READINESS AND INTENTION TO PROVIDE EXTENDED COMMUNITY PHARMACY SERVICES

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ความพร้อมและความตั้งใจในการขยายบทบาทการให้บริการเภสัชกรรมชุมชน

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ในปัจจุบันการให้บริการเภสัชกรรมชุมชนในร้านยาในหลายๆประเทศได้มีการเปลี่ยนแปลงรูปแบบไป จากการให้บริการที่มุ่งเน้นตัวผลิตภัณฑ์ เป็นการให้บริการที่มุ่งเน้นที่ผู้ป่วยเป็นศูนย์กลาง ซึ่งพบได้แพร่หลายโดยเฉพาะในประเทศที่พัฒนาแล้ว การศึกษานี้มีวัตถุประสงค์เพื่อสำรวจทัศนคติของ แพทย์ ผู้รับบริการ และเภสัชกรชุมชน ต่อการให้บริการเสริมในร้านยา และเพื่อประเมินปัจจัยต่างๆที่มีผลต่อความตั้งใจของเภสัชกรชุมชนในการให้บริการเสริมในร้านยา การศึกษาในวัตถุประสงค์ที่ 1 เป็นการวิจัยเชิงคุณภาพ โดยทำการสัมภาษณ์เชิงลึกจากผู้ที่มีส่วนเกี่ยวข้อง ได้แก่ แพทย์ ผู้มารับบริการที่ร้านยา และ เภสัชกรชุมชน ภายในจังหวัดกรุงเทพมหานคร เกี่ยวกับความคิดเห็นที่มีต่อบริการเภสัชกรรมชุมชนรูปแบบใหม่จำนวน 10 บริการรวมทั้งเหตุผลที่สนับสนุนหรือไม่ให้การสนับสนุนด้วยต่อการให้บริการนั้นๆในร้านยา การศึกษาในวัตถุประสงค์ที่ 2 เป็นการวิจัยเชิงปริมาณแบบภาคตัดขวาง เพื่อประเมินปัจจัยต่างๆที่มีผลต่อความตั้งใจของเภสัชกรชุมชนในการให้บริการเภสัชกรรมชุมชนรูปแบบใหม่ 2 บริการที่คัดเลือกจากผลการวิจัยในวัตถุประสงค์ที่ 1 ซึ่งผลการวิจัยพบว่า ปัจจัยที่มีผลผู้มารับบริการที่ร้านยามีความรู้เกี่ยวกับบริการเสริมในร้านยาน้อยที่สุดในขณะที่แพทย์เป็นผู้ที่รู้จักบริการเสริมในร้านยามากที่สุด การศึกษาองค์ประกอบหลักของความคิดเห็นจากคนทั้งสามกลุ่มพบว่า การเข้าถึงการให้บริการ การรับรู้ถึงประโยชน์และอุปสรรค ความพร้อมของระบบ คุณภาพของการให้บริการ ความพร้อมของร้านยาและขอบเขตหน้าที่ความรับผิดชอบของผู้ให้บริการ เป็นปัจจัยที่มีผลต่อการสนับสนุนหรือไม่ให้การสนับสนุนการให้บริการเสริมในร้านยา โดยการบริหารจัดการด้านยา เป็นงานบริการที่ได้รับการ สนับสนุนจากผู้เกี่ยวข้องทั้งสามกลุ่ม การรับคืนยาที่ไม่ใช้แล้ว บริการช่วยเลิกบุหรี่ บริการส่งเสริมสุขภาพ และการให้บริการควบคุมน้ำหนัก ได้รับการสนับสนุนเป็นอย่างมากให้มีการให้บริการในร้านยา การคัดกรองโรคได้รับการสนับสนุนจากเภสัช ในขณะที่ผู้มารับบริการที่ร้านยาและแพทย์ไม่สนับสนุน สำหรับผลการศึกษาในวัตถุประสงค์ที่ 2 พบว่าเภสัชกรส่วนใหญ่มีความตั้งใจในการให้บริการการบริหารจัดการด้านยา และการคัดกรองโรคในร้านยา ภายในหนึ่งปี (24.10% และ 27.60% ตามลำดับ) ปัจจัยที่มีผลต่อความตั้งใจในการให้บริการเสริม ภายใต้กรอบแนวคิดการวิจัยที่ได้จากทฤษฎีการแพร่กระจายนวัตกรรม พบว่า ลักษณะความสอดคล้องกันของบริการเสริมภายใต้กรอบวิชาชีพเภสัชกรรม (OR=2.995, 95% CI=1.034-8.671) มีผลต่อความตั้งใจของเภสัชกรในการให้บริการการบริหารจัดการด้านยา และ ความซับซ้อนในการให้บริการ (OR=0.328, 95% CI=0.111-0.968) มีผลต่อความตั้งใจของเภสัชกรในการให้บริการการคัดกรองโรค อย่างมีนัยสำคัญ ผลการวิจัยสามารถสรุปได้ว่า การให้บริการการบริหารจัดการด้านยาและบริการคัดกรองโรคเป็นงานบริการที่ควรให้การสนับสนุนในโครงการนำร่องเป็นอันดับแรก การส่งเสริมด้านความพร้อมของร้านยาทั้งในด้านเทคโนโลยีและระบบการจัดการข้อมูลเป็นสิ่งที่สำคัญอย่างมาก ลักษณะที่สำคัญของงานบริการเสริมในร้านยาคือลักษณะความสอดคล้องกันของบริการเสริมภายใต้กรอบวิชาชีพเภสัชกรรม และความซับซ้อนในการให้บริการ มีผลต่อความตั้งใจในการให้บริการการบริหารจัดการด้านยาและบริการคัดกรองโรคของเภสัชกรชุมชนอย่างมีนัยสำคัญตามลำดับ ผู้ที่มีส่วนเกี่ยวข้องในการร่างนโยบายควรนำข้อมูลที่ได้จากการศึกษาเพื่อไปพัฒนารูปแบบบริการเสริมในร้านยา รวมทั้งสร้างกลยุทธ์และนโยบายส่งเสริมให้เภสัชกรชุมชนมีความตั้งใจเพิ่มขึ้นในการให้บริการเสริมในร้านยา และเพื่อความยั่งยืนของวิชาชีพเภสัชกรชุมชน

ภาควิชา เภสัชศาสตร์สังคมและบริหาร ลายมือชื่อนิสิต .....

สาขาวิชา เภสัชศาสตร์สังคมและบริหาร ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

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PAYUNGJIT KANGWOL: READINESS AND INTENTION TO PROVIDE EXTENDED COMMUNITY PHARMACY SERVICES. ADVISOR: ASST. PROF. PUREE ANANTACHOTI, Ph.D., 110 pp.

Nowadays, roles of the community pharmacists have been changed from drug dispensing by expanding to focus more on patients-oriented service. The new extended services were implemented in several developed countries. This study aimed to investigate physicians', consumers' and community pharmacists' attitude toward the proposed extended community pharmacy services and to evaluate factors influencing community pharmacists' intention to deliver these new extended community pharmacy services. For the first phase study, a qualitative approach involving an in-depth interview was conducted in three informant groups; consumers, physicians and community pharmacists in Bangkok metropolitan area. The interviews investigated informants' knowledge about and opinions toward ten extended pharmacy services provided in community pharmacy. For the second phase study, a cross-sectional study using self-administered mail survey was conducted in Bangkok area. Community pharmacists; owners or managers, were requested to complete questionnaire. Factors affecting intention to provide two priorities extended services derived for first phase study, medicine management program ad disease screening, were evaluated. Results from the first phase study revealed that consumers were less acquainted with extended patient-oriented services while physicians were the most knowledgeable group. Six main themes were identified; access to service, perceived benefits and barriers, system readiness, service quality assurance, pharmacy readiness and scope of professional responsibility. Medicines management was 100% agreed by all informants that it should be provided in community pharmacy. Return of unwanted medicine, smoking cessation, promotion of healthy lifestyle and weight management were also highly agreed to be provided in community pharmacy. Disease screening was agreed by pharmacists and consumers, but some physicians disagreed. Results from the second phase study revealed that most community pharmacists intention to provide disease screening (27.60%) and medication management program (24.10%) within one year. As for factor which significantly affected on community pharmacists' intention to provide these services based on diffusion of innovation theory, only compatibility with pharmacy profession framework had statistically significant effect on intention to provide medication management program (OR=2.995, 95% CI=1.034-8.671). Complexity had statistically significant effect on intention to provide disease screening (OR=0.328, 95% CI=0.111-0.968). In conclusion, medicine management program and disease screening should be provided in Thai community pharmacy as priority. However, capacity building to prepare system readiness was identified a crucial success factor. Compatibility with pharmacy profession framework was the most important characteristic of medication management program while complexity was the most important characteristic of disease screening. NHSO and policy maker should develop business model and strategy based on findings from these study results for sustainable community pharmacy profession.

Department:	Social and Administrative Pharmacy	Student's Signature	----------
Field of Study:	Social and Administrative Pharmacy	Advisor's Signature	----------
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CHAPTER I
INTRODUCTION

The community pharmacy is considered a key player in healthcare system. As they are located in the community, they usually become the first health care resort for many people. Community pharmacy is considered convenient because they are easy to visit, and can be accessed without prior appointment. In most countries, the core service of community pharmacists is drug dispensing. In many developing countries, pharmacists not only dispense, but also diagnose, prescribe and dispense medicines for common illnesses (1).

Comparing with several other developed countries, the role of the community pharmacists has been changed by expanding to focus more on patients-oriented service than drug dispensing. The extended roles are more involved in primary care and public health, health promotion, and disease prevention. Many literatures demonstrated the effectiveness of various pharmaceutical care services provided by community pharmacists such as chronic disease management, screening and disease prevention (2, 3). For this reason, the extended services delivered by community pharmacist are available in national health insurance system in several countries such as United States of America, United Kingdom, Canada and Australia. The other extended services widely provided in those countries include disease screening, smoking cessation, weight management program, opioid substitution program, return of unwanted medicines, needle and syringe program. In some countries, advanced level of services such as medication management review[1] (Australia, UK), medical injection and immunization (Canada), and lab test interpretation (USA) requires pharmacists to acquire specific competency assessment certificate before they can provide such services (4-7).

The International Pharmaceutical Federation (FIP) stated that the future roles of community pharmacist are the expert in pharmaceutical care, pharmacotherapy, health

[1] Medication management review is called differently as medicine use review or prescription intervention.

promotion, and the professional communicator to patients, other health care providers, and decision makers (8). The World Health Organization (WHO) also supported scope of pharmacists' work towards increasing pharmacists' involvement in health care system (9).

In Thailand, the community pharmacy is functioned outside the health insurance scope. Normally, patients seek care under health insurance programs from hospitals, and usually get their prescriptions filled from the pharmacy department within the hospital. If the eligibility access to care under the national health insurance program, their medical services including diagnosis, lab and medicines are covered free of charge without any cost sharing. Those who seek medical services through community pharmacy have to pay out of their own pockets. Since the inception of national health insurance program in 2001, people have more access to care. Most government out-patient services are very crowded. This is because the service and the medicine are free of charge, together with more elderly patients with chronic diseases (10, 11).

With the increasing prevalence of the elderly with chronic diseases, the National Health Security Office (NHSO) recognized the need to acquire additional healthcare partner. In 2001, NHSO created a pilot project aimed to partnering the accredited community pharmacies[2] as a contracting unit for primary care (CUP). The aim of the project was to let community pharmacy provide professional pharmacy services to its eligibilities. The first project began in 2001 at Mahasarakham University pharmacy (12). The extended services included refill of prescription, pharmaceutical care in chronic disease patients and common disease management. Next project was launched in 2004 at Sombun pharmacy in Nakhon Ratchasima province to refill of prescription and manage drug inventory for the contracting community caring clinic (13). In 2005, the pilot project was set up at an accredited community pharmacy in Samutprakarn province to provide refill of prescription for diabetes mellitus, hypertension and dyslipidemia patients (14). In 2008, the NHSO further expanded the pilot project to three selected provinces consist of Nakhonratchasima, Khonkaen and Mahasarakham (15). There were 12 community pharmacies attended this pilot project since 2008 until

[2] The pharmacy council was authorized to accredited community pharmacy. Many pharmacies are not convinced for the additional benefits of being an accredited pharmacy. Only 6% of pharmacies in Thailand were accredited.

now. The provided services covered refill of prescription, common illness management, disease screening and referral, lifestyle modification, and health education.

The NHSO not only conducted pilot project in the province, but also conducted project in Bangkok. During 2008-2009, there were 15 accredited community pharmacies attended the pilot project. These community pharmacies provided extended services which composed of medication therapy management (MTM) and home pharmaceutical care for chronic disease patients. Reimbursement for providing the service from NHSO was $25 per visit. Most frequently found drug related problems (DRPs) were drug utilization problem (90%), life style problems (47%), clinical symptom (30%), ADRs problems (22%), and non-compliance (30%) (16). The results from providing MTM service to diabetes patients three times in six month period showed that 18.2% and 26% of the patient had adhere or partially adhere to their medical regimen. Almost half of the patients (48.6%) had improved average systolic and diastolic blood pressure. The economic outcome showed that MTM service provided by community pharmacists save $45.27/person/month by decreasing unnecessary drugs and preventing ADRs which might occur (17).

The pilot project was continuously expanded among accredited community pharmacies in Bangkok since 2013. The services included disease screening for diabetes, hypertension and metabolic syndrome, and health education program. A year later, project was aimed to reach all accredited community pharmacies, however, only 368 accredited community pharmacies (36.6%) participated in this pilot project (18).

In order to successfully expand the project, NHSO and The Pharmacy Council should have information regarding perception of key stakeholders; the medical doctors, the consumers and the community pharmacists on extended services provided in community pharmacy. The situation analysis results would help prepare community pharmacies' readiness to become formal provider under NHSO. Factors related to community pharmacist's decision to provide the extended service should also be studied.

Research Objective

1. To investigate physicians', consumers' and community pharmacists' attitude toward the proposed extended community pharmacy services.
2. To evaluate factors influencing community pharmacists' intention to deliver these new extended community pharmacy services.

Expected Benefit

1. The outcome from this study will help identifying extended services that should be adopted by community pharmacist.
2. Finding from this study will help formulating strategies which would bridge the gap and build capacity of community pharmacist in increasing intention level and for successful implementation.

CHAPTER II
LITERATURE REVIEW

1. Community pharmacy in Thailand
2. Community pharmacy in developed countries
3. Related literature and studies
4. Theoretical Framework
5. Conceptual framework

The community pharmacy is healthcare facility which located whether in rural area, urban area or business area. People always visit the community pharmacy when they need advice for common illness and other health related problems. A community pharmacy is one of major drug distribution channels in Thai drug system. Around 26 % from overall domestic drug consumption in 2010 were distributed through community pharmacy channel, less than hospital channel (62.52%) but more than ambulatory setting (6.50%) (19). Nowadays, all Thai citizens have been provided the universal health coverage according to national health insurance policies through 3 schemes consist of the Civil Servant Medical Benefit Scheme (CSMBS) for civil servants and families, Social Security Scheme (SSS) for private employees and the Universal Coverage scheme (UC) for all the rest Thai citizens who do not cover by any schemes. In Thailand, the Universal Coverage scheme (UC) is the largest national health program which has been implemented since 2001 and provided full coverage for around 73.7% of Thai population as of 2014 estimates (20).

However, with the current economic situation and living lifestyle today which people give more concentrate on their work than to take care of their health together with a sedentary lifestyle living contributed to various health problems. Particularly in urban and business area where people spent time to work most of the day and have no time to see physicians at hospital, people is more likely to purchase medicines from community pharmacy for self medication. Correspond to the household expense for drug purchasing from community pharmacy still increase continuously from 13.9% in

2001 to 35.4% in 2011 whereas the most dispensed drugs are antipyretic, analgesic, skin treatment drug and nasal decongestant (21). It reflects that people are more likely to purchase drugs from community pharmacy than visit other healthcare facilities when they are unable to see a physician at hospital as needed for common illness.

Moreover, self-medication also include the continued use of prescribed drug for chronic disease or recurring symptom and use of medicine for treatment of family members who are elderly people or children. Self-medication may consequence in the potential risks particularly the ordinary user who has no specific knowledge either in their symptom and treatment or drug selection (22). Moreover, patients with non-infectious chronic disease, particularly for diabetes and hypertension which are the greatest number of chronic diseases problems also caused a burden in disease management and impact national health budget (10). The provision of seamless care through multidisciplinary team working is needed to ensure continuity of care and optimal health outcomes for chronic disease patients. Health services provided through community pharmacy channel are helpful to achieve this goal particularly in medication management aspect.

1. Community pharmacy in Thailand

The community pharmacies operation in Thailand are regulated and controlled by Drug Act B.E.2510 which including any business operations concerning with production, importation and sales either modern medicines or traditional medicines in Thailand. The law has been amended in several times particularly section for pharmacy establishment and operation in proper to the current situation. Together with the latest Ministerial Regulation, Ministry of Public Health related to license to sell modern medicines has been announced and become effective since 26 June 2014 so, the community pharmacies in Thailand are now classified into 5 categories according to the present pharmacy operational license as follows.

1. License to sell modern medicines
2. License as a wholesaler of modern medicines
3. License to sell modern medicines in sealed package which are not classified as dangerous or specially-controlled drugs
4. License to sell modern medicines in sealed package for veterinary use

5. License to sell traditional medicines

As required by regulation, a person who needs to establish pharmacy must be granted for the pharmacy operational license from authority. The Bureau of Drug Control under Food and Drug Administration is the licensing authority for pharmacy establishment in Bangkok metropolis and territories whereas the Provincial Public Health Offices is the licensing authority in another province of Thailand. However, the pharmacy owners are not required to be a registered pharmacist. Especially for pharmacy operation with license to sell modern medicines and license as a wholesaler of modern medicines that the owner must be responsible to organize the registered pharmacist practitioners or superintendent pharmacist to control over pharmacy operation in business hour (23).

As of 2014, there are 21,318 community pharmacies all over the country by 5,721 (26.84%) are located in Bangkok capital city, 15,359 pharmacies (72.05 %) are holding license in categories 1&2 related to sales of modern medicines and a registered pharmacist is required by law for pharmacy operation. The number of community pharmacies in category 1&2 is raising continuously while number in the other categories which don't need registered pharmacist practitioner for providing service are remain the same and tend to decreasing gradually (24).

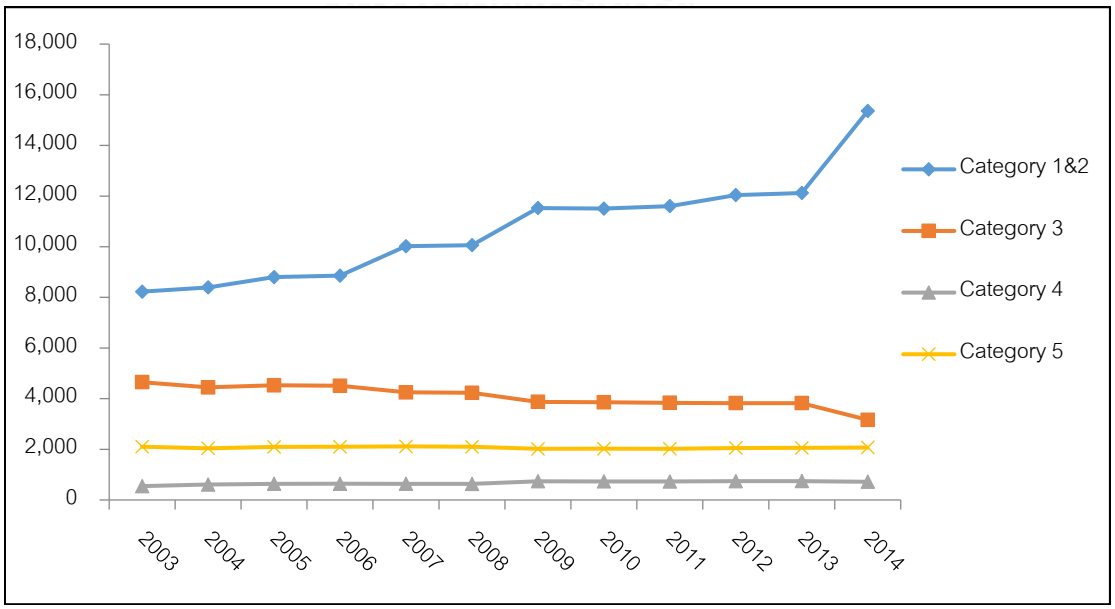

Figure 1 Number of community pharmacies in Thailand by categories

Business structure of the community pharmacy in Thailand referring to business owners are classified as 3 types consist of independent pharmacy, franchise pharmacy and chain-store pharmacy. The largest and original business owner type is independent pharmacy while proportion of chain-store pharmacy is only around 7 % market share with low growth rate at 3%. Considering from value of drug consumption through chain-store pharmacy is only 22.67% from overall value of drug distribution through community pharmacy channel. Growth rate of chain store pharmacy in Thailand is expected to remain low even after Asian Economic Communication (AEC) integration in 2015. The main reason is from insufficiency of community pharmacists for providing service during business hour according to the new updated requirement in 2014. One study indicated that only 19% of chain store pharmacies and 66% of independent pharmacies that have registered pharmacist for working full time while the rest has arranged registered pharmacists to deliver service only in their permitted operating time (25).

