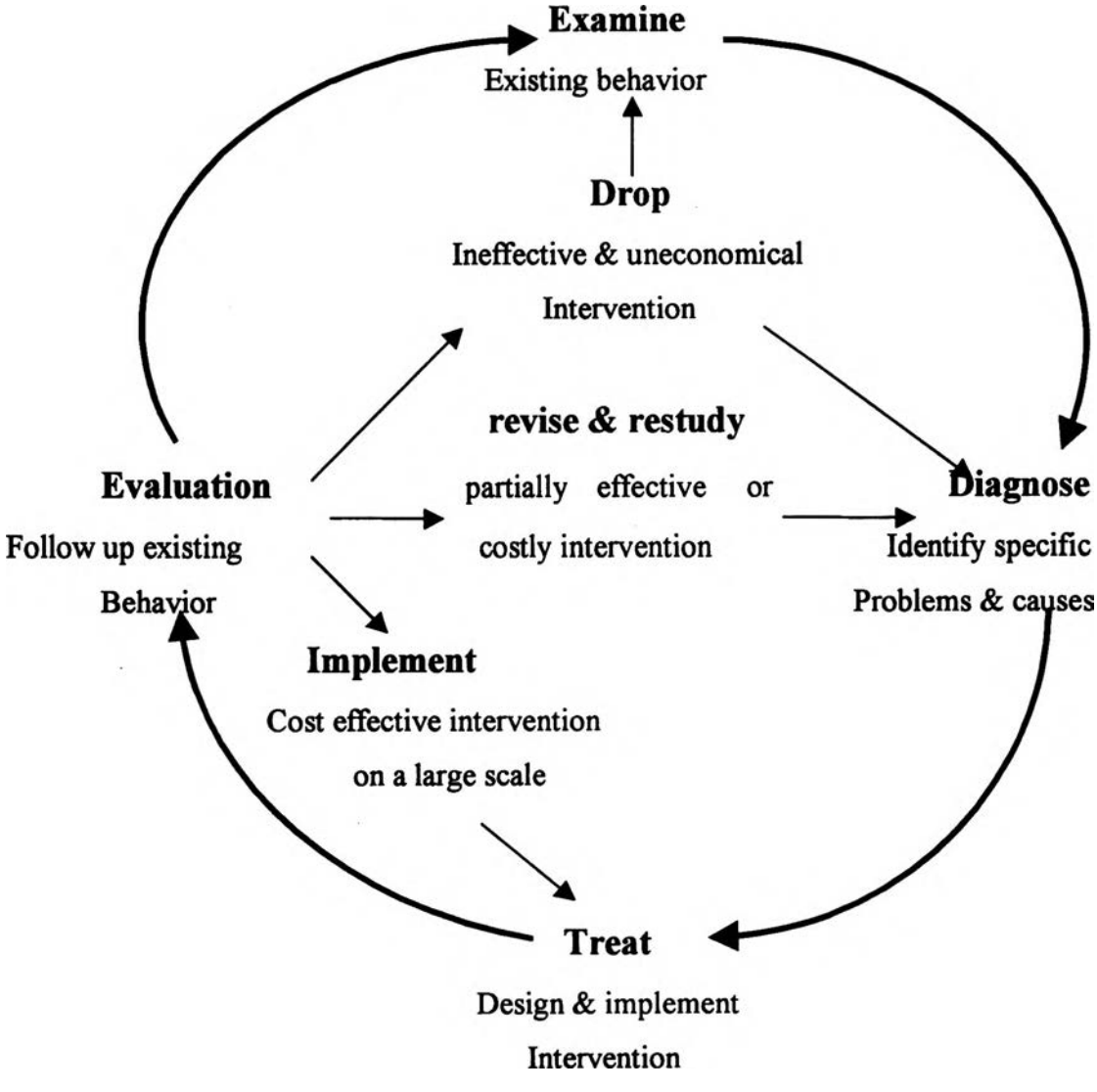


3.4.3.1 Approach

Like diagnosis of a disease or clinical illness, changing the antibiotic use behavior follow the same process of identification (Examination), understanding

(diagnosis) and taking action (Treatment) accordingly. The framework adopted from PRDU CD-ROM training program (INRUD) comprises two broad portions. A diagrammatic representation of the framework is shown below:

Steps of determining existing practices and their causes and approaches to solving problems



Source : Adapted from Laing R.; PRDU CD-ROM Training Program, WHO,DAP,INRUD

The first portion of the above mentioned model states that we can identify a problem that exists in that setting (examine), diagnose its motivating factors and underlying causes, choose an intervention or interventions to treat the problem and finally evaluate outcomes of intervention(s). It is a cyclical medical model through which we can improve and maintain rational prescribing, hence promoting rational use of antibiotics, by repeated measures of identifying existing behavior and specific problems

The second portion states that after evaluation of an intervention, we can consider three of the following steps. If intervention is successful (i.e. cost effective and improves the problems with antibiotic use pattern), we can implement the intervention on a large scale in all wards of Bavi District Hospital. It is model for other conditions that may be addressed in the future. If the intervention is partially effective or effective but very costly, we can revise the part of the cycle and restudy it. If the interventions were ineffective or uneconomical, we would drop the study and consider the cycle again partly or completely. However, for the purpose of quality of care, we can use this cycle again and again to identify the problem and solve it by means of implementing intervention(s) to maintain and improve the rational use of antibiotics.

