

## **CHAPTER II**

### **ESSAY**

#### **Irrational use of antibiotics in children under 5 years old with acute respiratory infection (ARI) in Ba vi District Hospital, Vietnam**

##### **2.1 Introduction**

Globally, diarrhea, acute respiratory infection (ARI), and measles account for over a half of the deaths among children under five years of age (UNICEF, New York 1990). In developing countries, ARI alone is responsible for four million of the estimated 15 million annual deaths occurring in children under five years of age (WHO). The serious consequences of ARI have made it pertinent for health systems to deal with the problem with special emphasis on investigation and intervention. Vietnam is a developing country that reflects similar morbidity and mortality patterns as other developing countries in South - East Asia. Hence, the disease profile is dominated by diseases such as malaria, diarrhea, tuberculosis and ARI (Vietnam the blazing flame of reforms, Hanoi 1993).

Vietnam, since its establishment as the People's Republic, has through a political commitment given high priority to public health. This is reflected in its' low infant mortality rate, 46 per 1000 live births in 1990 (SIDA, 1992), in comparison to other countries with per capital income levels similar to Vietnam. The organization of

the health care system over a period of time has resembled the proposed recommendations of the World Health Organization (WHO).

The health care system in Vietnam is organized at four levels: The central, the provincial, the district, and the communal level; each level has specific duties and areas of responsibility. The Commune Health Stations, which serves a population of about 5000 – 10000, are intended to provide primary health services and preventive health activities proposed in the Alma - Ata declaration on primary health care (PHC) in 1978.

The health care system in Vietnam has encountered financial constraints in realizing its goals. Stagnation of the economy in the late 1970's, followed by the macroeconomic instability and hyperinflation of the 1980's, has taken its toll on the health system ( Truong Viet Dung et al. ). In response to this, political efforts to meet the economic crisis were formulated in 1986 in a new policy called " Doi Moi " (Vietnamese for " renovation "). The reforms have had major effects on the organization and efficiency of public health care (SIDA, 1992 and Vietnam the blazing flame of reforms, Hanoi 1993). The liberalization of the health care system has led to the emergence and rapid growth of private services such as : private pharmacies and private practitioners. The Ministry of Health (MoH) has estimated the increase in the number of registered pharmacies from 2000 in 1989 to more than 6000 in 1992 after permitting the emergence of private pharmacies. There are also a substantial number of unregistered pharmacies (SIDA, 1993). Furthermore, since most drugs including antibiotics do not require prescriptions, the proportion of health

- seekers bypassing the official health care system has increased. This follows a trend seen in other developing countries (Accepted for publication in J.Soc.Adm.Pharmacy 1995). The acquisition of drugs in this fashion has been shown to be irrational ( Tomson G. and Sterky G., 1986 ). Further illustrating the irrational use of drugs, a recent case study investigating two private pharmacies in Hanoi showed that only 0.8 percent of customers had a prescription and that 94.9 percent of customers made their own choice of which drugs to buy ( “ Doi Moi “ and Private Pharmacies, 1995). The annual per capita consumption of pharmaceuticals in 1992, according to the MoH, had increased approximately six times compared to the estimate from 1986 (SIDA, 1992). The SIDA Evaluation Report of 1992/93 pointed out that, “ It has been demonstrated by surveys that the public health service attendance has decreased in recent years, and that a large proportion of sick people now go straight to the market to buy drugs, without consultation. Hence, the increased and uncontrolled supply of drugs constitutes a danger.” (SIDA, 1992)

In Vietnam the treatment and management of ARI remains a major concern for the health care system. According to Doanh Le Dang, ARI is ranked among the ten leading causes of ill-health in Vietnam ( SIDA,1993 and UNICEF ). ARI hereby is the cause of 40 percent of hospital admissions, and is particularly common among children. In rural areas it is estimated that children under five suffer 4 -7 episodes of ARI per year ( National ARI Program ).

The over- treatment of ARI with antibiotics is a world - wide problem and common when discussing and evaluating public health strategies. In addition to

possible serious side effects, the dire consequence of uncontrolled use of antibiotics is the development of strains of bacteria resistant to the first line antibiotics and ultimately all antibiotics. As a result, banal infections can lead to life-threatening infections. The risk of this development also pertains to Vietnam, and is stated among the conclusions arrived at in an extensive study conducted in four rural Vietnamese communes : “the quite frequent occurrence of short course, the widespread availability of non-essential antibiotic, the availability of antibiotics for OTC (Over the Counter) purchase and prescriptions of antibiotics by (usually) little educated HHWs (Hamlet Health Worker) must all be a cause for concern with respect to the development of bacterial antibiotic resistance” ( Quality of Public Health Services and Household Health Care Decision, Vietnam 1994 )

In dealing with the rational case management of ARI, WHO has devised guidelines for early recognition of pneumonia, antibiotic treatment at home, referral of cases to hospitals, and supportive home care (ARI news, 1991). In Vietnam, an ARI control program was initiated in 1983 but gained ground first in 1986 when UNICEF and WHO gave it their support (UNICEF Vietnam The situation of children and women). The purpose was to standardize case management in health facilities especially at the district and commune levels. This vertical programme has been criticized by SIDA for lacking proper horizontal co-ordination . Efforts have been made to reach the private sector (SIDA, 1992). In the Bavi District, the area of study, the ARI programme was introduced in late 1988.

Until now, irrational use of drugs, especially antibiotics in children under five years old with ARI, is big public health care problem of in Vietnam as well as in Bavi District. Irrational use of drugs resulted in increasing morbidity, mortality, and treatment cost as well as increasing unwanted affects, and it also lead to increased demand for drugs. The main causes of this problem are related to prescribers, dispensers, patients and the health care system. To overcome the negative situation mentioned above, and to achieve rational use of antibiotics a comprehensive solution is needed to intervene with the four subjects: prescribers, dispensers, patients and the health care system. However, an intervention should be focused on specific problem behavior and targeted at the facilities or people having the greatest need for improvement to reduce irrational use of antibiotic in children under five years old with ARI.

## **2.2 Definition and concepts**

### **2.2.1 Definition of rational drug use:**

It is very difficult to describe and define the notion of rational use of drugs. All the patients are involved in drug use, from manufacturers to users in the community, and have their own perceptions and perspectives about rational use. A prescriber looks at the rational use of drugs from the perspective of medical criteria, a patient looks on the basis of his expectation, a manager looks at his goals and priorities and a pharmaceutical company on the basis of its success in promotion of

drugs. However, the conference of the experts on the rational use of drugs, convened by WHO in Nairobi ( *Managing Drug Supply, 1997* ) defined that:

“ The rational use of drugs 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. “ (WHO in Nairobi in 1985)

The term rational drug use includes the following criteria:

- Correct drug
- Appropriate indication that the prescriber’s reason is based on sound medical considerations;
- Appropriate drug, considering efficacy, safety, suitability for the patient, and cost.
- Appropriate patient: There is no contra-indication and likelihood of patient’s adverse reaction is minimal .
- Appropriate administration, dose and duration : Drugs should be prescribed in appropriate doses and duration to ensure that they are administered properly.
- Correct dispensing, including appropriate information for the patient about the prescribed medicine.
- Patient appropriately adheres to treatment.

