COMMUNITY INVOLVEMENT FOR PREVENTING ANTIBIOTIC SALE IN VILLAGE GROCERIES AT MAHASARAKHAM PROVINCE

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A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program in Social and Administrative Pharmacy
Department of Social and Administrative Pharmacy
Faculty of Pharmaceutical Sciences
Chulalongkorn University
Academic year 2010

การมีส่วนร่วมของชุมชนเพื่อป้องกันการขายยาปฏิชีวนะในร้านชำในหมู่บ้าน จังหวัดมหาสารคาม

นายสมศักดิ์ อาภาศรีทองสกุล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรดุษฎีบัณฑิต
สาขาวิชาเภสัชศาสตร์สังคมและบริหาร ภาควิชาเภสัชศาสตร์สังคมและบริหาร
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ปีการศึกษา 2553

Thesis Title	COMMUNITY INVOLVEMENT FOR PREVENTING ANTIBIOTIC SALE IN VILLAGE GROCERIES AT MAHASARAKHAM PROVINCE
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การวิจัยที่ได้แบบจำลองการแพร่กระจายนวัตกรรมมาใช้พัฒนาช่องทางการสื่อสารสำหรับเจ้าของร้านชำในหมู่บ้านเพื่อป้องกันการขายยาปฏิชีวนะในจังหวัดมหาสารคาม ประเทศไทย การสนทนากลุ่มได้ดำเนินการขึ้นเพื่อรวบรวมข้อมูลสำหรับการสร้าง intervention แบบหลายมุมมองโดยชุมชนมีส่วนร่วม (Multidiscipinary Perspectives Intervention with Community Involvement: MPI&CI) การศึกษานี้ได้ประเมินการเปลี่ยนแปลงความรู้ของเจ้าของร้านชำเรื่องยาปฏิชีวนะ ความตระหนักและการโน้มน้าวใจของผู้นำชุมชนต่อการป้องกันการขายยาปฏิชีวนะ และขนาดการกระจายยาปฏิชีวนะในร้านชำในหมู่บ้านหลังจากดำเนินการ intervention เจ้าหน้าที่ท้องถิ่นและผู้นำชุมชนได้รับการอบรมเป็นเวลา 1 วัน เพื่อดำเนินการ MPI&CI การวิจัยแบบกึ่งทดลองถูกออกแบบเพื่อประเมินผล intervention โดยเลือกหมู่บ้านกลุ่มทดลองและกลุ่มควบคุม กลุ่มละ 20 หมู่บ้าน การรวบรวมข้อมูลจากร้านชำ 116 แห่งก่อนและหลัง intervention พบว่ายาปฏิชีวนะในร้านชำลดลงอย่างมีนัยสำคัญ ($p<.001$) จาก 79.2% เหลือ 22.9% ในกลุ่มทดลองหลังจาก intervention ความรู้เรื่องยาปฏิชีวนะของเจ้าของร้านชำเพิ่มขึ้นอย่างมีนัยสำคัญ ($p<0.01$) ความตระหนักต่อ intervention ของผู้นำชุมชนเพิ่มขึ้นอย่างมีนัยสำคัญ ($p<.05$) การวิเคราะห์ modified poisson regression พบว่าร้านชำในกลุ่มควบคุมมียาปฏิชีวนะคิดเป็น 3.55 เท่าของร้านชำในกลุ่มทดลอง ผลการศึกษาแสดงให้เห็นประสิทธิภาพของ MPI&CI ในการป้องกันการขายยาปฏิชีวนะในหมู่บ้าน การศึกษานี้มีข้อเสนอให้ขยายการดำเนินการ MPI&CI ไปยังหมู่บ้านอื่นในความรับผิดชอบขององค์การบริหารส่วนตำบล เพื่อป้องกันผลเสียที่เกิดขึ้นจากการขายยาปฏิชีวนะในร้านชำในหมู่บ้าน

ภาควิชา เภสัชศาสตร์สังคมและบริหาร.....ลายมือชื่อนิสิต.....
สาขาวิชา เภสัชศาสตร์สังคมและบริหาร.....ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....
ปีการศึกษา.....2553.....ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม.....

4877105933 : MAJOR SOCIAL AND ADMINISTRATIVE PHARMACY

KEYWORDS : ANTIBIOTIC SALE / VILLAGE GROCERIES / COMMUNITY INVOLVEMENT / DIFFUSION OF INNOVATION

SOMSAK ARPARSRITHONGSAGUL : COMMUNITY INVOLVEMENT FOR PREVENTING ANTIBIOTIC SALE IN VILLAGE GROCERIES AT MAHASARAKHAM PROVINCE. THESIS ADVISOR : ASSOC.PROF.VITHAYA KULSOMBOON, Ph.D., THESIS CO-ADVISOR: PROF.ILENE H ZUCKERMAN, Ph.D., 109 pp.

The Diffusion of Innovation Model was used to develop communication channels for village grocery owners in order to prevent antibiotic sale in Mahasarakham Province, Thailand. Focus groups were developed to obtain information for establishing Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI) The study assessed the change of antibiotic knowledge of grocery's owner, awareness and perceived attribute to preventing antibiotic sale of community leaders, and the magnitude of antibiotic distribution in village groceries after intervention. Local officers and community leaders were trained in a one-day workshop to employ MPI&CI. To assess the effect of the intervention, the quasi-experimental study was designed by selecting 20 villages in each group. Data from 116 groceries obtained before and after intervention. Antibiotics in groceries significantly decreased ($p<.001$), from 79.2% to 22.9% in the MPI&CI group after intervention. Knowledge of grocery owner significantly increased ($p<.001$). Awareness of community leaders increase significantly ($p<.05$). Using modified poisson regression, groceries in control group were 3.55 times more likely to have antibiotic items after intervention compared to groceries in the control group. The results demonstrated the effectiveness of MPI&CI to prevent antibiotic sale in the village. The study recommended the extension of MPI&CI to other village of TAO to prevent the negative consequences of antibiotic sale in the villages.

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Academic Year : 2010 Co-Advisor's Signature .....

ACKNOWLEDGEMENTS

Encouragement from all acquaintance was an important impetus to impel the research up to achieve the purpose.

Be grateful to Associate Professor Vithaya Kulsomboon, Thesis Advisor, he concerned about my dissertation. He taught me substantially and advised with grand intention on behave of my optimal accomplishment.

Be grateful to Professor Ilene H Zuckerman, Thesis Co-advisor, she recommended me an excellent guidance to advance my design.

Be grateful to Assistant Professor Niyada, Assistant Professor Wanna Sriwiriyanupap, Dr. Nithima Sumpradit, Thesis Committee, fine suggestions were instructed intensely.

Be grateful to community leaders who involved in focus group discussion and implementing intervention, Tambon Administrative Organization officer, Health Center officer, Community Hospital pharmacist, working in the research area was participated nicely.

Be grateful to many participants, they assisted in focus group discussion, grocery survey, and training community leaders.

My wife collaborated in many parts of research, focus group discussion, grocery survey, training community leaders, and implementing intervention, thankful for her hearty assistance.

Finally, my parents promote me anything all along. Their kindness attends in my mind ever more.

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LIST OF ABBREVIATIONS

ARR	Absolute Risk Reduction
CER	Control Event Rate
CIH	Community Involvement in Health
DOI	Diffusion of Innovation
EER	Experimental Event Rate
FGD	Focus Group Discussion
INRUD	International Network for Rational Use of Drugs
MPI&CI	Multidisciplinary Perspective Intervention with Community Involvement
NGOs	Non-government Organization
PHC	Primary Health Care
RR	Relative Risk
RRR	Relative Risk Reduction
STGs	Standard Treatment Guidelines
TAO	Tambon Administrative Organization
VHCs	Village Health Communicators
VHVs	Village Health Volunteers
WHO	World Health Organization

CHAPTER I

INTRODUCTION

Rationale and Statement of Problem

Misuse of antibiotics occurs often. For example, people may not understand why they should take a full course of therapy, perhaps because the health workers' explanation does not make sense to them. A full course is expensive, and people are treated until the symptoms are gone (Chetley et al., 2007). Inappropriate use of medicines wastes resources – often out-of-pocket payments by patients – and results in significant patient harm in terms of poor patient outcomes and adverse drug reactions. Furthermore, misuse of antimicrobials is leads to increased antimicrobial resistance (WHO, 2002).

Self-medication with modern pharmaceuticals has been known to be a widespread phenomenon worldwide (Chuengsatiansup, et al., 2000). It can be defined as the use of medicines to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed medicine for chronic or recurrent disease or symptoms. It is widely accepted that self-medication has an important role to play in health care and, with the continued improvement of people's education, general knowledge and socio-economic status, self-medication has been successfully integrated into many health care systems throughout the world. Self-medication can facilitate access to medicines and reduce health care costs. But self-medication also has a number of potential risks such as rare but serious adverse events and poor health outcomes, perhaps due to incorrect self-diagnosis and/or incorrect choice of therapy (WHO, 2000a). The question is not how to eliminate self-care and self-medication and make people rely more on institutional care, but it is how to increase the capability of self-medication with rational use of drugs (Chuengsatiansup, et al., 2000).

Self-medication with antimicrobials is often cited as a major factor contributing to antimicrobial resistance. Self-medicated antimicrobials often are inadequately dosed or may not contain adequate amounts of active drug. This is

especially important in the treatment of communicable and life-threatening diseases such as tuberculosis. The World Health Organization (WHO) defines the appropriate use of antimicrobials as the cost-effective use of antimicrobials which maximizes clinical therapeutic effect while minimizing both drug-related toxicity and the development of antimicrobial resistance. The general principles of appropriate antimicrobial use are the same as those for all other medicinal products. An additional dimension for antimicrobials is that therapy for the individual may affect the health of society as a result of the selective pressure exerted by all use of antimicrobial agents. In addition, therapeutic failures due to drug-resistant pathogens or super-infections lead to an increased potential for the spread of these organisms throughout hospitals and the community. Although these risks occur even when antimicrobials are used appropriately, inappropriate use increases the overall selective pressure in favor of drug-resistant microorganisms (WHO, 2001).

In Thailand, self-medication is the most prevalent form for managing illness in the community. The Health and Welfare Survey, conducted by the National Statistics Office, reported that self-medication was the most common means of Thai citizens' healthcare seeking behaviors during 1991 and 1996. Over one-third of Thai citizens were reported to engage in self-medication during the 1990's (38.3% in 1991 and 37.9% in 1996). Prevalence of self-medication has decreased in the 2000's (24.2% in 2001 to 21.5% in 2003, 20.9% in 2004 and 25.1% in 2006 (Wibulpolprasert, 2007) but it is still relatively common, with over 20% of the population self-medicating. The most common sources for obtaining drugs for self-medication are groceries, community drug cooperatives, and drugstores. Analgesic/antipyretic, the most popular categories of drug in self-medication, was found in 95-100% of groceries. Cold/cough medicine was found in 84-98% of groceries. Antibiotic was found in 61-72% of groceries. Non-steroidal anti-inflammatory drug was found in 33-64% of groceries. In a household survey, 5.9% of 572 households in 15 villages used antibiotics for 5 common ailments within one month, including diarrhea, cold and cough, fever and headache, stomachache, and

muscle pain. Moreover, 63.6% of women who ever had or having a mot luuk ak seep[1] problem took oral antibiotics for this condition. (Luechai Sringernyuang, 2000).

Interventions to encourage rational use of medicines can be addressed in several ways. Two broad strategic areas are (1) communication and (2) strategies to create enabling environments, including managerial and regulatory strategies. Communication methods (sometimes called channels) usually fall into four broad areas: (1) face-to-face activities, sometimes called interpersonal communication; (2) drama and other folk media, sometimes called performance, popular or traditional media; (3) mass media, including electronic media; and (4) print materials and other support activities. An effective strategy usually will involve a combination of two or more of these approaches, such as face-to-face and print. Training might be needed to develop or improve knowledge and skills to use the different methods effectively. Participatory learning methods usually will give the best results, and will motivate the participants to use the skills well (Chetley et al., 2007).

Antibiotic use and resistance is a serious problem in many low-income and middle-income countries, including Thailand. Antibiotics can be purchased without a prescription in Thailand, even though this practice is illegal. Currently, antibiotics are found extensively in village grocery stores. This situation may lead to people spending limited resources on, and adverse effects from, these nonprescription antibiotics. Additionally, this illegal sale and use of nonprescription antibiotics has profound public health implications. Therefore, the goal of this research is to design a multidisciplinary perspective intervention for promoting improved antibiotic use in Thai villages, and to determine the effectiveness of the intervention.

Purpose of Study

1. To determine baseline knowledge of the risk of antibiotic misuse, persuasion for preventing antibiotic sales, and the magnitude of antibiotic distribution available in village groceries prior to the community involvement intervention as baseline information and for designing a multidisciplinary perspective intervention.

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[1] Literally, in Thai, mot luk is a womb. Ak seep is a pathology. Medically speaking, its meaning is identical to an inflammation.

2. To design a multidisciplinary perspective intervention with community involvement for preventing antibiotic sales in the village groceries.

3. To assess the change in knowledge of the risk of antibiotic misuse, persuasion for preventing antibiotic sales, and magnitude of antibiotic distribution available in village groceries after implementing the designed intervention.

Research Hypothesis

1. Implementing Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI) decreases number of groceries having antibiotic.

2. Antibiotic knowledge of groceries owner in intervention group increases after intervention.

3. Antibiotic knowledge of community leaders in intervention group increases after training.

4. Awareness and perceived attribute to MPI&CI of community leaders in intervention group increases after intervention.

Expected Benefit

1. Intervention package for preventing antibiotic sale in village groceries will be developed.

2. Community hospital pharmacists, health station officers, and Tambon Administrative Organization (TAO) officers may use the intervention package for preventing antibiotic sales in village groceries.

3. Grocery owners realize the risk of antibiotic misuse and know alternative treatment to be used to substitute antibiotic misuse.

Operational Definitions

Community leader is defined as the head of the village, member of Tambon Administrative Organization, health volunteer, and active villager or consumer.

Knowledge is defined as antibiotic knowledge of grocery owners, and antibiotic knowledge of community leader.

Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI) is defined as the intervention implemented as part of this dissertation, aiming

for preventing antibiotic sale in village groceries. This intervention consists of communication, investigation, and regulation.

Communication is defined as informing antibiotic knowledge by community leader to grocery owners and villagers.

Investigation is defined as examining availability of antibiotics in village grocery by community leader.

Regulatory compliance is defined as examining availability of antibiotics in village grocery by TAO, and TAO give advice grocery owner not selling antibiotics.

Regulatory enforcement is defined as examining availability of antibiotics in village grocery by TAO, and TAO punish grocery owner if antibiotics were found.

Awareness is defined as recognition of community leader to the intervention.

Perceived attribute is defined as characteristics of innovation in perception of community leader.

Conceptual Framework

Community involvement for health development involves not only health policy and health resources, but also the responsibilities and capabilities of the community. An important aspect of community involvement in health (CIH) is the precise determination of what a community can contribute to health development. It is assumed that it will contribute according to its capabilities and resources (Oakley, 1989).

To understand the potential of community contribution in health development will involve the process of assessment, in which the communities will play a part, in order to determine what local capabilities and resources are available and in what way they can built into health programs and projects. More specifically, knowledge of health care and health practices at the community (village) level should be ascertained and utilized. Essentially, the practice of CIH recognizes that communities do have something to contribute, materially and intellectually, to the tackling of health problems and that it is necessary to determine what those contributions could be and to incorporate them to health practice. Also implicit to this approach to CIH is the

recognition that communities will have their own view on health development and their own ideas on what the problems are (Oakley, 1989).

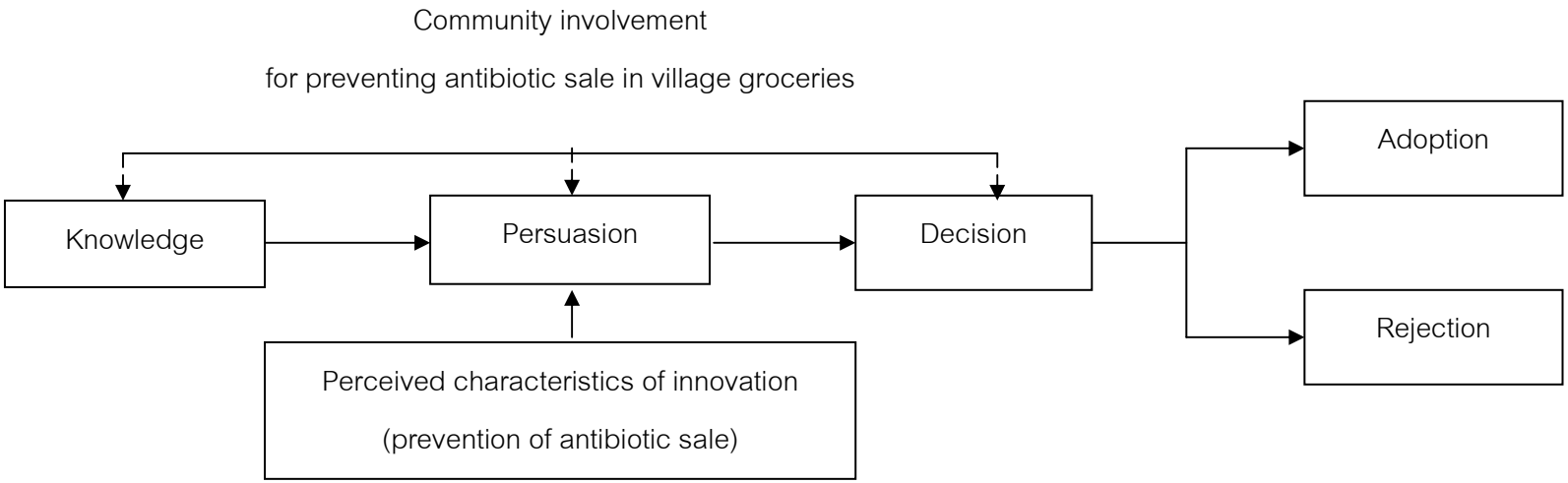
Diffusion is the process through which an innovation is communicated through certain channels over time among the members of a social system. Diffusion is a special type of communication concerned with the spread of messages that are perceived as dealing with new ideas, and necessarily represent a certain degree of uncertainty to an individual or organization. The four main elements in the diffusion of new ideas are (1) innovation, (2) communication channels, (3) time, and (4) the social system.

An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Why do certain innovations spread more quickly than others? The characteristics of an innovation, as perceived by the members of a social system, determine its rate of adoption. The characteristics that determine an innovation's rate of adoption are: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability (Rogers, 2002).

Therefore the conceptual framework of this study (Figure 1.1) was modified from Rogers' Diffusion of Innovation model (see Figure 2.2, page 38). Community involvement was added to the model as an important part of innovation. Antibiotic knowledge of community leaders and grocery owners was measured. Awareness, and perceived attributes of community leaders to innovation also was measured .

Figure 1.1 Conceptual framework for community involvement for preventing antibiotic sale in village groceries

(Modified from diffusion of innovation model) (Rogers, 2002)



CHAPTER II

LITERATURE REVIEW

Review literature in this chapter begins with Rational Use of Medicine and Irrational Use of Medicine. Problems of antibiotic use were explained in terms of Antibiotic Resistance and Self-medication of Antibiotics. Set of recommendations to solve antibiotic problems were mentioned including Intervention to Improve Use of Medicine, Ten Recommendations to Improve Use of Medicine in Developing Countries, A Strategy for Promoting Improved Pharmaceutical Use, and Improve the Use of Medicine by Consumer. Containment of Antimicrobial Resistance was discussed. The section on Community Involvement in Health Development, and Primary Health Care in Thailand emphasized the importance and necessity of community involvement. The last, diffusion of innovation, was reviewed and was used to develop conceptual framework.

Rational Use of Medicines

The WHO definition of rational use of medicines "requires that patients receive medications appropriate to their clinical needs, in doses that meet their own requirements, for an adequate period of time, and at the lowest cost to them and their community" (WHO, 1987).