Examination of the existing behavior

This step will identify problems with antibiotic use patterns. It includes :

- Collection and analyse of medical prescription encounters. The study requires 150 encounters per out-patient ward or 40 encounters per prescriber in the study's out-patient ward to be collected in January 2001 from Bavi District Hospital. Prescriptions diagnosed as ARI would be separated.
- KAP survey of all physicians who examined and treated children with ARI in Bavi District Hospital will be conducted in January 2001.

The objective of these quantitative techniques is to explore the treatment of ARI in children under five years old and to explore the area of improvement by intervention.

Quantitative data are very useful for finding out the actual behavior of the prescribers of Bavi District Hospital and the frequency of such behavior. This baseline data helps to identify problems with antibiotic use patterns and can also measure the success of intervention(s) during the evaluation process by comparing such problems with the data collected after intervention. All these study results are the most important source for measuring existing prescribing behavior in treatment of ARI in children under five years of age.

Diagnose the motivating factors and/or underlying causes

This step will identify the motivating factors for a specific problem and their causes. The motivating factors or underlying causes would be informational, economic, social/cultural and /or supply system (logistic/drug). A focus group discussion will be conducted at Bavi District Hospital. One FGD will consist of around 8-10 persons including clinical doctors, health managers, chief of nursing and drug dispensers. This qualitative technique will provide a broad insight of the problem

and also help to find out the possible mechanisms for improvement. A guideline format of FGD is attached in the appendices.

Treatment : Design and Implement Intervention

The intervention of this study has two phases. The first is face-to-face education to introduce the standard treatment guidelines developed by WHO and adapted by the national ARI program for the treatment of acute respiratory infection in children under 5 years of age by prescribers of Bavi District Hospital. The second is to establish monthly auditing of drug treatment, especially antibiotic use within the existing monitoring system using the same indicators which will be mentioned later and discussing the findings of auditing report with the prescribers during supervisory visits. Face-to-face education will be used during supervisory and auditing visits, between experts and prescribers. This auditing of antibiotic treatment is not only the part of this study, but also part of the management system. So, it is not elaborated in this proposal.

Evaluation of the Project

Two evaluations will be carried out, the one before intervention and the other after intervention conducted by researchers. Evaluation will include

- KAP of prescribers
- Encounter analyse

KAP of Prescribers

The KAP survey before intervention would be incorporated in the baseline survey. The KAP survey after intervention would be conducted during the post intervention evaluation. The KAP survey will be implemented by interview . Information to be collected from the KAP survey includes:

- Knowledge of prescribers about ARI treatment guidelines
- Perception and attitude of prescribers regarding ARI treatment guidelines
- Practice of prescribers in guideline implementation

Encounter Analyse

Prescription encounters will be collected prospectively from study outpatient wards. Collectors of encounters will be the nurse receptionists of hospital out-patient wards and inter-Commune polyclinics. These collectors will be trained for the collection and there will be one training course for each of the 2 evaluations (before and after intervention).

The study requires 150 encounters per out-patient ward or 40 encounters per prescriber in a study out-patient ward. There are 4 out-patient wards (1 out-patient ward and 3 inter-commune polyclinics of Bavi District Hospital) or 12 -16 prescribers (each ward has 3-4 prescribers) in the study. The total number of encounters for each evaluation would be 600. It is estimated that such a quantity of encounters could be collected within a period of 1-2 months. Therefore, the time

necessary for 2 evaluations must be from 2 to 4 months. Information to be collected from prescription encounters includes:

- Personal information of ARI patients (age, sex, place...)
- Time and environment of disease occurrence
- Diagnosis
- Treatment
- Responsible Physician

In addition, treatment encounters from prescribers of intervention wards during the 6 months intervention would also be recorded and collected by researchers for monitoring purposes during discussion and supervision. Collected encounters will be analyzed according to the standard treatment guideline.