### **2.2.2 What is irrational use of drugs?**

Irrational drug use occurs in all countries. These include cases in which no drug is needed; the wrong drugs or ineffective or unsafe drugs are prescribed; effective and available drugs are under utilized; and drugs are used incorrectly. (Managing Drug Supply, 1997)

**- No drug needed :**

The use of drugs when no drug therapy is indicated. Use of drugs when none is needed includes examples of where the majority of children suffering from minor upper respiratory infection are treated with antibiotics. Similarly, antibiotics or antidiarrheals, instead of oral rehydration solution (ORS) are indiscriminately prescribed for many children with acute diarrhea.

**- Wrong drugs :**

Those drugs which are not recommended by good standard treatment have been prescribed by physicians. For example, many children with streptococcal pharyngitis are not properly treated with narrow spectrum penicillin. Instead, tetracycline, a drug that is not recommended for the prophylaxis of rheumatic fever following streptococcal pharyngitis and that has serious side effects for children, is usually prescribed.

- **Ineffective drugs and drugs with doubtful efficacy:**

The use of drugs those are not effective or doubtful efficacy. Excessive and unnecessary use of multivitamin preparations or tonics is an example of this prescribing pattern.

- **Unsafe drugs:**

The likelihood of adverse reactions outweighs the therapeutic effects when unsafe drugs are prescribed. A common example includes the use of anabolic steroids for growth and appetite stimulation in children or athletes. In many countries, dipyrone (metamizol), a drug banned in most developed countries, is used indiscriminately in both health facilities and community for a large variety of minor ailments.

- **Underuse of available effective drugs :**

Failure to provide available, safe, and effective drugs, e.g., failure to prescribe ORS for children with acute diarrhea, failure to vaccinate against measles or tetanus. Regrettably, the under use of effective oral rehydration therapy for acute diarrhea in children still occurs in many countries.

- **Incorrect use of drugs :**

The use of drugs with incorrect administration, dosage, and duration, e.g., injectable preparation are commonly overused. Another example of the incorrect use of drugs is patients who are given only one or two days supply of antibiotic rather than the full course of therapy.



### **2.2.3 What is irrational use of antibiotic?**

The term irrational use of antibiotic includes the following criteria:

- The use of unnecessary antibiotics or excessive use of antibiotics.
- The ineffective dose where treatment is either too long or too short.
- The use of different antibiotics, which shouldn't be used together, simultaneously often causing undesired interactions.
- The use of antibiotics with wrong indication.

The term irrational use of antibiotic in this study is based on the standard treatment guidelines of ARI, developed by WHO and adopted by the national program in Vietnam (ARI program, 1993).

### **2.2.4 What is acute respiratory infection (ARI)?**

Acute respiratory infections are infections of any areas of the respiratory tract, including the nose, middle ear, throat (Pharynx), voice box (Larynx), windpipe (Trachea); air passages (brochi or bronchioles) and lungs. ( WHO )

Acute respiratory infections have been classified into three groups:

- Upper respiratory infections ( AURI ) including pharyngitis, tonsillitis, sinusitis and otitis media.
- Mid respiratory tract infections including laryngo- tracheal bronchitis and epiglottitis.
- Acute lower respiratory tract infections ( ALRI) including bronchiolitis and pneumonia.

(Khan et al., 1996)

### **2.3 Why is it targeted at the children with ARI?**

ARI is the leading cause of morbidity and mortality in children under five years old in both communities and hospitals.

- Acute respiratory infection kills 1.5 million children under five years old per year in the world ( WHO, 1999 )

(See figure 1)

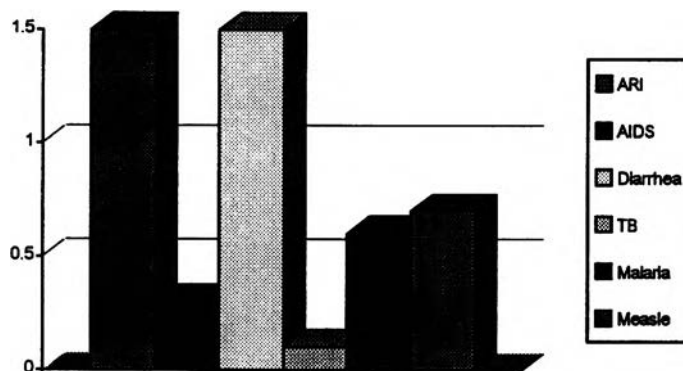
- Every child under five years old suffer 4-7 episodes of ARI per year in rural Vietnam ( National ARI program, 1995 ,Vietnam )
- Acute respiratory infection in children under five years old is the cause of 40% of hospital admissions in Vietnam (SIDA; UNICEF Vietnam).
- Deaths from ARI in children under five years old are among the top-ten leading causes of mortality in Vietnam: 1.15/ P.1000 (National ARI program, 1993))

Irrational use of antibiotics in children under five years old with ARI will create antibiotic resistance. Consequences of antibiotic resistance in treatment of ARI include increased morbidity rates and mortality rates in children with ARI.

**Figure 1. Leading infection killers, 1998 estimate**

**Children under five years old in the world**

Death per year (Millions)



(WHO, 1999)

## **2.4 Problems with the treatment of ARI by antibiotics**

### **2.4.1 Situation in Vietnam**

In Vietnam, the present use of drugs is still irrational, characterized especially by antibiotic, corticoid and vitamin abuse. This situation could be seen in all levels of the curative system from commune to district, and provincial to central levels; in the community, as well as hospitals (Health policy and medical sociology, 1999 ). In the public health sector, antibiotics account for 40-50% of the total cost for drugs and in some hospitals as much as 74% (Ha,1991). In Vietnam, as in most low-income countries, antibiotics can be bought over the counter without a prescription. (Chuc & Tomson,1999). The profits from drug sales lead to a temptation to over-

prescribe/dispense (Chalker, 1995). A case study at two pharmacies in Hanoi showed that 95% of the drugs sold were self-prescribed with a preference for broad spectrum antibiotics (Chuc & Tomson, 1999). In the ongoing research project "Toward good pharmacy practice in Thailand and Vietnam" (INCO-DC/STINT funded), preliminary results show that 83 % of the private pharmacy staff in Hanoi dispensed antibiotics for common cold and cough in children (Chuc et al., 2000). Commonly short (1-2 day) courses of antibiotics are given in the private (Chuc & Tomson, 1999, Chuc et al., 2000) and public (Chalker, 1998) sectors. Affordable drugs and active commercial advertising and marketing of drugs, both by national and international drug manufactures (Falkenberg et al. 2000, Finer, 1998), have contributed to a situation where frequent irrational dispensing of drugs by prescribers and dispensers, profit interest and a poor compliance with regulations result in a chaotic situation (Cederlof & Tomson, 1995). Studies in Vietnam have shown overuse of antibiotics (Phuong 1997, Larsson et al., 2000), high antibiotic resistance (Ha, 1991, MoH, 1998, Larsson et al. 2000, Parry, 2000) and treatment complications due to multi resistant pathogens (Hoa et al., 1998).