The consumers' perspective of rational use may well differ from the definition given. For the consumer, the rationality of using a drug is based on the (re)interpretation of his/her value of daily life, influenced by cultural perception and economic conditions. People may only buy a few antibiotic capsules because they cannot afford more. Or they may spend money on analgesics to relieve their misery, while good food and rest would have been better for health. For understanding actual drug use, both perspectives need to be considered (Grand, et al., 1999). Consumers have their own reasons for using drugs the way they do – reasons that are based on social and cultural rules, experience, health beliefs, financial means, and psychological aspects. Reasons can include (Chetley et al., 2007):

- People in general treat symptoms, and not the disease. They are not given a chance to understand how the disease works, and how the drugs should be taken to treat the disease, because most health workers and prescribers are not taught how to give such explanations in a way that people can understand, based on their own belief system.

- People self-medicate for diseases such as malaria because it is a common disease that occurs often, and drugs are available at the local shops. Malaria is called “fever” in many languages, and it is treated until the fever goes away – a logical response.

- Misuse of antibiotics often happens for the same reasons. People do not understand why they should take a full course (the reason given by the health workers does not make sense to them). A full course is expensive, and people treat until the symptoms are gone (Chetley et al., 2007).

Irrational Use of Medicine

Common inappropriate or irrational use of medicines include overuse of drugs, multi-drug use or polypharmacy, and incorrect drug use. Overuse of drugs occurs as a consequence of overprescribing as well overconsumption. It concerns particularly the use and prescription of antibiotics, antidiarrhoeals, painkillers, injections and cough and cold preparations. Injections have long had a special connotation as particularly powerful and fast acting medicines. Only 25 years ago, so-called ‘injection doctors’ existed, and still today, injections are widely overused by prescribers and consumers. Multi-drug use or polypharmacy, whereas the number of drugs per prescription is often more than needed, with an average of 2.4 and as many as ten drugs, while generally one or two drugs would have sufficed. Multi- drug use is also common among consumers who purchase their drugs from the private or informal sector. Incorrect drug use involves the wrong drug for a specific condition, drugs of questionable efficacy, drugs of uncertain safety status, or use of drugs at the wrong dose, route of administration or dosage form. Incorrect drug use occurs in the sense of incorrect prescribing as well as inappropriate use by consumers (Grand, et al., 1999).

Problems in use of medicines may be distinguished at three levels: community level, health care level, and national level. At the community level, correct prescribing does not guarantee that drugs are used properly. Non-adherence to doctors' prescriptions is very common. In many countries up to 60-80% of health problems are self-medicated. Self-medication often results in inappropriate drug use. At the health care level, in many developing countries objective, unbiased, evidence-based information on drugs is scarce. Health workers receive limited basic training or continuing education on drugs. Knowledge, however, is only part of the problem. In many developing countries, ownership of health facilities by medical societies or practitioners creates conflicts of interest, which may explain the overuse of certain drugs. Prescribing and dispensing patterns are influenced by socio-cultural factors such as patient demand, the prescriber's attitude to risk, previous prescribing experiences and pharmaceutical industry drug promotion. Misleading advertisements for pharmaceuticals and pharmaceutical sales representatives for certain drugs are common practice. At the national level, the weakness or absence of national drug policies has been found to be an important obstacle for implementing interventions to improve drug use. A drug policy can only be effective if mechanisms for implementation are in place, such as adequate monitoring of national drug regulation, a good distribution system, regular supervision, and adequate storage facilities (Grand, et al., 1999).

Research over the years has identified a number of common areas of inappropriate medicine use that have a negative impact on the health of consumers. These include:

- Not taking medicine in the way intended by the prescriber
- Self-medication with prescription drugs
- Misuse of antibiotics
- Overuse of injections
- Overuse of relatively safe medicines
- Unsafe use of herbal medicines
- Use of non-essential combination drugs

- Use of needlessly expensive medicines (Chetley et al., 2007)

Inappropriate use and overuse of medicines waste resources – often out-of-pocket payments by patients – and result in significant patient harm in terms of poor patient outcomes and adverse drug reactions. Furthermore, overuse of antimicrobials leads to increased antimicrobial resistance and non-sterile injection results in the transmission of hepatitis, HIV/AIDS and other blood-borne diseases. Finally, irrational overuse of medicines can stimulate inappropriate patient demand, and lead to reduced access and adherence rates due to medicine stock-outs and loss of patient confidence in the health system (WHO, 2002).

Antibiotic Resistance

The WHO Global Strategy defines the appropriate use of antimicrobials as the cost-effective use of antimicrobials which maximizes clinical therapeutic effect while minimizing both drug-related toxicity and the development of antimicrobial resistance. The general principles of appropriate antimicrobial use are the same as those for all other medicinal products. An additional dimension for antimicrobials is that therapy for the individual may affect the health of society as a result of the selective pressure exerted by all use of antimicrobial agents. In addition, therapeutic failures due to drug-resistant pathogens or super-infections lead to an increased potential for the spread of these organisms throughout hospitals and the community. Although these risks occur even when antimicrobials are used appropriately, inappropriate use increases the overall selective pressure in favor of drug-resistant microorganisms (WHO, 2001).

In a survey of approximately 600 interviewees randomly selected from 9 countries (United Kingdom, France, Belgium, Italy, Spain, Turkey, Thailand, Morocco, and Colombia), the majority of those questioned believed (but did not necessarily expect) that for most respiratory tract infection antibiotics should be prescribed: sore throat, 72%; fever, 67%; earache, 65%; bad cough, 65%; thick catarrh, 64%; and flu, 64%; but common cold only 37%. Eleven percent of those questioned admitted that they had to exaggerate symptoms to get antibiotic from their physicians. Twenty-seven

percent of interviewees experienced side effects during the last course of antibiotics they received. Older patients complained most of dizziness and headaches, whereas diarrhea and rashes were more common in children. Almost a quarter (24%) saved part of the antibiotic course for future use. Noncompliance behavior was commonly recorded. Only 69% of patients admitted that they took all daily doses. The percentage of patients who claimed to finish the antibiotic course varied from 53% in Thailand to 90% in United Kingdom. The reasons for stopping the course prematurely wee mostly because the patients felt better (87%). Memory loss, side effects, and bad taste in the mouth were quoted in 5% of cases or less. The study was concluded by highlighting the need to educate patients regarding antibiotic use and the consequences of misuse: what diseases actually require antibiotics, why full daily doses must be respected, absence of significant alterations of immunity associated with antibiotic therapy, danger of keeping part of a course for future uncontrolled use, and need of a prescription for getting antibiotics from the pharmacist could be some of the issues to be discussed with the patients (Pechere, 2001).

A study was conducted in two of the 61 health centers run by the Bangkok Metropolitan Administration (BMA), which provide care in under-served slum communities in Bangkok, Thailand. Patients with viral URI treated in health centers in two slum communities frequently receive unnecessary antimicrobials and patients with bacterial URI frequently receive inappropriate antimicrobial treatments. Almost one-third (60.3%) of patients with likely viral infection received antimicrobials, a proportion far higher than expected, implying substantial overuse of antimicrobials for most URI patients treated at these health centers. Among patients with bacterial URI who received antimicrobials, selection and duration of antimicrobial treatment were problematic. Antimicrobials that were not recommended by the treatment guideline were prescribed for 85.1% of these patients. About 4% of URI patients received tetracycline or ciprofloxacin, antibiotics which should be very carefully prescribed in women of childbearing age. The average duration of antimicrobial treatment among bacterial URI patient was 6.7 days and only 18% of patients received antimicrobial treatment for 7-14 days. These patterns are likely to accelerate rate of growth of antimicrobial resistance to

commonly use antibiotics. From the perspective of patients, this means wasting money for unnecessary and potentially harmful medicines and from the perspective of society, this means risking loss of potent antimicrobial through misuse (Suttajitr, et al., 2005).

Self-medication with Antibiotics

Self-medication with modern pharmaceuticals has been known to be a widespread phenomenon worldwide (Chuengsatiansup, et al., 2000). It is widely accepted that self-medication has an important role to play in health care and, with the continued improvements in education, general knowledge and socio-economic status, self-medication has been successfully integrated into many health care systems throughout the world. Self-medication can facilitate access to medicines and reduce health care costs. The combined efforts of industry and regulators must meet the expectations of consumers by providing products which are safe, effective, good value for money, and accompanied by complete and relevant information. High ethical standards should be applied to the provision of information, promotional practices and advertising. However, there are several critical issues that must be explored before promoting the potential benefits of self-medication. Any self-medication product should be safe for use. This implies the availability of appropriate consumer information and avoidance of any delay in diagnosis and treatment of diseases not suitable for self-medication. Furthermore, self-medication drugs are known to interact with many prescription-only drugs, alcohol and foods. How can interactions be avoided in the event of self-medication? In many countries, the possibility of reporting adverse drug reactions (ADR) to self-medication products is not available since many conventional ADR reporting schemes operate through health care professionals. Only in a small number of countries with highly developed ADR systems are patients and consumers able to report ADR directly to the authorities or through pharmacies (WHO, 2000a).

At the community level, in many countries up to 60-80% of health problems are self-medicated. Self-medication often results in inappropriate drug use (Grand, et al., 1999). Self-medication involves the use of medicinal products by the consumer to treat self-recognized disorders or symptoms, or the intermittent or

continued use of medication prescribed by a physician for chronic or recurring diseases or symptoms. In practice, it also includes use of the medication for family members, especially where the treatment of children or the elderly is involved. The benefit of self-medication is that it is voluntarily chosen by consumers for conditions when it is preferable to them. At the community level, good self-medication can also provide benefits such as saving scarce medical resources from being wasted on minor conditions, lowering the costs of community-funded health care programmes (including prescription reimbursement systems), and reducing absenteeism from work due to minor symptoms. However, self-medication has a number of potential risks such as incorrect self-diagnosis, incorrect choice of therapy and unintended adverse effects. In particular, the ordinary user will usually have no specialized knowledge of the principles of pharmacology or therapy, or of the specific characteristics of the medicinal product used. At the community level, improper self-medication could result in an increase in drug-induced disease and in wasteful public expenditure (WHO, 2000b).

In Thailand, self-medication is the most prevalent form for managing illness in the community. Self-medication tends to decrease with the improvement of socioeconomic status (Chuengsatiansup, et al., 2000). The Health and Welfare Survey, conducted by the National Statistics Office, reported that self-medication was the most common means of Thai citizens' healthcare seeking behaviors in 1991 and 1996. The rate of self-medication was 38.3% in 1991 and 37.9% in 1996. It decreased from 24.2% in 2001 to 21.5% in 2003, 20.9% in 2004 and increased to 25.1% in 2006. Self-medication monthly expenditures (in baht) was 35 in 1990, 41 in 1996, 49 in 2000, and 40 in 2004, while monthly health expenditures tended to decrease from 1990 to 2004 (18.9% in 1990; 11.9% in 1996; 18.6% in 2000, and 15.3% in 2004, (Wibulpolprasert, 2007).

The Village Drug Provision Profile Survey was conducted in 195 villages of 8 provinces. According to the survey, the most widespread type of drug outlets in the community is the grocery store, found in 99.4% of the villages. There are 775 grocery stores in 195 villages, approximately 4 stores per village. Village Drug Funds were found in 54.5% of the villages. Other drug sources are Drug Sellers, Injectionists, and Private

Clinics. Village groceries varied in size of business and physical setup. On the basis of the two criteria (size and physical setup) the Village Drug Provision Profile Survey classified groceries into small (75%), medium (21%), and large (4%). Medium and large size grocery shops differed from small ones by their provision of commodities other than basic household supplies (e.g. fresh food, oil & fuel). Large groceries were differentiated from the medium mainly by availability of fertilizer, agricultural instruments, and construction materials.

Analgesic/antipyretics, the most popular category of drug in self-medication, were found in 95-100% of groceries. Cold/cough medicines were found in 84-98% of groceries. Antibiotics were found in 61-72% of groceries. Non-steroidal anti-inflammatory drugs were found in 33-64% of groceries. Ya-chud was found in 17-28% of groceries (The word ya chud literally means drugs that are prepared as a set. Usually, each set of ya chud contains 4-6 pills of different shapes, sizes and colors of usually tablets but sometimes including capsules packed together in a small transparent plastic bag costing about 3-5 baht). Dexamethasone was found in 12-26% of grocery stores. Single-purpose drug cooperatives are usually found to sell only common household drugs when they first start operating. But once they evolve into multi-purpose community cooperative shops, drugs outside the list of common household drugs would be added and illegally dispensed. Among multi-purpose community cooperative shops, 78% carry antibiotics, 28% carry non-steroidal anti-inflammatory drug and 15% carry Ya-chud. Among single-purpose community cooperatives, 45% carry antibiotics, 5% carry non-steroidal anti-inflammatory drug and 5% carry Ya-chud (Sringernyuang, el al., 1994).

In a household survey, 5.9% of 572 households in 15 villages used antibiotics for 5 common ailments within one month including diarrhea, cold and cough, fever and headache, stomachache, and muscle pain. Moreover, 63.6% of woman who ever had or having a mot luuk ak seep problem take tablet of antibiotics for this suffering Literally, in Thai, mot luk is a womb. Ak seep is a pathology. Medically speaking, its meaning is identical to an inflammation (Sringernyuang, 2000).

Intervention to Improve Use of Medicine

Intervention strategies to improve drug use can be distinguished into 4 types: educational, managerial, financial, and regulatory (Grand, et al., 1999; Norris, 2007). Efforts to promote rational use of medicines have been targeted mainly at prescribers within the formal health care service. There are comparatively few interventions targeting use of medicines among consumers and patients. Educational interventions for patients/consumers often involve a multi-fold approach, including a combination of different educational strategies and materials. Methods to address the general public include posters, booklets, mass media, education in primary schools and innovative methods such as theatre, role plays, comics and videos. Some financial interventions have been implemented at the community level, for example, the establishment of community revolving drug funds. A primary aim of such funds was to ensure regular availability of essential drugs at the community level, so that people did not have to rely on the informal market where non-essential drugs are usually provided. However, management of funds and accountability were some of the problems commonly encountered. Although regulatory strategies are not targeted at consumers, their success may depend on the extent to which consumer and demand is address (Grand, et al., 1999).

Research examining the relationship of the level of activities of drug cooperatives and the knowledge, attitude and behavior of people in self-medication treatment was conducted in Soongnern District, Nakornrajsima. Although Soongnern hospital has a good drug supply system to support drug cooperatives and drugs were sold more than 324,261 baht/year from the hospitals, the numbers of inactive (or incomplete functions based on established criteria) level of drug cooperatives are 25.58% , moderate 52.32%, and active level of drug cooperatives are 22.11%. The level of drug cooperative activities are determined by 5 indicators, (1) management system, (2) persistence of funds, (3) present benefit, (4) use of benefit, and (5) distribution of essential drugs. “Active” level of drug cooperatives should receive 5 or 4 scores from these 5 indicators. “Moderately active” should receive 3 or 2 scores. “Inactive” should receive 1 or 0 scores. There were 11 sub-districts and only 3 of them were chosen.

Three villages that had different levels of drug cooperative activities were selected in each of 3 sub-districts, so there were 9 villages to be studied. Check list (SR1), data collection form (SR2), and summation of score (SR3) were used to determine the level of activities of drug cooperatives in each village. Interviewers used a questionnaire to ask the villager about knowledge, attitude, and behavior in self-medication treatment. There were 268 questionnaires received from villagers. The number of villagers who got sick in the past 3 months before being interviewed was 256 (95.6%). There were 597 sickness episodes. All of them were mild cases. The most prevalent symptom was common cold (16.6%), followed by headache (14.7%), muscle pain (14.6%), and fever with or without sore throat (12.4%). The two most important services that were used by people were drug cooperatives (42.4%), and groceries (20.9%). It was found that only among moderately active and inactive level, knowledge was related to behavior and attitude had no relationship with knowledge or behavior. The result of the study indicated that there is a relationship between level of drug cooperatives activity and level of knowledge, attitude, and behavior of villagers in self-medication treatment. The active level of drug cooperatives provided high knowledge, attitude and more correct behavior in self-medication treatment and vice versa to inactive level. Because existing drug cooperative programs are influencing the behavior of villagers in self-medication treatment, the MOPH should be aware of and act on this issue. The drug cooperative program should be conducted in term of “Rational Drug Use Program” to promote the correct self medication treatment and campaign against irrational and harmful use of ya-chud, pain-killing and other hazardous drugs (Kulsomboon, 1989).

Ten Recommendations to Improve Use of Medicine in Developing Countries

Several activities have proved very useful and effective in promoting rational drug use, and should be recommended for general use. However, when these activities are being implemented, care is necessary to ensure success. These are

1. Establish procedures for developing, disseminating, utilizing and revising national (or hospital-specific) standard treatment guidelines

2. Establish procedures for developing and revising an essential drug list (or hospital formulary) based on treatment of choice

3. Require hospitals to establish representative Pharmacy and Therapeutics Committees with defined responsibilities for monitoring and promoting use of medicines

4. Implement problem-based training in pharmacotherapy in undergraduate medical and paramedical education based on national STGs

5. Encourage targeted, problem-based in-service educational programmes by professional societies, universities and the Ministry of Health, and require regular continuing education for licensure of health professionals

In some setting impressive improvements in drug use have been achieved with innovative interventions. While these approaches would not be recommended yet for widespread implementation, they are worth testing in other settings and for other types of prescribing problems. Such testing will require collaboration between relevant departments of universities as an important first step. If a pilot programme is successful, it is advisable to expand the schemes slowly and not to jump from a single pilot project to a national programme. Whenever new interventions are tested, it is important to look for unintended consequences that might reduce or even negative improvements in practice.

6. Stimulate an interactive group process among health providers or consumers to review and apply information about appropriate use of medicines

7. Train pharmacists and drug sellers to be active members of the health care team and to offer useful advice to consumers about health and drugs

8. Encourage active involvement by consumer organizations in public education about drugs, and devote government resources to support these efforts

9. Develop a strategic approach to improve prescribing in private sector through appropriate regulation and long-term collaborations with professional associations

10. Establish systems to monitor key pharmaceutical indicators routinely in order to track the impact of health sector reform and regulatory changes.

Five strategies can be recommended on the basis of proven success in both developing and industrialized countries: standard treatment guidelines; essential drug lists; pharmacy and therapeutic committees; problem-based basic professional training; and targeted in-service education. Three approaches, while not widely tested yet, offer great promise: interactive discussions among peers; drug seller training; and consumer education. Finally, two approaches require longer-term policy commitment: private sector outreach through professional associations; and regular monitoring of key pharmaceutical indicators (Laing R, et al., 2001).

A Strategy for Promoting Improved Pharmaceutical Use

The decisions and behaviors that determine drug use encompass a variety of actors and settings, and often a wide geographical area. Pharmaceutical supply managers, manufacturers' representatives, health providers, drug sellers, patients and their families all play a role in determining how drugs are used. In assessing problems of choice on the part of specific providers and consumers of drugs, it is both revealing and necessary to examine their behaviors in the context of these broader influences. The sequence of activities that comprised the problem assessment methodology, as they were applied at the International Network for Rational Use of Drugs (INRUD) workshop, is described in Table 2.1 (Ross-Degnan, 1992).

Individual activities were led by country or support group members familiar with a particular methodology, and with how this method can be applied quickly and simply in the field. If this assessment exercise were carried out within the context of ongoing health services or a university research program, many of the component activities would be carried out more systematically. However, it is often true that health managers have few resources and limited time to apply to this sort of activity. One of the major lessons of the assessment exercise at the INRUD meeting was that useful and often unexpected information can be discovered in a short period by allowing people with different disciplinary perspectives to observe behaviors and environments simultaneously using multiple methodologies. The variety of techniques used in the assessment process, are listed in Table 2.2 (Ross-Degnan, 1992).