Indicators and Variables for evaluation would be defined as follows:

Variables

Table 2 : Variable Table

Construct	Variables	Measures/Indicators	Data collection method	Source
Reason for low utilization of existing ARI guidelines	Qualitative assessment of reasons	Description	FGD	Health manager, Clinical doctors, Chief of nurses, Drug dispenser
Knowledge and attitude of doctors about ARI treatment and existing STG	- Knowledge of doctors about ARI treatment and existing STG - Attitude of doctors about existing ARI STG	- Knowledge score - Attitude score	Questionnaire	Doctors
Appropriate prescribing	Treatment of ARI	1. Percentage of ARI encounters containing antibiotic 2. Percentage of ARI encounters containing 1 antibiotic 3. Percentage of ARI encounters containing 2 antibiotics 4. Percentage of ARI encounters containing antibiotic recommended by STG 5. Percentage of ARI encounters containing injection antibiotic 6. Percentage of ARI encounters containing oral antibiotic 7. Percentage of ARI encounters containing antibiotic used by other administration 8. Percentage of ARI encounters containing full dose of antibiotics (5 days or more)	Prescribing analysis	Out – patient ward

Sources of Data

- *Hospital records*: The records will be reviewed at out- patient wards as well as at the Dept. of Service Administration in Bavi District Hospital. Data will be collected from registration books, from individual medical records, from monthly, quarterly and annual hospital reports, etc....
- *District records*: The records will be reviewed at the Bavi District Dept. of Statistics
- *Prescription encounters*: The encounters will be collected from the outpatient departments and inter-commune polyclinics of Bavi District Hospitals.
- *Survey data*: The data to be collected from the baseline survey as well as from evaluation surveys are the most reliable data for analysis because the surveys have to be conducted on the basis of standardized methods.

Data Collection

+ *Collection of baseline data*

- A cross sectional study will be conducted in Bavi District Hospital for the collection of baseline data
- The collection of baseline data should be implemented before the intervention .

- Data will be collected from records kept at Bavi District statistics department and district hospitals and from interviews with prescribers and key informants.
- Researchers will conduct the baseline survey by themselves.

+ ***Collection of prescription encounters for evaluation***

- Two prospective studies will be conducted in Bavi District Hospitals for the collection of prescription encounters for evaluation before and after intervention.
- The collection will be implemented at out-patient wards.
- Administrative nurses working in out-patient wards would be trained for the collection.
- Information from collected encounters should respond to requirements for analysis of evaluation indicators and variables.
- The duration of each prospective evaluation study would be 1-2 months in order to collect 150 encounters per ward or 40 encounters per prescriber.

+ ***Collection of data on prescribers' behavior***

- Two KAP surveys of prescribers in the hospital's out-patient ward and 3 inter-commune polyclinics (Bavi District Hospital) will be conducted before and after intervention

- The survey before intervention will be incorporated into the baseline survey in order to get more information for finding out the physicians' prescribing behaviour.
- The survey after intervention will be implemented during the second collection of encounters for evaluation.

+ ***Collection of data by focus groups***

- An FGD will be conducted at Bavi District Hospital.
- FGD will be used to identify the underlying factors of problems in using existing ARI treatment guidelines. Results of FGD will help to confirm the designed intervention.
- One FGD will consist of around 8-10 persons within one district including clinical doctors, health managers, chiefs of nurses and drug dispensers.
- The moderator will be the researcher. An assistant will take notes. A guideline for discussion will be developed by researchers. Discussions will be recorded with a tape recorder and transcribed for analysis.
- The place for FGD will be the Bavi District Hospital meeting room at an appropriate and convenient time decided by hospital staff.
- Duration of the FGD will be around 2 hours.

+ ***Instruments for data collection: Questionnaire***

- A questionnaire will be developed by researchers to investigate the knowledge and attitude of doctors about ARI treatment and existing STG.

- The questionnaire will be used by trained interviewers 2 times during the study: Before and after intervention.
- All doctors who treat ARI at Bavi District Hospital will answer the questionnaire.

Data Analysis

This study combines both quantitative and qualitative methods. Quantitative analysis is to be done by SPSS software. Qualitative analysis is to be done by Ethnography software.

+ ***Quantitative data analysis***

This method is applied to analyse the prescriptions and questionnaire. For prescription analysis, a form will be created to collect information from the prescriptions. The data will be coded, then entered into a computer. Before analyzing this data, cleaning the data will be done. The Epi – Info program will be used to analyse the data. The questionnaire of doctor's knowledge will be scored according to the number of correct answers. Using T- test for means will test the significant difference between before and after the intervention. Attitude of doctors will be measured by responses to items on an ordinal scale. Wilcoxon signed ranks will be used to test the significant difference between before and after the intervention .

+ ***Qualitative data analysis***

The qualitative data will be collected from FGD. The FGD will be noted and taped. Field notes and tape transcription will be used to summarize the FGD. Information will be analyzed to reveal types of problems in using the existing treatment guidelines for ARI.