In 2003, Thai FDA in collaboration with the Pharmacy Council has developed the quality standard for community pharmacy development and accreditation program called "Standard of Pharmacy". The Standard of Pharmacy consisted of 5 part of quality standards compose of Pharmacy premise, Quality management, Pharmacy service, Ethics and Community participation. The purpose of the pharmacy accreditation program is to ensure that people will receive the highest quality of drug supply and health services delivered by the accredited pharmacies (26). Moreover, the community pharmacy that passed the pharmacy accreditation by the Pharmacy Council could be qualified as the pharmacy sub-contractor under Universal Coverage scheme (UC), the national health insurance which is responsible by NHSO. However, the pharmacy accreditation program is quite less successful indicated by number of the accredited pharmacy that is just around 6% from all community pharmacies in categories 1&2 as well as lower growth rate since the program has been started.

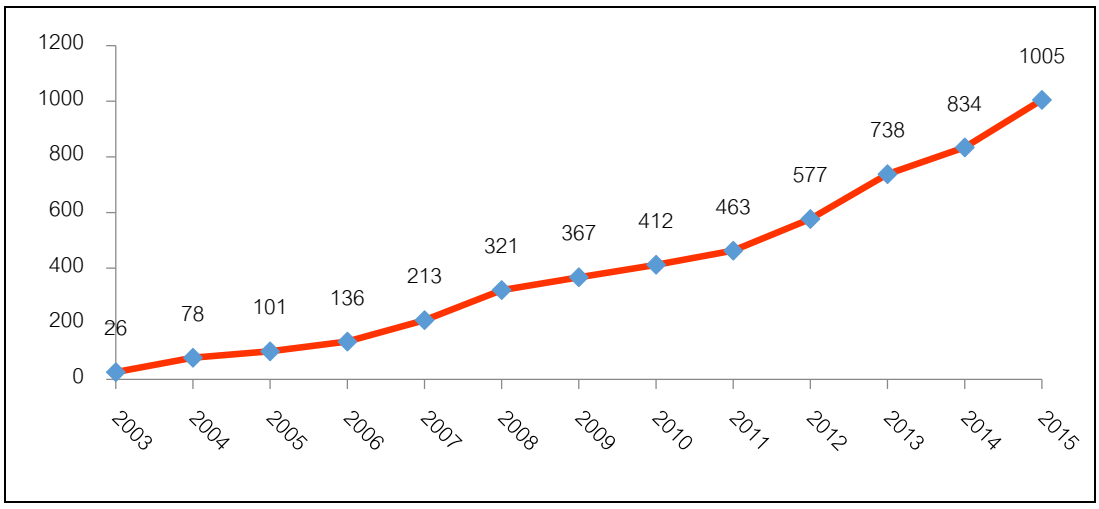

Figure 2 Number of the accredited community pharmacy in Thailand

At present, there are 1,005 accredited pharmacies across Thailand which around 360 (36%) are located in Bangkok (27). Literatures demonstrated that around 50% of the community pharmacies are on development in order to pass the accreditation process and 30% are taking into consideration. Lack of registered pharmacist to provide service during business hour is the main barrier to comply with accreditation criteria. The other factors which influence pharmacy owner's intention to attend the accreditation program such as the extra cost for pharmacy renovation and employ full time pharmacist, benefit package for being accreditation pharmacy, lack of support from government agency and sustainable of accreditation program (25, 28). Even most of community pharmacies are willing to participate in the pharmacy accreditation program but they still need time for improvement. The pharmacy accreditation is a voluntary program which may lead to less successful. In order to enforce all community pharmacies to achieve the quality standard of pharmacy services and preparing for integration as part of national health insurance system, so the new ministerial regulation regarding pharmacy establishment has been announced and effective in 2014. The new regulation has included the Good Pharmacy Practice standard (GPP) referring to Joint FIP/WHO guidelines with the standard of pharmacy from accreditation program as the new criteria for pharmacy operational license approval. Anyway, lack of full time pharmacist is also a serious concern for the existing community pharmacies especially in category 1&2 which established before the new regulation is effective. This requirement has been consolidated on license renewal criteria which the existing

community pharmacies need to be improved as this requirement within timeline for continuing pharmacy operation.

As for the community pharmacist in Thailand, according to Drug Act B.E.2510 and the Pharmacy Profession Act B.E.2537 stated that pharmacist practitioner must be registered with the Pharmacy Council for the pharmacy profession license. At present, almost 35,000 pharmacists have been registered with the Pharmacy Council and working in vary pharmacy practice fields including hospital, industry, research and academia, regulatory and community pharmacy (29). Especially pharmacists who will work in community pharmacy must pass the training course from Pharmacy Council as new regulation requirement. Pharmacist graduation is now extended to 6 years and the pharmacist license must be renewed every 5 years (30).

Roles of community pharmacist in Thailand

The community pharmacist roles in Thailand are quite different from developed countries such as Australia, Canada and the United Kingdom (UK) where diagnosis and prescribing role of physician and dispensing role of pharmacist are clearly separated. In a developing country like Thailand, most people frequently get difficulties in accessing to healthcare services. Key Barriers to accessing healthcare services such as poor transportation particularly in rural area resulting in longer traveling time and high traveling expense, low socioeconomic status, shortage of physician and other healthcare providers. Even in urban and business area, people also have difficulties to access healthcare services during office hours due to absence work resulting in loses income and these factors lead to self-medication behavior in Thai people. Most people prefer to receive healthcare services from community pharmacy due to easy access location without additional traveling cost, convenient access after office hours, fast service offer and satisfied with health service and outcome from community pharmacy services (31, 32). Therefore, roles of the community pharmacists in Thailand are not only drugs dispensing but need to play the important role for diagnose, prescribing and dispensing medication for minor ailments including provide counseling service for medicines use and other health related problems activities (33).

Since the Universal Coverage Scheme (UC) has been implemented in 2001, Food and Drug Administration by the Office of Advancement Pharmacy Project has highly attempted to propose the practical models for integrating community pharmacies

with UC scheme. The accredited pharmacy is the most appropriated healthcare facilities that should be responsible for pharmacy service cause by quality of pharmacy management for products and services are accredited and acceptable. Finally, NHSO in associated with the Office of Advancement Pharmacy Project initiated the pilot projects with the aim to study and develop a business-practice model for pharmacy services in the accredited pharmacy sub-contractors. The developed business-practice model will be used as practice guideline once the accredited community pharmacies are integrated with the Primary Care Unit (PCU) as sub-contractors in the near future.

1. Refill prescription, drug counseling and common disease management

The first pilot project began in 2001 at Mahasarakham university pharmacy as a pharmacy sub-contractor of Mahasarakham provincial hospital (main contractor with NHSO) in order to provide prescription refill service for Diabetes patients, monitoring and drug counseling for Hypertension and Tuberculosis patients as well as common disease management. All services were provided by the accredited pharmacy under service agreement according to primary care services guideline for community pharmacy concerning roles and scope of services. However, remuneration system was not well addressed so the pharmacy sub-contractor received only 30 Baht co-payment per visit except for low-income and elderly person. As a result of services provided by pharmacy sub-contractor, 68.9% patients recovered from common illnesses and 28.1% partially improvement. High patients satisfaction were reported in many aspects including convenient accessibility, short waiting time, good counseling service, quality of drugs and health outcomes. Factors affecting patient's choice of community pharmacy service were convenience (89.6%), common illnesses (67.4%), short waiting time for service (65.9%), fast service (53.3%) and good advice (51.9%). Furthermore, cost of services operation by community pharmacy were lower than hospital services as just 22.31 Bath per capita (34).

2. Dispensing a prescription and inventory management

In 2004, a pilot project at Nakhon Ratchasima province was launched to connect the accredited community pharmacy with the contracting community caring clinic according to public-private mix policy. This is to reduce investment from government section by include private section such as the accredited pharmacy in provincial health insurance system. The accredited pharmacy was required for dispensing a prescription

from contracting community caring clinic and responsible for drug inventory management. The study demonstrated that cost of dispensing service from the accredited pharmacy subcontractor (23.80 Bath per prescription) was cost effective than hiring experienced pharmacist to provide service at clinic (26.78 Bath per prescription). As for satisfaction survey, 75.3% patients reported high satisfaction due to saving time for service and satisfied with counseling service. Moreover, the accredited pharmacy services can reduce workload from drug dispensing at caring clinic then physicians can spend more time with their patients' treatment. All other stakeholders including provincial policy maker also reported high satisfaction with outcomes from this project in lowering budget for investment in provincial health insurance system (13).

3. Refill prescription for controlled chronic disease patients

A year later in 2005, Samutprakarn province developed the model for linking the accredited pharmacy with primary care unit under UC scheme. Services agreement and practice guideline for chronic disease management consist of diabetes mellitus, hypertension and dyslipidemia were developed according to national standard treatment guidelines in Thailand. The accredited pharmacy received 30 Bath per visit from patients and the hospital will supply drugs for the community pharmacy as agreed list. The research comparing clinical outcomes between patients refilled prescription at the accredited pharmacy and hospital pharmacy. The result showed no statistically difference of clinical outcomes measurement (fasting blood sugar level, systolic and diastolic pressure) between groups. Patients in treatment group who refilled prescription at the accredited pharmacy reported high satisfaction for overall services as 63.5% particularly for convenience and fast services delivered by the accredited pharmacies. All patients preferred to continue in this program cause by convenience (54.2%), location (45.8%), saving time (33.3%) and good service (4.2%) (14).

4. Disease screening and referral, lifestyle modification and health education

As a successful from pilot projects in connecting the accredited pharmacy with primary care unit, NHSO in collaboration with the Office of Advancement Pharmacy Project were moving forwards with the aim to improve and develop practical business model for the extended roles of the accredited pharmacy in healthcare system. The selected 3 provinces consisted of Nakhon Ratchasima, Khon

Kaen and Mahasarakham whereas 12 accredited pharmacies collaborated with 8 community medical units to provide pharmacy services containing disease screening and referral, lifestyle modification, refill prescription, common illness management and health education. The study results demonstrated that the community pharmacist were able to screen people at high risk for diabetes and hypertension (35.9%) and 124 from 156 people in this group (79.5%) who were referred to confirm testing at community medical unit were newly diagnosed with diabetes and hypertension. The result from lifestyle modification service in reducing blood sugar level to normal level for Pre-DM groups achieved NHSO targets at 60% (result = 75% achieved). Regarding health education, the community pharmacists will provide recommendation for healthy eating and exercise every time when patients were back to pharmacy for refill prescription due to non-compliance still occurred among these controlled patients (15).

5. Medication therapy management (MTM) and home medicine review

The community pharmacy association (Thailand) by supporting from the NHSO area 13 Bangkok set up the special program during 2008-2009 in order to develop business model of pharmaceutical care in community level and home pharmaceutical care for individual patient in Bangkok area. A number of 15 community pharmacies were participated in program. Target population is patients with chronic diseases, non-compliance, use of 3 or more medications, use of more than 2 high alert drugs which taking risk of ADEs and patients who need to be closely follow up as required by physician. The community pharmacists have been trained regarding disease knowledge, medication, home pharmaceutical care procedure and practiced prior to work in community. Total 2000 home visits of 700 patients from 52 communities were included to this project Preliminary data from 2000 home visits by community pharmacists showed that Drug Related Problems (DRPs) can be found in 417 patients from 35 communities since the first visit. These problems can be categorized as problems related to drug utilization 375, representing 90%, life style problems 47%, clinical symptom 30%, ADRs problems 22% and non-compliance 33% (16).

6. Health promotion program

The accredited community pharmacy contractors with the community pharmacy association (Thailand) were eligible to provide health promotion service which can be remunerated service fee from the association that supported by NHSO. This project was

started in 1 December 2013 and ended in 30 September 2014 by aimed to pilot in 100 accredited pharmacies in Bangkok. Details of services are as follows.

6.1 Screening for diabetes, hypertension and obesity

6.2 Health education for metabolic syndrome patients

6.3 Health education related to health promotion and disease prevention activities;

- Vaccination (EPI program)
- Respiratory tract diseases/asthma
- Disease prevention in pregnant women

6.4 Education related to family planning

- Oral contraceptive administration
- Emergency contraceptive pills
- Condom use

6.5 Education related to sexual health behavior

- Sexually Transmitted Infections
- Pap smear
- Unintended pregnancy

However, the project had low participant rate from the accredited community pharmacies by only 81 accredited pharmacies from estimated 250 accredited pharmacies across Bangkok attended the program (18).

2. Community pharmacy in developed countries

In this study, researcher selected the literature for reviewing background of community pharmacy in 3 developed countries including Australia, Canada and the United Kingdom (UK). The national health insurance system in these 3 countries is the Universal Coverage (UC) scheme in which all citizens have the right to access the essential healthcare services that are mostly free at point of service delivery. The community pharmacies in these 3 countries are formalized as part of healthcare system for providing pharmacy services under national healthcare schemes. The community pharmacy will be eligible to provide services under national healthcare system once they are registered as a pharmacy contractor with the government agency who responsible for national health program administration. The community pharmacy

contractor must provide services in accordance with service agreement under pharmaceutical benefit scheme and the remuneration system are clearly defined also. As for the Universal Coverage program in Australia which is administered by Medicare, not only the licensed pharmacy premise that needs to be registered with Medicare as contractor but the licensed pharmacist is required to apply for the approval from Medicare in order to provide pharmaceutical benefit and agreed services also. Medicare will evaluate the qualification both of licensed pharmacist and particular for pharmacy premises which must by complied with the Pharmacy Location Rules. This is to control the number of community pharmacy providers that will be sufficient and evenly distributed in all communities across country. As well as the National Health Serviced (NHS) in UK and Medicare in Canada, these government agencies are responsible for organization of national health insurance program and policy development. Meanwhile, their branch offices across country will be responsible for processing payment and claim from their service contractors including the community pharmacy providers.

The pharmacy establishment in these 3 countries must be approved by licensing authority which is the Pharmacy Approval Authority in Australia, the General Pharmaceutical Council in UK and the Pharmacy Regulatory Authority by each state and territories in Canada. These licensing authorities are responsible for pharmacy operational license approval as well as annual license renewal. Regarding pharmacy ownership and establishment in Australia and Canada, only licensed pharmacist or partnership of license pharmacists that are entitled to own a pharmacy. In contrast with UK, anyone can own the pharmacy but however, the pharmacy owner must have the licensed pharmacist to control legal operation and practice at all time of pharmacy opening hour. Pharmacists who need to practice in Australia and UK must pass examination and competency assessment by authority in order to register for pharmacist license and need to be renewal annually. The pharmacist licensing authorities in Australia is the Pharmacy Board of Australia while this authority in UK is the General Pharmaceutical Council (GPhC). In contrast, pharmacist license registration in Canada is regulated by Pharmacy Regulatory Authority (PRA) in each state and territories depending on pharmacist working area while in Australia and UK, pharmacist license registration will be controlled by central organization as national level.

Table 1 Overview of national healthcare system and community pharmacy in Australia, Canada and the United Kingdom (UK)

	Australia	**Canada**	**UK**
National Health Insurance Program	Medicare (Universal Coverage)	Medicare (Universal coverage)	Universal coverage
Health System Administrator	Medicare	Medicare	National Health Service (NHS)
Outpatients pharmacy service provider	Medicare's pharmacy contractor	Community Pharmacy contractor	NHS's pharmacy contractor
Pharmacy licensing authority	Pharmacy Approval Authority	The General Pharmaceutical Council	Pharmacy Regulatory Authority
Pharmacist licensing authority	The Pharmacy Board of Australia	Pharmacy Regulatory Authority (PRA)	The General Pharmaceutical Council (GPhC)
Pharmacy owner	Registered pharmacist / Pharmacist Partnership	Non-pharmacist	Registered pharmacist / Pharmacist Partnership
Pharmacy contractor service agreement	Community Pharmacy Agreement (5 years agreement)	The Canadian Pharmacy Services Framework (CPSF)	The Community Pharmacy Contractual Framework (CPCF)

	Australia	Canada	UK
Pharmacy contractor Representative in negotiation with government	The Pharmacy Guild of Australia(PGA)	The Canadian Association of Chain Drug Stores (CACDS)	Pharmaceutical Services Negotiating Committee (PSNC)

Roles of community pharmacy in developed country

The community pharmacies and community pharmacists in developed countries have been officially integrated with national healthcare systems in which professional service agreements and remuneration systems are clearly specified. The community pharmacy as healthcare providers is able to reimburse service fee from directly government agency as stated in service agreement. The community pharmacy-based services in Australia, Canada and the United Kingdom (UK) can be generally categorized into core services and advance extended services.

1. Core service: Dispensing service / Product oriented

Major role of community pharmacy service in Australia, Canada and the United Kingdom (UK) is dispensing of prescriptions and other medical devices including provide drug information and counseling service. In these 3 countries, government will provide subsidized drugs and medical devices under National Formulary through community pharmacy provision in which patients will be accessible and affordable to essential drugs. In Australia, patient contribution will be required for prescription items at outpatient service depending on type of beneficiaries and level of patient contribution. As for pharmaceutical benefits program in UK and some state and territories of Canada, government will provide subsidized prescription drugs for elderly and low-income people without cost sharing.

2. Extended Service: Pharmaceutical care / Patient oriented

Nowadays, roles of the community pharmacists in developed countries have been transformed by focusing on patients-oriented service rather than drug dispensing. The new extended roles are more involved in primary care and public health at either individual or community levels such as health promotion, disease prevention and medication management. Especially for chronic disease patients, the community

pharmacists provide dispensing services as usual and also provide the additional patient-oriented service in medication management of current medication. This is to ensure that patients will be safe from medicine use and achieve optimal treatment outcome. Moreover, community pharmacists are able to provide drug information and recommendation including cost effectiveness of treatment to other healthcare practitioners particularly for physicians who prescribed medication as well. The patient-oriented services delivered by community pharmacist also advantage in reducing drug expenditure as well as irrational use of drugs.The extended roles of community pharmacy in Australia, Canada and UK, the pharmacy contractors can reimburse service fee directly from government due to government provide support as indicated in services agreement. This is to promote healthy development and improve quality of life for all people across country. The available extended roles in these 3 countries are summarized in Table 2.

Table 2 The extended patient-oriented services in Australia, UK and Canada

Service	Australia	Canada	UK
1. **Medication Management Program**			
1.1 Medication management	✓	L	✓
1.2 Diabetes medication management	✓	L	✓
1.3 Home medicine review	✓	L	✓
1.4 Residential medication management review	✓	L	✓
1.5 Interpreting and ordering laboratory tests	-	L	-
2. Public Health Services			
2.1 Disease prevention			
- Disease screening / Risk assessment	✓	-	L
- Immunization	-	L	L
- Support for self care	-	-	✓
2.2 Health promotion			
- Promotion of healthy lifestyles	P	-	✓
- Smoking cessation	✓	L	L
- Weight management	P	-	L
- Alcohol screening and brief intervention	P	-	L

Service	Australia	Canada	UK
2.3 Community service and outreach program			
- Needle & syringe exchange or sharp disposal service	✓	-	L
- Opioid substitution or Methadone managed care program	✓	L	-
- Return or disposal of unwanted medicine	✓	-	✓
- Appliance use review and customization	-	-	✓
- Signposting to other service	-	-	✓
Note; ✓ = National level with reimbursement L = Local level with reimbursement P = Pilot project			

Service description

1. Medication Management Program

Medication management program is the extended patient-oriented service delivered by community pharmacist that focuses on medicines use by patient, providing counseling on safety, risk and benefit including patient education, identifying problems from medication, monitoring for noncompliance, adverse effect together with medicine effectiveness in order to optimize patient outcomes.