Table 2.1 Sequence of activities in the problem assessment process

Activity	Description	Time Frame
Observe Drug Use Environment	•Conduct informal observations of activities related to drug use in a number of environments, including: •District health administration •District drug warehouse •District hospital inpatient, outpatient, pharmacy •Health center services, community health programs •Private polyclinic, private practitioner •Licensed pharmacy, drug retail store, marketplace	One full day
Observe Drug Use Identify Problem Practices	•Conduct informal observations of activities •Describe behaviors and perceived problems in each location •Highlight differences in perceptions between separate teams of observers, between disciplines •Identify similarities and differences among environments that are part of the drug use system	One full day 1½-2 hr
Select a Problem for Study	•List identified cross-cutting problems in drug use worthy of further study •Establish priorities to select the focus of further study •Identify single problem to examine with multiple methods	2 hr

Table 2.1 Sequence of activities in the problem assessment process (continue)

Activity	Description	Time Frame
Develop Protocols and Methods	•Identify study methods and particular locations to be studied •Develop necessary data collection instruments •Design protocols and sampling methods	2-8 hr depending on method
Observe Drug Use Collect Data	•Conduct informal observations of activities •Implement individual research methods as planed •Describe successes and unanticipated problems in implementing the research method	One full day 36 hr in field, plus 1-2 hr synthesis
Analyze and Synthesize	•Process data and prepare data displays •Present findings of individual studies •Describe recommended changes in study methodology •Synthesize information on the problem studied reporting •Synthesize lessons from study process	4-10 hr analysis, plus 4 hr

Table 2.2 Research methods used for drug use problem assessment

Method	Study units	Description	Characteristics measured
Review data on drug consumption and morbidity	•Records at district office	•Compilation and review of data on morbidity patterns and drug consumption for target health problems	•Reported morbidity profile and drugs consumed •Problem patterns for particular health facilities, health problems, or drugs
Audit of Prescription	•Hospital outpatient clinic record •Health center registers or prescription records	•Retrospective review of records in one or more health facilities •Data elements: age, diagnosis, drug and quantity prescribed, type of prescriber, quantity dispensed	•Usual treatment practices for target conditions •Key features of inappropriate drug use for target conditions •Particular health facilities or type of prescribers with problem practices
Patient interviews	•Patients attending health facilities	•Short structured questionnaire interviews with patients arriving at or exiting health facilities •Exit interviews can be restricted to patients with a particular complaint	•Health complaints of patients •Number and types of drugs prescribed and dispensed •Patient understanding about health problem or drug •Reported satisfaction with services provide
Observation of health care process	patients presenting for care at health center with target condition	•Observation of the process of care for a small sample of patients from an anthropological or clinical perspective •Venue include patient	•Quality of care from the patient perspective •Adequacy of examination, diagnosis,drug dispensing •Constraints on performance by prescribers or dispensers

Table 2.2 Research methods used for drug use problem assessment (continue)

Method	Study units	Description	Characteristics measured
		patient waiting area, clinical examination room, drug dispensary	•Quality of communication between patients and care-givers
Focus groups	•Physicians or other providers •Patients or mothers of children with target condition	•Group discussion guided by a trained moderator on a defined set of topics among a small, homogenous group of participants	•Beliefs motivations, imagery, incentives related to topics discussed •Contrast the perspectives of prescribers and consumers of drugs
In-depth interviews	•Physicians or other prescribers presenting health facility for trained target conditions	•Extended open-ended interview on a defined set of topic between key informant(s) and observer	•Beliefs motivations, imagery, incentives related to topics discussed •Contrast the perspectives of prescribers and consumers of drugs

In order to promote more generalizable and reliable drug use research, participants at the first INRUD workshop took the first steps towards the development of a draft set of indicators related to appropriate drug use. The intention is that these indicators be used as consistent measures of important aspects of drug use when surveys or studies are undertaken. An effort was made to select indicators which would mean the same in different countries, yet which might also be expected to be able to change over time as a result of interventions designed to improve drug use policies and practices. The indicators covered five areas: prescribing, patient care, drug supply, marketing, and policy. Brief descriptions of these draft indicators, as they were proposed at the meeting, are given in Table 2.3 (Ross-Degnan, 1992).

Table 2.3 Draft drug use indicators proposed at INRUD meeting

Prescribing Indicators

- Average number of drugs prescribed at primary care level at each visit.
- Proportion of primary care outpatient cases receiving antibiotics.
- Proportion of primary care outpatient cases receiving an injection.
- Percentage of children under 5 with diarrhea receiving ORS.
- Percentage of children under 5 with diarrhea receiving antidiarrheal drugs.
- Percentage of cases who receive treatment according to the national or institutional standard treatment schedules.
- Percentage of patients leaving a primary care unit without a drug being prescribed.
- Percentage of drugs prescribed in generic form.
- Percentage of drugs prescribed in a fixed dose combination form.

Patient Care Indicators

- Percentage of patients leaving a unit at defined level able to report the correct dosing schedule.
- Percentage of patients attending a primary care unit who receive a minimal basic examination, e.g. temperature, pulse.
- Average consultaton time period with a prescriber.
- Percentage of penicillin resistant infections at primary level.

Drug Supply System Indicators

- Per capita consumption of specific indicator drugs (g. per capita).
- Per capita expenditure on drugs.
- Percentage of total expenditure on antibiotics.
- Percentage of total expenditure on injectables.
- Percentage of drugs in a facility not on the essential drug list or formulary.
- Availability of drugs for treating the 5 most common conditions.

Table 2.3 Draft drug use indicators proposed at INRUD meeting (continue)

Marketing Indicators

- Number of drug representatives employed compared to number of physicians registered.
- Number of breaches of IFPMA marketing code.

Policy -related Indicators

- Presence of a national essential drug list.
- Percentage of prescribers with access to impartial pharmaceutical information.
- Are antibiotics, steroids, or psychotropic drugs available without a prescription?

Improve the Use of Medicines by Consumer

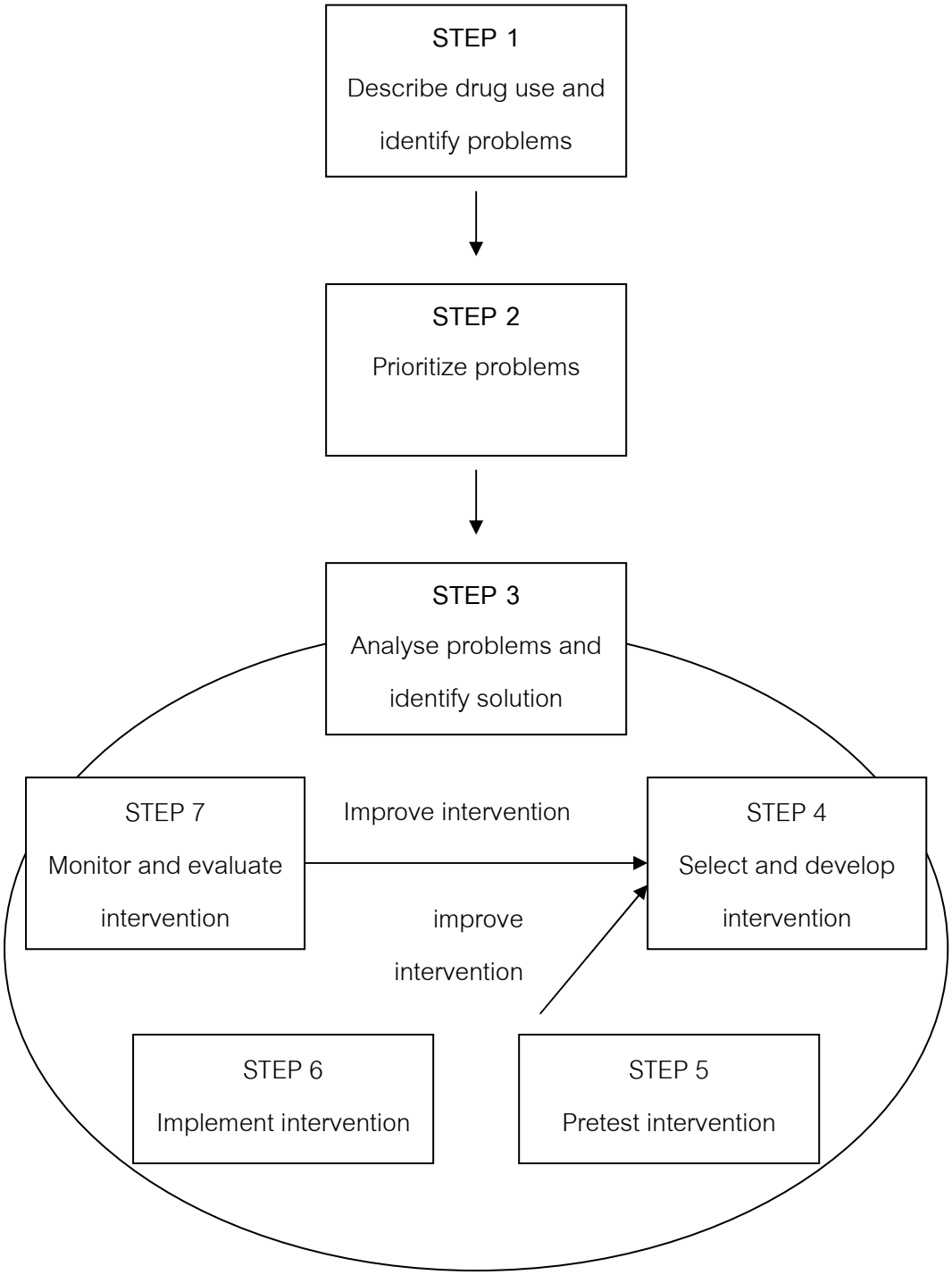
Rational drug use interventions that focus on health worker prescribing can only partly improve the use of drugs. This is because self-medication is the most common form of therapy choice and people often rely on informal drug distribution channels as much as on the medicines prescribed and supplied by trained health professionals (Chetley et al., 2007). To address the problem of irrational use of medicines, health planners and administrators need specific information on:

- The types of irrational use that occur in their country or district, so that strategies can be targeted towards changing specific problems.

- The amount of irrational use, so that the scale of the problem is known and the impact of the strategies can be monitored.

- The reasons why medicines are use irrationally, so that appropriate, effective and feasible strategies can be chosen. People often have very rational reasons for using medicines “irrationally” (WHO, 2002; Chetley et al., 2007).

Figure 2.1 Steps in developing an effective intervention aimed at enhancing rational drug use by consumers



Organizations working with medicine program need to pay more attention to educate consumers on the appropriate use of medicines. Interventions directed towards consumers are most relevant if they focus on common patterns of irrational use of medicines, and examine medicines use problems that consumers consider to be important. Policy-makers need to be involved in research into drug use interventions to facilitate the process of translating evidence into action. Drug use studies should be an integral part of the process by which we develop interventions to enhance more appropriate drug use by consumers. An overview of the process is given in figure 2.1 (Hardon el al, 2004).

Step 1: Identify medicine use problems

To identify drug use problems one first needs to describe common drug use practices and assess to what extent these are rational, and to describe what people in the communities and health workers consider to be drug use problems. In this step one aims to get an overview of community drug use problems. They can use existing (secondary) data, and if resources are available new data on drug use by consumers can be collected. In this phase drug use studies should focus on what people do with drugs and what they consider to be problems in drug use, not on why they take drugs the way they do.

Step 2: Prioritize medicines use problems

The overview of problems identified in step 1 forms the basis for step 2, in which problems are prioritized and selected as the focus of your intervention.

Step 3: Analyse medicines use problems and identify possible solutions

In this step you analyse the factors that contribute to and cause the selected problem and identify possible solutions. Research in this step aims to describe the core-problem(s) in more detail and analyse why the problems occur. In conducting such an analysis you need to consider the various layers of influence. These layers include the family, the community, the health institution, the state, and the global environment. Such analysis helps you develop an appropriate intervention aimed at

changing the inappropriate medicines use practices. The analysis is done in consultation with key stakeholders. They also help to identify possible solutions.

Step 4: Select and develop interventions

How to select and develop rational drug use interventions is dealt with in the manual of WHO, “How to Improve the Use of Medicines in Communities” (Chetley, 2007). This guide will provide information on how to develop and use printed materials, folk and mass media, and video, as well as giving information on how to work with journalists, and advocate for better health and medicines policies. The intervention methods presented in the manual can be used to change individual behaviour and to convince health policy-makers and politicians that they need to change health and medicines policies.

Step 5: Pretest interventions

Once an intervention has been developed, you will need to pretest it. Pretesting involves trying out the intervention and/or educational materials to be used in the intervention with a small group of the target audience. The group’s feedback and the results are used to fine-tune the intervention and the evaluation and monitoring activities.

Step 6: Implement interventions

Pretesting can lead to changes in the way the selected intervention is implemented. Once the intervention has been optimized, it can be implemented.

Step 7: Monitor and evaluate interventions

Research plays a role in monitoring and evaluating interventions. Evaluation results serve to improve an intervention, and help in sharing successes and failures with others.

We also need to find out what health workers, women and men in communities, opinion leaders, and essential drugs program planners consider to be problems with drug use in communities. Key research questions in step one of developing effective communication interventions are:

- Where do you go if you or a family member is sick? If you don't go there what do you do?

- What are the common health problems in the community? What do people do if they suffer from them? What medicines, if any, do people use to treat them? To what extent are these drug use practices rational?

- What are the most common medicines used to promote health? To what extent are these practices rational?

- What do people consider to be drug use problems in their communities?

- What do health workers believe are drug use problems in the community?

Additional questions that can help describe community drug use patterns include:

- What medicines do people keep in their homes? What are they used for?

- What medicines are commonly sold in community shops and other sources of medicines in the community? What are they used for? How much do they cost?

- Where do people go to obtain medicines? What are the advantages and disadvantages of the various sources?

Various quantitative and qualitative methods can be used to describe and analyze drug use problems. Each method has its own weaknesses and strengths. In the following sections, you will find more details on a selection of methods that are especially useful for collecting data in communities on drug use.

Quantitative data are needed to describe how often certain drug use practices occur. They are frequently used when the study's aim is to obtain a representative picture of the situation amongst a given population. In that case, researchers need to use a so-called probability sample to make sure that the study population has all the important characteristics of the general population from which it is drawn. The size of the sample depends on what you want to measure.

Qualitative methods are used to find out more about people's ideas, the reasons why problems occur, what people see as possible solutions and constraints. The emphasis is not on representation but on in-depth understanding. When selecting informants you should choose people who can provide the information you need. Make sure you cover the heterogeneity in the population, as views and ideas may differ between older and younger people, men and women, and people with different religious or social backgrounds. Qualitative studies can also be used to formulate appropriate questions for a quantitative survey, or they can be used to elucidate findings from quantitative studies.

The following data collection methods are often used to investigate drug use:

- Study of documents
- Semi-structured interviews
- Focus group discussions
- Observation techniques, including simulated clients visits
- Structured interviews, including weekly health recalls

Instead of having an interview with one person, a researcher preparing an FGD invites several people to participate. It is important to develop questions to be used in the focus group that provide information to meet with the objectives. Question lists for FGD should include a limited number of questions. Preparing five or six good and relevant questions is generally more than enough for about one and a half hours discussion with six to 10 people. The most important requirement for a successful FGD is a skilled moderator. Group discussions, though very efficient as a data-gathering tool, are not easy to conduct. The moderator does not need to have high academic qualifications, but (s)he must understand the aim of the discussion, and must have good communication skills.

Two broad strategic areas for interventions to encourage rational medicine are (1) communication strategies and (2) enabling environments including managerial and regulatory strategies (Chetley, 2007).

(1) Communication strategies

Communication methods (sometimes called channels) usually fall into four broad areas:

- Face-to-face activities, sometimes called interpersonal communication
- Drama and other folk media, sometimes called performance, popular or traditional media
- Mass media, including electronic media
- Print materials and other support activities

An effective strategy will usually involve a combination of two or more of these approaches, such as face-to-face and print, as shown in the illustration. Training might be needed to develop or improve knowledge and skills to use the different methods effectively. Participatory learning methods will usually give the best results, and will motivate the participants to use the skills well.

The choice of an intervention will depend on the type of medicine use problem and the reasons why it exists. Not all interventions are equally effective. Over the years, experience and studies have shown that:

- A combination of strategies for example, communication with managerial staff or those who create an enabling environment always produces better results
- A one-off communication intervention is usually not very effective and its impact is not sustainable
- Focused small group and face-to-face interactive workshops have been shown to be effective, if effective trainers or facilitators are used
- The use of print materials alone is not effective
- Monitoring and feedback and peer review are very effective managerial strategies, but require the agreed use of standards against which to judge prescribing and medicine use

(2) Enabling environments

An enabling environment is a characteristic of a society or a community that encourages change, supports development and seeks to support those that are

innovators and proponents of change. One of the clearest examples of enabling environments in public health issues is work that has been done over the years to combat the smoking epidemic in many countries. Combinations of legislation and regulations, price controls, information and communication strategies, advocacy, work by self-help groups and a number of techniques developed to support individuals to change their behaviour have led to dramatic declines in smoking in some places (Chetley et al., 2007).

Containment of Antimicrobial Resistance

The WHO Global Strategy for the Containment of Antimicrobial Resistance (WHO, 2001) provides a framework of interventions to slow the emergence and reduce the spread of antimicrobial-resistance microorganisms through:

- Reducing the disease burden and the spread of infection
- Improving access to appropriate antimicrobials
- Improving use of antimicrobials
- Strengthening health system and their surveillance capabilities
- Enforcing regulations and legislation
- Encouraging the development of appropriate new drugs and vaccines

The strategy is people-centered, with interventions directed towards the groups of people who are involved in the problem and need to be part of the solution, i.e. prescribers and dispensers, veterinarians, consumers, policy-makers in hospitals, public health and agriculture, professional societies and the pharmaceutical industry. Recommendations for intervention in patients and the general community is education:

- Educate patients and the general community on the appropriate use of antimicrobials
- Educate patients on the importance of measures to prevent infection, such as immunization, vector control, use of bednets, etc.
- Educate patients on simple measures that may reduce transmission of infection in the household and community, such as hand washing, food hygiene, etc.
- Encourage appropriate and informed health care seeking behavior

- Educate patients on suitable alternatives to antimicrobials for relief of symptoms and discourage patient self-initiation of treatment, except in specific circumstances

In low-income countries, antibiotics are available to the public from a variety of sources because they can be purchased without a prescription, even when this practice is illegal. This widespread availability has lead to inappropriate use by patients and health care providers, and a steady increase in drug resistance. The rapid growth in antimicrobial resistance demands concerted action. The followings are the recommendations for governments, public and private institutions, and medical leaders to change the way that antibiotics are used.

1. Governments need to create not only appropriate regulations, but also programs to address antibiotic use and resistance, especially among private medical providers and dispensers.

2. Health delivery systems should routinely assess appropriateness of antibiotic use, and adopt policies and quality improvement programs that encourage more appropriate use.

3. Health training institutions should incorporate explicit component in their curriculum on appropriate use on antibiotics and the problem of antibiotic resistance.

4. Professional societies should offer modern, evidence-based continuing education programs about antibiotic use that address the behavioral aspects of prescribing and dispensing.

5. Pharmaceutical companies should voluntarily control promotional messages about antibiotics, and should work together with other stakeholders to deliver information about the prudent and correct use of antibiotics.

6. Consumer organization should be encouraged to take up antibiotic use and resistance as consumer issues, and be subsidized to provide simple, targeted information to consumers.

To achieve lasting change, interventions will need to be multifaceted, long-term and based on solid understanding of the behaviors involved. Strategies that

lean too heavily on professional education are not likely to result in large-scale or long-lasting improvement (Radyowijati, et al., 2003).

Community Involvement in Health Development

Community involvement in health development is a process by which partnership is established between the government and local communities in the planning, implementation and utilization of health activity in order to benefit from increased local self-reliance and social control over the infrastructure and technology of primary health care. Community involvement means that people, who have both the right and duty to participate in solving their own health problems, have greater responsibilities in assessing health needs, mobilizing local resources and suggesting new solution, as well as creating and maintaining local organization (Oakley, 1989).