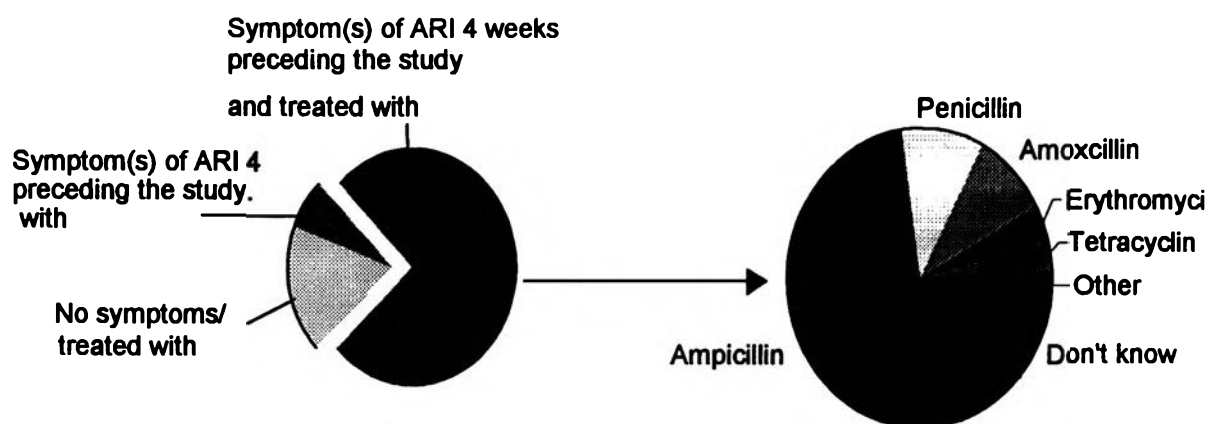
In Vietnam, an ARI control program was initiated in 1983. The purpose was to standardize case management in health facilities especially at the district and commune levels. STG of ARI developed by WHO and adopted by the national program was introduced to all health facilities in the country. Personnel were trained on those, and the results of those programs were successful. However, irrational use of antibiotics in children under five years old with ARI is still a problem in public health care. Children under 5 years of age are often treated with antibiotics for

respiratory infections in short courses of too little duration (Halfvarsson et al. 1998). In 1995, a survey of the national program on ARI revealed that in polyclinics and district hospitals more than 23 % of cases had used antibiotics based on wrong STG for children who with ARI ( National ARI program, 1995 ). A study on antibiotics use in communities showed that 91% of cases of ARI used antibiotics for 3 days or less. Only 2.7% got right dosage, 1.3% got higher and 96% got lower dosage ( Hoang Hiep et al., 1995). Another study, using in-depth interviews with clinical doctors at public district hospitals in Vietnam, showed that most doctors did not use the existing guideline in their prescribing ( Chuc, N.T.K et al., 1995 )

All results of the studies are mentioned above; these showed that irrational use of antibiotics, especially in children under five year old with ARI is still a big problem in Vietnam.

#### **2.4.2 Situation in Bavi District**

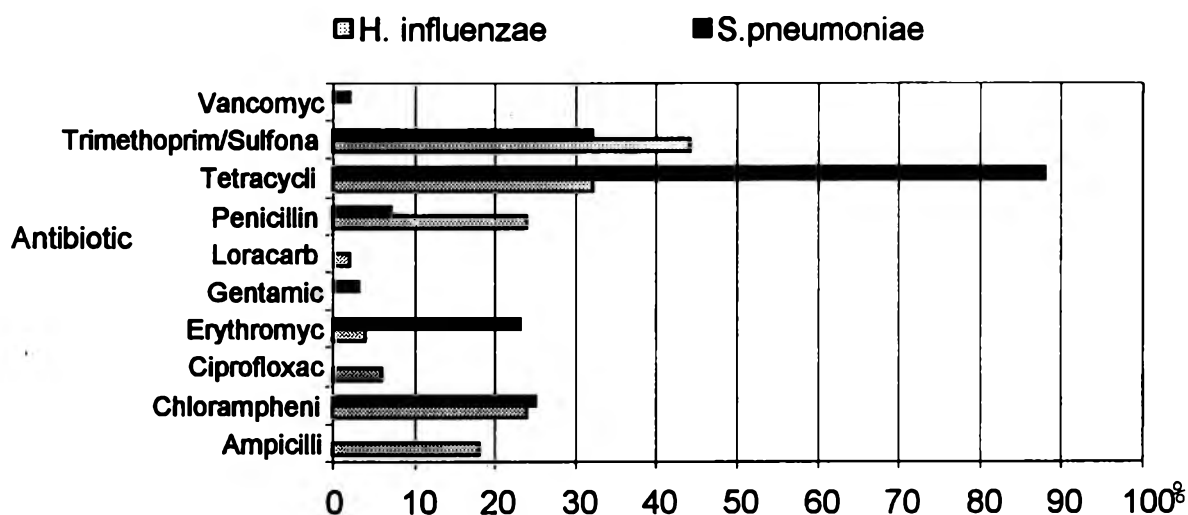
In Bavi District, the ARI programme was introduced in 1988. STG of ARI developed by WHO and adopted by national program (ARI program, 1993 ) exists in BDH. Personnel from the district level to commune level were trained on those, and the result of the program is satisfactory. But the present situation of antibiotic use in children under five year old with ARI is still irrational. The first community-based study in Bavi (accepted; Trop. Med. Intern. Health) assessing antibiotic use and antibiotic resistance in a study population of 200 children from 1-5 years of age in five villages in Bavi District, Hatay Province, Vietnam supported by SAREC (Swedish Agency for Research Education Cooperation), and showed that 82% of



**Figure 2.** Antibiotic consumption among the children in Ba Vi

Eighty-two percent of the 200 children had symptoms of ARI four weeks preceding the study (left pie chart). 75% of the children had used antibiotics within four weeks preceding the study (right pie chart). As some antibiotics were used in combination, the percentages add to more than 100%.

children had, according to the carers, at least one symptom of acute respiratory infection in the period 4 weeks prior to the study, and of these 91% were treated with antibiotics (Figure 2). Short courses were frequent e.g. ampicillin was used for an average of 3.4 days. When deciding which antibiotic to use, 68% of the caretakers consulted the pharmacy, 24% followed a doctor's prescription and 12% decided themselves. Eighty percent of the antibiotics were purchased from private pharmacies. High levels of antibiotic resistance and high prevalence of multi-resistant strains were found among respiratory pathogens (Figure 3) and there was a significant difference in ampicillin and penicillin resistance between the group of children previously treated with beta lactam antibiotics and the group of children who were not given antibiotics.