1.1 Medication management is services for patient who received on multiple medications, patient who discharge from hospital and patient who receive new medication. Normally, medication management program consisted of activities as follows.

- Medication therapy review with patient on the use of all medicines and medication and identify problems that consumer may be experienced with their medicines.
- Arrange the personal prescription record for tracking progress for self-management and health concerns.
- Develop the medication action plan as agreed with patient and their physicians or other healthcare provides.
- Implementation plan and refer to the other concerned healthcare provider if needed.

- Filing the consultation documentation and follow up.

1.2 Diabetes medication management is the medication management program specific to patient with Diabetes.

1.3 Home medicine review is the medication management program that provided at patient's home

1.4. Residential medication management review is the medication management program provided at the government funded aged care facilities.

1.5 Interpreting and ordering laboratory test is part of medication management service that community pharmacist can order and interpret lab test for monitoring problem from medication used.

2. Public Health Services

Public health services are activities related to disease prevention, health promotion and outreach programs in order to prolong live among population in community, to support people in community on several needs, ensure medicine safety, minimize harm and increase access to people who need of services at their places.

2.1 Disease prevention

- **Disease screening / Risk assessment** for people at risk of diseases such as diabetes, respiratory disease, cardiovascular disease, kidney disease, mental health conditions and sexual transmittance disease.
- **Immunization** is the service that community pharmacist will inject vaccine for prevention purpose.
- **Support for self care** is the delivery of advice and support by community pharmacist to enable people to take care themselves and families for optimal benefit from self care management. This service will help to reduce irrational utilization of healthcare service and social care service.

2.2 Health promotion

- **Promotion of healthy lifestyles** is the service that aims to empower people to improve their health particularly patient with chronic disease condition, people who smoke, overweight or alcohol drinking.
- **Smoking cessation;** is the service to help people quit smoking according to quit plan.

- **Weight management** is the service that aims to improve diet and nutrition, promote healthy weight and to reduce obesity levels on people who have Body Mass Index over the limit.
- **Alcohol screening and brief intervention** is service that community pharmacist will screen and provide advice to people over 18 years of age, identify higher-risk and increasing-risk drink, provide brief interventions to motivate them to adjust their drinking patterns and provide referral to specialist services if necessary.

2.3 Community service and outreach program

The services intend to support people in community on several needs, ensure medicine safety, minimize harm and increase access to people who need of services at their places.

- **Needle & syringe exchange or sharp disposal service;** is service for people who injected drug in order to prevent HIV infection among drug users.
- **Opioid substitution or Methadone managed care program** is service for injected drug user in which the community pharmacy will dispense pharmacotherapy to patients in opioid dependency treatment.
- **Return or disposal of unwanted medicine** is service that people can return the unwanted medicines at community pharmacy for properly disposal and reduce pharmaceutical waste to environment.
- **Appliance use review and customization** is service for patient on specific appliance use review and customization by community pharmacist such as stoma appliance, a catheter appliance, a laryngectomy or tracheotomy appliance, an anal irrigation system, a vacuum pump or constrictor ring for erectile dysfunction, or a wound drainage pouch. The service can be delivered in pharmacy or patient's home in order to review, identify problems, increase knowledge, advise on safety storage, appropriate selection of specific appliance and properly disposal of unwanted appliance to minimize waste to environment.
- **Signposting to other services** is service in which community pharmacist provide the information to consumers who need additional support, advice

or treatment which cannot be provided within pharmacy. Consumers may need to refer to other health and social care providers or any support organizations that can help people, where the appropriate form of a referral may be required.

3. Related literature and studies

A total of 23 relevant studies were selected for review by these studies mainly focused on exploring perspective, perception and attitude of various stakeholders towards the extended services provided by community pharmacists. The remaining studies intended to understand public trust (35), to determine need of community pharmacy for service implementation and area for improvement when implementation (36), to identify factors influence community pharmacists' adoption the extended service (37) and to quantify factors for practice change in community pharmacy (38). Besides, the potential barriers and facilitating factors which affected on provision of the extended services in community pharmacy or which enhance utilization of the extended service by general public and other healthcare providers especially by physicians were also identified (39). The majority of studies assessed perspective of community pharmacists in which 6 studies assessed especially for community pharmacists perspective, 2 studies investigated perspective of both community pharmacist and general public and only one study assessed perception between community pharmacists and general practitioners. In addition, 3 studies investigated perspective among 3 stakeholders consist of community pharmacists, general public and general practitioners. The remaining 3 studies evaluated only general public perspective toward the extended roles of community pharmacists. Regarding methodology, 8 studies used qualitative study design in which 2 studies employed only focus group discussion, 3 studies used semi-structured interview and 2 studies used both methods of focus group discussion and semi-structured interview. The other 6 studies used quantitative study design employing standard survey or questionnaire which developed though finding from discussion group and literature review, particularly 3 studies also included key constructs from theoretical framework as guidance for questionnaire development (36, 38, 40). The remaining one study used systematic review methodology for collecting data from studies published in UK (41). These selected studies were conducted in the

developed countries consist of 4 studies in Australia, 4 studies in United Kingdom (UK), each 2 studies in Canada and United State (USA) and the remaining studies were carried out in New Zealand, Scotland and Netherlands. In these developed countries, the trend of community pharmacy-based services are shifting interest from product-oriented services as medicine supplier to patented-oriented services which are more contributing to optimize medication use and improve patient health outcomes.

With regards to the extended patient-oriented services provided by community pharmacists, as investigated from these related 23 studies can be summarized accordingly.

1. Medication management program

Medication management program is the extended patient-oriented service delivered in community pharmacy focuses on medicines use by patient, providing counseling on safety, risk and benefit including patient education, identifying problems from medication, monitoring for noncompliance, adverse effect together with medicine effectiveness in order to optimize patient outcomes. Moreover, community pharmacists will have to work in collaboration with physicians through a regular meeting which is required a well structured and documented process. This is to advise opinion to physician concerning cost effectiveness on treatment or recommend special advice to particular patient. In total 6 from 23 studies tended to investigate on medication management service (37, 40, 42-45), in which 3 studies highlighted on medication management in chronic disease patients such as diabetes and hypertension. One study in Scotland focused on medication management services particularly for Heart Failure (HF) patients in order to improve self care and medication adherence. However, in United Kingdom and Scotland, HF community pharmacy based service was formalized in contractual agreement between community pharmacy contractors and the National Health Service (NHS) (44). A study in Australia assessed chronic patients' perspective towards the extended service such as dose administration aid and Home Medicine Use review provided by the accredited community pharmacists (45). In addition, one another study sought for potential of community pharmacist to assist patients with chronic disease by providing information of any support services, managing patient medication and providing health advocacy (43).

The finding from these studies stated that both general public and physicians were lack of awareness on availability of medication management services in community pharmacies while community pharmacists perceived that is their legitimacy to provide these extended services (37, 43, 45). However, general public and patients also reported need of the extended services offered by community pharmacies (42, 43). Physicians accepted in the technical roles of community pharmacist which related to dispensing services such as checking dosage and drug interaction, counseling on medicine use, monitoring adverse drug reaction and noncompliance and need a community pharmacist to reinforce medication information when they had limited time. In contrast, physicians are less likely to support community pharmacists to provide the extended clinical roles in monitoring effectiveness of medicines by following up patient progress and providing clinical advice to physicians (42). The community pharmacists reported high confidence for their competency to provide the extended services and perceived barriers in providing service as lack of time and workload, lack of remuneration and policy support including less communication and feedback from physicians. Some community pharmacist needed more training due to complex knowledge requirement in providing new extended service. Moreover, the community pharmacists also needed collaboration and support from physician in providing service as multidisciplinary team (37, 40, 43, 44). Anyway, the community pharmacists also perceived lack of readiness to change from their current practice for increasing more clinical roles (42).

2. Public health services

In this review, 5 studies investigated on the extended services in community pharmacies related to public health activities. In UK, the public health activities consisted of health promotion programs such as advise on healthy living and self care, smoking cessation, promotion of flu vaccination, advice on increasing physical activities, sexual health service including Chlamydia screening and emergency hormonal screening. Promotion of healthy lifestyle was stated in NHS pharmacy contract as essential service which all pharmacy contractors must be participated. In Alabama USA, Health Watch program was implemented in community pharmacy across the state in order to provide biometric screening contained consists of blood pressure, blood glucose, serum cholesterol, and BMI screening (46). A cross-sectional

mail survey study to explore perceptions of community pharmacists in Quebec, Canada found that perception of their involvement in providing health promotion and prevention services are highly significant, particularly in smoking cessation (84.3%), screening for hypertension (81.8%), diabetes (76.0%), dyslipidemia (56.9%), and counseling on sexual health especially for emergency oral contraceptive use (89.1%). Conversely, only a few number of community pharmacist reported their actual practices in providing these services as very high involvement. The general public, community pharmacists and physicians showed similar views that community pharmacy could be a potential source of some public health services but these were still less supportive. Although community pharmacist were confidence in their competency and willing to provide public health but these were not aware by general public and other healthcare professional. The general public lack of understanding for the changing roles of community pharmacist and still perceived community pharmacy as medicine supplier. As well as physicians, even they were aware of benefits from public health services available at community pharmacy but still less confidence in competency of community pharmacists in providing such service particularly for chronic disease patients. The community pharmacist viewed public health services as important as part of their role but less than medication related roles and their confidence in providing public health services was low in average. The barriers to providing of these services were reported as lack of time, lack of collaboration from other health care professionals, inadequate staff and resources, financial compensation and lack of clinical tools, lack of demand and expectation from customers and need for additional training to provide public health service. The general public reported confident in well trained pharmacists that will be able to provide public health services more proactively and has high satisfaction in public health services provided in community pharmacy.

The community service support and outreach programs delivered by community pharmacy are kind of the extended services which intend to support people in community on several needs, ensure medicine safety, minimize harm and increase access to people who need of services at their places. However, only a few studies explored on stakeholders' perception and perspectives on these evidence-based extended community pharmacy services. The selected studies which related to these

kinds of services consist of; disposal of unwanted medicine, needle and syringe exchange service, opioid substitution service.

A survey study accessed user and non-user perceptions on a community pharmacy-based medication take back program in USA performed that all user perceived benefit of this program in order to help them to properly dispose the expired or unwanted medicine which were kept at their home and these service can prevent harm to environment from pharmaceutical wastes. Most consumer prefer the community pharmacy which deliver this service rather than those doesn't deliver and willing to pay for take back service at community pharmacies. In overall, consumers has positive views and support for take back service in community pharmacy (47). Generally, consumers always destroy their unwanted medicines by throwing in garbage, sink and toilets which these methods have negative impact to community environment. Pharmacists will be the most appropriated healthcare professional who have potential to take responsible for management the disposal of unused or expired medicines including the packaging waste. The responsibilities are not only taken care of the proper disposal but also educate consumers and other healthcare professionals for appropriate use of medicines and properly methods for disposal of unwanted medicines (48). In Australia and UK, the return of unwanted medicines services in community pharmacy has been funded by government so consumers have no need to pay for service fee. However, The community pharmacists in some countries such as New Zealand reported lack of knowledge of proper disposal methods and needed government support for providing this service (49).

The extended community pharmacy services for people who injected drug were also reported. The feasibility studies conducted in USA, Russia, Vietnam, China, Canada and Mexico to investigate laws, policies and barriers to extend this service demonstrated that people who injected drug preferred a number of extended services delivered by community pharmacies such as needle and syringe distribution, disposal of used needle and syringe, methadone or the other opioid substitution, provision of naloxone for overdose prevention and counseling service. In these countries, there are no legal barriers for distribution of needle and syringe but for disposal of used needle and syringe at community pharmacy in Russia required license while the rest countries are no need. However, methadone and other opioid substitution services including

naloxone dispensing still faced the legal barriers in most countries. Even there is no legal issue for distribution and disposal of needle and syringe service together with other opioid substitution which can be remunerated from government in some countries but participation rate of community pharmacies is still low. Knowledge and information support, attitude of individual community pharmacist, policies support for individual pharmacy and financial support were mainly reported as barriers to extend these services (50-52). The other factors influence community pharmacies to provide these services included negative attitude and relationship with injected drug clients and professional's moral obligation (51). General public showed negative attitude towards drug users consequence by stereotyping and stigmatization. The community pharmacies users have highly concerned with appropriateness of service area in community pharmacy and would not like to share facilities with drug users (53).

Finding from these related studies demonstrated that successful adoption of the extended patient-oriented services delivered by community pharmacies depended on the potential factors involving perspectives from consumers, general public, community pharmacists as services provider and supportive from physicians as multidisciplinary team. A cross-sectional survey study in Thailand to determine the behavioral intention of Thai community pharmacist in order to provide primary pharmaceutical care services in 4 domains ;(1) Medical use review (2) Prevention and promotion (3) Behavioral modification and (4) Health consumer protection based on theory of planned behavior performed that disease screening is the most preferable services for Thai community pharmacists, follow by health promotion, medical use review and behavioral modification respectively. Key factor affecting Thai community pharmacists' intention to provide primary pharmaceutical care services is perceived behavioral control over providing service and the other potential factors are attitude, subjective norm and self esteem (54).

Presently, there is limited information regarding perspective of consumer, community pharmacist and physician towards the new extended patient-oriented services in Thailand. In addition, the information regarding potential factors which influence Thai community pharmacists to provide the extended patient-oriented services were still not enough. Therefore, research is required to better understanding perception of consumers, community pharmacists and physicians towards the extended

roles of community pharmacists which consequence to successful implementation. This information is essential to the development of the extended patient-oriented services in Thai community pharmacy as well.

4. Theoretical framework

The Diffusion of Innovation Theory was developed by E.M. Rogers in 1962. The theory explained that diffusion is process in which “innovations communicated through certain channels over time among the participants in a social system”. Four key elements from theory which influence diffusion and adoption process of a new innovation among social members in a period of time consist of the innovation, communication channels, time, and a social system (55).

Table 3 Four main elements in Roger’s Diffusion of innovation theory and definition

Element	Rogers’ Definition
Innovation	"An idea, practice, or object that is perceived as new by an individual or other unit of adoption”
Communication channels	"The means by which messages get from one individual to another"
Time	"The innovation-decision period is the length of time required to pass through the innovation-decision process. Rate of adoption is the relative speed with which an innovation is adopted by members of a social system"
Social system	"A set of interrelated units that are engaged in joint problem solving to accomplish a common goal"

Especially for factors related to the innovation itself, Rogers’ theory of perceived attributes defined the characteristics of new innovation which influence adopters’ decision whether to adopt or reject an innovation. The potential adopters will evaluate new innovation through 5 attributes of new innovations which are Relative advantage, Compatibility, Complexity, Observability and Trialability. If an individual adopter perceived attributes of new innovation as to provide many relative advantages,

is compatible with daily life, is not complex to understand and apply, provide the visible outcomes and can be trial without any commitment, so rate of adoption of new innovation will be increased significantly (55).

Table 4 Definition of each factor from Rogers' theory of perceived attributes

Factor	Roger's Definition
Relative advantage	The advantage of an innovation that is greater than previous generation.
Compatibility	The level of compatibility that an innovation has to be assimilated into an individual's life.
Complexity	If the innovation is perceived as complicated or difficult to use, an individual is unlikely to adopt it.
Trialability	How easily an innovation may be explored. If a user is able to test an innovation, the individual will be more likely to adopt it.
Observability	The extent that results of an innovation is visible to others. An innovation that is more visible will drive communication among the individual's peers and personal networks and will, in turn, create more positive or negative reactions.

In addition to attributes of innovation, the adopter's characteristic also influence rate of adoption referring to the theory that classified adopter's characteristic into 5 categories according to individual adopter's innovativeness. The 5 adopter categories consist of innovators, early adopters, early majority, late majority and laggards. These adopter categories will be used to describe influence of individual characteristic to the diffusion mechanism through their perspective towards new innovation (55).

Table 5 The definition of each adopter category according to the individual innovativeness theory by Rogers

Adopter category	Roger's Definition
Innovators	Innovators are willing to take risks, have the highest social status, have financial liquidity, are social and have closest contact to scientific sources and interaction with other innovators. Their risk tolerance allows them to adopt technologies that may ultimately fail. Financial resources help absorb these failures.
Early adopters	These individuals have the highest degree of opinion leadership among the adopter categories. Early adopters have a higher social status, financial liquidity, advanced education and are more socially forward than late adopters. They are more discreet in adoption choices than innovators. They use judicious choice of adoption to help them maintain a central communication position.
Early Majority	They adopt an innovation after a varying degree of time that is significantly longer than the innovators and early adopters. Early Majority have above average social status, contact with early adopters and seldom hold positions of opinion leadership in a system.
Late Majority	They adopt an innovation after the average participant. These individuals approach an innovation with a high degree of skepticism and after the majority of society has adopted the innovation. Late Majority are typically skeptical about an innovation, have below average social status, little financial liquidity, in contact with others in late majority and early majority and little opinion leadership.
Laggards	They are the last to adopt an innovation. Unlike some of the previous categories, individuals in this category

Adopter category	Roger's Definition
	show little to no opinion leadership. These individuals typically have an aversion to change-agents. Laggards typically tend to be focused on "traditions", lowest social status, lowest financial liquidity, oldest among adopters, and in contact with only family and close friends.

The individual innovativeness theory by Rogers explained about the different in adoption of new innovation in each adopter category. A bell-shaped curve is used to demonstrate the percentage of individuals that adopt new innovation. However, there are the external factors outside individual level which effect individual's rate of adoption including type of innovation decision whether is made by individual or authority, the communication channel whether through mass media or interpersonal, the nature of social system, such as its norm and level of interconnectedness, and change agency's promotion effort (55).

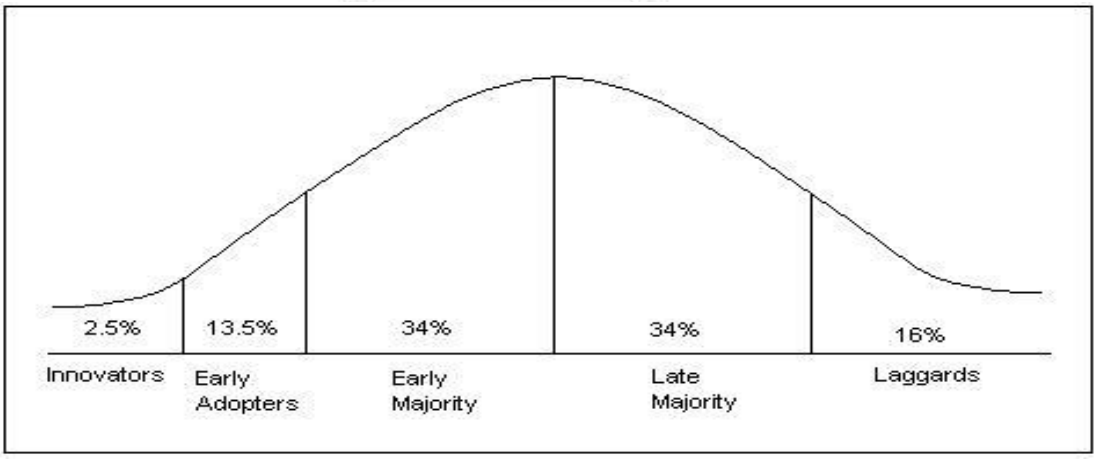

Figure 3 The distribution of adopters' categories

Greenhalgh et al have developed a theoretical framework based on Rogers' diffusion of innovation theory by expanded and included key finding from review of theoretical frameworks and literature reviews to describe key factors associated with diffusion, dissemination, and implementation of innovation such as new health

technologies or new practices in health service organizations (56). The theory considered the potential factors that enhance adoption of new innovation at organizational level in further to those at individual level. The eight key elements within Greenhalgh's model including the attributes of innovations, the characteristics and behavior of adopters, communication and influence activities, system antecedents, system readiness, outer context, implementation and linkage as described in below table.

Table 6 Greenhalgh's model of diffusion, dissemination and implementation of innovation in health service organizations

Factor	Greenhalgh's Definition
Innovation characteristic	"The innovations likely to be adopted when they are clearly superior than the idea that it supersedes, consistent with adopters' values norms and perceived needs, are perceived as simple to use, can be experimented with on a limited basis, carry a low risk, and are relevant to the adopters' work and improve task performance."
Adopter characteristic	"Adopter characteristics associated with the propensity to trial and use innovations include tolerance of ambiguity, motivation, values, and learning style."
Communication and influence activities	"Depend on a degree of diffusion, from informal diffusion to formal dissemination on the other."
System antecedents	"The size or maturity of an organization, the absorptive capacity for new knowledge, and receptivity for change"
System readiness	"Ability of an organization's adopting a particular innovation which may be facilitated by tension for change, support and advocacy by others in the health care system and dedicated time and resources."