Community involvement for health development is not merely related with health policy and health resources, the responsibilities and capabilities of the community is also important. An important aspect of community involvement in health (CIH) is the degree to which a community can contribute to health development. It is assumed that it will contribute according to its capabilities and resources. The potential of community contribution in health development involves the process of assessment, in which the community will play a part, in order to determine what local capabilities and resources are available and in what way they can built into health programs and projects. More specifically, local people's knowledge of health care and health practices should be ascertained and utilized. Essentially, the practice of CIH recognized that communities do have something to contribute, materially and intellectually, to the tackling of health problems and that it is necessary to determine what those contributions could be and to incorporate them to health practice. Also implicit to this approach to CIH is the recognition that communities will have their own view on health development and their own ideas on what the problems are (Oakley, 1989).

It is commonly agreed that CIH cannot be instituted and developed without the support of appropriate mechanism at different levels. Such mechanism can exist and operate both at national and community level and are dispensable for the

process of CIH. The evidence to date suggested that in countries where CIH has begun to develop, it has done so with the assistance of a variety of support mechanism. The mechanisms established to support CIH, particularly at the community level, must be realistic and sustainable under local conditions. It is no good established mechanisms such as administrative structures that cannot be sustained locally and can only function with external assistance (Oakley, 1989).

National and international NGOs (non-government organization) have gained considerable experience in health care and health development. In relation to supporting CIH, NGOs have certain advantage over government. They tend to be less bounded by bureaucratic procedures. They are usually staff by the type of people likely to support CIH ideologically. Since they are not government-controlled, they are often able to promote local initiatives that can generate their own momentum for development rather than coming to depend on external support. NGOs are particularly useful as "brokers", helping local community plan and implement health program and linking them up with government program (Oakley, 1989).

Primary Health Care in Thailand

Based on the experiences gained and the global movement on primary health care (PHC) after the Declaration of Alma Ata in 1978, Thailand fully launched the national PHC program in the 4th National Development Plan (1977-1981). Thailand PHC program started with the establishment of new district hospitals and health centers and the creation of community health workers i.e. village health communicators (VHCs) and village health volunteers (VHVs) to offset the main problem of health professional shortage. Later on, all VHCs were upgraded to VHVs.

The development of VHVs is evidently the most unique achievement of PHC development in Thailand. In the past, even though the VHVs did not receive salary for their public service, they did not only sustain but are still very much alive and growing. At the present time, there are more than 800,000 VHVs all over the country, in every village. More than 35% were recruited in less than 5 years. Reasons responsible for their sustainability may include.

- The primary mission of VHVs is to care for the sick in their neighborhood which goes along with the Thai culture.

- The volunteerism nature of the job without any personal gains builds up trust and respect from the community.

- The selection process which was done through wide consultation with the community resulted in VHVs with good qualification for the job and acceptance from the community.

- The training process which comprised of 7day- basic training at the local health center followed by 15 day -on the job training at the local district hospital build up close relationship linkage between VHVs and local health staffs, a key for partnership.

- The large number of VHVs in the community, each covering 10 -15 households in their own neighborhood made them the valuable resources for health workers to reach out to the people.

- The continuous technical support and morale support from the central and community.

VHVs have now become the model for other government and nongovernmental organizations to follow. Many VHVs have also been selected to be volunteers in other fields beyond health, i.e., social development volunteer, livestock volunteer, migrant worker health volunteer, etc. Also, there are more and more VHVs elected to local political posts because of the long time community serving as VHVs. The emerging role is the surveillance of infectious diseases such as avian influenza in poultry and human.

The present political-socio-economic situation in Thailand is much different than the health situation when PHC was introduced to the country. For instance, the government has had policy to give salary to the VHV. The VHVs receive salary 600 Baht a month. It can be observed that the continuous trend of decentralization and community empowerment are essential factors that should be taken into account in moving forward. The establishment of the sub district administrative authority to be the local body for community development is the major milestone for community self

reliance. Community organization, and people themselves will have more potential to undertake the most innovative schemes for social development. Thus PHC management and implementation should be decentralized to the sub district Administrative Organization which is closely linked to existing PHC program (WHO, 2006).

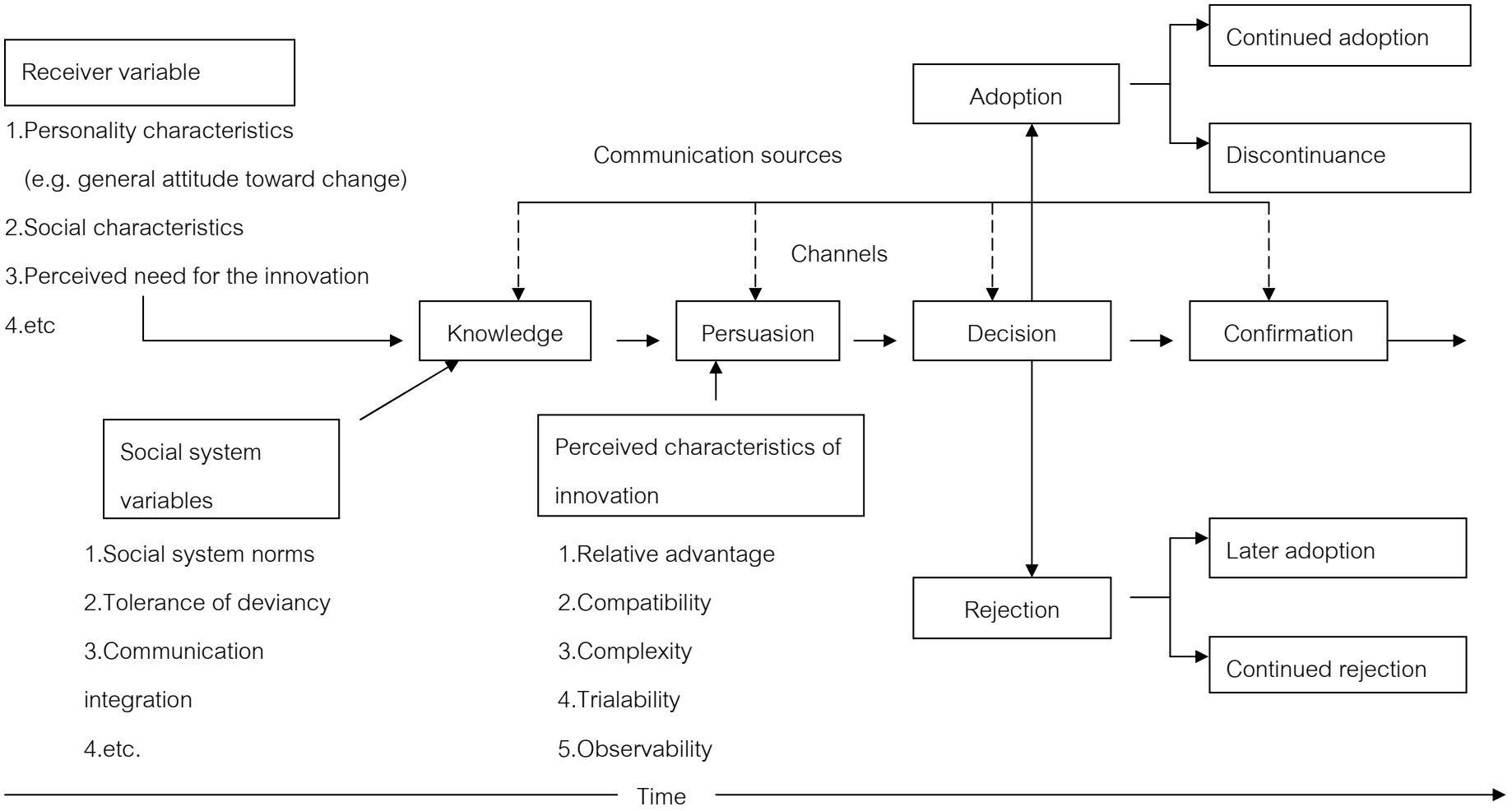
Diffusion of Innovation

Diffusion is the process through which an innovation is communicated through certain channels over time among the members of a social system. Diffusion is a special type of communication concerned with the spread of message s that are perceived as dealing with new ideas, and necessarily represent a certain degree of uncertainty to an individual or organization. The four main elements in the diffusion of new ideas are (1) innovation, (2) communication channels, (3) time, and (4) the social system. In Figure 2.2, the diffusion of innovation model was demonstrated.

An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Why do certain innovations spread more quickly than others? The characteristics of an innovation, as perceived by the members of a social system, determine its rate of adoption. The characteristics that determine an innovation's rate of adoption are: (1) relative advantage, (2) compatibility, (3) complexity, (4) trialability, and (5) observability (Rogers, 2002).

Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes. It does not matter so much if an innovation has a great deal of objective advantage. What does matter is whether an individual perceives the innovation as advantageous. Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. Complexity is the degree to which an innovation is perceived as difficult to understand and use. Trialability is the degree to which an innovation may be experimented with on a limited basis. Observability is the degree to which the results of an innovation are visible to others. Innovations that are perceived by individuals as having greater relative advantage, compatibility, trialability, observability, and less complexity will be adopted more rapidly than other innovations.

Figure 2.2 Diffusion of innovation model



Preventive innovations are new ideas that require action at one point in time in order to avoid unwanted consequences at some future time. The rewards to the individual from adopting a preventive innovation are often delayed in time are relatively intangible, and the unwanted consequences may not occur anyway. Thus, preventive innovations are relatively low in relative advantage, compared to nonpreventive innovations. Strategies used to speed up the diffusion and use of preventive innovation could be

1. Change the perceived attributes of preventive innovations. As mentioned previously, the relative advantage of a preventive a preventive innovation needed to be stressed.

2. Utilize champions to promote preventive innovations. A champion is an individual who devotes his/her personal influence to encourage adoption of an innovation.

3. Change the norm of the system regarding preventive innovations through peer support. Changing norms on prevention is a gradual process over time, but can be accomplished.

4. Use entertainment-education to promote preventive innovations. Entertainment-education is the process of placing educational ideas (such as on prevention) in entertainment messages.

5. Activate peer networks to diffuse preventive innovations. Anything that can be done to encourage peer communication about a preventive idea thus encourage adoption.

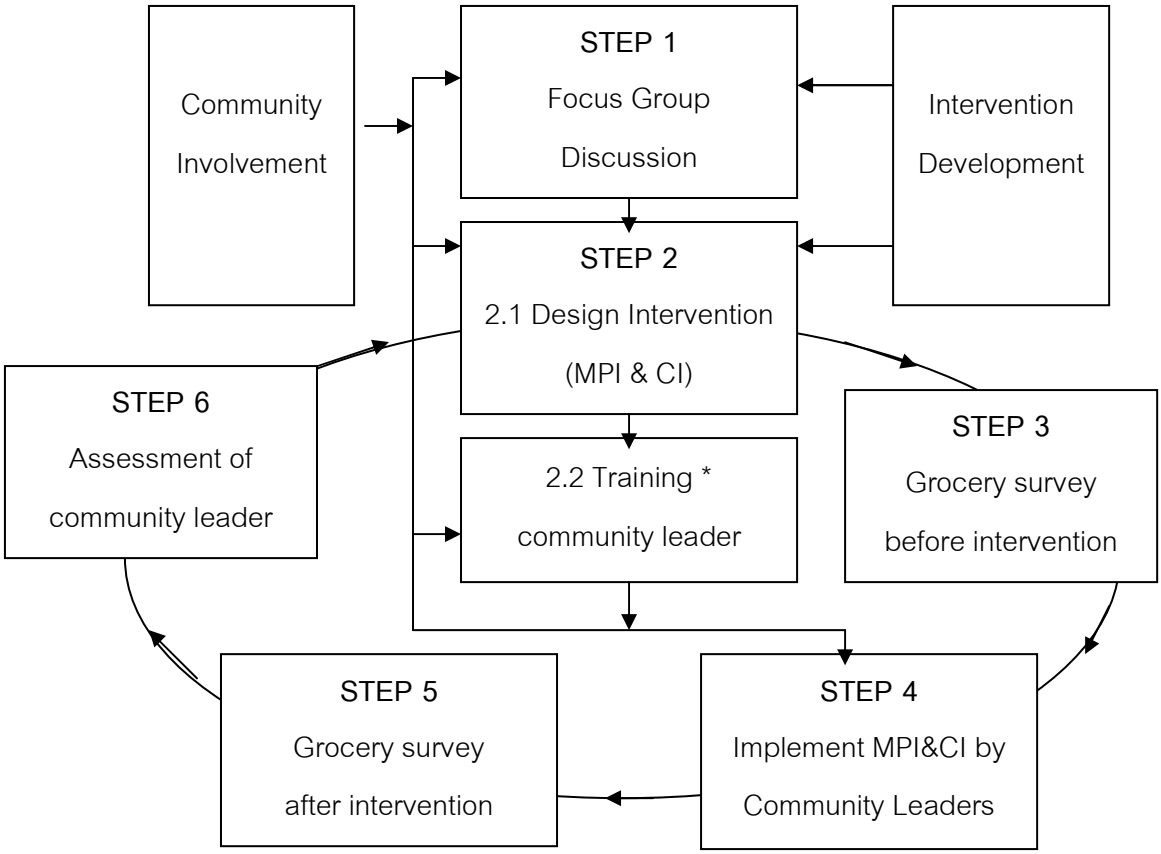
We used this model to develop our conceptual framework to provide communication sources aiming to improve knowledge, persuasion, and decision which led to adoption of expected behavior.

CHAPTER III

METHODOLOGY

Using the steps from developing an effective intervention aimed at enhancing rational drug use by consumers (Figure 2.1 page 26), the steps for intervention development and implementation of the intervention were developed including 6 steps (Figure 3.1). Step 1 was focus group discussion to obtain information for intervention development and step 2 was to design the Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI). To assess the outcome from implementing intervention using quasi-experimental study, the additional 4 steps were employed. Step 3 grocery survey before intervention, step 4 implement MPI&CI by community leaders, step 5 grocery survey after intervention, and step 6 assessment of community leader.

Figure 3.1 Steps for Intervention Development and Implementation of the Intervention



* This step 2.2 came from the focus group result which suggested to have a training for changing agent (see table 4.1 page 60)

Intervention Development

This research aimed to promote improved antibiotic use in the community. The result of the study would beneficial to the community. An intervention designed only by health professionals or other officers might not suitable for the community. People might not understand. And they might not accept the intervention. Conflict among the groups who had benefit might occur during implementation. Community involvement in designing and implementing the intervention might reduce this obstacle. People would share their experience and opinion during the development. The intervention would come from their ideas and their benefit. The steps for developing an effective intervention was already mentioned in figure 3.1.

Step 1 Focus group discussion

Focus group discussion was conducted for obtaining idea about preventing antibiotic sale in village groceries. Three focus groups were conducted. There were 24 people included in these focus groups with 6-7 people in each group. They were (1) village leader(s), (2) member of TAO, (3) Village Health Volunteer (4) Active Villager or Consumer and (5) Village grocery store owner.

Step 2 Design intervention and training community leader

2.1 Design intervention

After focus group discussion, designing the intervention was conducted. Using the information from focus group discussion, the MPI&CI intervention was developed. It consists of communication, investigation, and regulatory as shown in the result of focus group page.60 component (1).

2.2 Training community leader

Based on the results of our focus groups in Chapter 4 page 60 component (2), the training course for community leaders and government officers to be the changing agents based on MPI&CI. The purposes of training those who were expected to be the changing agent in the village, were to provide information and enhance them to implement the MPI&CI intervention especially the interaction with

grocery owner. At least two main groups of changing agents were (1) villagers including community leaders, village health volunteers, and active villagers or consumers, (2) government officer including public health officer and TAO. These two groups could have their different roles that were addressed in MPI&CI intervention. The first group which is villagers should have their role emphasize on communication and investigation. They could not have role on regulation enforcement because they do not have authority. The second group is officer, so they can use their authority if the grocery owners do not comply with the recommendation on antibiotic selling. However, in our model we much emphasize on the communication and investigation, and provide opportunity for grocery owner to realize that antibiotic risk to the villagers is out weight the benefit that they can set from their antibiotic sale.

The content and schedule of the training course appears in appendices. The trainer includes doctor and/or pharmacists, researcher who provides the information on MPI&CI, and some training assistants. The program include in the first half day was (1) the provision of information on risk of antibiotics and the content of drug act concerning regulation on antibiotic sales, (2) the rational to conduct MPI&CI activities in the villages. For the second half day, group discussions on the ways to implement MPI&CI were discussed. The participants had opportunity to share their view on the intervention and had a plan to conduct together for their plan to be employed in the village, it could be observed that they emphasized much on communication and investigation component in MPI&CI model more than regulation enforcement.

In training course, antibiotic knowledge of community leader was measured before and after training. We also measured awareness and perceived attribute to MPI&CI of community leader at the end of training. The reason that we measured perceived attribute of community leader instead of groceries owner is perceived attribute could not be measured in groceries owner. If we asked about awareness and perceived attribute, they would be uncomfortable and worry about what will effect to them. After that they might not answer any question and would not corporate with us in investigating availability of antibiotics in their groceries.

The reason that in community leader we measure awareness because previous study mentioned that awareness has an effect to perceived attribute (Steckler

el al, 1992). We want to know whether there is a change in both awareness and perceived attribute of community leader.

Implementing intervention

The study was quasi-experimental research with pretest posttest design. The study could not be conducted as a randomized controlled trial (RCT) because of the potential for diffusion between experimental and control groups. If the experimental and control group are the village in the same district, or in adjoining districts, diffusion would likely occur. Therefore, areas for research were the North and the South of Mahasarakham province. The central region was used as a border to separate experimental and control groups.

There were 2 groups; 1 experimental group, and 1 control group. Intervention was community involvement in problem solving of selling antibiotics. The research consists of 2 phases. Phase 1 is focus group discussion to design intervention. Phase 2 is implement intervention.

To assess the outcome from implementing intervention using quasi-experimental study, the additional 4 steps were employed.

Step 3 Grocery survey before intervention

Grocery survey before intervention was conducted to determine baseline knowledge of antibiotic, and the magnitude of antibiotic distribution available in village groceries.

Step 4 Implement MPI&CI by community leaders

MPI&CI was implemented by community leader. After that, researcher went to the village to discuss with community, what intervention they implement in the village, how they work in each intervention, what difficulties occur in the implementation, how they do to solve those difficulties.

Step 5 Grocery survey after intervention

Grocery survey after intervention was conducted to assess the change of antibiotic knowledge of grocery owner, and magnitude of antibiotic distribution available in village groceries.

Step 6 Assessment of community leaders

The meeting with community leaders, who were trained to be changing agent, was conducted to assess information of community leader after intervention. Awareness and perceived attribute of community leader to the intervention was measured.

Population and Sample

The research was conducted in Mahasarakham Province. The province was divided into area of Municipality and area of Tambon Administrative Organization. The population was 936,005. Most people (89.5%), lived in the area of Tambon Administrative Organization (Table 3.1). The research was conducted in the area of Tambon Administrative Organization.

The province was subdivided into 13 districts. The districts were subdivided into 133 tambon which were further subdivided into 1,934 villages (Table 2). The district was subdivided into Municipality and Tambon Administrative Organization (TAO). The districts was grouped into 3 zones according to Provincial Health Office: Central, North, and South.

Table 3.1 Population and households in Mahasarakham Province (Department of Provincial Administration, 2008)

Zone	District	Municipality		Tambon Administrative Organization		Total	
		population	household	population	household	population	household
Northern	Chiang Yuen	5,393	1,826	56,650	14,321	62,043	16,147
	Chuen Chom*	-	-	24,663	5,819	24,663	5,819
	Kosum Phisai	9,889	3,345	109,353	26,804	119,242	30,149
	Kantarawichai	3,758	1,155	75,117	19,371	78,875	20,526
Central	Mueang**	45,362	17,460	97,292	25,730	142,664	43,190
	Borabue	5,609	1,989	102,382	27,693	107,991	29,682
	Kut Rang*	-	-	36,276	8,825	36,276	8,825
	Kae Dam	5,561	1,276	23,900	5,510	29,461	6,786
	Wapi Pathum	5,492	1,845	108,274	25,733	113,766	27,578

Zone	District	Municipality		Tambon Administrative Organization		Total	
		population	household	population	household	population	household
Southern	Phayakkhaphum Phisai	8,455	3,136	79,670	17,929	88,125	21,065
	Na Dun	4,522	1,313	32,037	7,255	36,559	8,568
	Na Chueak	3,849	1,352	57,073	13,502	60,922	14,854
	Yang Sisurat*	-	-	35,391	8,027	35,391	8,027
Total		97,927 (10.5%)	34,697	838,078 (89.5%)	206,519	936,005	241,216

* There is no municipality in 3 districts; Chuen Chom, Kut Rang, and Yang Sisurat.