**Figure 3.** Prevalence of antibiotic resistant (R) strains of *H influenzae* (Vancomycin not tested), and *S pneumoniae* (Ampicillin and Loracarbef not tested).

In another study, the rationality of antibiotic prescription was assessed by measuring serum C-reactive protein (CRP), a well-established laboratory test for the discrimination between bacterial and viral infections (Babu et al., 1988, Peltola & Jaakkola, 1988). A total of 135 children aged 1-5 years old (100 in the study group and 35 in the control group), were tested for their CRP levels in the blood after receiving an antibiotic prescription by a physician. Of the children in the study group, 16% had slightly elevated CRP (10 - 25 mg/L), and 2 children had CRP > 25 mg/L of whom one had 36 mg/L and the other had 140 mg/L. Thus 84% of children who had received antibiotic prescription had positive C-Reactive protein (CRP) indicating non-bacterial infections. Therefore, there is a reason to suspect a high rate of antibiotic over-prescribing within the Bavi District Hospital.

## **2.5 Main cause of the problem**

Many interrelated factors influence irrational use of antibiotics ( See Figure 4 ). The health system, prescribers, dispensers, patients and communities are all involved in the therapeutic process, and all can contribute to irrational use of antibiotics in a variety of ways.

### **2.5.1 Prescribers ( Physicians)**

The prescribers can be affected by internal and external factors.

- *Lack of training* : Physicians received inadequate training, or prescribing practices may have become outdated due to a lack of continuing education. Many doctors working at District Hospitals did not refresh their knowledge on antibiotics for 10 - 15 years after graduation. They lack retraining.
- *Poor role models* : The role models that are imitated may not prescribe rationally
- *Inadequate information*. Lack of information on antibiotics, and the information provided by drug sellers may be unreliable. A heavy patient load and pressure to prescribe from colleagues, patients and drug company representatives all influence prescribing decisions.
- *Financial interest* : Profit may effect a prescriber's choice if the prescriber's income depends on the drug seller.



### **2.5.2 Dispensers (Pharmacies)**

The dispenser plays an important role in the therapeutic process. The quality of dispensing may be affected by the training and supervision that the dispenser has received and the drug information available to the dispenser. A shortage of dispensing material and short dispensing time due to heavy patient load may also have an adverse impact on dispensing. Finally, the low status of dispensers and their profit affect the quality of dispensing. In Vietnam there are pharmacies in which sellers are still not professionals.

### **2.5.3 Patients and communities**

Prescribing also depends on the culture, belief and perception of the patients. For example, there may be a belief that injections are more powerful than capsules, or capsules are more effective than tablets.

It is clear that the knowledge and experience of the prescribers are important aspects of the interaction between prescribers and patients. Finally, some poor patients do not have enough money to buy drugs according to the physicians.

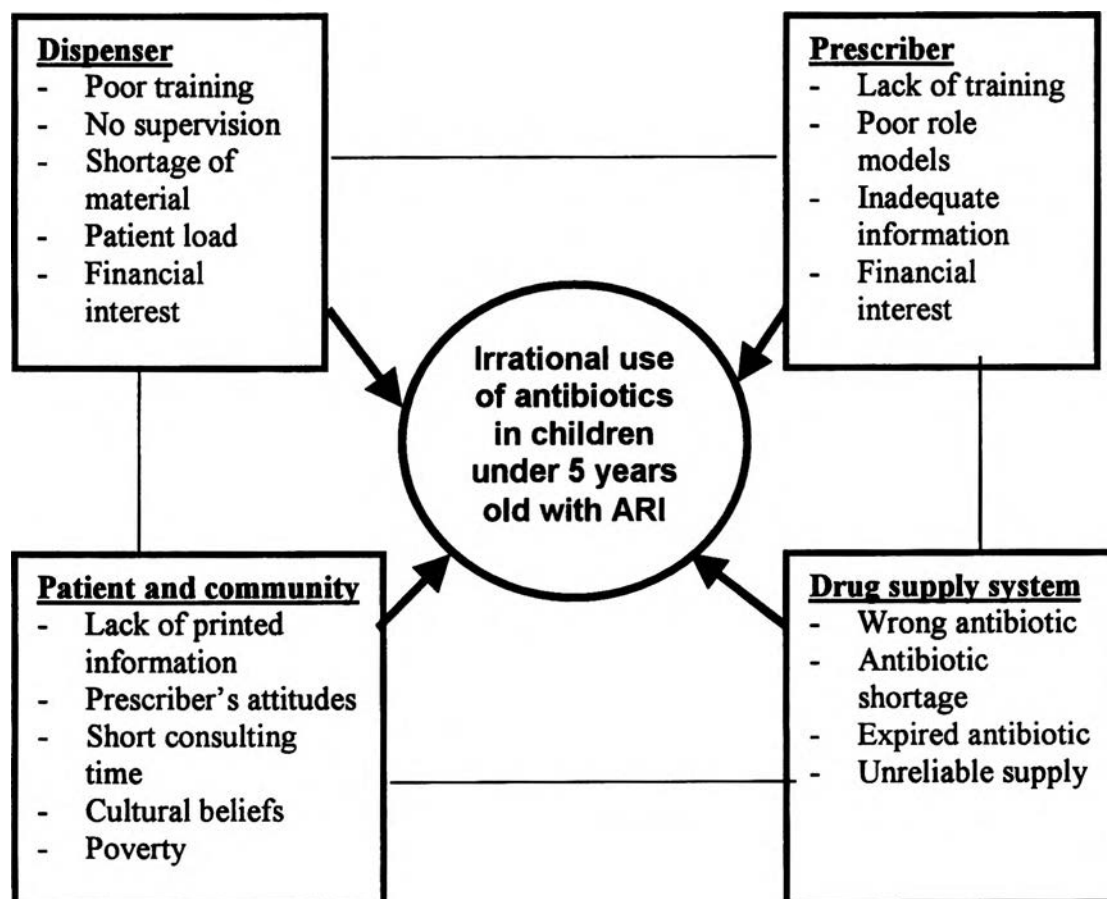
### **2.5.4 Health system**

Factors affecting the health system include unreliable supply, antibiotic shortage, expired antibiotics, and availability of inappropriate antibiotics. Such problems in the

system lead to a lack of confidence in the system by the prescribers and the patients. The patients demand treatment, and the prescriber feels obliged to give what is available, even if the antibiotic is not the correct one to treat the condition.