3. 5 Activities and Time Plan

Activities for implementation of the study include:

1. Discussion with Bavi District Hospital director and Program director.
2. Approval for the study funds.
3. Forming a research team.
4. Evaluation study before intervention :

   + Collection of data

   + Data entry in a computer
5. Conduct Focus group discussion.
6. Develop motivating references.
7. Collection & copying of national guideline & WHO guideline
8. Conduct face-to- face education.
9. Evaluation study evaluation after intervention

   + Collection of Data

   + Data entry in a computer.
10. Analysis and report writing

Time Plan (2001)

Activity					M	O	N	T	H			
	1	2	3	4	5	6	7	8	9	10	11	12
1. Discussion with Bavi District Hospital director and program director												
2. Approval for the study and funds												
3. Forming research team												
4. Evaluation study before intervention												
5. Conduct focus group discussion												
6. Develop motivating references												
7. Collection & copying of national guideline & WHO guideline.												
8. One workshop in Bavi Distric Hospital for introducing guideline and evaluation indicators.												
9. Twenty -four supervisions and discussions with prescribers; one time per month for each ward.												
10. Evaluation study for evaluation after intervention												
11. Analysis and report writing												

Phasing: The activities that the research team will carry out during the study will take 12 months, starting from January to December 2001.The study would be divided into 3 phases:

1.The preparatory phase includes 7 activities:

1.1 Discussion with Bavi District Hospital director and Program director.

1.2 Approval for the study funds

1.3 Forming a research team.

1.4 Evaluation study before intervention :

+ Collection of data

+ Data entry in a computer

1.5 Conducting focus group discussion.

1.6 Develop motivating references.

1.7 Collection & copying of national guideline & WHO guideline

2.The intervention phase includes 2 activities

2.1 One workshop in Bavi District Hospital for introducing the guidelines and evaluation indicators

2.2 Twenty-four supervisions and discussions with prescribers; one time per month for each ward.

3.The evaluation and dissemination phase include 2 activities:

3.1 Evaluation study for evaluation after intervention

3.2 Analysis, report writing and dissemination

3.6 Budget

1.Per diem

Activity	Budget Allocation
Preparation phase	
1.1 Discussion with Bavi District Hospital director and program director	
4 participants x 1 days x 10$	40$
1.2.Baseline survey of out-patient ward and 3 inter-commune polyclinics	
2 researchers x 4 Wards x 3 days x 10$	240$
1.3. Meeting of researchers for the planning of research	
6 participants x 2 days x 10$	120$
1.4 Conduct one focus group discussion	
10 participants x 1 day x 10$	100$
Intervention phase	
1.5.One workshop in Bavi District Hospital of guidelines and evaluation indicators	
1 workshop x 23 participants x 3 days x 10$	690$
1.6. Twenty- four supervisions and discussions with prescribers : one time per month for each Ward	
24 supervisions x 3 persons x 10$	720$

Activity	Budget Allocation
Evaluation, Analysis, Reporting, Dissemination	
1.7.Training for data collectors:	
4 encounter collectors x 5 days x 15$	300$
1.8.Evaluation study before intervention	
2 researchers x 4 wards x 3 days x 15$	360$
4 encounter collectors x 2 months x 50$	400$
1.9.Evaluation study for evaluation after intervention	
2 researchers x 4 wards x 3 days x 15$	360$
4 encounter collectors x 2 months x 50$	400$
1.10.Analysis, report writing and dissemination	
3 persons x 30 days x 15$	1,350$
Sub total 1: Per diem	**5,080$**

2. Travel

Activity	Budget Allocation
Preparation phase	
2.1. Discusion with Bavi District Hospital director and program director.	
No requirement for travel	
2.2. Baseline survey of out-patient ward and 3 inter-commune polyclinics	
2 researchers x 4 wards s x 10$	80$
2.3. Meeting of researchers for the planning of research	
4 participants (one from each of the 4 wards) x 10$	40$
Intervention phase	
2.4. One workshop in Bavi District Hospital of guidelines and evaluation indicators	
1 workshop x 16 participants x 10$	160$
2.5. Twenty -our supervision and discussion with prescribers : one time per month for each Ward.	
24 supervisions x 4 persons x 10$	960$
Evaluation, Analysis, Reporting, Dissemination	
2.6. Evaluation study before intervention	
2 researchers x 4 wards x 10$	80$

Activity	Budget Allocation
2.7.Evaluation study for evaluation after intervention	
2 researchers x 4 wards.x 10$	80$
2.8.Analysis, report writing and Dissemination	
No request for travel	0$
Sub total 2: Travel	**1,400$**

3.Others

Items	Allocated budget
Dissemination results	300$
Materials	200$
Subtotal 3: Others:	500$
Subtotal 1 + 2 + 3 =	6,980$
Administrative cost (10%)	698$
Grand total	**7,678$**

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