** There are 2 Municipalities in Mueang District

Table 3.2 The number of tambon and villages in Mahasarakham Province

Zone	District	Tambon	Municipality	TAO	
				TAO	village
Northern	Chiang Yuen	8	1	8	116
	Chuen Chom	4	-	4	47
	Kosum Phisai	17	1	17	231
	Kantarawichai	10	1	10	183
	sobtotal				577
Central	Mueang	14	2	13	182
	Borabue	15	1	15	203
	Kut Rang	5	-	5	85
	Kae Dam	5	1	5	89
	Wapi Pathum	15	1	15	240
	subtotal				799
	Phayakkhaphum Phisai	14	1	14	227
	Na Dun	9	1	9	94
	Na Chueak	10	1	10	146
	Yang Sisurat	7	-	7	91
	subtotal				558
Total		133			1934

To separate the experimental group and control groups, the research was conducted in 2 zones, North, and South. The Central zone was a border area, in which there was no control group or intervention group in the research (Figure 2). There were 577 villages in the Northern zone, 558 villages in the Southern zone, and 799 in the Central zone. We randomly selected the zone (North or South) and the district to either in experimental group or control group. Then, 20 villages from each zone was randomly selected for the study. In total, 40 villages were included in the study. All groceries in 40 villages, about 160 groceries, were included in the research. To evaluate intervention, groceries survey was conducted.

The South zone was randomized to the intervention group. After that, Phayakkhaphum Phisai district, and Na Chueak district were randomly selected to this intervention group. In the North zone, Chiang Yuen district and Chuen Chom district were in the Antibiotic Smart Use Project which has an extraneous effect to the research. These 2 districts were excluded. Consequently, Kosum Phisai district and Kantarawichai were selected as districts for the control group. From each district, 5 tambons were randomly selected, and from each of these tambons, 2 villages were randomly selected, resulting in 40 villages in 20 tambons of 4 districts for the study.

Figure 3.2 Map of 13 districts in Mahasarakham Province.

Note 1. Area of conducting research:

1.1 the Northern zone: district no. 3 = Kosum Phisai, 4 = Kantarawichai, 5 = Chiang Yuen, 13 = Chuen Chom

1.2 the Southern zone: district no. 7 = Na Chueak, 8 = Phayakkhaphum Phisai, , 10 = Na Dun, 11 = Yang Sisurat

2. Area of border-line, the Central zone: district no. 1 = Mueang, 2 = Kae Dam, 6 = Borabue, 9 = Wapi Pathum, 12 = Kut Rang

Sample Size

The research aims to decrease proportion of grocery stores that sell antibiotics before and after intervention. The recent survey found that the proportion of grocery stores that sell antibiotics was .86 (P0 = .86). Researcher expected that, after intervention, proportion of grocery stores that sell antibiotics should be .40 (P1 = .40).

Using the PS Program (Power and Sample Size Calculation) Version 3.0.2 (Department of Biostatistics, Vanderbilt University, 2009)

α = .05

Power = .80

P0 = .86

P1 = .40

m = 1

then, the sample size is

experimental group = 20 villages

control group = 20 villages

Data Collection

Data were collected from 116 groceries of 40 villages. Data were collected 2 times, before and after implementing intervention. At first, data are collected from all groceries in 40 villages. After that, focus group discussions to design intervention were conducted. Implementing intervention in 20 villages of experimental group is conducted later. Three month after intervention, data were collected twice from all groceries in 40 villages. The process of data collection appears in Table 3.3. Data collection was in step 1, 2.2, 3, 4, 5, and 6. The content of data collection, target, and duration were described in the table.

Checklist for availability of antibiotics was used to measure antibiotics found in grocery (see Appendix B page 101). Questionnaire was used to measure antibiotic knowledge (see Appendix B page 102-104). Questionnaire used for measuring awareness of community leader, was modified from Steckler el al. (1992). There are 12-items for awareness (see Appendix B page 105-106). Questionnaire used

for measuring awareness of community leader, was modified from Pankratz et al. (2002). There are 17 items of perceived attribute (see Appendix B page 107-108).

Table 3.3 Data Collection

Steps	Content	Target (Places/persons)	Duration
1. Focus Group Discussion	-information for intervention development	People of Mahasarakham province who live out of research area	December 2009
2.1 Design intervention 2.2 Training Community Leaders	- -Antibiotic knowledge of community leader before and after training -Awareness and Perceived attribute of community leader to intervention	- Community leader from 20 villages of intervention group, 5 persons per village	- April 2010
3. Grocery survey before Intervention	-Antibiotic found in the groceries -Antibiotic knowledge of grocery owner	All groceries in 40 villages, (116 groceries)	March 2010
4. Implememt MPI&CI	Information on implementing intervention	Community leaders in 20 villages who were trained	May 2010
5.Grocery survey after intervention	-Antibiotic found in the groceries -Antibiotic knowledge of grocery owner	All groceries in 40 villages, (116 groceries)	June 2010
6. Assessment of Community Leaders	-Awareness of community leader -Perceived attribute of community leader	Community leaders in 20 villages who were trained	July 2010

Data Analysis

1. Descriptive statistics

Data collected will be analyzed by descriptive statistics

1.1 Antibiotic knowledge

1.2 Awareness and perceived attribute to intervention

1.3 Magnitude of antibiotic available in village groceries

2. T-test

2.1 independent t-test

2.1.1 antibiotic knowledge of grocery owner between intervention and control group before intervention

2.1.2 antibiotic knowledge of grocery owner between intervention and control group after intervention

2.2 paired t-test

2.1.1 antibiotic knowledge of grocery owner in intervention group before and after intervention

2.1.2 antibiotic knowledge of grocery owner in control group before and after intervention

2.1.3 antibiotic knowledge of community leaders in intervention group before and after intervention

2.1.4 awareness, and perceived attibute of grocery owner to intervention in intervention group before and after intervention

3. Chi-square

3.1 antibiotic availability between intervention and control group after intervention

4. Risk

Calculating risk of having antibiotics

4.1 Control Event Rate (CER) is the risk of event in control group or those unexposed

4.2 Experimental Event Rate (EER) is the risk of event in intervention group or those exposed

4.3 Relative Risk (RR) or Risk Ratio is the risk of event in the exposure (intervention) group divided by the risk of event in the unexposed (control) group

4.4 Absolute Risk Reduction (ARR) is the difference in risk between control group and intervention group

4.5 Relative Risk Reduction (RRR) is the percent reduction in risk in the intervention group compare to the control group

5. Modified poisson regression

In order to study the independent effect of the intervention on antibiotic availability in village groceries, a modified poisson (Zou, 2004) regression was used to estimate prevalence ratios rather than odds ratios, since the prevalence of antibiotic sales was high, and thus odds ratios will not be a good approximation of the prevalence ratio. The variables in the analysis included:

5.1 independent variable of interest: intervention (MPI&CI)

5.2 Covariates

5.2.1 Demographic factors

-population of the village

-distance from village to center of district

5.2.2 Grocery factors

grocery owner

-gender

-age

-antibiotic knowledge before intervention

- availability of antibiotics before intervention

-number of antibiotic items on the shelves available for sale before the intervention

5.3 dependent variable

5.3.1 Antibiotic availability (yes/no) in village grocery

CHAPTER IV

RESULTS

The research was conducted in the village of Mahasarakham province. Initially, focus group interviews were conducted to collect ideas of various community leaders for developing the intervention to prevent antibiotic sales in village groceries. After that, the availability of antibiotics in the village groceries was surveyed. Antibiotic knowledge of village grocery store owners also was measured during the grocery survey. Community leaders in targeted villages of the intervention group were trained. Antibiotic knowledge, awareness and persuasion to the intervention (among those in the intervention group) of the community leaders were measured. Finally, the village groceries were surveyed once more after the intervention. These results were shown in 2 parts as follow:

4.1 Intervention Development

4.1.1 Information from focus group discussion

4.1.2 Design the intervention MPI&CI

4.2 Implementing intervention

4.2.1 Availability of antibiotics in the grocery

4.2.2 Antibiotic knowledge of grocery's owner

4.2.3 Antibiotic knowledge of community leader

4.2.4 Awareness of community leader to the intervention

4.2.5 Persuasion of community leader to the intervention

4.3 Risk of having antibiotics

4.4 Effect of the intervention on antibiotic availability in village groceries

4.1 Intervention Development

4.1.1 Information from focus group discussion

The focus group interviews were conducted for intervention development, 3 focus groups in three locations: Ban Khok Si, Ban Wang Chai, and Ban Nong Wang. The first two locations are villages in Wapee Pathum district and the third is village in Borabue district. These villages are in the Central area of Mahasarakham Province.

The focus groups were conducted on 24, 27, 28 December 2009. They were performed in the village because participants were familiar with the surroundings, they can talk comfortably, and transportation to a less convenient location such as Bangkok was not a barrier to attending. Participants were reimbursed for local travel expenses, and participants received lunch. There was no additional remuneration for participating.

The participants were recruited from people who live in the village. There are people from 3-4 villages in each group. Each focus group consists of 8 people who have different roles in the village: village head, member of Tambon Administrative Organization, health volunteer, grocery's owner, and village citizens. The researcher was the moderator. An assistant and a note taker also were present at the focus groups. Audio-tape was used to record the focus group sessions; tapes were later transcribed by the researcher. Each focus group lasted 45 to 60 minutes.

Results of the focus group discussions were categorized into 8 topics. Participants talked about each topic as follow. Then, Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI) was explained. A summary of the focus group discussions follows. The reader should note that this summary was translated from Thai to English, which may introduce mis-interpretations. A Thai summary is included in the Appendix A (page 93-99).

Problems caused by antibiotic sale in village groceries

Hypersensitivity to antibiotics may occur. Grocery seller doesn't have knowledge of antibiotic use. Hypersensitivity is rash, edema, breathless, tight heart. Severe hypersensitivity is convulsion. .Antibiotic resistance may also take place.

Activities for preventing antibiotic sale in village groceries

The grocery owner should be informed that antibiotics are harmful to health, and antibiotic sale in village groceries is illegal. They have to be recognized about risk of antibiotics. They will not get antibiotics for sale if they understand. However, unresponsive merchants still sell it. The consumer should be informed also that antibiotics are harmful to health. Making understanding has to be done in both trader level and consumer level.

Preventing antibiotic sale can be performed in the cooperative store. The committee can talk about antibiotics during the meeting and conclude to stop selling antibiotics in the cooperative store. The cooperative grocery committee should set up resolution for not taking antibiotics into the groceries. In the private store, grocery's owner should be emphasized about risk of antibiotics. They should consider that the hazard may happen to people in the village. They should stop selling antibiotics.

Solving this problem is very difficult. The knowledge has to be talked with the community leaders, and they should tell to people frequently. Publicize by community leader will be successful more for the reason that people believe community leader more. The achievement may not be 100%.

The responsible organization should check the grocery normally. There are antibiotics in almost village groceries. The law must prohibit antibiotic sale in village groceries. However, they can buy antibiotics at the market. It will be a long-term measure to solve the problem. They will continue selling if they are not punished. Law enforcement is to be used.

The role of community leader for preventing antibiotic sale in village groceries

Community leader should survey village grocery once a month, and suggest. Community leader should survey village grocery once a month, and suggest the grocery's owner that antibiotics have many harmful. Community should not force them to stop antibiotic sale. They should be requested for cooperating in preventing antibiotic sale in the village grocery.

Community leaders can inform the people that antibiotics are harmful to health, the people believe community leader more than other. TAO can do project making people understanding antibiotics. Grocery owner should be trained risk of antibiotics, and regulation. Community leader must have knowledge, and speak daily in the morning or evening by announcer tower. People will understand that risk of antibiotics is as same as community leader speak. People will listen to announcer tower because there is much information from any agency also.

The role of health volunteers for preventing antibiotic sale in village groceries

Health volunteers should survey the grocery and suggests the grocery owner not to sell antibiotics. They should inform groceries owner that pharmacists and/or health professional will come to survey the grocery.

The role of grocery's owner to collaborate for preventing antibiotic sale in village groceries

Grocery owners won't take antibiotics for sale in the store when they have received information or committee examines the groceries. It is difficult to proceed for grocery's owners because of their own advantage. Exacting measures have to be performed. Cooperative store is capable to proceed.

How do community leader, health volunteer, and grocery's owner collaborate to work for preventing antibiotic sale in village groceries.

Commitment for preventing antibiotic sale in village groceries should be agree in village meeting. Drug committee should be set up, consists of village leader, member of TAO council, health volunteer, and people representative. All committee should involve the groceries survey at the first time. The grocery should be surveyed once a month. Committee should inform groceries owner during grocery survey. Poster and sticker are used. Poster is placed at the public place. Sticker is provided for each household and groceries. Cut-out is placed at the village center.

The message used for communication should not be "stop antibiotic sale". It may be "antibiotics are harmful, should not use, buy or sale if not necessary". Finally, if someone still use antibiotics by self medication, face-to-face at their household will be held.

Difficulties in working for preventing antibiotic sale in village groceries

Health volunteer worry that grocery owner will be angry. But village leader told that they won't be angry if there is a commitment of village. When health professional and health volunteer examine groceries and give advice to stop selling these dangerous drugs, they are disappoint, speak angrily. When there is grocery examination, health volunteer has to tell grocery's owner before. Health volunteer has responsibility to take care people. Grocery owner will be angry if Health volunteer does not tell them before. Grocery owner may keep antibiotics secretly, sell furtively. If rule of TAO punish grocery's owners to be fined, they may not pay.

If there are no antibiotics in a grocery, people will go to other groceries or market. Some consumers think in the opposite direction. They would like to buy antibiotics. They condemn grocery's owner if there is no antibiotics. Some grocery's owners require money, so they sell antibiotics. We have to solve problem in our village. If there is no antibiotic sale in our village, but they try to buy it from other village or market. We cannot help them. Community leaders may be grocery owner or relationship. They

may not aware to the problem. Community leaders have to listen to their people. They have to pay attention to conclusion from village meeting.

Conclusion of village will not accept antibiotic sale in groceries. Conclusion will be in line with other villages, tambon, district, and province. TAO officers may be anxious that they will lose vote for election. They will do deliberately when they will not be a candidate for next election. In a different way, they should think that it has to be achieved because it is benefit to the people.

How do implementing the activities for preventing antibiotic sale in village groceries will be success and be sustainable change

The implementation must be continuously. Communication has to carryon. Examination maintain regularly. The measure must be serious. Intention of village leader will bring about to the success of the project. Cooperation of community member is also necessary. Grocery's owners who sell antibiotics have to be punished. If the committee survey grocery monthly, the grocery owner will not take antibiotics to sell in the groceries. However, this problem is endways. The consumer can buy these antibiotics from other sources.

4.1.2 Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI)

In conclusion, most of the results from the focus group indicated the need for communication to villager and grocery owner, inspection the grocery and inform them about the risk of incorrect use of antibiotic, and regulation enforcement after the grocery's owner does not comply with the recommendation.

Focus group results came from multiperspectives of participants in the focus group including community leader, health volunteer, grocery owner and village. This assured that the idea for intervention development came from community involvement at the beginning of designing of the intervention.

At least, the three components of the intervention should include communication, investigation, and regulation enforcement.

MPI&CI model in this study comprised of two important components which was developed from focus group discussion including the design of intervention and the implementation of intervention. The summarize of these two components appears in the table 4.1.

Table 4.1 Summary of focus group discussion on the two components developed for MPI&CI

Components	Multiperspective intervention	Community involvement
(1) Design of intervention	Various stakeholders including -community leader -health volunteer -grocery owner -villager were the participants in focus group	Using focus group discussions Set up three times focus group discussion Content analysis of focus group result were used for the design of intervention
Result: MPI&CI including communication, investigation, and enforcement		
(2) Implementation of intervention	Training changing agents including -community leader -health volunteer -villager It should be noted that the grocery owner were not invited in training course, but they were in focus group	The content of training course include -provide information on antibiotic risk -propose MPI&CI (communication, Investigation, regulation enforcement) -group discussion
Result: The changing agent will go to the village and follow the MPI&CI model including communication, investigation and regulation enforcement.		

4.2 Implementing intervention

4.2.1 Availability of Antibiotics in Village Groceries

The groceries were surveyed in 40 villages, each 20 villages of intervention and control group. There are 116 groceries, an average of 2.9 groceries per village (Table 4.2). Antibiotics found in groceries were 6 generic names, 14 trade names. Tetracycline is antibiotics that found the most, 5 trade names (Table 4.3). The pictures of those antibiotics appear in figure 4.1 (page 63-65).

Table 4.2 Number of groceries in the district

No.	District	Number of village	Number of grocery	Number of grocery/village
	Intervention group			
1.	Phayakkhaphum Phisai	10	24	2.4 (1-5)
2.	Na Chueak	10	24	2.4 (2-4)
	Subtotal	20	48	2.4 (1-5)
3.	Control group			
	Kosum Phisai	10	35	3.5 (2-5)
4.	Kantarawichai	10	33	3.3 (1-6)
	Subtotal	20	68	3.4 (1-6)
	Total	40	116	2.9 (1-6)

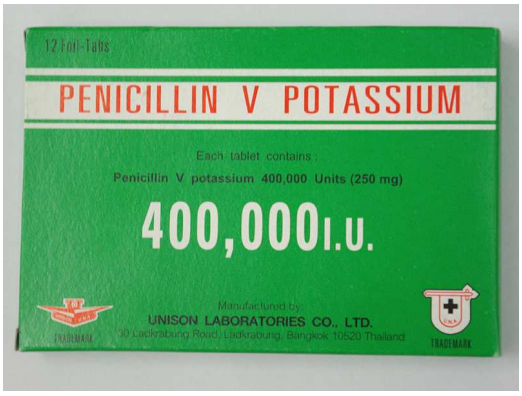
Table 4.3 Antibiotics found in the grocery

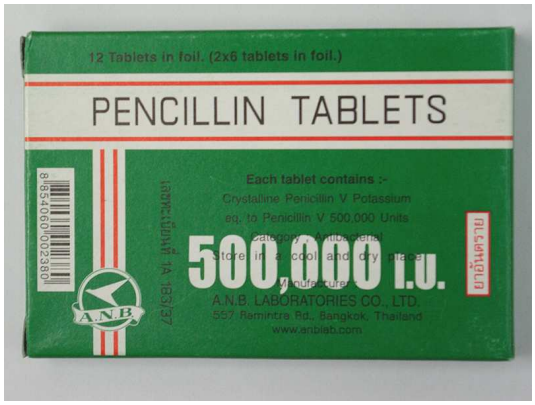
No.	Generic name	Number of Brand name	Brand name	Price/unit (Baht)
1	Tetracycline			
	-capsule 500 mg	5	Gano, Bomcin	5
	-capsule 250 mg		Heromycin, TC-mycin	3
	-tablet 250 mg		Trex 250	5
2	Penicillin V	2		
	-tablet 400,000 u (250 mg)		Penicillin V potassium	1.50
	-tablet 500,000 u		Penicillin tablet	1.50
3	Co-trimoxazole	4		
	-tablet 240 mg		Canamed, Plocanmad	1.50
	-tablet 120 mg		Trex 120	2
	-suspension 60 ml		Mycosamthong	30
4	Sulfadiazine	1		
	-suspension 60 ml		SUL B.C.O	35
5	Sulfanilamide			
	-powder	1	Pises powder	10
6	Thiamphenicol			
	-capsule 250 mg	1	Mycochlorin T	5

Figure 4.1 Picture of Antibiotics found in the village groceries

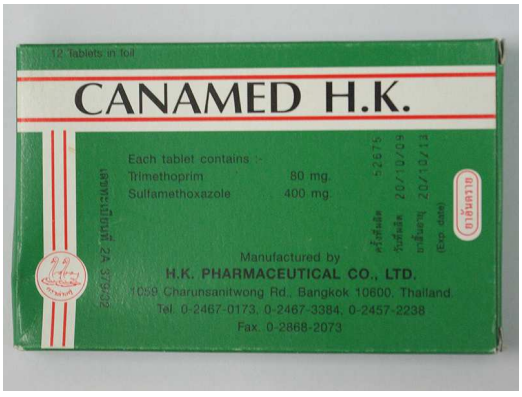
Tetracycline

Penicillin V



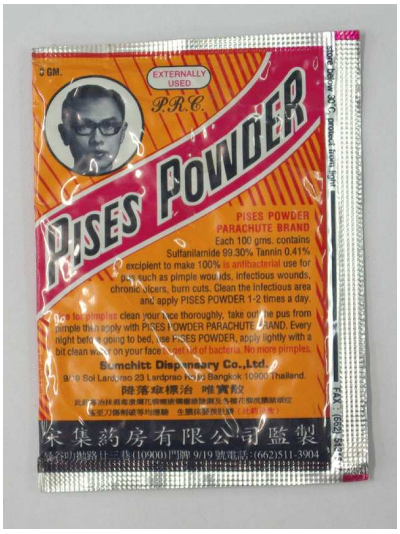


Co-tromoxazole



Sulfadiazine

Sulfanilamine



Thiamphenicol

Antibiotics were found in 19 of the 20 intervention villages and in 20 of the 20 control villages. The most commonly found antibiotic was tetracycline, which was found in 18 intervention villages and 20 control villages. Penicillin V was found in 17 intervention villages and 20 control villages. After the intervention, antibiotics were found in 10 of the intervention villages and 20 of the control villages. Tetracycline decreased from 18 villages to 8 villages and Penicillin decreased from 17 villages to 2 villages in the intervention region, with no change in availability of these antibiotics after the intervention in the control villages. (Table 4.4).