As discussed above there are many causes for irrational drug use and many factors involved in the decision making process. These factors vary for each person and situation. This means that specific interventions to improve prescription may work under some circumstances but not others. Due to the complexity of factors involved, it is unlikely that any single intervention will work in every situation.

**Figure 4: Causes related to problem**



*Source:* Adapted from Finer and Tomson 1992

## **2.6 Consequences of the problem**

### **2.6.1 Impact on medical care**

Inappropriate prescribing practices can, directly or indirectly, jeopardize the quality of patient care and negatively influence the outcome of treatment. The irrational use of antibiotics leads to antibiotic resistance. Consequences of antibiotic resistance are:

- Treatment failures
- Increased morbidity
- Increased mortality.

### **2.6.2 Economic impact**

- Overuse of antibiotics causes excessive spending on pharmaceuticals and a waste of financial resources by both patients and the health system.
- Under use of antibiotics at an early stage of a disease may also produce excessive cost by increasing the probability of prolonged disease and hospitalization.

### **2.6.3 Increased risk of unwanted effects**

Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance. An example of unwanted effects are cases where incorrect misuse

injection has been implicated in a high incidence of anaphylactic shock. Multiple drug resistant tuberculosis also are example.

#### **2.6.4 Psychosocial impact**

Over prescribing communicates to patients that they need medications for any and all conditions, even trivial ones. The concept that “ There is a pill for every ill ” is harmful. The patient comes to believe in antibiotics, and this reliance increases the demand for them.

### **2.7 Developing strategies to improve antibiotic use.**

#### **2.7.1 Identify the problem.**

To overcome the negative situations mentioned above and to achieve rational use of antibiotics, a comprehensive solution is needed that intervenes with four subjects: Health supply system, Dispensers, Prescribers, patients and communities. However, These factors vary from person to person and from situation to situation. In Bavi District Hospital prescribing behavior of physicians is more important. As mentioned above, a study conducted in collaboration with the Bavi District Hospital assessed antibiotic prescription by measuring serum C-Reactive Protein ( CRP ), a well - established test for discriminating between bacterial and viral infections. It was found that 84 % of children who had received antibiotic prescriptions had CRP levels

indicating non-bacterial infections. Another study conducted in Bavi District Hospital showed that 76% of physicians awareness of ARI standard treatment guidelines and 33% of physicians willing to apply standard treatment guidelines. ( Ng. T. Dung et al.,1999)

There are four groups that need to be intervened to use antibiotics rationally In which the physicians group is most easily to be intervened due to number of doctors who should to be intervened is smaller than other is, the time and human resources needed to implement intervention is smaller too. But its impact is better.

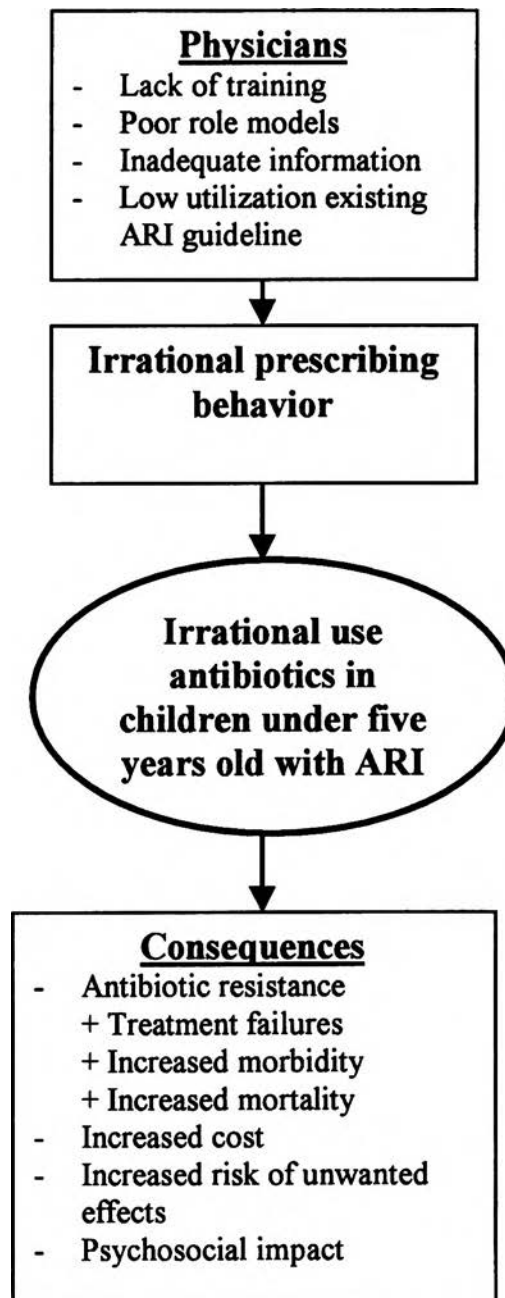
In addition, due to shorted of time, human resources and budget the intervention can not be implemented at the same time with all four groups.

From reasons mentioned above, an intervention should be focused on prescribing of physicians in Bavi District Hospital.

### **2.7.2 Identify Underlying Causes of irrational prescribing of physicians**

Causes of irrational prescribing of physicians were mentioned in part 2.5.1. Among the various factors, those that upgrade the knowledge of the prescribers are perhaps more important, as they will bring changes in attitude and habit. So, it is feasible to motivate prescribers to prescribe rationally by stimulation, such as, implementation STG and educating them about rational prescription of antibiotic.

**Figure 5: Conceptual framework**



### 2.7.3 Possible intervention strategies to improve rational prescribing

The three types of approaches, which have so far been discussed in this arena of rational drugs (Managing Drug Supply, 1997 in USA.), are:

## **Education strategies**

Educational approaches which seek to inform prescribers about using drugs in different ways and where promoting effective, safe and economical drug use are potentially quite successful.

Examples of educational strategies are Prescribers' pre - service or in-service training or workshops, and printed educational materials (such as, newsletters, drug bulletins or feedback report etc.).

## **Managerial strategies**

Managerial strategies structure or guide decisions through the use of specific processes, forms and so forth and where there is an attempt to achieve more cost-effective use of pharmaceutical resources.

Examples of managerial strategies are - diagnostic and treatment schedules or guidelines, structured drug prescribing forms, periodic effective monitoring and clinical supervisory systems etc.

## **Regulatory strategies**

Regulatory strategies that restrict allowable decisions by placing absolute limits are generally focused to aim at saving money or preventing improper use of

drugs. So, they completely rely on rules and regulations to change behavior. There may be some unintentional impact of specific types of regulations. For example, in some countries banning all antidiarrheals resulted in increased use of metronidazole and mebendazole as antidiarrheal substitutes.