Factor	Greenhalgh's Definition
Outer context	"The external influences, such as political directives, that impact a decision to adopt, implement, and sustain an innovation."
Implementation	"The successful implementation can be facilitated by factors such as devolved decision-making and management support."
Linkage	"Linkage between innovators and potential users during the development stage may lead to more successful adoption."

Diffusion of Innovations theory has been used to investigate the adoption of new innovations in various contexts as well as the adoption of new practice in health care system. Not only to explore consumers' behavior in the uptake of public health services provided by healthcare professionals, but also to investigate factors which influence healthcare professionals' decision to adopt and deliver new services into daily practice. There is a need to apply new perspectives by using theoretical framework in studying adoption of new innovation by Thai community pharmacists in order to overcome research limitation. These theoretical frameworks will be used as guidance for data collection and measurement as well as interpretation systematically.

5. Conceptual framework

The conceptual framework in this study is developed according to study objective as described below.

Conceptual framework for 1st objective (Phase I study)

The first objective of this study is to investigate opinions of physicians, consumers and community pharmacists toward the new extended community pharmacy services. The conceptual framework for the first study objective is developed based on key findings from review related literatures and studies regarding opinions among physicians, consumers and community pharmacists toward the new extended services as shown in below table.

Table 7 Key findings from review related literatures and studies which will be used as conceptual framework for 1st objective (Phase I study)

Key findings	Physician	Consumer	Community Pharmacist
Knowledge of new service	✓	✓	✓
Demand of new service	✓	✓	✓
Acceptance of new service	✓	✓	✓
Advantage	✓	✓	✓
Competency of community pharmacist	✓	✓	✓
Collaboration from other healthcare provider	✓	✓	✓
Manpower/Workload	✓	✓	✓
Pharmacy area	✓	✓	✓
Reimbursement	-	✓	✓
Easy access location	-	✓	✓
No appointment	-	✓	✓
Policy support	✓	-	✓

These 12 key findings derived from related literatures and studies are used as guideline for investigation opinions of physicians, consumers and community pharmacists toward the new extended community pharmacy services in this study.

Conceptual framework for 2nd objective (Phase II study)

The extended patient-oriented services delivered by community pharmacists in Thailand are the new initiative to enhance community pharmacists delivering the extend roles beyond traditional product-oriented services by focusing more on patient health outcome and continuity of care. In order to understand this transformation and determine the potential factors which affect intention to deliver new extended services of Thai community pharmacists, perception towards attributes of the proposed new extended patient-orient services as well as personal factors of individual community pharmacists and further potential organizational factor are taken into account. The

developed conceptual framework in this study was derived from 2 major theoretical frameworks, based on perceived attributes from Rogers' diffusion of innovation theory (55) and included a potential organizational factor as guided by Greenhalgh's model of diffusion, dissemination and implementation of innovation in health service organizations (56). In addition, key finding form related literature and studies was applied in the developed conceptual framework for this study as well.

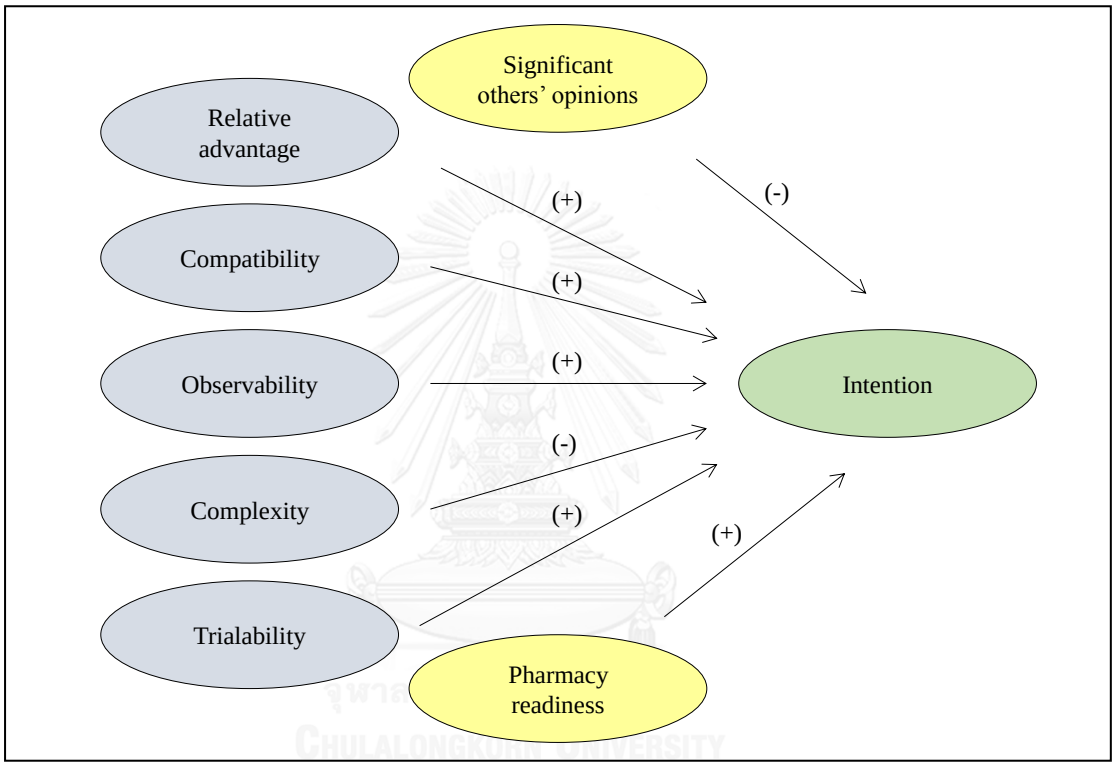

Figure 4 The developed conceptual framework based on diffusion of innovation theory

The theory of perceived attributes has been used as the basis theoretical framework in this study. The attributes of new extended service are the characteristic of particular services which individual pharmacist perceived and evaluated in various aspects before making decision to provide or not to provide the new extended services. Perceptions of relative advantage, compatibility, complexity, trialability and observability have been found as significant factors in several studies concerning adoption of new practices in community pharmacy setting. Since these theoretical frameworks used adoption in terms of outcome measurement whereas majority of the extended services in Thailand have not been formally integration in any health

insurance system. So, community pharmacists' intention will be used as outcome measurement in this study instead of adoption. Finally, the potential factors affect intention of Thai community pharmacists to deliver new extended services, which will be considered in this study consists of 5 attributes of new innovation; relative advantage, compatibility, complexity trialability and observability, pharmacy readiness which represented organizational factor. Significant others' opinion factor derived from review related literatures and studies together with finding from pilot test conducted for the 1st study objective. In addition, personal factors of individual community pharmacist are considered as confounding factors.

Conceptualization and operational definition

Each factor in the developed conceptual framework is conceptualized into particular definition accordingly.

Relative advantage

The advantages of new extended services that greater than core dispensing service. If community pharmacists perceive relative advantage of providing new extended services, they will be more likely to provide these in their pharmacies.

Compatibility

The level of new extended services which community pharmacists perceived consistent with their existing work system. The new extended service which is perceived for this system fit will be enhanced for provision in community pharmacies.

Observability

The visible service outcomes of providing new extended services as perceived by community pharmacists. If community pharmacists perceived observability of new extended services, then the likelihood of implementation is increased.

Complexity

The degree of difficulty to provide new extended services. The new extended services which are perceived as more complex are less likely to be implemented.

Trialability

The degree to which new extended services can be trialed to provide on limited basis. The extended services that can be trialed will increase the likelihood of implementation.

Significant others' opinions

Opinions from key stakeholders regarding community pharmacists providing new extended services as perceived by individuals. The negative feedbacks will decrease likelihood of implementation.

Pharmacy readiness

The ability of community pharmacy in supporting implementation of new extended services as perceived by individuals. The new extended services that fit with pharmacy's structure, supporting technologies, staff and financial resources, are more likely to be implemented.

Intention to adopt service

Intention to adopt service refers to individual community pharmacist's intention to adopt or reject the new extended services into their usual practice in community pharmacy.

CHAPTER III
METHODOLOGY

The study aims to (1) investigate consumers', physicians' and community pharmacists' opinions toward the extended community pharmacy services, and (2) to assess factors affecting community pharmacists' intentions to deliver the extended services. The methodologies for the two objectives were explained below.

Phase I study

To investigate consumers', physicians' and community pharmacists' opinions toward the extended patient-oriented services provided by community pharmacist, the methodology used were described as follows.

Study design

In-depth interviews were conducted in three informant groups; consumers, physicians and community pharmacists in Bangkok during January 18th and February 26th, 2016. Content in informed consent form was read to the informants. Consent by action is counted when informants agree to be interviewed. Qualitative information about (1) whether they know the extended services, (2) whether they think the service is appropriate to be provided in community pharmacy, and (3) what are the reasons for their support or not support the services were collected. The informants were asked with these three open-ended questions to collect information for all ten extended services. The unstructured interview was applied to allow informants express their opinion independently.

Sampling method

All informant groups were purposively selected. Those who provided oral consent were interviewed. Consumers were selected if they were 18 years or older, made healthcare decision for themselves or their family members, and visited any community pharmacies in Bangkok in the past month. Physicians were included if they currently practice medicine in government hospital in Bangkok metropolitan area. Broad types of medical specialties related to chronic diseases were included in the study. Community pharmacists were selected if they were owners or managers of

community pharmacies in Bangkok, and worked at least 35 hours per week. Only pharmacists who have never provided the extended service were screened for the study. The study was confined in Bangkok because primary hospitals and private clinics in the metropolitan area were not well accepted and utilized by Bangkokian. Community pharmacy, on the other hands, was a more preferred choice. The interview investigated informants' opinions toward extended services provided by community pharmacists.

Sample size

Sample size was not calculated for a qualitative study. A new informant from three groups; consumers, physicians and community pharmacists, was further recruited until no additional information was added or until the information was saturated. Normally, the core themes will emerge within early six interviews and the saturation of information always appear since the first twelve interviews (57). In this study, at least six informants per group were planned for in-depth interview.

Measurement

The informants were approached for interview in different methods depending on each group as described below.

Physicians group: due to work burden and time constraint, researcher approached physicians through healthcare practitioners who work in the same hospital with personally contact.

Consumers group: researcher approached consumers through their family, relative, friend or colleagues.

***Community pharmacists group*:** researcher approached community pharmacists by visiting their practicing community pharmacy in various locations including residential area, working area and shopping area.

Researcher made an appointment via telephone with the informants who are willing to be interviewed. The appointment date and place were arranged at their convenience. At the appointment date, the interviewer who is researcher conducted an interview which took approximately 30-50 minutes and took place with their connivance. Physician and Pharmacist informants took longer time for interview when compared to consumer informants. The interview was started with questions regarding informant's characteristics. Afterwards, three main open-ended questions were used to guide the interview among three informants group.

1. Do you know each of the extended service? Please explain.

After the subject explains what a service is, the interviewer provided the definition and scope of service to the subject.

2. Do you agree that this extended service should be provided by community pharmacist?
3. What are the reasons you agree or disagree to provide the extended services?

Ten extended services; (1) Medication Management Program / Medication Therapy Management (2) Disease screening (3) Immunization (4) Promotion of healthy lifestyles (5) Smoking cessation (6) Weight management (7) Alcohol screening and brief intervention (8) Needle & syringe exchange or sharp disposal service (9) Opioid substitution or Methadone managed care program (10) Return or disposal of unwanted medicine, currently provided in Australia, Canada and UK are included in this survey.

These three questions for interview were developed according to study objective. Key findings derived from related literatures and studies are used as guideline for investigation opinions of physicians, consumers and community pharmacists toward the new extended community pharmacy services in this study.

The verbatim note was be taken by researcher during the interview. Audio recorder was used according to permission from each participant. Audiotapes were transcribed verbatim for analysis by researcher. All transcripts and notes were anonymized. Audiotapes were kept completely confidential and will be destroyed one year after completing this study.

Data analysis

All transcripts and notes were reviewed and coded. Data saturation was observed using a theme saturation table. After the completion of the interview, data was extracted. Thematic analysis (58) was conducted independently by two researchers (PK and PA). If the theme was identified differently, additional researcher was included for discussion and final conclusion. Quotations were referenced to informants in each group in which C_i, M_i and P_i represented consumers, physicians and community pharmacists, respectively.

Selection of two extended services for Phase II study

Two extended services; medication management program and disease screening which are two main activities according to three year strategic plan as supported by NHSO in cooperation with the pharmacy council and FDA were selected for questionnaire development. The extended service that physicians, consumers and community pharmacists unanimously agree, considered by the highest % agreement was selected firstly. Next, the extended service that community pharmacist have highest % agreement to provide it but, got lowest % agreement among physicians and consumers, was selected as the second service to study also. The result showed that medication management program and disease screening met these two criteria respectively.

Phase II study

The second objective is to evaluate factors influencing community pharmacists' intention to deliver extended pharmacy services. The methodology used was described as follows.

Study design

A cross-sectional study using self-administered mail survey was carried out during 18th January – 1st February 2016.

Sampling method

List of category 1 and 2 community pharmacies which holding license to sell modern medicines in Bangkok from FDA website was used as sampling frame (59). Community pharmacy, which is a sampling unit, was selected by simple random sampling method (SRS) using Microsoft Excel to generate sampling. Questionnaires were asked to complete by community pharmacists, owners or managers, in Bangkok who met the inclusion criteria.

Inclusion criteria: If more than one community pharmacists were employed in a pharmacy, community pharmacist owner or manager who practiced at least 15 hours per week was considered acceptable for inclusion.

Exclusion criteria: The community pharmacists who worked in the community pharmacy that already implemented the selected service.

Sample size

Sample size was calculated to assure that the study has adequate power to detect statistical significance. In this study, the G*Power analysis program 3.1.9.2 was used to estimate the necessary sample size for multiple logistic regression analysis (60). From the review literatures, most of previous studies were qualitative study. A small pilot study to verify the measurement and to assess the effect was conducted among 30 samples.

Results from pilot study were used as an input to G*Power program. The following parameters were required for G*Power sample size calculation.

Estimated odd ratio	= 1.3
Probability of an event occurring [Pr(Y=1)|H0]	= 0.2
α	= 0.05
Power	= 0.80
Squared multiple correlation with others covariates (R^2)	= 0.15

With all these parameters, the required sample size was estimated to be 848. Given mail survey usually has 30-40% response rate (61, 62) so, 2,500 questionnaires were sent to community pharmacies.

Measurement

A self-administered questionnaire was developed according to conceptual framework which derived from two major theories; Rogers' diffusion of innovation theory (55) and Greenhalgh's model of diffusion, dissemination and implementation of innovation in health service organizations (56). Key findings from related literature and studies together with findings from the first phase study were applied to form the wording of the questionnaire items. Seven concepts; relative advantage, compatibility, complexity, observability, trialability, significant other's opinion and pharmacy readiness were used to provide a conceptual framework. Seven concepts were operationalized and the definition of each concept was presented below.

Relative advantage - the advantage of new extended services which are greater than core dispensing service. If community pharmacists perceive relative advantage of providing new extended services, they will be more likely to provide these in their pharmacies.

Question: How do you agree with the following statement?

Providing MMP/DS…

- Reveal pharmacist's roles
- Increasing the number of returned customer
- Make people in nearby community to better know my pharmacy
- Increase the profit
- Strengthen community pharmacy profession

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

Compatibility **-** the level of new extended services which community pharmacists perceived consistent with their existing work system. The new extended service which is perceived for this system fit will be enhanced for provision in community pharmacies.

Question: How do you agree with the following statement?

Providing MMP/DS…

- Compatible with my pharmacy's goal
- Not conflict with routine dispensing service
- Patients have convenience access rather than hospital
- Comply with professional pharmacy act
- Not redundant with other healthcare professional roles
- Need coordination between hospital and community pharmacy which is difficult

Question: How do you agree that each work procedure is compatible with routine dispensing service?

MMP Procedure

- Review patients' information
- Preparing record for individual patient
- Provide action plan to optimize use of medicines
- Intervention and referral
- Documentation and follow up

DS Procedure

- Screen people at risk
- Disease screening from checklist

- Referral & follow up
- Counseling people with high risk to disease
- Documentation

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

Observability **-** the visible service outcomes of providing new extended services as perceived by community pharmacists. If community pharmacists perceived observability of new extended services, then the likelihood of implementation is increased.

Question; How do you agree with the following statement?

Providing MMP…

- Reduce drug used problem in patients
- Improve patient health outcome
- Increase continuity of care
- Help physicians to recheck the proper use of medicines in patients
- Mitigate burdens of hospital doctors
- Reduce patient's health expenditure

Providing DS…

- Warning patient for their risk for disease
- Patients with high risk for disease can receive treatment at the beginning stage
- Mitigate burdens of hospital doctors
- Reduce patient's health expenditure

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

Complexity **-** the degree of difficulty to provide new extended services. The new extended services which are perceived as more complex are less likely to be implemented.

Question; How do you agree with the following statement?

Providing MMP/DS…

- Need higher knowledge than dispensing service
- Need higher skills than dispensing service
- I need to pass the training
- I need to pass the certification examination

- This is easy to me

Question; How do you agree that each work procedure is complicated?

MMP Procedure

- Review patients' information
- Preparing record for individual patient
- Provide action plan to optimize use of medicines
- Intervention and referral
- Documentation and follow up

DS Procedure

- Screen people at risk
- Disease screening from checklist
- Referral & follow up
- Counseling people with high risk to disease
- Documentation

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

Trialability - the degree to which new extended services can be trialed to provide on limited basis. The extended services that can be trialed will increase the likelihood of implementation.

Question; I will decide to provide the extended service when…

Providing MMP/DS

- I can observe work practice from other community pharmacy
- I can attend knowledge training for work practice
- I can attend the workshop
- I can provide service in the pilot project of NHSO

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

Significant others' opinions - opinions from key stakeholders regarding community pharmacists providing new extended services as perceived by individuals. The negative feedbacks will decrease likelihood of implementation.

Question: How do you agree with the following statement?

Providing MMP…

- Physicians are not confident in my knowledge for providing MMP

- Physicians comment that I shouldn't provide MMP due to dispensing service is not completely done
- Patients are not confident to receive MMP service from my pharmacy
- Patient worry about good relationship with physician if they receive MMP service at my pharmacy

Providing DS…

- Physicians worry about false negative screening result which negatively impact with patients
- Physicians comment that DS checklist at community pharmacy is not standardised
- Physician comment that DS is physicians' role only
- Patients are not confident to receive DS service from my pharmacy
- Patient comment that DS is not community pharmacists' role
- Hospital ignore DS result from my community pharmacy

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

Pharmacy readiness - the ability of community pharmacy in supporting implementation of new extended services as perceived by individuals. The new extended services that fit with pharmacy's structure, supporting technologies, staff and financial resources, are more likely to be implemented.

Question: How do you agree with the following statement?

- I have enough knowledge to provide MMP/DS
- I have enough skill to provide MMP/DS
- My pharmacy has a proportion area to provide MMP/DS
- My pharmacy lack of instrument and supporting tools
- My pharmacy has the information system to manage patient information for supporting MMP/DS
- My pharmacy has enough staffs to provide MMP/DS
- I have enough time to provide MMP/DS

The answer is four point Likert's scale ranges from Agree (4) – Disagree (1).

The developed questionnaire was reviewed by three experts. Content validity was assessed using Content Validity Index score. The questionnaires were then pilot tested in 30 community pharmacists. The ambiguous sentences were adjusted. The

items assessing trialability were deleted because they did not have face validity. In Thailand context, it was an extraordinary practice to try out the extended services and the “trialability” construct was difficult for interpretation (63). Internal consistency of the questionnaires was measured. All domains were found reliable with Cronbach's alpha greater than 0.7 as presented in Table 8 and Table 9. The proposed conceptual framework was presented in Figure 5.