Table 4.4 Number of villages in which found antibiotics before and after intervention classified by antibiotic name

Antibiotics	Intervention group (n=20)		Control group (n=20)	
	before	after	before	after
Tetracycline	18	8	20	20
Penicillin V	17	2	20	20
Cotrimoxazole	10	3	13	11
Sulfadiazine	3	0	9	8
Sulfanilamide	13	2	16	16
Thiamphenicol	2	1	9	10
Total	19*	10	20	20

* There were 10 villages in each district, but one of them had no grocery that sold antibiotics

Before the intervention, antibiotics were found in 38 groceries (79.2%) in the intervention villages, and 60 groceries (88.2%) in the control villages. After intervention, antibiotics decreased from 38 groceries to 11 groceries in the intervention villages. There was a little change in control group (Table 4.5). Using chi-square, number of groceries in intervention group that have antibiotics decrease significantly ($p<.001$).

Table 4.5 Number of groceries in which found antibiotics before and after intervention classified by intervention and control group and district

Antibiotics	Intervention group (n=48)		Control group (n=68)	
	before	after	before	after
Tetracycline	36 (75%)	9 (18.8%)	58 (85.3%)	57 (83.8%)
Penicillin V	38 (79.2%)	2 (4.2%)	47 (69.1%)	50 (73.5%)
Cotrimoxazole	15 (31.3%)	3 (6.3%)	20 (29.4%)	15 (22.1%)
Sulfadiazine	3 (6.3%)	0 .	17 (25%)	10 (14.7%)
Sulfanilamide	16 (33.3%)	2 (4.2%)	29 (42.6%)	28 (41.2%)
Thiamphenicol	2 (4.2%)	1 (2.1%)	15 (22.1%)	16 (23.5%)
Total	38 (79.2%)	11 (22.9%)	60 (88.2%)	58 (85.3%)

Gano was the most commonly found antibiotic trade name. Before the intervention, it was found in 66.7% and 75% of groceries in intervention group and control group, respectively. Penicillin tablet was found in 56.3%, 67.6% of groceries in control group. After intervention, Gano decreased to 12.5%, and Penicillin tablet decreased to 4.2% in the intervention villages, with no change in the control villages (Table 4.6).

Table 4.6 Number of groceries in which found antibiotics before and after intervention classified by antibiotic trade name

Antibiotics	Intervention group (n=48)		Control group (n=68)	
	before	after	before	after
1.Gano	32 (66.7%)	6 (12.5%)	51 (75%)	51 (75%)
2.Penicillin tablet	27 (56.3%)	2 (4.2%)	46 (67.6%)	50 (73.5%)
3.Bomcin	16 (33.3%)	3 (6.3%)	38 (55.9%)	30 (44.1%)
4.Pises powder	16 (33.3%)	2 (4.2%)	29 (42.6%)	28 (41.2%)
5.Trex 250	19 (39.6%)	2 (4.2%)	15 (22.1%)	16 (23.5%)
6.Heromycin	5 (10.4%)	0	22 (32.4%)	21 (30.9%)
7.Mycochlorin	2 (4.2%)	1 (2.1%)	15 (22.1%)	16 (23.5%)
8.SUL B.C.O	3 (6.3%)	0	17 (25%)	10 (14.7%)
9.Mycosamthong	4 (8.3%)	0	17 (25%)	13 (19.1%)

Table 4.6 Number of groceries in which found antibiotics before and after intervention classified by antibiotic trade name (continue)

Antibiotics	Intervention group (n=48)		Control group (n=68)	
	before	after	before	after
10.TC-mycin	7 (14.6%)	0	5 (7.4%)	4 (5.9%)
11.Trex120	5 (10.4%)	1 (2.1%)	3 (4.4%)	4 (5.9%)
12.Penicillin V potassium	3 (6.3%)	0	4 (5.9%)	1 (1.5%)
13.Canamed	5 (10.4%)	2 (4.2%)	0	0
14.Plocanmad	3 (6.3%)	0.	2 (2.9%)	1 (1.5%)

Before intervention, antibiotic cost was 11,571 bahts in 20 villages of intervention group and 25,343 bahts in 20 village of control group. The most cost of antibiotic is tetracycline, 7,424 baht in intervention group, 15,161 baht in control group. After intervention, the antibiotic cost in intervention group decrease significantly (P<.001).

Table 4.7 Cost of antibiotics in the groceries before and after intervention

Antibiotics	Intervention group		Control group	
	before	after	before	after
1.Tetracycline	7,424 (64.2%)	595 (50.9%)	15,161 (59.8%)	15,284 (66.0%)
2.Penicillin V	1,296 (11.2%)	30 (2.6%)	1,745 (6.9%)	1,502 (6.5%)
3.Cotrimoxazole	986 (8.5%)	55 (4.7%)	2,272 (9.0%)	1,413 (6.1%)
4.Sulfadiazine	300 (2.6%)	0 .	2,010 (7.9%)	960 (4.1%)
5.Sulfanilamide	1,350 (11.7%)	390 (33.3%)	2,610 (10.3%)	2,290 (9.9%)
6.Thiamphenicol	215 (1.9%)	100 (8.5%)	1,545 (6.1%)	1,720 (7.4%)
Total	11,571 (100%)	1,170 (100%)	25,343 (100%)	23,169 (100%)
Average (Baht/grocery)	241	24	373	341

4.2.2 Antibiotic Knowledge of Village Groceries' Owner

Most of village grocery's owners don't know about antibiotic knowledge. Five issues that they knew less than other are as follow. Antibiotics don't make wound cure more quickly (8.3-10.3%). Antibiotics don't need for sore throat (8.3-14.7%) .Diarrhea doesn't need antibiotics (25-33.3%). Cold with yellow or green secretion don't need antibiotics (29.4-33.3%). Legal punishment for selling antibiotics in grocery is imprisonment (41.2-43.8%).

Table 4.8 Antibiotic knowledge of grocery' owners before and after intervention

Antibiotic knowledge	Acceptable response	Percentage of acceptable response			
		intervention group		control group	
		before	after	before	after
Use					
- Cold with yellow or greenish nasal discharge need antibiotics	no	33.3	39.6	29.4	26.5
- Antibiotics need for sore throat	no	8.3	20.8	14.7	17.6
- The best treatment for cold is drinking warm water and rest	yes	97.9	97.9	98.5	97.1
- Diarrhea need antibiotics	no	33.3	43.8	25.0	25.0
	yes	93.8	100	100	98.5
- The best treatment for diarrhea is drinking ORS	no	8.3	12.5	10.3	5.9
- Antibiotics make wound cure more quickly	yes	89.6	93.8	98.5	97.1
- The best wound treatment is dressing					

Table 4.8 Antibiotic knowledge of grocery' owners before and after intervention

Antibiotic knowledge	Acceptable response	Percentage of acceptable response			
		intervention group		control group	
		before	after	before	after
Adverse effect					
- Self-medication with antibiotics increase risk of adverse effect	yes	87.5	93.8	92.6	91.2
- Hypersensitivity to antibiotics may cause death	yes	87.5	87.5	85.3	85.3
- Self-medication with antibiotics increase risk of toxicity	yes	83.3	91.7	92.6	94.1
- Self-medication with antibiotics decrease drug resistance problem	no	50	66.7	51.5	50
Regulation					
- Selling antibiotics in grocery is illegal	yes	72.9	89.6	72.1	75
- Legal punishment for selling antibiotics in grocery is to be fined	yes	60.4	87.5**	60.3	57.4
- Legal punishment for selling antibiotics in grocery is imprisonment	yes	43.8	77.1**	41.2	45.6
- TAO can discontinue permit to grocery which sell antibiotics	yes	54.2	87.5**	50	55.9

* paired t-test score before and after intervention $p<0.05$

** paired t-test score before and after intervention $p<0.01$

After intervention, their knowledge increase significantly in 3 issues. Law punishment for selling antibiotics in grocery is to be fined ($p<0.01$) and imprison ($p<0.01$). TAO can discontinue permit to grocery ($p<0.01$). Total knowledge increases significantly ($p<0.01$). There was no increase significant in control group.

Table 4.9 Antibiotic knowledge score of grocery' owners before and after intervention

Antibiotic Knowledge	Total score	Mean score			
		Intervention group		Control group	
		before	after	before	after
Use	7	3.65	4.08**	3.76	3.68
Adverse effect	4	3.08	3.40*	3.22	3.21
Regulation	4	2.31	3.42**	2.24	2.34
Total	15	9.04	10.90**	9.22	9.22

* paired t-test score before and after intervention $p<0.05$

** paired t-test score before and after intervention $p<0.01$

4.2.3 Antibiotic Knowledge of Community Leader

Community leader know about antibiotics more than grocery's owner. Five issues that they knew less than other are as follow. Self-medication with antibiotics increase drug resistance problem (40%). Antibiotics don't make wound cure more quickly (40%). Diarrhea doesn't need antibiotics (47.1%). Cold with yellow or green secretion don't need antibiotics (51.4%). Antibiotics don't need for sore throat (65.7%).

After training, their knowledge increase significantly in 5 issues. Cold with yellow or greenish secretion don't need antibiotics ($p<0.01$). Antibiotics don't need for sore throat ($p<0.05$). Diarrhea don't need antibiotics ($p<0.05$). Antibiotics don't make wound cure more quickly ($p<0.05$). Selling antibiotics in grocery is illegal ($p<0.05$). Total knowledge increases significantly ($p<0.01$).

Table 4.10 Antibiotic knowledge of community leader before and after training

Antibiotic knowledge	Acceptable response	Percentage of acceptable response	
		before	after
Use			
- Cold with yellow or green secretion need antibiotics	no	51.4	72.9**
- Antibiotics need for sore throat	no	65.7	77.1*
- The best treatment for cold is drinking warm water and rest	yes	95.7	92.9
- Diarrhea need antibiotics	no	47.1	62.9*
- The best treatment for diarrhea is drinking ORS	yes	97.1	94.3
- Antibiotics make wound cure more quickly	no	40	55.7*
- The best wound treatment is dressing	yes	95.7	97.1
Adverse effect			
- Self-medication with antibiotics increase risk of adverse effect	yes	85.7	92.9
- Hypersensitivity to antibiotics may cause death	yes	97.1	98.6
- Self-medication with antibiotics increase risk of toxicity	yes	90	95.7
- Self-medication with antibiotics decrease drug resistance problem	no	40	51.4
Regulation			
- Selling antibiotics in grocery is illegal	yes	87.1	97.1*
- Legal punishment for selling antibiotics in grocery is to be fined	yes	82.9	92.9

Table 4.10 Antibiotic knowledge of community leader before and after training

Antibiotic knowledge	Acceptable response	Percentage of acceptable response	
		before	after
Regulation			
- Legal punishment for selling antibiotics in grocery is imprisonment	yes	75.7	78.6
-TAO can discontinue permit to grocery which sell antibiotics	yes	72.9	80

* paired t-test before and after intervention $p<0.05$

** paired t-test before and after intervention $p<0.01$

Table 4.11 Antibiotic knowledge score of community leader before and after intervention

Antibiotic Knowledge	Total score	Mean score	
		before	after
Use	7	4.93	5.53**
Adverse effect	4	3.13	3.39*
Regulation	4	3.19	3.49
Total		11.24 (74.9%)	12.40** (82.7%)

* paired t-test before and after intervention $p<0.05$

** paired t-test before and after intervention $p<0.01$

4.2.4 Awareness of Community Leader to the Intervention

Before the intervention, the community leaders' awareness to the innovation is fairly. The most 3 favorable awareness are interesting in learning more about the intervention, some individuals consider the intervention important, and concerning the health consequences of the intervention. After the intervention, the community leaders had raised five of their awareness significantly. They knew what

MPI&CI is ($p<0.01$). They believed preventing antibiotic sale in village groceries is so important ($p<0.01$). They were concerned about preventing antibiotic sale in village groceries ($p<0.01$). They knew the status of the intervention in their villages ($p<0.05$). They knew why preventing antibiotic sale in village groceries is so important ($p<0.05$). Overall, awareness to intervention changes significantly ($p<0.05$) after intervention.

Table 4.12 Awareness [a] of community leaders to the intervention before and after intervention: Mean, SD, and Paired t-test

Awareness	before		after	
	Mean	SD	Mean	SD
- Did not know what the intervention is[R]	1.87	0.97	2.89**	0.95
- Aware of activities in this intervention	3.46	0.58	3.54	0.58
- Can distinguish between different activities	3.27	0.63	3.29	0.63
- Know the status of the intervention	3.29	0.93	3.60*	0.56
- Don't believe the intervention is so important[R]	2.35	1.32	2.87**	1.30
- Not concerned about the intervention[R]	2.76	1.26	3.19**	1.13
- Not certain why individual consider the intervention important[R]	1.35	0.66	1.33	0.71
- Don't know why the intervention is so important[R]	2.00	1.17	2.39*	1.20
- Interested in more information	3.35	0.78	3.56	0.63
- Interested in learning more	3.67	0.58	3.67	0.58
- Explore the possibility of improving intervention	3.50	0.57	3.65	0.48
- Concern about the health consequence	3.61	0.65	3.67	0.61
- Average	2.90	0.34	3.14*	0.38

[a] Responses: 1=Not at all true; 2=slightly true; 3=somewhat true; 4=very true

[R] reverse score

* paired t-test before and after intervention $p<0.05$

** paired t-test before and after intervention $p<0.01$

4.2.5 Perceived attribute of community leader to the Intervention

Before the intervention, the community leaders anticipated little relative advantage to the implementation of the innovation. The greatest benefit was expected to be from implementing the MPI&CI was advantageous for their villages. To some extent, the community leaders saw MPI&CI was compatible with solving drug use problems in the village and fit well the way they liked to work. The intervention was expected to be somewhat complex, mainly because it required community involvement to make substantial changes and required more activities to solve drug use problem. They had slightly positive view of trialability and observability to the intervention.

After the intervention, the community leaders had changed two of their opinions significantly. They would like to implement the MPI&CI even if there was not encouraged from other agency for example Tambon Administrative Organization (TAO), health center, hospital ($p<0.01$). They would like the changes if the MPI&CI were implemented ($p<0.05$). Implementing the MPI&CI was advantageous for their villages is slightly better and is the greatest benefit so far.

Table 4.13_ Perceived attribute[a] of community leaders to the intervention before and after intervention: Mean, SD, and Paired t-test

Awareness	before		after	
	Mean	SD	Mean	SD
Relative advantage				
- Each of the activity need to be implemented	3.81	0.93	3.93	0.66
- Enhance your effectiveness on the job	3.09	1.29	3.02	1.22
- The village will lose other project if do not implement the intervention[R]	2.09	0.73	1.98	0.74
- Increase your village to get other project	3.98	0.65	4.04	0.72
- Make antibiotic sale in order to the act	4.07	0.88	4.26	0.62
- Have no effect on antibiotic sale[R]	3.19	1.06	3.09	1.12
- Implement the MPI&CI even if there was not encouraged from other agency	3.15	0.98	3.68**	1.01

Table 4.13_ Perceived attribute [a] of community leaders to the intervention before and after intervention: Mean, SD, and Paired t-test

Awareness	before		after	
	Mean	SD	Mean	SD
- Overall, MPI&CI is advantageous for their villages	4.25	0.89	4.53	0.50
Compatibility				
- Compatible with solving drug use problems in the village	4.07	0.74	4.22	0.53
- Fit well with the way like to do	3.93	0.72	3.87	0.72
Complexity				
- Require community involvement to make substantial changes	4.02	0.76	4.17	0.69
- Difficult to train community leader[R]	2.63	1.06	2.65	1.01
- Complicate to implement[R]	3.00	1.07	2.98	0.97
- Require more activities to solve drug use[R] problem	2.11	0.87	2.24	1.03
Trialability				
- Try out some activity before	3.80	0.81	3.94	0.65
Observability				
- People will not see any change if the MPI&CI were implemented[R]	2.76	1.03	2.76	1.03
- Like the changes if the MPI&CI were implemented	4.00	0.82	4.28*	0.52
Average	3.43	0.30	3.52	0.28

[a] Range: 1-5 (5 is most favorable for adoption)

[R] reverse score

* paired t-test before and after intervention $p<0.05$

** paired t-test before and after intervention $p<0.01$

4.3 Risk of having antibiotics in village groceries

After MPI&CI, antibiotics, the number of groceries that have antibiotics decreased (Table 4.14). Risk of having antibiotics was calculated.

Table 4.14 Risk of having antibiotics in village groceries

	Having antibiotics	No antibiotics
Intervention group	11	37
Control Group	58	10

Experimental Event Rate (EER)

= 11/11+37 = 0.23

Control Event Rate (CER)

= 58/58+10 = 0.85

Relative Risk (RR) = EER/CER

= 0.23/0.85 = 0.27

Absolute Risk Reduction (ARR) = CER-EER

= 0.85 – 0.23 = 0.62

Relative Risk Reduction (RRR) = (CER-EER)/CER

= 0.62/0.85 = 0.73

Relative Risk (RR) is 0.27. This means that risk in intervention group is 0.27 times (27%) compare with risk in control.

Risk reduction could be measured in several ways. For Absolute Risk Reduction (ARR), it is 0.62. This means that risk in intervention group decreases 0.62. For Relative Risk Reduction (RRR), it is 0.73. This means that risk in intervention group reduced 73% compare with risk in control group.

4.4 Effect of the intervention on antibiotic availability in village groceries

Our study had research hypothesis stating that implementing Multidisciplinary Perspective Intervention with Community Involvement (MPI&CI) decreases number of groceries having antibiotics. In order to study the independent effect of the intervention on antibiotic availability in village groceries, modified poisson regression was used. Data were analysed by using SAS version 8 (SAS, 2010). The variables in the analysis included:

a) Independent variable of interest: intervention (MPI&CI)

b) Covariates

(1) Demographic factors

-population in the village

-distance from village to center of the district

(2) Grocery factors

-grocery owner characteristics including gender, age, and antibiotics knowledge before intervention

- availability of antibiotics before intervention which is the number of antibiotic items on the shelves available for sale before the intervention

c) Dependent variable

- Antibiotic availability (yes/no) in village grocery

Results from modified poisson regression were shown in Table 4.15. The model gave an estimate of the effect of the intervention. Groceries in the intervention group were 72% less likely (1 – RR = 1 – 0.28) to have antibiotic items for sale after the intervention compared to groceries in the control group. Groceries in the control group were 3.55 times more likely (RR=3.55) to have antibiotic items for sale after the intervention compared to groceries in the control group.