## **Mechanisms**

According to Laing, a single strategy or measure may improve the drug use situation, but combining two strategies is likely to be most successful and sustainable in improving a single drug use problem. Different approaches work in different ways to improve drug use. Educational strategies such as training, workshops or printed materials may help to change the attitude of the prescribers by increasing their knowledge and skill. Virtually, it is the foundation for writing a rational prescription. By this approach, specific motivation can be provided to the prescribers and usually it is interactive and participatory. An educational strategy practically builds habit through norms. A managerial strategy such as a list of essential drug or formularies, structured prescription pad, treatment guidelines etc., develops some norms in the organizational setting. Whether these are working well in the organization could be ensured by effective supervision. One of managerial strategies to improve rational use of drugs, is enactment of regulation measures, such as limiting which drugs are supplied, limiting the number or quality of drugs per patient or generic prescribing etc. The measures are carried out to control the situation by force. Practically, it might have some disadvantages and might have some of the unintentional effects mentioned above.



These strategies could be implemented together to maximize impacts at a single point in time or in sequence to reinforce effects. Recently a series of interventions launched in Mexico City to improve the treatment of diarrhea was a good example of how interventions can combine different approaches. Initially, a prescribing survey was done and physicians from the clinic then participated in a training workshop where results of the survey were presented. In that workshop the physicians developed a normative treatment algorithm for diarrhea. This was followed by peer review committee activity for the next six months where the review committee rotated and assessed their own and their colleague's diarrhea case records. At the base line, the status of study physicians and control physicians was almost the same, 25% and 20% respectively. After the workshop, the prescribing pattern among the study physicians became double from the base line according to the treatment algorithm they prepared. And after the peer review, it rose to triple in the study physicians, whereas the prescribing pattern remained same in the control group (Gutierrez, Conyer, Guiscafre, Reyes, Martinez and Kumate, 1996 ).

#### **2.7.4 Choose intervention**

An intervention should focus on a specific problem behavior and target the facilities or people that have the greatest need for improvement.

## **Face-to-face Education**

Talking directly to prescribers about appropriate drug use is a common intervention strategy. Face-to-face education is two-way communication, where the educator can talk with the prescribers resulting in a high level of understanding, suggesting and encouragement for a behavior. It is perhaps the best medium for providing effective education ( Ross-Degnan et al.,1997 ). It has been found to be an effective strategy for improving prescribing practices, especially when it is combined with other approaches. It is flexible strategy, which can be arranged in any setting, such as health centers, hospitals, pharmacies or even at continuing education seminars held at district levels where educators are able to talk to prescribers. Also it can be used in many situations like during training, supervisory or regular supportive visits. There are some reasons why face-to-face education is more effective than other approaches:

- As it is participatory discussion ( Two-way ) the prescriber remembers and learns more than by passive reading of information.
- During the process, the educator can assess specific motivations of prescribers for their practices and adopt messages in relation to this motivation.
- A verbal informed agreement with the educator about correct behavior can create psychological incentives to conform to recommended practices.

This face-to-face education is planned systematically on the basis of need assessment and prioritization resulting from the focus group discussion involving the prescribers of BDH. It is responsive to rapid change in the world and inclusive of the prescribers.

### **Other approaches versus face-to-face education**

In a review, Ross-Deganan found a study carried out in 1983 in the United State by Avorn and Soumerai, where prescribers were divided into 3 groups. One group received printed material and another group received printed material and face-to-face individual visits by trained educators and the third was considered as a control group. There was highly significant improvement of prescribing practices in the print and face-to-face visit group. In 1989 the authors reviewed published experiences in primary care interventions where 44 reports of educational, managerial and regulatory approaches were identified. The two reports concluded that printed educational materials alone may change knowledge but did not change practice. Raisch in 1990 categorized methods used to influence prescribing into direct methods, with individual and practice factors, indirect methods, and continuing education. (Raisch, 1990) while agreeing that one-on-one interaction were effective, he reported that the positive effects of printed individual feedback may not sustained.

A study in Indonesia compared large group training with small group face-to-face training on diarrhea. The small group face-to-face educational intervention has shown greater impact on improving prescribing pattern over a large group formal

seminar. Furthermore, the small group approach was less expensive and fitted better with the existing supervisory system ( Santoso,Suryawati, Prawitasari & Ross-Degnan, 1997 ).

A critical review by Ross-Degnan et al in 1997 found that 3 out of 14 educational interventions achieved greater improvements while 7 showed moderate and 4 had little impact on improving prescribing behavior. The first two groups which had larger impact used either problem oriented, multiple sessions using large groups (deVaries 1995,Lopez Linares 1991, qazi 1996) or focused on a single health problem (Diarrhea, ARI etc.) using small groups (Chowdhury 1995, Gani 1996, Santoso 1997, Kafuko 1996). The educational sessions are useful in any setting (district or health center based), but on-site educational sessions using small groups were found sustained results when compared with the control after 2 years (Santoso et al., 1996).

The other studies in Indonesia and Uganda came with the same results indicating that face-to-face education has had greater impact on promoting rational prescribing, especially when it is conducted more than once. In both countries there were significant increases in ORS sales and corresponding decreases in antidiarrheal sales (Gani et al., 1996; Adome et al., 1997).

Hadiyono Jep conducted one important study in Indonesia where she identified that prescribers and patients together had different ideas about injections. After bringing prescribers and patients together in a neutral place and neutral environment with clinical experts, the injection practices of prescribers were

dramatically changed. While this intervention was a little different from the conventional face-to-face educational activity, it showed how important this strategy was to motivate the prescribers (Hadiyono, J.E.P et al., 1997 )

### **Focus and selection of interventions**

This study focused on the rational antibiotic treatment of acute respiratory infection in children under five years old to improve rational prescription of antibiotics in children with ARI who are under five years old. This focus of introducing standard treatment guidelines to the prescribers and supervising their implementation by the prescribers through face-to-face education is the best way to minimize irrational prescription. Face-to-face education is chosen to introduce standard treatment guidelines to the prescribers and supervising their implementation by the prescribers in Bavi District Hospital, because:

- **Organizational and cultural feasibility:** there already exists a STG of ARI in the organization. Personnel in these programs are trained on STG of ARI and the program is running well.
- **Technical feasibility:** For implementing this program, there is no need of sophisticated communication systems or equipment. Introducing STG and the supervision of its implementation through face-to-face education fits better with the existing supervisory system of the organization.

- **Likelihood of success:** Face-to-face education is a two-way, participatory and interactive discussion between the prescribers and educators. Educators can assess specific motivation and adapt messages to relate to this motivation. This face-to-face strategy not only introduces STG but also creates a verbal agreement between prescribers and educators during the supervision process.
- **Economic feasibility:** Face-to-face education would be implemented during the supervisory visit, it will be economical. Other strategies such as training need a wide range of resources and are more costly than face-to-face education.