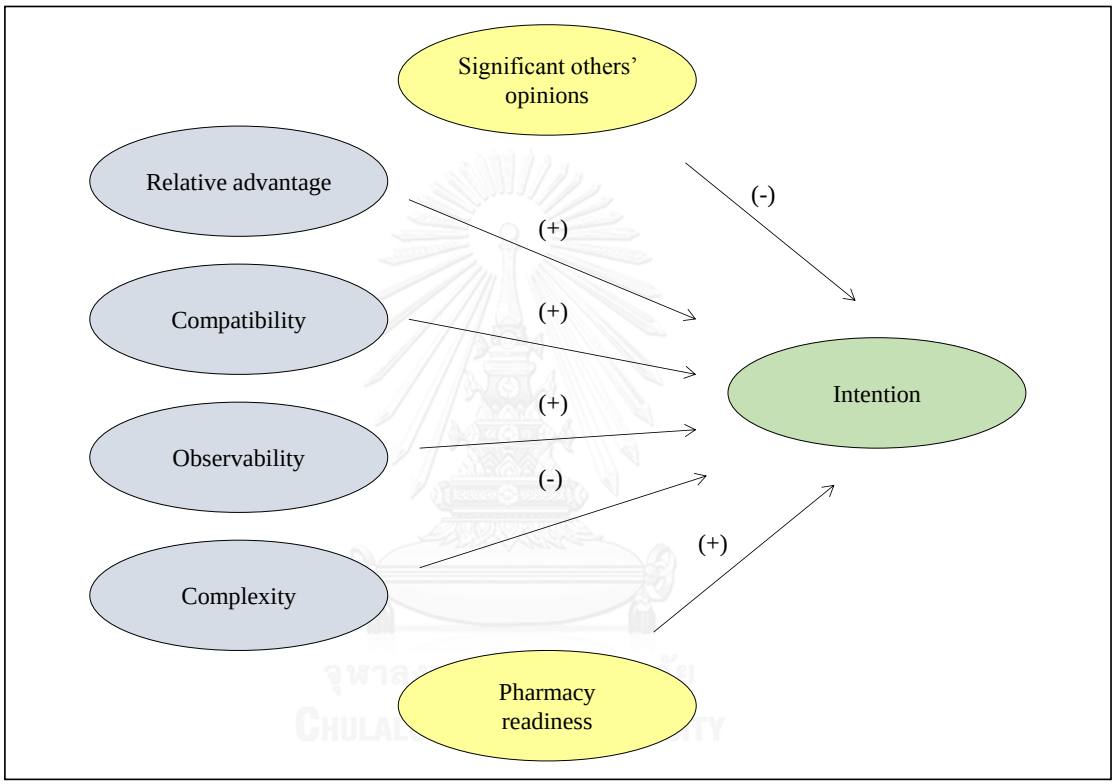

Figure 5 The conceptual framework based on diffusion of innovations theory

Table 8 Reliability analysis for MMP questionnaire items

Factor	Cronbach's Alpha	N of items
Relative Advantage	0.789	5
Compatibility	0.721	11
Complexity	0.769	11
Observability	0.857	6
Significant Others' Opinion	0.890	4
Pharmacy Readiness	0.723	7
Total	-	44

Table 9 Reliability analysis for DS questionnaire items

Factor	Cronbach's Alpha	N of items
Relative Advantage	0.837	5
Compatibility	0.891	11
Complexity	0.768	11
Observability	0.790	4
Significant Others' Opinion	0.887	6
Pharmacy Readiness	0.767	7
Total	-	44

The final questionnaire composed of three parts with eight-page length (Please see Appendix A for full questionnaire).

- Part I of the questionnaires composed of
    - Knowledge of the specific extended services (true-false evaluation)
    - Intention to provide the two services (ordinal scale range from intend to provide service within 1 month, 3 months, 6 months, 1 year, more than 1 year and no intention)
- Part II of the questionnaires composed of questions for six concepts. The four point Likert's scale was applied to measure agreement level on a continuum from strongly agree (4) to strongly disagree (1).
- Part III of the questionnaires asked about details of the respondents and his or her community pharmacy.

A one-page cover letter explained the rationale, objectives, benefit to community pharmacy and the incentive they might get from sending back the questionnaire. Rights to skip or not answer the questions, the attempt to protect individual information were explained. Instruction to fill in and how to return a questionnaire was described. The self-addressed stamped return envelope was enclosed to encourage respondents to send back the completed questionnaires to researcher within two weeks. Ten lucky respondents received the books "Comprehensive pharmacy Review" as the thank you gifts for providing information and returned questionnaires.

Ten lucky draw prize winners were randomly selected from all returned prize coupons by using Microsoft Excel program .The lucky respondents were contacted trough telephone or e-mail depending on contact information indicated on prize coupon.

Data analysis

Factor analysis was used to ensure construct validity. Descriptive statistics was used to analyse respondents' characteristics and domains' scores. The domains' scores derived from mean scores of all Likert scale items within same domain. The Pearson correlation coefficient was used to measure the relationship among independent variables. Univariate and multivariate logistic regression analysis were conducted to access the potential existence of causal relationships among factors affecting community pharmacists' intention to deliver MMP and DS. Five levels of intention were transformed to dichotomous variables taking on a value of 0 or 1 for logistic regression analysis (0 = no intention and intention > 1 year, 1= intention within 1 month, 6 months and 1 year).

Ethical consideration

The responses data were anonymous and kept completely confidential. Analysis results were presented as group summary reports. Regarding respondent autonomy, informants can refuse to answer any questions which are highly personal. Informed consent was explained before starting an interview in the first study objective. In addition, informed consent statement was stated on a cover letter of self-administered questionnaire for second study objective. Subject who accepted to participate in this study was giving consent by action.

The study was approved by the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University, on 14th January 2016 with COA No. 003/2559.

CHAPTER IV
RESULTS

Phase I study

The first phase study aims to investigate consumers', physicians' and community pharmacists' opinions toward the extended community pharmacy services. Among 20 consumers, 14 physicians, and 20 community pharmacists approached, 20, 13, and 17 of them were agreed to participate in the study (yield 100%, 92.9% and 85% response rate respectively). Those who refused to participate were interrupted with urgent tasks at an appointed interview time and were not available thereafter. There were higher proportions of female informants than male counterparts in consumer and pharmacy groups. All physician informants earned postgraduate degree. Their specialties included family medicines, medicines, neurology, and nephrology. All of them were from tertiary hospital settings. Most community pharmacist informants earned bachelor's or Pharm.D. degree. Majority of them worked in independent community pharmacy, only 5 worked in chain or franchise community pharmacy. Majority of consumer informants earned at least bachelor's degree, while less than one fifth had less than university education. Characteristics of the three informant groups were shown in Table 10. The study assessed whether they knew the ten extended services, and how each informant group thought about the services.

Table 10 Informants' characteristics

Characteristics	Consumer n = 20	Physician n= 13	Pharmacist n = 17
%Female	90%	54%	65%
Age (Mean $\pm$ SD)	39.4 $\pm$ 11.6	42.8 $\pm$ 12.4	36.2 $\pm$ 9.7
>18 - 30	5	-	5
31- 40	8	8	8
> 40	7	5	4

Characteristics	Consumer n = 20	Physician n= 13	Pharmacist n = 17
Education (n)			
High school	3	-	-
Bachelor's degree	10	-	14
Postgraduate degree	7	13	3
Working experience (years)			
0 – 10	-	3	13
11-20	-	6	3
> 20	-	4	1
Pharmacy Owner : Manager (n)	-	-	12:5

Knowledge about extended pharmacy services

The interviewer assessed whether informants knew ten extended services. To count as "know", the self-report statement from informants must be conceptually correct, although details provided might not completely matched with the study's definition. As expected, consumers were less acquainted with these ten extended services when compared to their healthcare professional counterparts.

Immunisation was the service which all informants from three groups reported knowing about, while *needle & syringe exchange or sharp disposal service* was identified as a service they don't know the most. Five services; *immunisation, smoking cessation, disease screening, promotion of healthy lifestyle, and weight management*, were reported know very well by three informant groups. On the other hands, more than 75% of consumers, and more than 65% of community pharmacists stated that they did not know the *opioid substitution, MMS*, and *alcohol screening*. Physicians were more familiar with all extended services, because most services were available in hospitals. Some reported that they knew the services since they studied abroad. Community pharmacists who reported familiarity with the extended services had previously worked in hospitals. Some community pharmacists expressed that they learnt about the extended services through continuing education.

It was worth noting that there were discrepancies between what physician informants understood, and operational definitions which were used in this study. Physician informants assumed that *disease screening* covers screening of infectious diseases, while this study included only non-communicable diseases. Both physician and community pharmacist had rough ideas about what *MMS* was, but did not know all the components and process in detail.

Table 11 Self-reporting on knowing extended community pharmacy services

Extended services	Consumer N = 20	Physician N = 13	Pharmacist N = 17
Immunisation	100%	100%	100%
Smoking cessation	90%	100%	100%
Disease screening	65%	100%	100%
Promotion of healthy lifestyle	70%	92%	100%
Weight management	55%	85%	88%
Return of unwanted medicine	25%	77%	76%
Opioid substitution	10%	92%	35%
Medicines management service	0%	77%	35%
Alcohol screening	0%	77%	29%
Needle & syringe exchange	10%	38%	24%

Agreement on extended patient-oriented services that should be provided in community pharmacy

All informants were asked whether they think each extended services should be provided in community pharmacies, and why they agreed or disagreed. *MMS,* although reported known by 0% of consumers, 77% of physicians, and 35% of community pharmacists, it was 100% agreed by all informant groups that the service be provided in community pharmacy. Other services highly accepted by all groups were *return of unwanted medicine* (>90% of informants in three groups agreed), *smoking cessation, promotion of healthy lifestyle*, and *weight management* (>85% of informants in three groups agreed). *Disease screening* was the service pharmacists wanted to provide, and consumers agreed to receive in community pharmacy, but was disagreed by one third

of physicians. Services that the majority of pharmacists (> 70%) disagreed to provide were *alcohol screening service* and *immunisation.* Services that none of pharmacists wanted to provide were *opioid substitution service* and *needle & syringe exchange or sharp disposal service.* . Detailed information on agreement on each extended service informants thought should be provided in CP were illustrated in Table 12.

Table 12 Agreement on extended services that should be provided in community pharmacy

Extended services	Consumer N = 20	Physician N = 13	Pharmacist N = 17
Medicine Management Service	100%	100%	100%
Return of Unwanted Medicine	90%	92%	94%
Smoking Cessation	95%	85%	100%
Promotion of healthy lifestyle	90%	100%	88%
Weight Management	85%	85%	100%
Disease screening	85%	69%	100%
Alcohol Screening	75%	92%	24%
Opioid Substitution	75%	62%	0%
Immunisation	65%	15%	29%
Needle & Syringe exchange	20%	46%	0%

Reasons why informants agree or disagree for particular service to be provided in community pharmacy

After extracting data from three informant groups, six main themes were identified. These themes were 1) access to service, 2) perceived benefits and barriers, 3) system readiness, 4) service quality assurance, 5) pharmacy readiness, and 6) scope of professional responsibility. Other data that could not be grouped was also described.

Access to service

Access to service was reported by three informant groups as a supportive factor for providing extended services, especially *MMS, return of unwanted medicine, smoking cessation, promotion of healthy lifestyle,* and *weight management*. There were many reasons that all three informant groups supported these services. All three

informant groups indicated that community pharmacy was easy to access as they are located near residences or workplaces. Patients expressed that community pharmacy was a preferred choice as no appointment was needed. Patient could spend more time consulting with pharmacist. Physicians agreed that some patients did not want to discuss health problem with their doctors, they preferred to talk to a pharmacist. The statements from many informants were shown in the following example:

"...community pharmacy allows patients access anytime at their convenient" (C_3, M_{13}, P_2)

"…physician have no time to provide consultation, I will consult with nearby community pharmacy instead" (C_4)

"…hospital is far, and the queue is a whole day long" (P_6)

Perceived benefits and barriers

Theoretically if benefits are foreseen, services will get more support. However, if barriers are perceived, it is more likely to face denial. This is also true with this study. Consumers reported that they supported *MMS* because it helped detecting drug related problem. Moreover, under *MMS*, pharmacist would frequently monitor and record drug use and clinical outcome. Consumers conveyed that *MMS* would make them use drugs more responsibly. As one consumer stated:

"...the service helps preventing problems from taking many medicines, and visit many doctors" (C_2).

Physicians highly supported *MMS* because they perceived pharmacist as drug expert. Physicians indicated that when pharmacists provided *MMS*, they could detect drug-drug and drug-food interactions, noncompliance problems, and polypharmacy problems. In addition, they could ensure continuing drug use, and provide proper counseling to patients. Many physicians indicated similar comments, for example:

"…help physicians detecting drug related problems in patients, counseling them with accurate information, change their unhealthy behavior" (M_3, M_8).

"…reduce irrational use of medicine and ensure the continuity of drug use during next appointment [with physicians] particularly for chronic disease patients" (M_6)

Pharmacists extremely supported *MMS* because it prominently highlighted the pharmacists' professional role. Moreover, providing *MMS* would enhance pharmacist-

patient relationship resulting in better compliance, rational use of medicine, and finally better clinical outcome. Pharmacists mentioned providing *MMS* would provide monetary profit to their community pharmacies. Pharmacists also mentioned about patients trusted in pharmacy professional services received, they would become engaged customers. These statements were exemplified by the following informants:

> "... role of community pharmacists become more apparent if we (pharmacists) provide medicine management service in community pharmacy" (P_3, P_5)
>
> "…medicines management service helps develop good patient-pharmacist relationship, which in return resulted in more trust and lead to better compliance and clinical outcome (P_7, P_{10})

Three informant groups also had some concerns about community pharmacist providing *MMS.* Consumers and physicians raised concerns about absence of pharmacist problem[3]. They also concerned about communicating patient's medical information from the hospital to community pharmacy, and the other way around. Some consumers were nervous to let a physician knew that they consulted with a community pharmacist. Physicians were questionable about knowledge updating, and familiarity of community pharmacists to drugs used in hospital settings. As one physician stated:

> "…if an absence of pharmacist problem still exists, I don't think that extended service will work" (M6)

Return of unwanted medicine was second highly supported service of all three informant groups. Most informants supported the service because it helped reducing environmental contamination, enhancing patient safety from taking wrong or expired medicines as shown in the following example:

> "...don't know how to discard expired or unused medicines, normally discard them in garbage" (C_9, C_{12}) "or toilet bowl" (C_{16})
>
> "...it would be good if there is a public place where people can drop unwanted medicines like dropping soda can or battery" (C_4, C_6, C_{10}, M_4)
>
> "...medicines if wrongly discard will contaminate the environment; both water reservoir and land" (M_4, P_7)

[3] Absence of pharmacist refers to an existing problem that pharmacists providing their license to community pharmacy in return of remuneration, but not take any responsible for their role in community pharmacy. Thailand had Drug Act that pointed to this problem, however, law enforcement is ineffective.

Although the service was highly supported by all groups, some concerns were raised. If the service was implemented, there should be a standard operating procedure on how to manage unwanted medicines. The process should be transparent and accountable so that community pharmacy cannot re-sell returned medicines. Also, who should be responsible, and what method should be used for drug disposal should be specified in detail.

Smoking cessation, promotion of healthy lifestyle, and *weight management* were ranked in a third, fourth and fifth places by all informant groups. Consumers supported these services because they thought pharmacists provided more accurate information than self-searching from an internet. Physicians and pharmacists unanimously agreed that community pharmacists should provide lifestyle modification services which were prevention and promotion measures to enhance patient's health. Pharmacists also added that they can prevent consumers from over claimed, unregistered or counterfeit drugs and health supplement products. Physicians expressed that for the services to be remunerated, there should be supporting evidence that intervention is effective and worthwhile. Pharmacists also expressed that it might be more beneficial for the service provided in community. As shown in the following example:

> "...I'm not sure which information is correct. There are too many [information] in the web" (C_{12})
>
> "…Information from healthcare professional is trustable, but most of the time doctor are too busy and hard to access. Pharmacist is a source of accurate information easier to access" (C_{15})
>
> "…chronic diseases cannot be cured by only medicine, but patients should have change their lifestyle as well" (P_5)

Disease screening was highly supported by consumers and pharmacists, but less by physicians. Consumers and pharmacists expressed that *disease screening* in community pharmacy could help early disease detection. The earlier the detection, the better the disease control and treatment effectiveness. Some physicians supported that *disease screening* service in community pharmacy was a proactive measure. However, many of them concerned about false negative screening which would result in delay timely and proper treatment. Screening checklist and detecting criteria were other issues physicians concerned. Comparing to standard scientific test, physicians relied more on

screening in hospital setting than in community pharmacy setting. Many physicians mentioned about provision of disease screening in community pharmacy as following example:

> "...I am particularly worry about false negative result as it will mislead patients. Disease will be more progress, patient will be delay for proper care. (M_2, M_{10})
>
> "…hospital usually ignored the screening result from community pharmacy. We usually order another test anyway" (M_6)

Immunisation was denied to put in extended community pharmacy service's list. Although some consumers and physicians supported immunisation, but the majority of the three informant groups raised significant concerns about immunisation in community pharmacy. Storage temperature, injection experience, severe allergic reaction and life-saving procedure were significant issues raised. Physicians stated that physical checkup and prescription were required prior to immunisation. The whole process would be more convenient at a hospital than at a community pharmacy. Pharmacist worried about scope of pharmacy practice stated in a law. By law, immunisation cannot be done by a pharmacist. As some pharmacists and physicians stated:

> "…by law, we (pharmacists) cannot do any procedure that touch patients" (P_3), and "providing immunisation is not in our (pharmacists) curriculum" (P_2)
>
> "…severe allergic reactions might happen; vaccination should be done only in hospital" (M_7)
>
> "…vaccine requires special storage temperature for its best efficacy, do community pharmacy well equipped for controlled temperature storage" (M_{13})

Alcohol screening service, opioid substitution service, and needle & syringe exchange or sharp disposal service were services related to addiction behavior. Consumers said community pharmacy might be a good place for drug users. Visiting community pharmacy was not a stigma compared to visiting methadone clinic or specialized hospital providing care for drug users. Consumers, however, expressed concerns about their safety when seeking care from community pharmacy. They stated that they did not want to utilise health services in a setting where drug users appeared. Some physicians said these groups of patients were wrong doers. Providing *opioid substitution service, and needle & syringe exchange or sharp disposal service* were

seen as supporting action for the felony. If the service was implemented, strong measures to avoid abuse must be laid out, implemented, and monitored. Pharmacists were also highly nervous about used needle as they might get infected from unintentional needle stick. Like consumer counterpart, pharmacists fear of robbery and violence which might occur with this group of patient. The examples of statements made by some informants were as follows:

> "…drug users are felony, drugstore will not be a safe place" (C_3, M_5, P_2)
>
> "… (pharmacists) scare of unintentional stab myself with possible infected needle" (P_4)

System infrastructure readiness

One of the factors that affected successful extended services implementation was the infrastructure within a healthcare system. Basic infrastructure included IT communication network, standard codes, standard documents, and standard operating procedures. With the stated infrastructure, patients' information can be effectively and efficiently communicated from one setting to another. Moreover, standard practice guideline, roles and responsibilities of stakeholders should be laid out and endorsed by related healthcare professional organizations.

Although three informant groups agreed that *MMS*, *disease screening* and other services should be provided in community pharmacy, they had concerns about how patients' information will be communicated among stakeholders; physician-pharmacist-insurer. Moreover, they also worried about the process to ensure data privacy and data security. Patient information should be kept secure and can be accessed only if a patient provided consent to authorized person. As presented by the following example:

> "…communication blueprint between hospital, community pharmacy, and insurer must be identified. Real-time online system must be established" (M_1, P_6)
>
> "…standard protocol must be clear, agreed upon by the involving healthcare practitioners and must be supported by law" (M_2).

Service quality assurance

Pharmacists are very well accepted by consumers and physicians as drug experts. Quality standards required to provide pharmacy service are pharmacist

licensure and community pharmacy license granted to pharmacist and community pharmacy, respectively. These two minimum standards allow pharmacist to provide pharmacy services, however, some concerns were raised by consumers, physicians and even pharmacists themselves upon providing extended services. Services not previously provided in community pharmacy (e.g. *immunisation*), or service that required complex knowledge and skills (e.g. *MMS, smoking cessation, promotion of healthy lifestyle, weight management*) should be provided only by trained or certified pharmacists. The example of statements from three informants groups were as follows:

> "…community pharmacist needs to pass specific training, or be certified to ensure their special skills" (C_9)
>
> "…to provide service such as immunisation, smoking cessation, weight management, alcohol
> screening and opioid substitution services one need to attend workshop, trained, or certified" (P_3)
>
> "....in medicine, physicians must be certified for their specialties, so do the pharmacists must be
> certified for each extended service" (M_4)

Pharmacy readiness

Community pharmacy is perceived by the NHSO that they can alleviate hospital overcrowding problem. Pharmacist informants also agreed that they could provide several services, although, many concerns were raised such as inadequate manpower in community pharmacy, increased cost to set up additional infrastructure, not enough space for service requiring private counseling, not enough equipment and less management experience with infectious waste. As some community pharmacists stated:

> "…many extended services take more time to deliver, and one pharmacist is not enough to
> provide extended services" (P_6)
>
> "…have to invest in human resource, additional instruments and IT system" (P_7).