Table 4.15 Effect of the MPI&CI on antibiotic availability in village groceries, analyzed by using modified poisson regression

Variable	Beta	S.E.	P	Exp(B)	Confidence Limits	
No intervention	1.2659	0.2490	<.0001	3.5463	2.1767	5.7776
population	-0.0005	0.0003	0.1507	0.9995	0.9989	1.0002
distance	0.0168	0.0147	0.2539	1.0169	0.9880	1.0466
male	0.1830	0.1434	0.2017	1.2008	0.9067	1.5904
age	-0.0016	0.0042	0.7109	0.9984	0.9902	1.0068
knowledge before	0.0379	0.0259	0.1425	1.0387	0.9873	1.0926
antibiotic item before	0.1471	0.0300	<.0001	1.1585	1.0924	1.2286
constant	-1.0376	0.4969	0.0368			

CHAPTER V

CONCLUSION AND DISCUSSION

Conclusion

Antibiotics were found in village groceries. There were 6 generic names, 14 trade names. Before intervention, antibiotics were found in 38 groceries (79.2%, n=48) in intervention group, and 60 groceries (88.2%, n=68) in control group. Cost of antibiotics was 241, 373 baht/grocery of village groceries in intervention group and control group respectively. After intervention, antibiotics decreased significantly ($p<.001$) in intervention group. Cost of antibiotics decreased significantly in intervention group ($p<.001$).

Antibiotic knowledge of groceries' owners after intervention without training increased significantly ($p<0.01$). Antibiotic knowledge score of groceries' owners before intervention are 9.04 and 9.22. Antibiotic knowledge score of groceries' owners after intervention are 10.9 and 9.22 respectively.

Antibiotic knowledge of community leader after training increased significantly ($p<0.01$). Antibiotic knowledge score of community leaders after training 11.24 and 12.40 respectively.

Awareness of community leader to intervention had raised five of their awareness significantly. They knew what MPI&CI is ($p<0.01$). They believed preventing antibiotic sale in village groceries is so important ($p<0.01$). They were concerned about preventing antibiotic sale in village groceries ($p<0.01$). They knew the status of the intervention in their villages ($p<0.05$). They knew why preventing antibiotic sale in village groceries is so important ($p<0.05$).

Perceived attributed of community leader to intervention had changed two of their opinions significantly. They would like to implement the MPI&CI even if there was not encouraged from other agency for example Tambon Administrative Organization (TAO), health center, hospital ($p<0.01$). They would like the changes if the MPI&CI were implemented ($p<0.05$).

Groceries in the intervention group were 72% less likely to have antibiotic items for sale after the intervention compared to groceries in the control group. Groceries in the control group were 3.55 times more likely to have antibiotic items for sale after the intervention compared to groceries in the control group.

Discussion

1. Failure of drug regulation management

Finding antibiotics in more than 80% of village groceries represent the failure of drug distribution system. Drug act determines that antibiotics are dangerous drug. Selling drug except general household drugs must have a license. The person who sell dangerous drug must have a license type 1 which pharmacist is responsible for drug selling.

Concerning on Registration and Permission of Packaging, there is a need for policy recommendation. In our study, we found several antibiotics were packed in box. They are convenient to be sold in groceries. Villagers usually remember the box of the medicines, they previously used. For instance, they used penicillin G 500,000 tablet, which were already withdrawn from the market. They still used other drugs that have similar packaging as penicillin G 500,000 tablet (see picture in page 64). Policy recommendations are proposed.

2. Design Community-based Intervention

Community involvement is important for the program that is implemented in the village. Because problems occur in the village, people in the village should know the cause, and the method that they can solve. The achievement will be benefit to people in the village. This intervention implemented with the concept of community involvement. Community leader and other inform antibiotic knowledge to people and groceries' owner. After that, they investigate the grocery to check availability antibiotics in the groceries. During the investigation of grocery, they also inform antibiotic knowledge to groceries' owner. Later, TAO officer, health professional, and community member inspected antibiotics in groceries.

After implementing intervention in the village, antibiotics in village groceries were found less, and antibiotic knowledge of groceries' owner increased. This means that communication from community leaders to groceries' owner has effect. The communication method used in the village is other than village broadcasting tower, face-to-face communication. Although, most of village groceries didn't have antibiotics after intervention, some still sold antibiotics. This means that law enforcement may necessary to control these village groceries.

3. Effect of intervention on awareness and perceived attribute of community leader

Intervention for preventing antibiotic sale consists of three process, communication, investigation, and law enforcement. This intervention was designed to be suitable for implementing in the village. Thus, community leaders, health volunteers, and people from the village out of research area were recruited to focus group discussion. It was conducted in 3 locations for having enough information in designing intervention. This intervention was presented in training community leader, health volunteer, and people in the research area before intervention.

Awareness of community leader to intervention increased significantly. Perceived attributed of community leader to intervention had increase. Two of their opinions increased significantly. It implied that community leaders had good opinion to intervention. However, community support should be continued to maintain information for preventing antibiotic sale in the village.

4. Effect of MPI&CI on availability of antibiotic

This intervention decreased harmful to health and wasteful. It should be continued in the village. Today, community leader health volunteer and people have enough information and recognize good consequence of the intervention. They understand how to prevent antibiotic sale in the groceries. The intervention should be continued to maintain communication in the village. Tambon Administrative Organization can support intervention.

5. Generalization of MPI&CI

MPI&CI can be implemented in other village in the responsible area of TAO even this research is quasi-experimental with pretest posttest design. It cannot be randomized control trial because intervention and control may locate adjacent, or in the same Tambon or District. Information from intervention group will diffuse to control group. Diffusion will occur. Even district was selected using geographical data. Village was stratified random sampling from the district. Hence, the village in the research does not different from other village.

Limitations of the Study

There were some limitations in the research. First, theoretically, community leaders should get involve in checking antibiotics before or after employing intervention, so they could learn about the change. However, our study design did not allow them to do so because some of them might tell the grocery owners about the survey. Data collected might not reflect the actual practice of grocery owners. Second, awareness and perceived attribute of grocery owners could not be measured directly. If we asked them about awareness and perceived attribute, they would be uncomfortable and might be worry about what would have effect to their business. Consequently, they might not answer any question and would not corporate with us in investigating availability of antibiotics in their groceries. Third, grocery survey by our research team may have some influence to the grocery owner even we did not show any relationship with community leaders in employing the intervention.

Policy Recommendation

1. National Level

People still used other drugs that have similar packaging as penicillin G 500,000 tablet. Policy recommendations for the national drug committee are proposed here.

1.1 Similar appearance of packaging, as those that are withdrawn, should not be allowed for registration or asking for permission.

1.2 Since violation of selling these antibiotic drugs packing in the box is rampant in village groceries, labeling indicating no selling outside hospital, clinic, and drugstore should be posted on the package.

2. Provincial Level

Effect of MPI&CI that decreased availability of antibiotics has benefit to people. To expand this intervention to any TAO, provincial health office should set up the implementation package in the province. The implementation of intervention can started with one or two tambon in each district, or with some or all tambon in a few district. At the end, MPI&CI should be implemented cover in all area in the district.

3. Tambon Level

Consumer protection on drug in the village should be improved. Today, Consumer Protection Subcommittee of Tambon Administrative Organization has been set up. Active consumers are included in this subcommittee. Therefore, this subcommittee should be responsible for drug consumer protection.

The Consumer Protection Subcommittee of TAO should be trained to inform detail of consumer protection on drug. The subcommittee together with health authority, consumer group, and other stakeholders should be share together abouty how to improve consumer protection on drug in the village. Finally, consumer on drug should be applied in the plan of Consumer Protection Subcommittee of TAO.

Recommendation for Further Study

The research shows the success of MPI&CI in 20 villages of intervention group. Those villages should have a study to assess the sustainability of intervention. Further study could be conducted to measure the long term effect of intervention and expansion of the effect of MPI&CI in other areas.

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APPENDICES

APPENDIX A

Questioning Route

คำถามการสนทนากลุ่ม
เรื่อง การขายยาปฏิชีวนะในร้านชำ

ประเภท	คำถาม	ระยะเวลา
Opening	1. ให้ทุกคนแนะนำตัว บอกชื่อ มาจากหมู่บ้านไหน บอกบทบาทในหมู่บ้าน เช่น กำนัน ผู้ใหญ่บ้าน อบต. อสม. เจ้าของร้านชำ เป็นต้น หรือไม่มีตำแหน่งอะไรในหมู่บ้าน	5
Introduction	2. เนื่องจากการใช้ยาฆ่าเชื้ออาจทำให้เกิดอันตรายต่อร่างกาย เกิดการดื้อยา และการเสียเงินโดยเปล่าประโยชน์ ดังนั้น จึงจำเป็นต้องป้องกันการขายยาฆ่าเชื้อในร้านชำ	5
Transition	3. การใช้ยาฆ่าเชื้อ อาจทำให้เกิดอันตรายต่อร่างกาย เช่น การแพ้ยา เป็นพิษต่อไต ทำให้เกิดการดื้อยา และการใช้ยาโดยไม่จำเป็นทำให้เสียเงินโดยเปล่าประโยชน์ ท่านคิดว่าการขายยาปฏิชีวนะในร้านชำทำให้เกิดปัญหาอะไรบ้าง	10
Key	4. เนื่องจากการใช้ยาฆ่าเชื้อทำให้เกิดอันตรายต่อร่างกายและเกิดผลเสียต่อประชาชนในหมู่บ้าน ท่านคิดว่าควรจัดกิจกรรมอะไรเพื่อป้องกันการจำหน่ายยาฆ่าเชื้อในร้านชำ	10
Key	5. ผู้นำชุมชนจะมีบทบาทอะไรบ้างในการป้องกันการขายยาฆ่าเชื้อในร้านชำ	5
Key	6. อาสาสมัครสาธารณสุข อสม ในหมู่บ้านจะมีบทบาทอะไรบ้างในการป้องกันการขายยาฆ่าเชื้อในร้านชำ	5
Key	7. เจ้าของร้านชำจะมีบทบาทอะไรบ้างในการให้ความร่วมมือกับการป้องกันการขายยาฆ่าเชื้อในร้านชำ	5
Key	8. ผู้นำชุมชน อสม อาสาสมัครในหมู่บ้าน และเจ้าของร้านชำสามารถร่วมมือกันอย่างไรบ้าง ในการจัดกิจกรรมเพื่อป้องกันการจำหน่ายยาฆ่าเชื้อในร้านชำ	10
Key	10.การจัดกิจกรรมเพื่อป้องกันการขายยาฆ่าเชื้อในร้านชำ อาจมีอุปสรรคอะไรบ้าง จะป้องกันแก้ไขได้อย่างไร	10
Key	12. ทำอย่างไร การจัดกิจกรรมเพื่อป้องกันการขายยาฆ่าเชื้อในร้านชำจะประสบผลสำเร็จ และ เป็นการเปลี่ยนแปลงแบบยั่งยืน	10
Ending	13. เราได้วิธีการที่ชุมชนมีส่วนร่วมในการป้องกันการขายยาฆ่าเชื้อ ในร้านชำแล้ว ท่านคิดว่ามีวิธีการใดเพิ่มเติมอีกหรือไม่	5

Focus Group Result

คำถามและคำตอบการสนทนากลุ่ม

คำถามที่ 1

- การใช้ยาฆ่าเชื้อ อาจทำให้เกิดอันตรายต่อร่างกาย เช่น การแพ้ยา เป็นพิษต่อไต ทำให้เกิดการดื้อยา และการใช้ยาโดยไม่จำเป็นทำให้เสียเงินโดยเปล่าประโยชน์ ท่านคิดว่าการขายยาปฏิชีวนะในร้านชำ ทำให้เกิดปัญหาอะไรบ้าง

คำตอบ

ครั้งที่ 1

-อาจมีผลทำให้คนกินแพ้ยา เนื่องจากคนขายไม่ใช่เภสัช ไม่สามารถแนะนำว่ายานี้ใช้รักษาโรคอะไร

ครั้งที่ 2

-ความเข้าใจเรื่องยาฆ่าเชื้อยังไม่ชัดเจนกับประชาชนเท่าไร กินตั้งแต่นานแล้ว

-ส่วนใหญ่ไม่ซื้อยากินเอง ส่วนใหญ่ไปปรึกษา อสม. ส่วนใหญ่ร้านค้าไม่ค่อยได้ เพราะได้รับคำแนะนำว่ามีอันตราย ลดลงจากแต่ก่อนมา แตกต่างจาก 10 ปีที่แล้ว

-บางคนเข้าใจ บางคนไม่เข้าใจ เคยกินก็เลยกิน โทษอย่างไรยังไม่รู้ท่าที่ควร คนกินจะบอกว่าห้ามทำไม กินแล้วดี

ครั้งที่ 3

-แพ้ยา มีหลายแบบ การแพ้แบบลมพิษก็มี การแพ้แบบเฉียบพลัน ชักกระตุกก็มี รุนแรงมาก เกี่ยวกับการแพ้ยาแบบชักกระตุก การแก้เขาให้น้ำเกลือ ถ้าไม่แก้โอกาสตายมี

คำถามที่ 2

- เนื่องจากการใช้ยาฆ่าเชื้อทำให้เกิดอันตรายต่อร่างกายและเกิดผลเสียต่อประชาชนในหมู่บ้าน ท่านคิดว่าควรจัดกิจกรรมอะไรเพื่อป้องกันการจำหน่ายยาฆ่าเชื้อในร้านชำ

คำตอบ

ครั้งที่ 1

-จะให้คำแนะนำผู้ขายว่าผิดกฎหมาย ส่วนผู้ที่ซื้อไปกิน ก็จะบอกเขาว่าเป็นยาอันตรายต่อร่างกาย ถ้าคนขายยังไม่เลิกขายก็จะแจ้งเรื่องกฎหมาย

ครั้งที่ 2

-ห้ามไม่ให้ร้านค้านำมาขาย

-ให้ความรู้เจ้าของร้านว่าเป็นอันตรายต่อร่างกาย

ให้ความรู้เจ้าของร้านแล้ว ให้ความรู้กับชาวบ้านด้วย

-ให้คณะกรรมการร้านค้าชุมชนมีมติไม่ให้นำมาขาย

-ไม่ให้บริษัทผลิตมาขาย ถ้าบริษัทไม่ผลิต ร้านค้าก็ไม่มีขาย

-จุดใหญ่อยู่ที่ผู้บริโภค ต้องเรียกผู้บริการมาประชุมแนะนำความรู้ อันตรายของยา ถ้าไม่มีผู้บริโภคจุดหยุดร้านค้าไม่ให้ขายได้

-ให้คำแนะนำร้านค้าว่าอย่านำมาขายเลย เพราะว่ามีอันตรายหลายอย่าง ประชาสัมพันธ์อันตรายของยา ไปบังคับเลยคงไม่ได้ เพราะว่าเคยนำมาขายอยู่ ส่วนใหญ่ก็ขอความร่วมมือกันและทำความเข้าใจกับผู้บริโภค

-ให้ผู้นำไปพูดที่ร้านค้า ต้องไปเป็นคณะ บอกผลเสีย บอกว่ากำไรแค่นี้ แต่อันตรายกับผู้ป่วยมากหยุดขายได้ไหม ขอร้องด้วย จะค่อยๆหายไป ถ้าเราไปส่วนบุคคล ถ้าบอกว่ายาพวกนี้ไม่ให้เอามาขาย คงไม่ได้ ต้องขอร้อง

<u>ครั้งที่ 3</u>

-ขั้นแรก ต้องนำผู้เกี่ยวข้องมาทำความเข้าใจเกี่ยวกับโทษของการใช้ยาตัวนี้ ต้องให้รู้ว่ายาตัวนี้เป็นอันตราย จะได้ไม่นำมาขาย ถ้าไม่สร้างความเข้าใจ ก็จะไปซื้อมาขาย เอากำไร เอาผลประโยชน์ใส่ตัวเองเหมือนเดิม ถ้าผู้ขายไม่มีจิตสำนึกก็คือเก่า

-อบรมให้ความรู้เจ้าของผู้ประกอบการ

-แก้ปัญหายากมาก เวลาประชุมผู้ใหญ่บ้าน ผู้นำประชุม ถ้ามีข้อเสนอนี้ไปพูดกับผู้นำบ่อยๆ ต้องให้ผู้นำนำความรู้ที่ได้รับไปให้ความรู้กับชาวบ้าน ต้องทำบ่อยครั้งจึงจะประสบผลสำเร็จ ชาวบ้านจึงจะมีจิตสำนึก และอยากให้หน่วยงานลงไปตรวจบ่อยๆ

-มันจะเป็นการแก้ปัญหาระยะยาว ยาวมาก ถ้าอยากให้ชัดเจน คิดว่าต้องใช้มาตรการเด็ดขาดออกเป็นกฎหมาย ผู้ประกอบการผิดตามมาตรานั้น มาตรานี้ พระราชบัญญัติการใช้ยา

-มันจะเหมือนกับการขายยาดอง ถ้าไม่ขับก็ไม่เลิกขาย พอกมีการจับก็เลิกขาย

-การสร้างความเข้าใจต้องทำทั้งระดับผู้ประกอบการ ระดับผู้กิน ผู้บริโภค

-ต้องมีมาตรฐานที่ชัดเจน จึงจะห้ามได้ ไม่เช่นนั้น ห้ามไม่ได้ ถ้าไปโรงพยาบาลก็ไม่ได้ มันจะยากอีก

<u>คำถามที่ 3</u>

- ผู้นำชุมชนจะมีบทบาทอะไรบ้างในการป้องกันการขายยาฆ่าเชื้อในร้านชำ

<u>คำตอบ</u>

<u>ครั้งที่ 1</u>

-ให้กำนันเป็นคนบอกผ่านให้ชาวบ้านได้รู้ถึงโทษของยาฆ่าเชื้อและยาชุด

-ให้ผู้นำเข้าไปตรวจดูว่าร้านค้ามียาฆ่าเชื้อขายอยู่ในร้านหรือไม่ ถ้ามีคนยังซื้อไปกินอยู่ไหม อย่างน้อยให้ตรวจดูเดือนละครั้ง เพราะคิดว่าคนในหมู่บ้านจะเชื่อผู้นำมากกว่าคนในหมู่บ้านบอกกันเอง

-เวลาไปประชุมหรือประชุมในหมู่บ้าน จะประชาสัมพันธ์แจ้งไม่ให้คนขายยานี้อีก และบอกคนที่ซื้อกินว่ามีโทษอย่างไร

-ถ้ามีรถมาขายยาจะเฝ้าระวัง ถ้ามีคนป่วยจะแนะนำให้ไปหาหมอ ไม่ควรซื้อยากินเองเพราะจำทำให้อาการที่เป็นอยู่ดื้อยา

ครั้งที่ 2

-การขายยาฆ่าเชื้อผิดกฎหมาย ให้มีผู้สอดแนม

-ผู้นำต้องวางแผน มีประชาคมบอกว่ายาอันตรายต่อร่างกาย คนที่จะกินให้ไปซื้อตลาด อนามัย

-ถ้าไปเตือน ถ้าบอกว่าผิดกฎหมาย อันตราย ถ้าขายอาจตถูกจับ จะเชื่อกัน

-คุยกับร้านค้าไม่ให้ขาย แนะนำว่ายาไม่ดี อันตรายต่อชาวบ้าน ให้ใช้ยาอื่นแทน

ครั้งที่ 3

-ช่วยประชาสัมพันธ์ ช่วยรณรงค์ ผู้ใหญ่บ้านให้ความร่วมมือดี ยกตัวอย่างอยู่บ้าน ก็ฟังผู้นำ อะไรที่ไม่ดี

-อสม.เป็นผู้ใหญ่บ้านหลาย อบต.ยังเป็นอสม.หลาย

-เรื่องการให้ความรู้ เรื่องการจัดอบรมให้ความเข้าใจอยู่ในส่วนของ อบต. เอาโครงการเข้าไป ตั้งงบฝึกอบรมสร้างความรู้ความเข้าใจให้ผู้บริโภคเกี่ยวกับการใช้ยา