### **Standard treatment guideline**

The term *Standard treatment guidelines (STG)* is used to indicate systematically developed statements to help practitioners or prescribers make decisions on appropriate treatments for specific clinical conditions. Treatment guidelines exist in different levels of health care, ranging from general prescribing guidelines for paramedical workers in rural areas to detailed protocols for tertiary health care centers in wealthy urban areas.

Important considerations for the development of standard treatment guidelines are:

- To target priority condition which contribute the most to rates of morbidity and mortality existing in the community. Note that some condition, which contribute substantially to the number of patients treated.

- To coordinate with special programs.
- To use the fewest drugs necessary.
- To use essential drug list only.
- To involve respected clinicians.
- To consider the patient's perspective and choose cost-effective treatment.

The key feature of standard treatment guidelines includes simplicity and credibility as the treatment is developed by the most respected clinicians. Implementation of standard treatment guidelines changes the attitude of the prescribers after being trained or educated. Drug procurement and supply also depends on the standard, hence increases adherence to the drug list. So, one of the managerial strategies selected for this project is to improve prescribing behavior.

When managing drug supply, U.S.A., 1997 standard guidelines benefit health officials, supply management staff, health care providers, and patients.

- From the managers and policy maker's point of view, there should be sufficient quantities of drugs available at the health center; as drug demand becomes more predictable, so forecasting will be more reliable. Furthermore STG provides a method to control costs by using drug funds more efficiently and serves as a basis to assess and compare quality of care.

- From the prescriber's point of view, standard treatment providers can concentrate on correct diagnosis and give expert consensus on the most effective, economic treatment for a specific setting.
- From the patient's point of view, consistency of the prescribing pattern among prescribers reduces confusion to the patient and increases compliance. Moreover, STG is the most effective treatment prescribed for the patients.

Together with a national list of essential drugs, treatment guidelines are powerful tools to promote the rational use of drugs. They offer an opportunity to ensure that the training of health workers is based a logical approach to treatment and on a consensus about the selection of essential drugs. The national treatment guidelines should be used for in-service training, supervision, and medical audits.

Although use of standard treatment guidelines has a lot of advantages, it may not produce any effect on the prescriptive pattern of the prescribers when implemented alone. A study of rural health units in Uganda by Kafuko illustrated that provision of standard treatment guidelines alone did not change the behavior of the prescribers. In that study, STG were supplied to all 3 groups, but there was a targeted training to one group of prescribers on STG. The third group had STG plus training along with additional monthly supervisory visits for 6 months. The second group was considered a control group. All indicators of those who were tested showed that simple dissemination of STG had no effect, but targeted on - site training had



consistent positive effects on performance, and supervision sometimes resulted in additional improvement.

Another study in Tanzania by Wiedenmayer et al. illustrated the same results; although adherence with the STG improved significantly, other prescribing indicators did not change from the base line. The study suggested that more effective and repeated educational programs including supervision of the prescriber, along with the standard treatment, might be necessary to improve prescribing behavior. Therefore, disseminating standard treatment guidelines without activity implementation was clearly ineffective ( Wiedenmayer et al.,1997 )

Standard treatment guidelines are now currently used all over the world; in the U.S., Europe, Latin America, Asia, Africa, and the Western Pacific. As mentioned above, standard treatment guidelines of ARI developed by WHO adopted by the national program ( ARI program,1993) exist in the Bavi District Hospital setting. The personnel were trained in those guidelines, and the result of those programs is satisfactory. However, implementation of standard treatment guidelines alone did not change the behavior of the prescribers. So, when implemented effectively with other measures, standard treatment guidelines can produce improvement and perhaps promote rational prescribing.

Therefore, an educational program (face-to-face education) is needed to introduce and supervise implementation of standard treatment guidelines usage to change the prescriptive pattern of the prescribers of BDH.

## 2.8 Conclusion

Acute respiratory infection account for 30-50% of visits by children to health facilities and 20 – 40% of pediatric hospitalization in most developing countries. They are the conditions for which antibiotic are most frequently used, often unnecessarily, in out-patient services. Although the incidence of ARI is similar throughout the world, the incidence of pneumonia is 5-10 time higher in developing countries than developed countries. ( WHO, 1993). Who estimates (1993) indicate that pneumonia is leading cause of death in children under five years of age in developing countries. Out of nearly 12.2 million children under five years old who die each year in developing countries, about 4.1 million ( 34%) die from illnesses associated with ARI primarily pneumonia.

Most pneumonia in children cannot be prevented by vaccines currently available , but they can be treated with standard antibiotic therapy. Rational use of antibiotics is important to reduce morbidity and mortality of ARI in children. Introducing standard treatment guidelines to prescribers and supervising implementation of such guidelines by prescribers through face-to-face education is the best way to improve rational prescription of antibiotics by physicians for children under five years old with ARI.

## References

- UNICEF. State of World's Children Report. New York: 1990.(Nordisk Medicin vol.107,11/1992 )
- WHO. Programme for the Control of Acute Respiratory Infections, “ Acute respiratory infections in children: Case management in small hospitals of developing countries.” (N.D.)p.1.
- Statistical publishing house: Vietnam the blazing flame of reforms. Hanoi: 1993.
- SIDA. Evaluation Report: 1992/3 Doi Moi and Health, p.13;p.15;p.25;p.26;p.47;p.48
- Quality of Public Health Services, Truong Viet Dung et al.p.1.
- Cederlof C., Tomson G. Private Pharmacies and the Health Sector Reform in developing countries-Professional and commercial Highlights. Accepted for publication in J.Soc.Adm.Pharmacy, 1995.
- Tomson G. and Sterky G. Self-prescribing by ways of pharmacies in three Asian developing countries. Lancet ii, 1986.620-622,

“ Doi Moi “ and Private Pharmacies: A case study on dispensing and financial issues in Hanoi, Vietnam.p7 Accepted for publication European Journal of pharmacology, 1995.

Doanh Le Dang: The role of the state in transition of the Vietnamese Economy into market Economy in Redefining the role of the state and the market in the development Process, SIDA: 1993.

UNICEF Vietnam the situation of children and women. P.83.

Quality of public Health services and Household Health care Decisions in Four rural communes of Quang Ninh Province, Vietnam. July 1994. P.38.

Pio A. Programme Planing. ARI Knew, issue No. 19, , 1991. pp.2-3.

UNICEF Vietnam the situation of children and women. p. 84.

Ministry of Health - Area of drug policy and control - National control project on micro – Organism resistance to drugs, 1999.