Scope of professional responsibility

Professional responsibility was mentioned by physicians and pharmacists as a framework for decision making about which extended services should be provided in

community pharmacy. Services considered directly related to pharmacist's expertise e.g. *MMS and return of unwanted medicine* were highly supported to be provided in community pharmacy. Physicians, however, identified that *immunisation* and *disease screening* were out of scope of pharmacy profession and the services should be provided by physicians or nurses. As some physicians stated:

> "…it was said in the law that pharmacists cannot touch the patient" (M_3)
>
> "…providing immunisation is not a pharmacy practice and it's not in pharmacy curriculum" (M_7, M_{13})

Miscellaneous factor

Reasons that could not be grouped in the six previous themes, but raised by informants were expressed as miscellaneous factors. A few physicians proposed that to implement any extended services in community pharmacy, there should be prove of evidence that a particular service result in good clinical, humanistic or economic outcomes. Consumers expressed that the services should be put in public insurance benefit package, and should be provided free of charge. All parties stated that detailed procedure should be set e.g. who are the eligibility to receive a particular service, how to access to the service, and what are key performance indicators for those providing service.

Phase II study

The second phase study aims to determine factors affecting community pharmacists' intention to provide medication management program (MMP) and disease screening (DS) based on diffusion of innovations theory. The study was conducted during 18 January - 1 February 2016. A total of 302 questionnaires were returned including 138 completed questionnaires and 164 undeliverable questionnaires. Of these completed questionnaires which generated response rate 5.52%, 120 cases met the inclusion criteria. In particular for DS, four cases were excluded due to many missing data. Therefore, data analysis for DS was based on 116 cases.

Validity and reliability of measurement scales were evaluated. The exploratory factor analysis was used to access the construct validity of the questionnaire and to combine the highly associated variables into a factor. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was greater than 0.6 (MMP = 0.731, DS = 0.738). The

Bartlett's test of sphericity showed significance less than 0.05. These parameters were considered acceptable for data for factor analysis. The principal component analysis method was used for factor extraction with varimax rotation procedure. The component matrix output excluded items with factor loading less than 0.3 which revealed 12 components and 11 components with Eigenvalues greater than 1 that explained 73.1% and 73.7% of total variance for MMP and DS, respectively. Compatibility was divided into two components for pharmacy profession framework and routine work procedures. Two new compatibility constructs were re-operationalised as following definition.

- **Compatibility with pharmacy profession framework** – the level of new extended services which community pharmacists perceived consistent with existing work conditions, particular with scope of professional pharmacy act.
- **Compatibility with routine work procedure** - the level of new extended services which community pharmacists perceived consistent with their routine dispensing work procedures.

The factors that explained the least amount of variance were removed. Consequently, seven major factors were focused on. Reliability of the adjusted measurement scales were reported through Cronbach's alpha which ranged from 0.768 - 0.873 for MMP and 0.794 - 0.886 for DS.

Table 13 KMO and Bartlett's Test results

KMO and Bartlett's Test		**MMP**	**DS**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.731	0.738
Bartlett's Test of	Approx. Chi-Square	3231.611	3659.926
Sphericity	df	946	946
	Sig.	0.000	0.000

Table 14 Reliability analysis for MMP questionnaire items

Factor name	Conceptual framework		Factor analysis	
	N of Items	Cronbach's Alpha	N of Items	Cronbach's Alpha
Relative advantage	**5**	**0.848**	5	0.848
Compatibility	**11**	**0.804**	-	-
Compatibility with pharmacy profession framework	-	-	5	0.79
Compatibility with routine work procedure	-	-	5	0.873
Complexity	**11**	**0.784**	9	0.778
Observability	**6**	**0.863**	4	0.856
Significant others' opinions	**4**	**0.768**	4	0.768
Pharmacy readiness	**7**	**0.721**	6	0.774
Sum	**44**		**38**	

Table 15 Reliability analysis for DS questionnaire items

Factor name	Conceptual framework		Factor analysis	
	N of Items	Cronbach's Alpha	N of Items	Cronbach's Alpha
Relative advantage	**5**	**0.886**	5	0.886
Compatibility	**11**	**0.849**	-	-
Compatibility with pharmacy profession framework	-	-	5	0.842
Compatibility with routine work procedure	-	-	5	0.837
Complexity	**11**	**0.805**	10	0.794
Observability	**4**	**0.843**	2	0.872
Significant others' opinions	**6**	**0.864**	6	0.864
Pharmacy readiness	**7**	**0.816**	6	0.861
Sum	**44**		**39**	

Demographic characteristic

Majority of community pharmacist respondents were female (54.2%) and the average age of respondents in this study was 42.91 $\pm$ 13.53 years old. Most of the respondents graduated with a Bachelor's degree (66.7%) and had work experiences in community pharmacies more than 6 years (63.2%). The community pharmacies mainly located in residential area (79.3%) and 69.1% were single pharmacies. Only 21.4% of the community pharmacy respondents earned the accreditation through the community pharmacy development and accreditation program by the Pharmacy Council. Most community pharmacists who responded to this study were pharmacy owner (63.6%) and 83.3% had only one community pharmacist on duty. Table 16 shows the demographic characteristics of all respondents that were included in this study.

Table 16 Demographic characteristic

Characteristic (n=120)	*n* (%)
Sex Male : Female	54:64 (45.8%:54.2%)
Age Mean ± SD (Range)	42.91 ± 13.53(25-86)
Education	
Bachelor's degree	78 (66.7%)
Pharm D.	7 (6.0%)
Master's degree	32 (27.4%)
Community pharmacy experience	
< 1	4 (3.4%)
1-4	20 (17.1%)
4-6	19 (16.2%)
>6	74 (63.2%)
Community pharmacy location	
Residential area	92 (79.3%)
Working/office area	13 (11.2%)
Shopping area	11 (9.5%)
Type of community pharmacy	
Single : Chain / Franchise	76:34 (69.1%:30.9%)
Accredited pharmacy	25 (21.2%)
Pharmacy ownership	75 (63.6%)
Number of pharmacists per store	
1	100 (83.3%)
2	17 (14.2%)
> 2	3 (2.5%)

Knowledge of service

Comparing between two extended services, result demonstrated that community pharmacists were more familiar with DS (59.48%) than medicine management program (MMP) (19.17%). When considered from knowledge on standard procedure, there were 20 (16.67%) and 42 (36.21%) community pharmacists who actually knew all steps in providing medicine management program and disease screening respectively.

Table 17 Knowledge of service

Known report	MMP (n=120)	DS (n=116)
Reported as known service	23 (19.17%)	69 (59.48%)
Reported as known all procedure	20 (16.67%)	42 (36.21%)

Table 18 Actual practice on Medicine management procedure based on known reported.

Procedure	Actual practice based on Known reported
Review	3/20 (15.00%)
Record	6/21 (28.57%)
Action plan	14/21 (66.67%)
Intervention & Referral	16/22 (72.73%)
Documentation and follow up	1/20 (5.00%)

Table 19 Actual practice on Disease screening procedure based on known reported

Procedure	Actual practice based on Known reported
Screen people at risk	23/56 (41.07%)
Screening from checklist	6/53 (11.32%)
Referral & follow up	27/59 (45.76%)
Counseling people with high risk to disease	51/59 (86.44%)
Documentation	2/45 (4.44%)

Intention to provide new extended services

Community pharmacists reported their intention to provide MMP and DS in their pharmacies as presented in Table 20. Around one-fourth of respondents had high intention to provide MMP (24.10%) and DS (27.60%) within a year. Most respondents had intention to provide MMP (75.90%) and DS (72.40%) in more than one year or longer. The respondents had more intention to provide DS rather than MMP.

Table 20 Intention to provide MMP and DS

Intention to provide MMP	MMP (N=120)	DS (N=116)
No intention	25.0%	20.7%
> 1 year	50.8%	51.7%
Within 1 year	15.8%	15.6%
Within 6 month	5.8%	6.0%
Within 1 month	2.5%	6.0%

Description of key variables affecting intention to provide MMP and DS

Overall, observability (MMP=3.42 ± 0.14, DS =3.53 ± 0.01) had the highest mean scores among all factors. Relative advantage (MMP=3.33 ± 0.31, DS=3.26 ± 0.36) and compatibility with pharmacy profession framework (MMP=3.16 ± 0.11, DS=3.16 ± 0.11) were in the high range. Complexity for providing MMP (3.00 ± 0.24) was in the borderline high range whilst DS (2.80 ± 0.29) was in moderate range. Compatibility with routine work procedures (MMP=2.68 ± 0.28, DS=2.73 ± 0.27) was in moderate range of mean scores. Significant others' opinions (MMP=2.40 ± 0.22, DS=2.59 ± 0.24) were in a quite low range of mean scores. Pharmacy readiness (MMP=2.12 ± 0.26, DS=2.17 ± 0.25) were in the low range of mean scores as presented in Table 21.

Table 21 Mean scores for each factor affecting intention to provide MMP and DS

Factors	MMP (n=120)	DS (n=116)
	Mean ± SD (min, max)	Mean ± SD (min, max)
Observability	3.42 ± 0.14 (3.23, 3.55)	3.53 ± 0.01 (3.53, 3.54)
Relative Advantage	3.33 ± 0.31 (2.80, 3.61)	3.26 ± 0.36 (2.64, 3.54)
Compatibility with pharmacy profession framework	3.16 ± 0.11 (3.06, 3.34)	3.16 ± 0.11 (3.06, 3.34)
Complexity	3.00 ± 0.24 (2.58, 3.23)	2.80 ± 0.29 (2.22, 3.09)
Compatibility with routine work procedures	2.68 ± 0.28 (2.43, 3.02)	2.73 ± 0.27 (2.35, 3.11)
Significant others' opinions	2.40 ± 0.22 (2.18, 2.63)	2.59 ± 0.24 (2.29, 2.86)
Pharmacy readiness	2.12 ± 0.26 (1.80, 2.46)	2.17 ± 0.25 (1.86, 2.44)

In general, DS obtained the higher mean scores than MMP in observability, compatibility with routine work procedures, significant others' opinions and pharmacy

readiness. Respondents gave high scores to observability of DS in warning people for their risk of disease. They also agreed that DS procedures were more compatible with dispensing work than MMP. Documentation process was given the lowest compatibility scores in this domain. For significant others' opinions, respondents mostly agreed with physicians' opinions rather than patients' opinions. The statement which was most agreed, was that physicians always ignored screening results from community pharmacy and did the duplicate screening. Pharmacy readiness got the lowest scores from respondents in both MMP and DS, particularly in readiness for supporting technology and information system to manage patient information. The given scores for having enough staff and time to provide extended services were low also. Some respondents agreed that they had enough knowledge and skill, and appropriate area for providing both MMP and DS, but the domains' scores were still very low compared with other factors.

MMP had the higher mean scores than DS for relative advantage and complexity domains. Relative advantage for MMP was agreed to reveal community pharmacists' roles and strengthen community pharmacy profession. For complexity, provision of MMP was agreed on higher skill and knowledge requirement rather than dispensing service. However, respondents had low agreement with certification examination as a condition for providing extended services. Review and prepare patients' record, and documentation were identified as the most difficult procedures in providing both services. The mean scores of compatibility with pharmacy profession framework in both services were equal, but were higher than compatibility with routine work procedures domain. Respondents highly agreed for compatibility with pharmacy profession framework that the scope of providing MMP and DS must comply with the professional pharmacy act.

Relative Advantage

The study results showed that most community pharmacists strongly agreed with advantage of proving MMP and DS beyond dispensing service. They mostly agreed with that would reveal community pharmacists' roles and strengthen community pharmacy profession. The increasing of customers' turnover and pharmacy reputation were also highlight. However, almost half of respondents disagreed with that will make more profits from providing MMP and DS.

Table 22 Relative advantage scores

How do you agree with the following statement?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
Providing MMP …						**3.33**
Q1: Reveal pharmacist's roles	67.5%	25.8%	6.7%	0.0%	3.61	
Q2: Increase the number of returned customers	49.2%	40.8%	10.0%	0.0%	3.39	
Q3: make people in nearby community to better know my pharmacy	50.0%	37.5%	12.5%	0.0%	3.38	
Q4: Increase the profit	22.5%	36.7%	39.2%	1.7%	2.8	
Q5: Strengthen community pharmacy profession	56.7%	35.0%	8.3%	0.0%	3.48	
Providing DS …						**3.26**
Q1: Reveal pharmacist's roles	59.5%	36.2%	3.4%	0.9%	3.54	
Q2: Increase the number of returned customers	45.7%	41.4%	12.1%	0.9%	3.32	
Q3: make people in nearby community to better know my pharmacy	49.1%	40.5%	8.6%	1.7%	3.37	
Q4: Strengthen community pharmacy profession	55.2%	34.5%	8.6%	1.7%	3.43	
Q5: Increase profit	18.1%	34.5%	40.5%	6.9%	2.64	

Compatibility

This study divided compatibility measurement into two subdomains related to existing work conditions and routine work practice.

Compatibility with pharmacy profession framework

Overall, the respondents focused on compatibility with pharmacy profession framework rather than that with routine work procedures. The most concern was that a scope of providing both MMP and DS services must be complied with professional pharmacy act. They agreed that patient will be more easily accessed these services from community pharmacy than hospitals. Provision of new services should not be inconsistent with routine work. The less concerns were about compatibility of new services with pharmacy's goal and redundancy with other health professional roles.

Compatibility with routine work procedure

Community pharmacists were in low agreement for compatibility of new services with routine dispensing procedures. In general, respondents perceived DS procedures as more compatible with dispensing work than MMP. Counseling high risk patients in DS procedures were accepted as most compatible with dispensing work. Meanwhile, providing action plan and intervention including referral in MMP procedures were agreed as most compatible. However, many MMP and DS procedures

were opposed to be compatible with their routine work particularly review and prepare patients' record, screening patients from standard checklist and documentation.

Table 23 Compatibility with pharmacy profession framework scores

How do you agree with the following statement?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
Providing MMP …						**3.16**
Q1: Compatible with my pharmacy's goal	30.0%	47.5%	20.8%	1.7%	3.06	
Q2: Not conflict with routine dispensing service	35.0%	45.0%	16.7%	3.3%	3.12	
Q3: Patients have convenience access rather than hospital	36.7%	45.8%	15.0%	2.5%	3.17	
Q4: Comply with professional pharmacy act	45.0%	45.0%	9.2%	0.8%	3.34	
Q5: Not redundant with other healthcare professional roles	38.3%	38.3%	21.7%	1.7%	3.13	
Providing DS will…						**3.16**
Q1: Compatible with goal of my pharmacy	31.0%	45.7%	21.6%	1.7%	3.06	
Q2: Not conflict with routine dispensing service	35.3%	46.6%	16.4%	1.7%	3.16	
Q3: Patients have convenience access rather than hospital	39.7%	41.4%	14.7%	4.3%	3.16	
Q4: Comply with professional pharmacy act	45.7%	43.1%	11.2%	0.0%	3.34	
Q5: Not redundant with other healthcare professional roles	34.5%	40.5%	21.6%	3.4%	3.06	

Table 24 Compatibility with routine work procedures scores

How do you agree that each work procedure is compatible with routine dispensing service?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
MMP Procedure						**2.68**
Q1: Review patients' information	11.7%	38.3%	37.5%	12.5%	2.49	
Q2: Preparing record for individual patient	10.0%	40.0%	32.5%	17.5%	2.43	
Q3: Provide action plan to optimize use of medicines	21.7%	54.2%	21.7%	2.5%	2.95	
Q4: Intervention and referral	30.0%	44.2%	23.3%	2.5%	3.02	
Q5: Documentation and follow up	16.7%	36.7%	30.0%	16.7%	2.53	
DS Procedure						**2.73**
Q1: Screen people at risk	19.0%	46.6%	27.6%	6.9%	2.78	
Q2: Disease screening from checklist	16.4%	41.4%	31.9%	10.3%	2.64	
Q3: Referral & follow up	20.7%	42.2%	31.9%	5.2%	2.78	
Q4: Counseling people with high risk to disease	31.0%	50.0%	18.1%	0.9%	3.11	
Q5: Documentation	10.3%	33.6%	37.1%	19.0%	2.35	

Observability

Among all these factors, observability got the highest agreement from community pharmacist respondents. This could reflect to its strong influence on their intention to provide new services. Most community pharmacists perceived MMP

outcomes in terms of reducing drug use problems in patients, improve patient health outcomes and increase continuity of care. For DS outcome, there were high agreement with that DS could be useful for warning people for their risk of disease. The high risk patients would be detected and benefit from receiving treatment at the early stage of disease.

Table 25 Observability scores

How do you agree with the following statement?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
Providing MMP …						**3.42**
Q1:Reduce drug used problem in patients	61.7%	31.7%	6.7%	0.0%	3.55	
Q2:Improve patient health outcome	57.5%	36.7%	5.0%	0.8%	3.51	
Q3:Increase continuity of care	50.0%	42.5%	5.8%	1.7%	3.41	
Q4:Help physicians to recheck the proper use of medicines in patients	36.7%	51.7%	9.2%	2.5%	3.23	
Providing DS…						**3.53**
Q1:Warning patient for their risk for disease	57.8%	37.1%	5.2%	0.0%	3.53	
Q2:Patients with high risk for disease can receive treatment at the beginning stage	62.1%	31.0%	6.0%	0.9%	3.54	

Complexity

The study results revealed that complexity of new work conditions get the higher agreement than complexity of new work procedures for both services. This indicated high impact of complexity of new work condition towards community pharmacists' intention. Provision of MMP was perceived as more complicated than DS. Community pharmacists considered MMP work conditions as more complex than DS. They emphasized on higher skill and knowledge requirement rather than dispensing service. Conversely, requirements for training and certification examination for both services were underrated. It demonstrated that most community pharmacists did not prefer any certification process as condition to provide new services. Most of DS procedures included screening people at risk, disease screening from checklist, referral and follow up, and counseling high risk patients were typically perceived as less complex. Review and prepare patient record, and documentation still be identified as the most difficult procedure in providing both services.

Table 26 Complexity of new work conditions scores

How do you agree with the following statement?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
Providing MMP …						**3.00**
Q1:Need higher knowledge than dispensing service	43.3%	31.7%	21.7%	3.3%	3.15	
Q2:Need higher skills than dispensing service	42.5%	34.2%	20.8%	2.5%	3.17	
Q3:I need to pass training	36.7%	37.5%	17.5%	8.3%	3.03	
How do you agree that each work procedure is complicated?						
Q1: Review patients' information	35.8%	46.7%	15.0%	2.5%	3.16	
Q2: Preparing record for individual patient	28.3%	49.2%	20.8%	1.7%	3.04	
Q3: Provide action plan to optimize use of medicines	13.3%	36.7%	46.7%	3.3%	2.60	
Q4: Intervention and referral	15.8%	34.2%	42.5%	7.5%	2.58	
Q5: Documentation and follow up	38.3%	48.3%	11.7%	1.7%	3.23	
Q6: Overall, MMP procerdure are complicated	22.5%	55.8%	21.7%	0.0%	3.01	
Providing DS will…						**2.80**
Q1:Need higher knowledge than dispensing service	34.5%	38.8%	23.3%	3.4%	3.04	
Q2:Need higher skills than dispensing service	34.5%	43.1%	19.8%	2.6%	3.09	
Q3:I need to pass training	25.0%	50.9%	17.2%	6.9%	2.94	
Q4:I need to pass the certification examination	13.8%	35.3%	30.2%	20.7%	2.42	
How do you agree that each work procedure is complicated?						
Q1: Screen people at risk	12.9%	53.4%	27.6%	6.0%	2.73	
Q2: Disease screening from checklist	17.2%	50.9%	25.9%	6.0%	2.79	
Q3: Referral & follow up	24.1%	43.1%	24.1%	8.6%	2.83	
Q4: Counseling people with high risk to disease	8.6%	26.7%	43.1%	21.6%	2.22	
Q5: Documentation	34.5%	42.2%	20.7%	2.6%	3.09	
Q6: Overall, DS procerdure are complicated	14.7%	55.2%	28.4%	1.7%	2.83	

Significant others' opinions

Significant others' opinions as perceived by individual community pharmacist referred to opinions from key stakeholders regarding community pharmacist providing new extended service. Key stakeholders could be patients, physicians and other healthcare professionals. The negative feedback from stakeholders could affect community pharmacists' intention. This study results demonstrated that physicians' opinions had more effected on community pharmacists' intention rather than patients' opinions. Community pharmacist felt that physicians did not confident in their knowledge to provide MMP. They perceived that physicians preferred community pharmacist to provide dispensing service thoroughly rather than MMP. As well as DS, community pharmacist stated hospital always ignored their screening result and do

another tests instead. There were some concerns from physicians about false negative results from disease screening by community pharmacist which have negative impact to patient. As for patients' feedback about their unconfident to get MMP and DS service at community pharmacies or impact to patient-physician relationship were less concerned for respondents.