คำถามที่ 4

-อาสาสมัครสาธารณสุขในหมู่บ้านจะมีบทบาทอะไรบ้างในการป้องกันการขายยาฆ่าเชื้อในร้านชำ

คำตอบ

ครั้งที่ 1

-แนะนำให้คนที่ซื้อยากินเองว่า ให้ซื้อเฉพาะยาสามัญประจำบ้าน ไม่ซื้อยาฆ่าเชื้อกินเอง

-ให้ อสม. แนะนำครัวเรือนที่ตัวเองรับผิดชอบ ช่วยเป็นตัวหลักในการกระตุ้นให้เลิกซื้อยามากินเอง

-แนะนำคนขายไม่ให้เอามาขาย จะมีเภสัชกรเข้ามาตรวจบ่อยๆ หรือมีสาธารณสุขมาตรวจด้วย

ครั้งที่ 2

-ออกตรวจร้านค้า ไม่ให้นำมาจำหน่าย

-ให้คำแนะนำ บอกว่าไม่ให้ขาย ไม่รู้ว่าจะเชื่อหรือไม่ คนที่เชื่อก็จะไม่ขาย คนที่ไม่เชื่อก็จะลักลอบมาขาย

-ให้ อสม. ออกตรวจบ่อยๆ แนะนำว่ายาชนิดใดดี ยาชนิดใดไม่ดี ยาชนิดใดควรใช้ ยาชนิดใดไม่ควรใช้ มีอันตรายอย่างไร

ครั้งที่ 3

-ให้ อสม. ออกตรวจร้านค้า แนะนำว่าเป็นยาอันตรายต่อร่างกาย ไม่ให้นำมาขาย

คำถามที่ 5

- เจ้าของร้านชำจะมีบทบาทอะไรบ้าง ในการให้ความร่วมมือกับการป้องกันการขายยาฆ่าเชื้อในร้านชำ

คำตอบ

ครั้งที่ 1

-ไม่เอายาที่ควรขายมาขาย ยาชุด ยาแก้อักเสบไม่เอามาขาย

-แนะนำให้ไปหาหมอดีกว่าซื้อยากินเอง จะได้รู้โรคที่ตัวเองเป็น

-เจ้าของร้านชำส่วนมากเป็นผู้นำ สามารถบอกกันได้

ครั้งที่ 2

-ร้านค้าชุมชน ถ้าแนะนำแล้วจะไม่นำมาขาย

-ถ้ายังมีคนแอบขาย มีกรรมการตรวจสอบไปบ่อย โกหกไม่ได้ เพราะกรรมการไปตรวจ

-ร้านค้าชุมชนมีกรรมการตรวจสอบ ร้านค้าอื่น อาศัยทีมงานไปตรวจสอบก็กลัวเหมือนกัน ไม่กล้าขาย มีการประชาสัมพันธ์ เสียงตามขาย

-ถ้าลักขาย ก็ละอายใจ

ครั้งที่ 3

-ร้านค้ายาก เพราะว่าเห็นประโยชน์ส่วนตัว

-ร้านค้าชุมชนทำได้

-แต่ว่าจริงๆแล้ว เขาก็ไม่รู้ว่ามันมีอันตรายอย่างไร

-มีร้านค้าหนึ่ง ไม่ขายเลย

-ในส่วนของคนขายก็มาจัดอบรมสร้างความรู้ความเข้าใจเกี่ยวกับโทษของยากับผู้ขาย

-เรียกมาอบรมก็ยาก ไม่ค่อยให้ความร่วมมือ ไม่ค่อยสนใจ

-ร้านค้าไม่ค่อยมา ในหมู่บ้าน

-ตั้งหัวข้อให้เป็นตาย่านแก่ผู้ค้า ขายยาฆ่าเชื้อแล้วถูกปรับ ถูกจับ

-ต่อไปเขาจะรู้ แต่แรงจูงใจที่จะทำให้เขาเข้าร่วมจะทำอย่างไร พวกพ่อค้าแม่ค้าแฮ่งเวลาน้อยคักไปมือใดก็เว่าความนั้นแหละ ช่างมันเถาะ จะสร้างแรงจูงใจอย่างไรถึงจะเข้าประชุม คนละ 500 ไปจังซี่ตั๊ว สิแล่นไป พอได้เบี้ยแล้วก็ซื่ออีก บ่เฮ็ดหยัง

-แน่นอน เป็อย่างนั้นแหละ

-เป็นปัญหาใหญ่ระดับประเทศ

-แก้ยาก อย่าว่าแต่ในระดับหมู่บ้านเลย แค่ระดับครอบครัว บอกแม่ใหญ่ว่าอย่าไปกิน ก็ยังว่ากินแล้วสิเป็นหยัง สูบกินก็อย่ากิน ไปหาหมอเอาโลด ผู้เฒ่านี่ก็ฮักเจ้าของอยู่ แต่ว่าฮักแบบไหน แบบมักง่าย

คำถามที่ 6

- ผู้นำชุมชน อาสาสมัครสาธารณสุขในหมู่บ้าน และเจ้าของร้านชำ สามารถร่วมมือกันอย่างไรบ้างในการจัดกิจกรรมเพื่อป้องกันการขายยาฆ่าเชื้อในร้านชำ

คำตอบ

ครั้งที่ 1

-ประชาสัมพันธ์ในวันประชุมให้ทราบโดยทั่วกัน

-อบต.ช่วยกันแก้ไข บอกโทษที่จะได้รับของการขายและการกินยาฆ่าเชื้อ

-ระบุชื่อยาฆ่าเชื้อไว้หน้าร้านว่าห้ามาขาย

-ให้อนามัยออกมาให้ความรู้กับคนในหมู่บ้านว่าไม่ควรขาย ไม่ควรซื้อยามากินเอง

-ไม่ให้ร้านค้าในหมู่บ้านขาย บอกโทษที่จะได้รับ โดยให้ อสม. เป็นคนเข้าไปคุยกับเจ้าของร้าน

-สำรวจร้านค้าเป็นประจำ

-ประชาสัมพันธ์ทางหอกระจายข่าว

-มีป้ายติดตามร้านค้าโดยระบุประเภทของยาฆ่าเชื้อว่าไม่ให้ขาย ติดที่ร้านค้าชุมชน ศาลากลางบ้าน

-ป้ายขนาดใหญ่ติดในหมู่บ้าน ป้ายขนาดเล็กติดที่ร้านค้า

-ป้ายติดบอกด้วยว่า พบปัญหาสามารถแจ้งได้ที่เบอร์โทร.นี้ ถ้ามีเบอร์โทร.ด้วย ร้านค้าจะไม่กล้า

-ถ้าพูดจบก็จบไป ถ้ามีป้ายติดอยู่ เป็นปีก็ไม่ชำรุด เป็นหลักประกันว่าไม่ได้พูดลอยๆ คนมองเห็นป้ายก็ไม่กล้า ถ้าไม่มีป้าย เวลาพูดจะไม่ชัดเจน มีป้ายเป็นหลักประกัน พูดแล้วชี้ได้ด้วย

ครั้งที่ 2

-ประชุมผู้นำ ผู้ใหญ่บ้าน อบต. อสม. และร้านค้า ปรึกษากันว่าจะทำอย่างไรชุมชนจึงจะปลอดยาที่ไม่มีประโยชน์

-ทำประชาคมตกลงกันว่าจะไม่ให้ขาย เมื่อทำประชาคมแล้ว ร้านค้าคงจะไม่นำมาขาย

-จัดตั้งกลุ่มไปตรวจร้าน เป็นคณะกรรมการจากแต่ละฝ่าย 3-4 ประเภท ตัวแทนประชาชน ผู้นำ อสม. จำนวน 15 คน ประชุมกันทำอย่างไร ไปตรวจร้านทั้งคณะ

-กลุ่มต้องมีผู้นำ เจ้าของร้านจะเกรง

-ถ้ามีคนมาถามหา บอกว่าไม่มีขาย แนะนำให้ไปอนามัย

-ถ้าร้านค้าไม่เชื่อ ให้โอกาส 3 ครั้ง ครั้งที่ 1 เตือน ครั้งที่ 2 ให้กรรมการลงไป ครั้งที่ 3 ถ้ายังไม่เชื่อดำเนินการตามกฎหมาย คิดว่าไม่ถึงขนาดนี้ กำไรไม่มาก

-ถ้าทำจริงแบบนั้น จะทำได้ผล ผู้ขายจะกลัว

-ไม่ไปคนเดียว ไปในรูปกรรมการ อาจเชิญเจ้าหน้าที่ร่วมทีมด้วย

ครั้งที่ 3

-ต้องประชุมชาวบ้าน หมอมาให้ความรู้ ให้ความรู้เป็นเรื่องสำคัญ กินยานี้เป็นอันตรายอย่างนี้ ผิดกฎหมายมาตรานั้น มาตรานี้ ปรับ เอาจริงเอาจัง จะทำให้ลดลง ไม่หมด แต่ทำให้ลดลงเติบนึง ในระยะแรก ลงหมู่บ้านสัปดาห์ละครั้ง ลงบ่อยๆ ลงไปสำรวจว่าร้านค้าร้านนี้ ขายได้เท่าไร มีคนซื้อหรือเปล่า จึงจะหยุดได้

-ให้คนในชุมชนสุ่มสำรวจเรื่อยๆ

-ประชาสัมพันธ์ในวันประชุมให้ทราบโดยทั่วกันทั้ง 17 หมู่บ้าน

คำถามที่ 7

- การจัดกิจกรรมเพื่อป้องกันการขายยาฆ่าเชื้อในร้านชำ อาจมีอุปสรรคอะไรบ้าง จะป้องกันแก้ไขได้อย่างไร

คำตอบ

ครั้งที่ 1

-ไม่มีปัญหา แต่จะยังไม่ได้ผลหมด 100% เพราะร้านที่ซื้อยามาขายแล้วก็จะขายให้หมดก่อน

-ถ้ายังไม่เลิกขาย แจ้งให้อนามัยเข้ามาตรวจ

-แจ้ง อบต. ว่าร้านค้านี้ไม่ให้ความร่วมมือในการป้องกันการขายยาฆ่าเชื้อ ไม่ต้องออกใบอนุญาตให้ขายต่อไป

-ใช้วิธีแจ้ง อบต. ถ้า อบต. ไม่ออกใบอนุญาตให้ก็จบ ร้านค้ากลัวเรื่องใบอนุญาต

ครั้งที่ 2

-จะโกรธ อสม. หรือไม่

-ไม่โกรธ เพราะทำประชาคมแล้ว และการไปตรวจครั้งแรกไปเป็นกรรมการ หลังจากนั้น จะเข้าเวรกันไป ถ้าพบ ก็รายงานคณะกรรมการ

ครั้งที่ 3

-ถึงแม้จะไม่ได้ 100% ก็จะได้ผลมากกว่า เพราะว่าการประชาสัมพันธ์ระดับผู้นำก็จริงอยู่ พี่น้องเชื่อก็จริงอยู่ แต่ผู้นำบางคนอาจจะมีธุรกิจเกี่ยวข้องกับการค้าขาย อาจจะเห็นแก่ตัว ช่างเถอะ ไม่ใช่พี่ไม่ใช่น้อง จะเป็นอย่างนั้น

-ถ้าพวกเจ้าหน้าที่อนามัยออกไปตรวจเอง เขาจะเชื่อกว่าที่ชาวบ้านไปบอกกันเอง คือเจ้าหน้าที่จะออกไปด้วย ไปดูว่าขายหรือไม่ มียาอะไรบ้าง เขาจะเก็บเลย ถ้าชาวบ้านไปบอก เขาจะว่ามึงเป็นใคร เชื่อทำไม

คำถามที่ 8

- ทำอย่างไรการจัดกิจกรรมเพื่อป้องกันการขายยาฆ่าเชื้อในร้านชำจะประสบผล สำเร็จ และเป็นการเปลี่ยนแปลงแบบยั่งยืน

คำตอบ

ครั้งที่ 1

-ให้มี อบต. นำร่องก่อน แล้วขยายไปที่ตำบลอื่น

ครั้งที่ 2

-ขึ้นกับผู้นำ ถ้าผู้นำเข้มแข็ง ทำได้ แต่ทำคนเดียวคงไม่ได้ เราต้องพึ่งทุกฝ่ายของตำบล ฝ่ายปกครอง ผ่านบริหาร บอก ทำความเข้าใจว่าอันตราย ผิดกฎหมาย

-จะได้ผล 80% อาจไปใช้บริการที่อื่นที่ไม่ใช่ร้านค้า ถ้ายังมีคนกิน เรียกผู้บริโภคมาประชุม เชิญสาธารณสุข เภสัชกรมา 2-3 หน่วยงาน

-อีก 20% ให้หน่วยเหนือดำเนินการ

-คิดว่าสำเร็จถ้าช่วยกัน ประชาสัมพันธ์ตามร้านแนะนำในการสำรวจ

-ทำจริงจัง จะสำเร็จ ร่วมมือกัน ประชุมกันก่อน ขอความร่วมมือร้านค้า แนะนำ

-คิดว่ายั่งยืน เพราะไปตรวจเป็นประจำเดือนละครั้ง ก็จะไม่นำมาขาย

ครั้งที่ 3

-ต้องใช้มาตรการเด็ดขาด จับ ไม่มีขายแน่นอน

-จับ ปรับ ผู้ประกอบการ

-ผู้ผลิตก็ยังผลิต ต้องทำตั้งแต่ต้นเหตุ ถ้าทำปลายเหตุ มันก็ยาก ผู้ผลิตก็ยังผลิต ก็ยังมีขาย ลักลอบไปซื้อเหมือนเดิม

-ก็ซื้อมากินได้ ไม่ได้ตรวจ ไม่ได้เป็นแบบยาบ้า

-ถ้าไม่ให้ขาย ก็หยุดผลิต

-ให้ป้าย ร้านค้าใดปลอดยา ให้ป้าย

-ถ้าร้านใดเลิกขาย ก็ให้รางวัล ให้ป้ายประกาศ ให้ใบเกียรติบัตร

APPENDIX B

Antibiotic Available Checklist

Grocery no. ..... Village no. ..... Tambon ..... District .....

Mahasarakham Province

Antibiotics

No.	Trade Name	Package	Unit per Package	Quantity	
				Package	Capsule/ Tablet
1	Gano	box	10 cap		
2	Bomcin	box	10 cap		
3	TC mycin	box	10 cap		
4	Heromycin	pack	4 cap		
5	Penicillin 500,000	box	12 tab		
6	Penicillin 400,000	box	12 tab		
7	Canamed	box	12 tab		
8	Plocanmad	box	10 tab		
9	Trex 250	pack	10 tab		
10	Trex 120	pack	10 tab		
11	Mycochlorin-T	pack	4 cap		
12	SUL B.C.O	bottle	60 ml.		
13	Mycosamthong	bottle	60 ml.		
14	Pises powder	pack			
15					
16					
17					
18					
19					
20					

Antibiotic knowledge Questionnaire
for grocery owner and community leader

Grocery no. ..... Village no. ..... Tambon ..... District .....
Mahasarakham Province

Part 1 (for Grocery owner)

1. Gender

☐ male ☐ female

2. Age …….. year

3. You are always seller of the groceries

☐ yes ☐ no

Part 1 (for community leader)

1. Gender

☐ female

☐ male

2. age …….. Year

3. situation

☐ head of tambon

☐ head of village

☐ TAO member

☐ health volunteer.

☐ grocery owner

☐ representative of Cooperatives store

☐ villager

☐ other, please specify.....

Part 2 Antibiotic knowledge

4. Cold with yellow or greenish nasal discharge need antibiotics

☐ yes

☐ no

5. Antibiotics need for sore throat

☐ yes

☐ no

6. The best treatment for cold is drinking water and rest

☐ yes

☐ no

7. Diarrhea needs antibiotics

☐ yes

☐ no

8. The best treatment for diarrhea is drinking ORS

☐ yes

☐ no

9. Antibiotics make wound cure more quickly

☐ yes

☐ no

10. The best treatment for wound is dressing

☐ yes

☐ no

11. Self-medication with antibiotics increase risk of adverse effect

☐ yes

☐ no

12. Hypersensitivity to antibiotics may cause death

☐ yes

☐ no

13. Self-medication with antibiotics increase risk of toxicity for example hepatotoxicity

☐ yes

☐ no

14. Self-medication with antibiotics decrease drug resistance problem

☐ yes

☐ no

15. Selling antibiotics in groceries is illegal

☐ yes

☐ no

16. Legal punishment for selling antibiotics is to be fined.

☐ yes

☐ no

17. Legal punishment for selling antibiotics is imprisonment.

☐ yes

☐ no

18.TAO can discontinue permit to groceries which sell antibiotics

☐ yes

☐ no

Awareness and Perceived Attribute to MPI&CI Questionnaire

for grocery owner and community leader

Grocery no. ..... Village no. ..... Tambon ..... District .....

Mahasarakham Province

Part 1

1. Gender

☐ female

☐ male

2. age …….. Year

3. situation

☐ head of tambon

☐ head of village

☐ TAO member

☐ health volunteer.

☐ grocery owner

☐ villager

☐ other, please specify.....

Part 2 Awareness to Preventing antibiotic sale in village groceries

	Question	Not al all true	Slightly true	Somewhat true	Very true
1	You don't know what preventing antibiotic sale in groceries is.				
2	You are aware of activities which address preventing antibiotic sale in groceries.				
3	You can distinguish between different activities which address preventing antibiotic sale in groceries.				

	Question	Not al all true	Slightly true	Somewhat true	Very true
4	You know the status of preventing antibiotic sale in groceries in your village.				
5	You don't believe preventing antibiotic sale in groceries is so important.				
6	You are not concern about preventing antibiotic sale in groceries in your village.				
7	There are some individuals consider preventing antibiotic sale in groceries important.				
8	You don't know why preventing antibiotic sale in groceries is so important.				
9	You are interested in more information about preventing antibiotic sale in village groceries				
10	You are interested in learning more about preventing antibiotic sale in village groceries				
11	You would like to explore the possibility of preventing antibiotic sale in village groceries				
12	You are concerned about the health consequence of selling antibiotics in village groceries				

Part 3 Perceived attribute to Preventing antibiotic sale in village groceries

	Question	least favorable	not favorable	moderate favorable	favorable	most favorable
1	Using MPI&CI is compatible with solving drug use problem in your village.					
2	You think that using MPI&CI fits well with the way like to work.					
3	I believe that using MPI&CI would require community involvement to make substantial changes to your present prevention program.					
4	It will be difficult to train community leader to implement the MPI&CI.					
5	Overall, you believe that it will be complicated to implement the MPI&CI.					
6	You believe that each of activities described in MPI&CI need to be implemented this time.					
7	You believe that it is okay for you to try out MPI&CI on a limited basis before fully implementing.					
8	People will not be able to see any change if MPI&CI is implemented.					

	Question	least favorable	not favorable	moderate favorable	favorable	most favorable
9	Community leader will like the change if MPI&CI is implemented.					
10	Using MPI&CI will enhance your effectiveness on the job.					
11	Your village will lose other funding if you do not use MPI$CI.					
12	Using MPI&CI will increase your ability to get other funds for your village.					
13	Using MOI&CI will increase the quality of regulation of antibiotic sale in groceries.					
14	Using MPI&CI will have no effect on antibiotic sale in groceries.					
15	MPI&CI require more work than can be done with previous program.					
16	Even if any agency did not encourage the use of MPI&CI, you would like to implement MPI&CI in your village.					
17	Overall, you find using MPI&CI to be advantageous to village.					

VITAE

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6 March 1963, Chonburi Thailand

Education

B.Sc. in Pharmacy, Mahidol University, 1985

Master of Science (Health Product Management), Khon Kaen University, 2005

Experience

Wapi Pathum Hospital, Mahasarakham, 1986

Mahasarakham Provincial Health Office, 1988

Bang Nam Priew Hospital, Chachoengsao, 1991

Ban Pho Hospital, Chachoengsao, 1993

Chachoengsao Provincial Health Office, 1998

Mahasarakham University, 2000 - now