Ministry of Health - Advisory committee on using antibiotics, campaign on rational and safe use of antibiotics, 1995

**Focused Programme Review - Document of National ARI control programme,  
Vietnam, February 1996.**

**ARI Health Facility Survey - Document of National ARI control Programme,  
Viet Nam, 1995.**

**World Health Organisation [On-line]. Available from:**

**[http//w.w.w.WHO.int/chd/pulications/ARI/mgt](http://w.w.w.WHO.int/chd/pulications/ARI/mgt)**

**MoH. Health statistics year book, 1998.**

**Managing drug supply: The selection, procurement, Distribution, and Use of  
pharmaceuticals Second edition, revised and Expanded, U.S.A, 1997, Chapter  
28,31,11.**

**Arkanul Islam Introducing standard treatment schedules through face-to-face  
education: A way to improve prescribing practices at Brac health center. The  
College of Public Health, Chulalongkorn University, Bangkok, Thailand. 1998.**

**Lancet acute respiratory infection in under fives. 15 million deaths in year. The  
Lancet. Eoliorial note. 1985. pp. 699-700.**

Finer, D., and G. Tomson, eds. *Essential drug information: The story of a workshop.*

Stockholm: Karolinska Institute, Department of International Health Care Research. 1992.

Cederlof C, Tomson G. Private pharmacies and the health sector reform in developing countries-professional and commercial highlights. *J. Social. Adm. Pharmacy* 3 (1995):101-111.

Chalker J. Viet Nam: profit and loss in health care. *World health forum* 16 (1995): 194-5.

Chalker J. Improving Quality of Care in Hai Phong Province. *Essential Drugs Monitor* (1998):25-26:15-17.

Chuc NTK, Larsson M, Falkenberg T et al. Knowledge and case management of ARI in private pharmacies in Hanoi, Vietnam. *Journal of Tropical paediatrics* (2000) Submitted

Chuch NTK & Tomson G. "Doi Moi" and private pharmacies: A case study on dispensing and financial issues in Hanoi, Vietnam. *European Journal of Clinical Pharmacology* 55 (1999):325-332.

Falkenberg T & Tomson G The world bank and pharmaceuticals. *Health policy and planning* (1999) Accepted.

Falkenberg T, Nguyen Thanh Binh, Larsson M, Nguyen Thanh Do and Tomson G.

Pharmaceutical Sector in transition – A cross sectional study in Vietnam.

Submitted to Health Policy and Planning.(n.d.)

Finer D., Thuren T., and Tomson G., Tet offensive: winning hearts and minds for prevention. Discourse and ideology in Vietnam's "Health" Newspaper. Soc Sci Med 47(1): (1998 Jul)133-45

Ha NTT . Resistance to antibiotics in enteric bacteria from patients with diarrhea and healthy persons in Vietnam and characterization of beta lactamases in escherichia coli, PhD thesis, The Karolinska International Research Training Program (KIRT), Karolinska Institute, Stockholm, Sweden. 1991.

Halfvarsson J., Heijne N., Ljungman P., Ham N.N., Holmgren G. and Tomson G.

“Knowing when but not how!”-Mothers perceptions and use of antibiotics in a rural area of Vietnam. Tropical Doctor, 1998. Accepted.

Hoa NT, Diep TS, Wain J, Parry CM, Hien TT, Smith MD, Walsh AL & White NJ.

Community acquired septicaemia in southern Vietnam: the importance of multidrug resistant Salmonella typhi. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 92 (1998): 503-508.

Nguyen Thi Kim Chuc et al,. A participatory evaluation of WHO criteria for medicinal drug promotion in multiple countries. 1995.

ARI program. Guidelines for the treatment of acute respiratory infections. 1993.

MoH. Health policy and medical sociology.1999. p.38.

Adome,R.O.,Whyte, S.R., Ortenblad, L.,Nsabagasani, X. & Turinde, A.K. The impact of community-based teaching on drugs : an experience from western Uganda. Paper presented at First international Conference on Improving use of Medicines, April 1-4, 1997,Chiang Mai, Thailand. 1997 .

Chowdhury, A. K. A.,Khan, O.F., Galib, M.A., Matin, M.A., Haque, Z.& Begum,K. Study of effect of standard treatment guidelines for diarrhoea and ARI in some thana health facilities of Dhaka division of Bangladesh. WHO/DAP web page. 1995 .

Degnan-Ross, D.,Laing, R., Santoso, B., Ofori- Adjei, D., Diwan, V. & Lamoureux, C. Improving pharmaceutical use in primary care in developing countries : A critical review of experience and lack of experience, Paper presented at First International Conference on Improving Use of Medicines, April 1-4, 1997, Chiang Mai, Thailand.1997 .

Gani, L., Tangkilisan, A., Pujilestari, L. Improving rational prescribing of physicians : an educational approach for acute diarrhea in children in Jakarta, Paper presented at First International Conference on Improving Use of Medicines, April 1-4, 1997, Chiang Mai, Thailand.1990.



Gutierrez, g., Conyer, T. R., Guiscafne, H., Reyes, H.,Martinez, H. and Kumate, J. Impact of oral rehydration therapy and selected public health intervention on reduction of mortality from childhood diarrheal diseases in Mexico. WHO Bulletin OMS. Vol.74(1996 ):pp. 139-197.

Hadiyono, J.E.P., Suryawati, S., Danu, S.S., Sunartono & Santoso, B. International Group discussion : an innovative behavioral intervention to reduce the use of injections in public health facilities. Paper presented at the first International Conference on Improving Use of Medicines, April 1-4,1997. Chiang Mai, Thailand. 1997.

Kafuko,J. M., Zirabamuzaale, C. & Bagenda, D. Rational drug use in rural health units of Uganda : Effect of national standard guidelines on rational drug use, Paper presented at the First International Conference on Improving Use of Medicines, April 1-4, 1997, Chiang Mai, Thailand.1996.

Santoso, B., Suryawati, S.,Prawitasari, J. E. & Ross- Degnan, D. Small group educational intervention Vs Formal seminar for improving appropriate drug use in acute diarrhea. Paper presented at the First International Conference on Improving Use of Medicines, April 1-4, 1997, Chiang Mai, Thailand.1997.

Wiedenmayer, k., Mtasiwa, D., Majapa, Z. & Lorenz, N. Impact of pilot intervention ( standard treatment guideline, training ) on prescribing patterns in Dar es Salaam.

Paper presented at First International Conference on Improving Use of Medicines, April 1-4, 1997, Chiang Mai Thailand. 1997.

WHO. Acute Respiratory Infection in South-East Asia report of an inter country of programme managers New Deli, 1992. p.3

Raisch D.W. A model of methods for influencing prescribing: part I- A review of prescribing model, persuasion theory, and administrative and education methods. Part II- A review of education methods, theory of human inference, and delineation of model. Drug Intell Clin Pharm. 24(4) (1990): 417-421.

Chinh ND and Hiep HT. Household Survey on Acute Respiratory Infections in children under five. Scientific conference of ARI National Program. 1995: 97-99.