Table 27 Significant others' opinions scores

How do you agree with the following statement?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
Providing MMP						**2.40**
Q1:Physicians are not confident in my knowledge for providing MMP	15.8%	40.0%	35.8%	8.3%	2.63	
Q2: Physicians comment that I shouldn't provide MMP due to dispensing service is not completely done.	17.5%	31.7%	38.3%	12.5%	2.54	
Q3:Patients are not confident to receive MMP service from my pharmacy	5.8%	26.7%	51.7%	15.8%	2.23	
Q4:Patient worry about good relationship with physician if they receive MMP service at my pharmacy	9.2%	24.2%	42.5%	24.2%	2.18	
Providing DS						**2.59**
Q1:Physicians worry about false negative screening result which negatively impact with patients	23.3%	43.1%	26.7%	6.9%	2.83	
Q2:Physicians comment that DS checklist at community pharmaciy is not standardised	14.7%	41.4%	33.6%	10.3%	2.60	
Q3:Physician comment that DS is physicians' role only	25.0%	26.7%	35.3%	12.9%	2.64	
Q4:Patients are not confident to receive DS service from my pharmacy	6.9%	27.6%	53.4%	12.1%	2.29	
Q5:Patient comment that DS is not community pharmacists' role	12.1%	26.7%	44.0%	17.2%	2.34	
Q6:Hospital ignore DS result from my community pharmacy	21.6%	48.3%	25.0%	5.2%	2.86	

Pharmacy readiness

Pharmacy readiness referred to the ability of community pharmacy in supporting adoption of new extended service as perceived by individual. The new extended services that fits with pharmacy's structure, supporting technologies, staff and financial resource, is more likely to be adopt. This study resulted indicated that pharmacy readiness factor got the lowest agreement from respondents in both service. Particularly readiness for supporting technology and information system to manage patient information and lack of manpower were highlighted. Although community

pharmacists indicated that they had enough knowledge, skill and private area for providing both MMP and DS but level of agree were still low comparing with other factors.

Table 28 Pharmacy readiness scores

How do you agree with the following statement?	4 Strongly agree	3	2	1 Strongly disagree	Avg. Item Score	Avg. Domain Score
Providing MMP						**2.12**
Q1:I have enough knowledge to provide MMP	9.2%	40.8%	36.7%	13.3%	2.46	
Q2:I have enough skill to provide MMP	9.2%	34.2%	41.7%	15.0%	2.38	
Q3:My pharmacy has a proportion area to provide MMP	7.5%	25.8%	40.0%	26.7%	2.14	
Q4:My pharmamcy has enough staffs to provide MMP	7.5%	20.0%	40.8%	31.7%	2.03	
Q5:I have enough time to provide MMP	2.5%	22.5%	40.8%	34.2%	1.93	
Q6:My pharmacy has the information system to manage patient information for supporting MMP	2.5%	14.2%	44.2%	39.2%	1.80	
Providing DS						**2.17**
Q1:I have enough knowledge to provide DS	7.8%	35.3%	50.0%	6.9%	2.44	
Q2:I have enough skill to provide DS	6.9%	36.2%	47.4%	9.5%	2.41	
Q3:My pharmacy has a proportion area to provide DS	9.5%	31.0%	42.2%	17.2%	2.33	
Q4:My pharmamcy has enough staffs to provide DS	5.2%	19.0%	45.7%	30.2%	1.99	
Q5:I have enough time to provide DS	1.7%	27.6%	39.7%	31.0%	2.00	
Q6:My pharmacy has the information system to manage patient information for supporting DS	2.6%	20.7%	37.1%	39.7%	1.86	

Relationships of key variables

Table 29 and Table 30 showed Pearson correlation coefficient indicated the strength of the association between the two factors. For MMP, it was found that relative advantage had high correlation with compatibility with pharmacy profession framework (0.796) and observability (0.556). Compatibility with pharmacy profession framework had high correlation with observability (0.556). Complexity had correlation with pharmacy readiness (-0.493).

For DS, relative advantage had high correlations with compatibility with pharmacy profession framework (0.737) and observability (0.562). Compatibility with pharmacy profession framework had high correlation with observability (0.596). Compatibility with routine work procedures had correlation with compatibility with pharmacy profession framework (0.491). Complexity had correlation with pharmacy readiness (-0.572).

Table 29 Pearson Correlation coefficient for factors affecting intention for MMP

Factors	F1	F2	F3	F4	F5	F6	F7
F1 Relative Advantage	1.000	**0.796****	0.279**	**0.556****	0.030	0.031	0.094
F2 Compatibility with pharmacy profession framework	**0.796****	1.000	0.326**	**0.556****	0.009	0.043	0.151
F3 Compatibility with routine work procedures	0.279**	0.326**	1.000	0.361**	-0.286**	-0.111	0.387**
F4 Observability	**0.556****	**0.556****	0.361**	1.000	-0.062	-0.108	0.125
F5 Complexity	0.030	0.009	-0.286**	-0.062	1.000	0.230*	**-0.493****
F6 Significant others' opinions	0.031	0.043	-0.111	-0.108	0.230*	1.000	-0.014
F7 Pharmacy readiness	0.094	0.151	0.387**	0.125	**-0.493****	-0.014	1.000
*Correlation is significant at the 0.05 level							
**Correlation is significant at the 0.01 level							

Table 30 Pearson Correlation coefficient for factors affecting intention for DS

Factors	F1	F2	F3	F4	F5	F6	F7
F1 Relative Advantage	1.000	**0.737****	0.395**	**0.562****	0.056	-0.067	0.081
F2 Compatibility with pharmacy profession framework	**0.737****	1.000	**0.491****	**0.596****	-0.122	-0.188*	0.270**
F3 Compatibility with routine work procedures	0.395**	**0.491****	1.000	0.322**	-0.221*	0.100	0.274**
F4 Observability	**0.562****	**0.596****	0.322**	1.000	-0.071	-0.126	0.110
F5 Complexity	0.056	-0.122	-0.221*	-0.071	1.000	0.280**	**-0.527****
F6 Significant others' opinions	-0.067	-0.188*	0.100	-0.126	0.280**	1.000	-0.051
F7 Pharmacy readiness	0.081	0.270**	0.274**	0.110	**-0.527****	-0.051	1.000
*Correlation is significant at the 0.05 level							
**Correlation is significant at the 0.01 level							

The Variance Inflation Factor (VIF) was calculated to detect if multicollinearity exists. The VIF values for all factors were less than 4 which considered acceptable. However, relative advantage highly correlated with compatibility with pharmacy profession framework as 0.796 and 0.737 in MMP and DS, respectively. Therefore, relative advantage was discarded to reduce the impact of multicollinearity which may occur. Finally, compatibility with pharmacy profession framework, compatibility with routine work procedures, observability, complexity, significant others' opinions and pharmacy readiness were included for logistic regression analysis.

Factors affecting intention to provide MMP and DS

The simple logistic regression was used to determine impact of each potential factor toward community pharmacists' intention to provide MMP and DS as presented in Table 31 and Table 32. The result from univariate analysis indicated that compatibility with pharmacy profession framework (MMP; OR=3.822; 95% CI=1.632-8.947, DS; OR=3.832, 95% CI=1.717-8.554), compatibility with routine work procedures (MMP; OR=2.591; 95% CI=1.362-5.065, DS; OR=2.138, 95% CI=1.106-4.134) and observability (MMP; OR=2.700, 95% CI=1.081-6.740, DS; OR=3.365,

95% CI=1.323-8.559) had significant positive impact on intention to provide MMP and DS. Pharmacy readiness (MMP; OR=2.361, 95% CI=1.093-5.102) had significant positive impact on intention to provide MMP only. Complexity (DS; OR=0.291, 95% CI=0.114-0.743) had significant negative impact on intention to provide DS only. Significant others' opinions which had non-significant impact on intention to provide MMP and DS with the least magnitude, was not included for multivariate analysis. Demographic characteristics of respondents had no significant effect on intention to provide both services.

Multiple logistic regression was used to identify factors that best predicted community pharmacists' intention to provide MMP and DS. With the sample size of 120 respondents for MMP, Table 31 showed that compatibility with pharmacy profession framework, compatibility with routine work procedures, observability and pharmacy readiness had positive effects on intention to provide MMP while complexity had a negative effect on intention to provide MMP. Only compatibility with pharmacy profession framework had statistically significant effect on intention to provide MMP (OR=2.995, 95% CI=1.034-8.671). The result showed that if one unit of compatibility with pharmacy profession framework increases, respondents will increase intention to provide MMP 2.995 times when controlled for other variables to be constant. Observability was less likely to impact intention to provide MMP because the odds ratio was close to 1.

Table 31 Univariate and Multivariate comparison of MMP

Factors	Univariate			Multivariate		
		95% CI			95% CI	
	OR	Lower	Upper	Adj OR	Lower	Upper
Compatibility with pharmacy profession framework	**3.822****	1.632	8.947	**2.995***	1.034	8.671
Compatibility with routine work procedures	**2.591****	1.326	5.065	1.642	0.754	3.575
Observability	**2.700***	1.081	6.740	1.145	0.356	3.679
Complexity	0.555	0.224	1.377	0.764	0.255	2.285
Significant others' opinion	1.294	0.693	2.416	-	-	-
Pharmacy readiness	**2.361***	1.093	5.102	1.572	0.601	4.109

* Statistically significant at p value < 0.05

** Statistically significant at p value < 0.01

As for DS, with the sample size of 116 respondents, results in Table 32 indicated that compatibility with pharmacy profession framework, compatibility with routine work procedures and observability had positive effects on intention to provide DS while complexity and pharmacy readiness had negative effects on intention to provide DS. Only complexity had statistically significant effect on intention to provide DS (OR=0.328, 95% CI=0.111-0.968) when controlled for other variables to be constant. It means that the change of one unit of complexity decreased intention to provide DS 67.2%. The odds ratio of compatibility with routine work procedures procedure and pharmacy readiness were close to 1 which indicated the less relationship of these two factors with intention to provide DS.

Table 32 Univariate and Multivariate comparison of DS

Factors	Univariate			Multivariate		
		95% CI			95% CI	
	OR	Lower	Upper	Adj OR	Lower	Upper
Compatibility with pharmacy profession framework	**3.832****	1.717	8.554	2.644	0.926	7.550
Compatibility with routine work procedures	**2.138***	1.106	4.134	1.123	0.518	2.433
Observability	**3.365***	1.323	8.559	1.670	0.534	5.225
Complexity	**0.291****	0.114	0.743	**0.328***	0.111	0.968
Significant others' opinion	0.773	0.418	1.429	-	-	-
Pharmacy readiness	1.815	0.920	3.580	0.846	0.359	1.992

* Statistically significant at p value < 0.05

** Statistically significant at p value < 0.01

CHAPTER V
DISCUSSION

Phase I study

The first phase study investigated consumers', physicians' and community pharmacists' knowledge and their opinions towards the extended community pharmacy services. Currently, ten extended community pharmacy services used in this study have been wildly provided in several countries. However, the study results demonstrated that many consumers don't aware about availability of the extended services in community pharmacy and which pharmacy could provide the extended services. In other countries where the extended services have been implemented already were facing the similar obstacles. A recent study demonstrated that service publicity as lack of promotion and advertisement material are barriers to service utilization from all stakeholders. In order to increase service publicity, government and community pharmacy should have announcement for these necessary information once the service was implemented in Thailand. This should be included the official announcement that community pharmacy was mandated to provide medicine management service as well.

Not all services already provided in developed country fit with Thailand context. Results from the study showed that only some services such as *MMS, return of unwanted medicine, lifestyle modification and disease screening* were well accepted by consumers, physicians and pharmacists.

Among the six themes extracted, "perceived benefit and barriers", and "scope of professional responsibility" were the two themes that provided differentiation power to identify which service should or should not be provided in community pharmacy. The themes such as "system readiness", "service quality assurance" and "pharmacy readiness" were useful for the government and public insurance program to better prepare healthcare system infrastructure which include IT system, standards code, standard data flow, data privacy and security, system update and maintenance. Health insurer also have to decide criteria for identify eligibility who can access to specific service, and set up detailed standard operating procedure. Community pharmacies must

ensure themselves to meet insurer's quality standard in order to join the program if extended services were launched.

Medication management service is one of the main activities according to three year strategic plan as supported by NHSO in cooperation with the pharmacy council and FDA. NHSO tried the best to promote medication management service but unexpectedly, most of community pharmacists do not familiar with medication management service. Some community pharmacists reported knowing this service but don't know all the scope of practice actually. This is because medicine management service was not put in the curriculum. Community pharmacists have never passed the training and didn't have experiences in service provision. In other countries, community pharmacists reported high confidence for their competency to provide the extended services. Anyway, they still needed some more training due to complex knowledge requirement in providing new extended services. Therefore, the additional activities in order to enhance their self-confident and add up experience are needed. These including special training course, academic conference, workshop and investigation from others' best practice. Additionally, community pharmacists also needed collaboration from physician in providing service as multidisciplinary team. In order to enhance physicians' collaboration of the extended community pharmacy services, the supporting system for a good communication and feedback between hospital and community pharmacy must be developed. Consumers also reported that they didn't recognize about medicine management service before. In many countries, both consumers and physicians lacked of awareness on availability of medication management services in community pharmacies and this appears to have further affected utilization of the extended services by community pharmacists.

Return of unwanted medicines also got highly supported from most informants. Benefits of the retuned of unwanted medicines were raised including the returned medicines can be donated to those who cannot afford the price. However, physicians in this study concerned about patients' storage of medicines which may not be kept in good condition. The quality of returned medicines may be under qualified. In Thailand, most hospitals dispense the returned medicines to patients who needed with limited budgets particularly chronic disease patients. This will help in reducing healthcare costs of hospital as well. According to Hospital Accreditations standard, hospital must have

standard practice to evaluate quality of the returned medicines whether can be reused or must be destroyed. The standard practice must be cleared among stakeholder to the same direction when this service will be implemented in Thai community pharmacy. Many studies demonstrated that consumers has positive views and support for medicines take back service in community pharmacy (47). Generally, consumers always destroy their unwanted medicines by throwing in garbage, sink and toilets which these methods have negative impact to community environment. Pharmacists will be the most appropriated healthcare professional who have potential to take responsible for management the disposal of unused or expired medicines including the packaging waste. The responsibilities are not only taken care of the proper disposal but also educate consumers and other healthcare professionals for appropriate use of medicines and properly methods for disposal of unwanted medicines (48). In Australia and UK, the return of unwanted medicines services in community pharmacy has been funded by government so consumers have no need to pay for service fee. However, The community pharmacists in some countries such as New Zealand reported lack of knowledge of proper disposal methods and needed government support for providing this service (49).

The less agreed services such as alcohol screening with brief intervention, opioid substitution, immunization and needle & syringe exchange revealed some barriers on providing these extended services in community pharmacy. These factors including scope of professional responsibility, pharmacy readiness, service quality assurance and legal issues. Even all groups known Immunization service 100% but there are many concerns form all groups if community pharmacists will provide this service. Community pharmacists in some countries were required training or specific competency assessment certificate as a condition to provide medical injection and immunization (4-7). As well as alcohol screening with brief intervention, opoid substitution and needle services which also got very low knowledge score. The feasibility studies conducted in USA, Russia, Vietnam, China, Canada and Mexico to investigate laws, policies and barriers to extend this service demonstrated that people who injected drug preferred a number of extended services delivered by community pharmacies such as needle and syringe distribution, disposal of used needle and syringe, methadone or the other opioid substitution, provision of naloxone for overdose

prevention and counseling service. In these countries, there are no legal barriers for distribution of needle and syringe but for disposal of used needle and syringe at community pharmacy in Russia required license while the rest countries are no need. However, methadone and other opioid substitution services including naloxone dispensing still faced the legal barriers in most countries. Even there is no legal issue for distribution and disposal of needle and syringe service together with other opioid substitution which can be remunerated from government in some countries but participation rate of community pharmacies is still low. Knowledge and information support, attitude of individual community pharmacist, policies support for individual pharmacy and financial support were mainly reported as barriers to extend these services (50-52). The other factors influence community pharmacies to provide these services included negative attitude and relationship with injected drug clients and professional's moral obligation (51). General public showed negative attitude towards drug users consequence by stereotyping and stigmatization. The community pharmacies users have highly concerned with appropriateness of service area in community pharmacy and would not like to share facilities with drug users (53).

In this study physicians strongly agreed that all drug related services should be provided as extended patient-oriented service in community pharmacy. The finding was well consisted with findings from Tarn MD et al, Bryant LJ et al and McMillan SS et al (42, 43, 64). Major difficulty identified by all parties in this study was how physician and pharmacist communicate to provide seamless care for their patient. Effective communication would result in more collaboration among all parties and better health outcome, but ineffective communication might lead to bad relationship. The result was compatible with findings from Bryant LJ et al and McMillan SS et al (42, 43) that physicians did not want pharmacists made recommendation to them. Although pharmacists are considered drug expert, many of them reflected that they would be more confident to provide complicated services such as MMS and lifestyle modification services if they had more training. This was also found in Lowrie R et al, Makowsky MJ et al (37, 44).

Law and culture differences also impacted on physicians' and pharmacists' perceptions for some services. Pharmacy Profession Act stated that pharmacist cannot touch a patient. According to the law, immunisation cannot be provided by pharmacist.

This is reflected in pharmacy curriculum. There is no course that teach pharmacy students to inject medicine to patients. Consumers, physicians and pharmacists also did not accepted services related to addiction behavior. In Thai culture, those who drink alcohol and use illegal drugs are considered breaking one of the minimum five Buddhist's precepts. They are viewed bad or dangerous. Thus, the services supposed to provide to addicted people are likely to be denied as pharmacists and their customers do not want to associate with addicted people.

Phase II study

Currently, MMP and DS are provided only in accredited community pharmacies who participate with NHSO pilot projects. These two services were considered as new practices for Thai community pharmacists. In this study, community pharmacists reported knowing MMP (19.17%) less than DS (59.48%). One main reason is that MMP is not integrated into Thai pharmacy curriculum. Community pharmacists had opportunity to learn MMP through continuing education program or academic conference.

This study's results demonstrated that around one-fourth of respondents had high intention to provide MMP (24.10%) and DS (27.60%) within one year. According to Roger's diffusion of innovations theory, respondents with high intention were categorised in early adopters (MMP=2.5%, DS=6.0%) and early majority category (MMP=21.6%, DS=21.6%). However, most respondents intended to provide MMP and DS in more than one year (MMP = 75.9%, DS = 72.4%) This group of respondents was consistent with the late majority category (55). Late majority people will adopt an innovation after most people adopted it. They are typically skeptical about an innovation unlike early majority people. Change agency's promotion had more influence on people in early majority and early adopters than late majority. In order to facilitate rate of MMP and DS adoption among community pharmacists, the pharmacy organisation leaders which play the important role as change agencies should have strategies to promote and encourage people in the early adopters category to adopt MMP and DS firstly. These strategies such as knowledge training and workshops, and continuing educational program should be included. Usually, the early adopters who have the highest degree of opinion leadership will provide advice and information about

new innovation to other adopters. The shared experience from early majority and early adopter people is necessary to motivate late majority people who were the large population in this study to adopt MMP and DS. Therefore, the strategies such as academic conference or publication should implement in which the experience of early majority adopters could be shared to other non-adopters for learning from current adopters. Furthermore, pre-conditions and procedures for providing MMP and DS must be uncomplicated and safe.

This study determined factors affecting community pharmacists' intention to provide MMP and DS using diffusion of innovations theory as a theoretical framework. The univariate analysis revealed the significantly positive effect of compatibility with pharmacy professional framework, compatibility with routine work procedures and observability on intention to provide MMP and DS. Pharmacy readiness had significant positive effect only for MMP. Complexity had significant negative effect on intention to provide DS only. These findings were in line with previous studies that perceived benefit, perceived compatibility and perceived complexity were most important significant predictors for extended services adoption (40, 65, 66).

When all factors were included in multiple logistic regression analysis, only compatibility with pharmacy professional framework was the significant predictor of intention to provide MMP while complexity was the best predictor for intention to provide DS. The other significant factors from bivariate analysis were not detected statistically significant in multivariate analysis due to the small sample size (67). The findings in this study emphasised that these dominant characteristics of MMP and DS must be considered when designing service model and strategies for implementation. The service model for MMP must be most compatible with professional pharmacy act, and not redundant with other healthcare professional roles. The service model for DS must be less complex particularly knowledge and skills requirement which should not be included certification examination. Documentation process must be developed to eliminate complexity.

Limitation of the studies

This is the first study in Thailand exploring consumers', physicians' and pharmacists' perception about extended patient-oriented service in community

pharmacy. Some limitations were confounded in the study. Informants from consumer and pharmacist groups contained more female than male. In consumer informant group, most of healthcare decision maker in a family are more likely to be female. In pharmacist informant group, the majority of practitioner in community pharmacy setting are female. Also, in pharmacy school, there are more female in a higher proportion (60%-75%) than male. In consumer group, most of the informants earned collage's degree with only 3 consumers had high school education. The distribution of education level in this study might not reflect Bangkokian. In this study, however, consumers with low or high education did not provide different response. All consumers were less familiar about extended patient-oriented services, and all of them had never experience this kind of service before. We found no different among those with high school education and those with at least college education in the analysis. For pharmacist group, most of them practiced in individual community pharmacy. Only 5 pharmacists practiced in chain or franchise community pharmacy setting. The two types of community pharmacies are in fact different. Chain and franchise pharmacists have more chance to participate in knowledge update workshop, or educational training supported by their head office. Their organisations have more resources, and are more likely to take lead when there is a change in professional practice, rules or law.

Limitations of the second phase study also were explored. The study was conducted in Bangkok metropolitan area where health care context was different from other provinces in Thailand. The findings from this study may not be generalised to other provinces where primary care units were distributed evenly. Most people who live in Bangkok are working people. These people don't have time to receive health services from primary care units in operation hours. They are more likely to visit community pharmacy instead due to easy access at anytime and no need for appointment. Therefore, the extended community pharmacy services should be supported for implementation in Bangkok as the potential area.

Another concern was about response rate which was lower than other studies that used postal questionnaires as data collection method. In this study, questionnaires were sent to cover the amount of required sample size. The follow up questionnaires were not sent due to limited budget. Many questionnaires were unable to be delivered due to address change or no receiver. The main reason was the obsolete address information

of community pharmacy database used. In addition, the postal delivery rate was slower than expected. These problems affected on response rate and reliability of study results.

Future research recommendations

From first phase study, certain extended services can be identified for future implementation. Study that identify which services have more impact on people's health, and country economic should also be performed so that the insurer and the government can make further decision for what select a few services for implementation at first stage. An in-depth study among community pharmacy perceived to be a leader for innovation, e.g. accredited pharmacy, chain and franchise pharmacy, should be conducted to identify gaps and barriers.

For the second phase study, future research should find the appropriate data collection methods instead of using postal questionnaires such as stratified random sampling and face to face interview, e-questionnaires or convenient sampling method. This is to increase response rate and maximise sample size for increasing power for significant detection. Furthermore, subsequent research should be conducted in accredited community pharmacies who are early adopters which participated in NHSO pilot project group to determine factors affecting their adoption of new extended services.

Since findings for the second phase study cannot be generalized to another provinces in Thailand which have the different health context from Bangkok. So, further studies should be conducted in community pharmacies in Bangkok's vicinity and the other urbanised provinces in Thailand to confirm these findings and for better generalisation.

Policy recommendations

Most of previous studies investigated consumers', physicians' and community pharmacists' opinions toward the extended patient-oriented services provided by community pharmacist in developed countries e.g Australia, Canada, Netherland, New Zealand, Scotland, UK and USA. The first phase study is the first study that assess all related stakeholders that conducted in developing country. Other developing countries, especially those with community pharmacy are not connected with official healthcare

or health insurance system could benefit from this study. Bridging concerns that consumers and physicians or even community pharmacists might have, would allow more acceptability for expanding patient-oriented services more widely in community pharmacy.

Since the findings in second phase study revealed that community pharmacist known DS rather MMP, intended to provide DS rather than MMP and perceived DS was less complicated than MMP. Therefore, DS is recommended to be the extended service that should be implemented in Bangkok at the initial stage of pilot project also.

In order to increase community pharmacists' intention to provide MMP and DS the intervention should be developed. MMP and DS business model must be included dominant characteristics of each particular service. Furthermore, the intervention in order to increase pharmacy readiness and collaboration from stakeholders must be included. NHSO should provide supporting tools such as IT infrastructure and building the capacity of pharmacy readiness.

CHAPTER VI
CONCLUSION

The first phase study revealed consumer's, physician's and pharmacist's opinions about extended services. This study suggested that easy access to services, perceived benefits and barriers, system readiness, service quality assurance, pharmacy readiness, and scope of professional responsibility were key factors for deciding which service should be provided in community pharmacy. *MMS, return of unwanted medicine, smoking cessation, promotion of healthy lifestyle,* and *weight management* were the very first services to be considered for implementation. Community pharmacy capacity building for system readiness is a crucial success factor. This is especially true for IT infrastructure establishment, communication lines establishment between physician-patient-pharmacist, increasing numbers of accredited community pharmacies and certified pharmacists, and establish appropriate remuneration system.

The second phase study provided the crucial factors which had significantly effect on community pharmacist intention to provide MMP and DS. These findings were useful for NHSO and the pharmacy organisations in strategic planning development to facilitate adoption. Most community pharmacists in this study were classified as late majority. The shared experience from current adopters and, uncomplicated and safe work procedures, are important to increase their intention to provide MMP and DS. Compatibility with pharmacy profession framework was the key characteristic of MMP and complexity was the key characteristic of DS which affected community pharmacists' intention to provide these services. To increase intention to provide MMP and DS, strategies designed by included these dominant characteristics of MMP and DS should be implemented. NHSO should provide supporting tools such as IT infrastructure and building the capacity of pharmacy readiness. The pharmacy organization and pharmacy schools should provide core knowledge through the curriculum and continuing educational program to support implementation of new extended services.

Lastly, the formal business model of the extended services and the remunerated roles of community pharmacists must be developed as tools for sustainable practice of community pharmacy profession.

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APPENDICES

Appendix A
Questionnaire

แบบสอบถาม เรื่อง ความพร้อมและความตั้งใจในการให้บริการเภสัชกรรมชุมชนรูปแบบใหม่

<u>ส่วนที่ 1</u> ความตั้งใจในการให้บริการการบริหารจัดการด้านยา (Medication Management Program; MMP) ในร้านยาที่ท่านปฏิบัติงานอยู่

<u>คำชี้แจง</u> กรุณาทำเครื่องหมาย / ในช่องคำตอบที่ตรงกับความคิดเห็นของท่านมากที่สุดและเติมข้อความในช่องว่างให้สมบูรณ์

1. ท่านรู้จักบริการ Medication Management Program หรือไม่ ( ) รู้จัก ( ) ไม่รู้จัก
2. เมื่อท่านได้ยินคำว่า Medication Management Program ท่านนึกถึงการให้บริการแบบใด (ถ้าไม่ทราบให้ข้ามไปทำข้อถัดไป)

   .....

   .....

3. ท่านทราบหรือไม่ว่า การให้บริการ Medication Management Program ประกอบด้วยขั้นตอนต่างๆ ดังต่อไปนี้

   ขั้นตอนที่ 1 รวบรวมและทบทวนข้อมูลประวัติการรักษาและการใช้ยาของผู้ป่วย (Review)

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 2 จัดทำบันทึกการใช้ยาของผู้ป่วยเฉพาะราย (Record)

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 3 วางแผนการใช้ยาที่ถูกต้องและเหมาะสมสำหรับผู้ป่วย (Action Plan)

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 4 ทำการแก้ไขปัญหาเบื้องต้นที่พบและส่งต่อแพทย์ (Intervention & Referral)

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 5 จัดเก็บข้อมูลอย่างเป็นระบบและติดตามผลการรักษาอย่างต่อเนื่อง (Documentation & Follow up)

   ( ) ทราบ ( ) ไม่ทราบ

4. ณ ปัจจุบัน ร้านยาของท่านมีการให้บริการ Medication Management Program ในขั้นตอนใดบ้างต่อไปนี้

   ขั้นตอนที่ 1 รวบรวมและทบทวนข้อมูลประวัติการรักษาและการใช้ยาของผู้ป่วย (Review)

   ( ) มี ( ) ไม่มี

   ขั้นตอนที่ 2 จัดทำบันทึกการใช้ยาของผู้ป่วยเฉพาะราย (Record)

   ( ) มี ( ) ไม่มี

ขั้นตอนที่ 3 วางแผนการใช้ยาที่ถูกต้องและเหมาะสมสำหรับผู้ป่วย (Action Plan)

( ) มี ( ) ไม่มี

ขั้นตอนที่ 4 ทำการแก้ไขปัญหาเบื้องต้นที่พบและส่งต่อแพทย์ (Intervention & Referral)

( ) มี ( ) ไม่มี

ขั้นตอนที่ 5 จัดเก็บข้อมูลอย่างเป็นระบบและติดตามผลการรักษาอย่างต่อเนื่อง (Documentation & Follow up)

( ) มี ( ) ไม่มี

5. ท่านมีความตั้งใจที่จะให้บริการ Medication Management Program ในร้านยาที่ท่านปฏิบัติงานภายในระยะเวลาเท่าใด

( ) 1 เดือน ( ) 6 เดือน ( ) 1 ปี ( ) มากกว่า1 ปี ( ) ไม่คิดที่จะให้บริการเลย

รายละเอียดบริการการบริหารจัดการด้านยา (Medication Management Program; MMP)

โดยทั่วไป MMP เป็นการให้บริการทบทวนการใช้ยาของผู้ป่วยและช่วยค้นหาปัญหาเนื่องจากการใช้ยาเพื่อช่วยส่งเสริมและจัดการดูแล ให้ผู้ป่วยสามารถใช้ยาได้อย่างมีประสิทธิภาพมากขึ้น ช่วยลดปัญหาเรื่อง ADRs ในผู้ป่วยสูงอายุ ผู้ป่วยโรคเรื้อรัง ผู้ป่วยที่มีการใช้ยาหลายชนิดพร้อมกัน ผู้ป่วยที่พึ่งออกจากโรงพยาบาล หรือผู้ป่วยกลุ่มที่มีความเสี่ยงที่จะเกิดปัญหาให้การใช้ยา ส่งเสริมให้ผู้ป่วยมีความรู้ ความเข้าใจมากขึ้น เกี่ยวกับการรักษาที่ได้รับ เพื่อให้มั่นใจได้ว่าผู้ป่วยมีการรับประทานยาตามที่แพทย์สั่งอย่างถูกต้อง อีกทั้งยังช่วยลดจำนวนยาที่เหลือใช้และไม่จำเป็นสำหรับผู้ป่วยอีกด้วย ส่งผลให้ผู้ป่วยใช้ยาได้อย่างมีประสิทธิภาพและได้รับผลการรักษาสูงสุด

<u>ส่วนที่ 2</u> ปัจจัยที่มีผลต่อความตั้งใจในการให้บริการการบริหารจัดการด้านยา (Medication Management Program; MMP) ในร้านยาที่ท่านปฏิบัติงานอยู่

<u>คำชี้แจง</u> ท่านมีความคิดเห็นอย่างไรกับข้อความด้านล่างต่อไปนี้เกี่ยวกับการให้บริการการบริหารจัดการด้านยา (Medication Management Program; MMP) ในร้านยา กรุณาทำเครื่องหมาย / ในช่องคำตอบที่ตรงกับความคิดเห็นของท่านมากที่สุดและเติมข้อความในช่องว่างให้สมบูรณ์

การให้บริการ Medication Management Program ในร้านยานั้น ...	**เห็นด้วยอย่างยิ่ง ⟷ ไม่เห็นด้วยอย่างยิ่ง**			
	4	3	2	1
1. ทำให้บทบาทเภสัชกรรมชุมชนของฉันชัดเจนมากขึ้นกว่าเดิม				
2. ทำให้ลูกค้าอยากกลับมารับบริการที่ร้านยาของฉันมากขึ้น				
3. ทำให้ร้านยาของฉันเป็นที่รู้จักของชุมชนมากขึ้น				
4. ทำให้ร้านยาของฉันมีรายได้เพิ่มขึ้น				
5. ทำให้เกิดความยั่งยืนของวิชาชีพเภสัชกรรมชุมชน				

การให้บริการ Medication Management Program **ในร้านยานั้น** ...	**เห็นด้วยอย่างยิ่ง** ⟷ **ไม่เห็นด้วยอย่างยิ่ง**			
	4	3	2	1
6. สอดคล้องกับเป้าหมายของร้านยาของฉัน				
7. ไม่ขัดแย้งกับการให้บริการจ่ายยาที่ทำอยู่เป็นประจำ				
8. เพิ่มความสะดวกให้แก่ผู้ป่วยที่มาใช้บริการเนื่องจากไม่ต้องเดินทางไปโรงพยาบาล				
9. สอดคล้องกับบทบาทตามพระราชบัญญัติวิชาชีพเภสัชกรรม				
10. ไม่ซ้ำซ้อนกับบทบาทของวิชาชีพด้านสุขภาพอื่นๆตามกฎหมาย				
11. ต้องมีการประสานงานระหว่างร้านยากับโรงพยาบาลซึ่งทำได้ยาก				
12. ช่วยลดปัญหาที่เกิดจากการใช้ยาของผู้ป่วย				
13. ช่วยทำให้ผลการรักษาของผู้ป่วยดีขึ้น				
14. ช่วยเพิ่มความต่อเนื่องในการดูแลผู้ป่วย				
15. เป็นการช่วยแพทย์ตรวจสอบความเหมาะสมในการใช้ยาของผู้ป่วย				
16. ฉันต้องใช้ความรู้สูงกว่าการให้บริการจ่ายยาที่ทำอยู่เป็นประจำ				
17. ฉันต้องใช้ทักษะสูงกว่าการให้บริการจ่ายยาที่ทำอยู่เป็นประจำ				
18. ฉันต้องผ่านการเข้าอบรมเสียก่อน				
ขั้นตอนต่างๆในการให้บริการ Medication Management Program **ในร้านยา เข้ากันได้กับการให้บริการจ่ายยาที่ทำอยู่เป็นประจำในระดับใด**	**เข้ากันได้ดีอย่างยิ่ง** ⟷ **ไม่เข้ากันอย่างยิ่ง**			
	4	3	2	1
1. การรวบรวมและทบทวนข้อมูลประวัติการรักษาและการใช้ยาของผู้ป่วย				
2. การจัดทำบันทึกการใช้ยาของผู้ป่วยเฉพาะราย				
3. การวางแผนการใช้ยาที่ถูกต้องและเหมาะสมสำหรับผู้ป่วย				
4. การแก้ไขปัญหาด้านการใช้ยาที่พบเบื้องต้นและส่งต่อแพทย์				
5. การจัดเก็บข้อมูลสุขภาพของผู้ป่วยอย่างเป็นระบบและติดตามผลการรักษาอย่างต่อเนื่อง				

ขั้นตอนต่าง ๆในการให้บริการ Medication Management Program **ในร้านยา มีความยุ่งยากสำหรับท่านในระดับใด**	**ยุ่งยากมากที่สุด◄—►ไม่ยุ่งยากเลย**			
	4	3	2	1
1. การรวบรวมและทบทวนข้อมูลประวัติการรักษาและการใช้ยาของผู้ป่วย				
2. การจัดทำบันทึกการใช้ยาของผู้ป่วยเฉพาะราย				
3. การวางแผนการใช้ยาที่ถูกต้องและเหมาะสมสำหรับผู้ป่วย				
4. การแก้ไขปัญหาด้านการใช้ยาที่พบเบื้องต้นและส่งต่อแพทย์				
5. การจัดเก็บข้อมูลสุขภาพของผู้ป่วยอย่างเป็นระบบและติดตามผลการรักษาอย่างต่อเนื่อง				
6. โดยรวมแล้วการให้บริการ MMP ตามข้อ 1-5 มีความยุ่งยากสำหรับท่านในระดับใด				
ท่านคิดอย่างไรกับข้อความต่อไปนี้เกี่ยวกับการให้บริการ Medication Management Program **ในร้านยา**	**เห็นด้วยอย่างยิ่ง ◄——►ไม่เห็นด้วยอย่างยิ่ง**			
	4	3	2	1
1. แพทย์ไม่มั่นใจในความรู้ของฉันในการให้บริการ MMP				
2. แพทย์คิดว่าฉันยังไม่ควรขยายบทบาทการให้บริการ MMP เพราะยังทำหน้าที่จ่ายยาได้ไม่สมบูรณ์				
3. ผู้ป่วยไม่มั่นใจในการมารับบริการ MMP จากฉัน				
4. ผู้ป่วยกลัวว่าการมารับบริการ MMP จากฉันจะส่งผลกระทบต่อความสัมพันธ์อันดีระหว่างผู้ป่วยกับแพทย์				
5. ขณะนี้ฉันมีความรู้เพียงพอที่จะให้บริการ MMP				
6. ขณะนี้ฉันมีทักษะเพียงพอที่จะให้บริการ MMP				
7. ร้านยาของฉันมีพื้นที่เป็นสัดส่วนสำหรับให้บริการ MMP				
8. ร้านยาของฉันมีบุคลากรเพียงพอในการให้บริการ MMP				
9. ฉันมีเวลาเพียงพอในการให้บริการ MMP				
10. ร้านยาของฉันมีระบบสารสนเทศน์ในการจัดการข้อมูลผู้ป่วยเพื่อรองรับการให้บริการ MMP				

วิธีการใดต่อไปนี้มีส่วนในการตัดสินใจที่จะให้บริการ Medication Management Program ในร้านยาของท่านมากที่สุด

( ) เมื่อท่านได้มีโอกาสเข้าร่วมสังเกตการณ์วิธีการให้บริการจากร้านยาอื่นก่อน

( ) เมื่อท่านได้มีโอกาสเข้าร่วมอบรมความรู้ที่เกี่ยวกับการให้บริการ MMP

( ) เมื่อท่านได้มีโอกาสทดลองให้บริการจากการประชุมเชิงปฏิบัติการ (workshop)

( ) เมื่อท่านได้มีโอกาสทดลองให้บริการในโครงการนำร่องของสำนักงานหลักประกันสุขภาพแห่งชาติ

ข้อเสนอแนะอื่นๆ ที่เป็นประโยชน์ต่อการให้บริการ Medication Management Program โปรดระบุ

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<u>ส่วนที่ 3</u> ความตั้งใจในการให้บริการการคัดกรองโรค (Disease Screening) ในร้านยาที่ท่านปฏิบัติงานอยู่

<u>คำชี้แจง</u> กรุณาทำเครื่องหมาย / ในช่องคำตอบที่ตรงกับความคิดเห็นของท่านมากที่สุดและเติมข้อความในช่องว่างให้สมบูรณ์

1. ท่านรู้จักการให้บริการ Disease Screening หรือไม่ ( ) รู้จัก ( ) ไม่รู้จัก

2. เมื่อท่านได้ยินคำว่า Disease Screening ท่านนึกถึงการให้บริการรูปแบบใด (ถ้าไม่ทราบให้ข้ามไปทำข้อถัดไป)

   .....

   .....

3. ท่านทราบหรือไม่ว่า การให้บริการ Disease Screening ประกอบด้วยขั้นตอนต่างๆดังต่อไปนี้

   ขั้นตอนที่ 1 คัดเลือกบุคคลที่อยู่ในกลุ่มเสี่ยงเพื่อเข้ารับการคัดกรองโรค

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 2 ดำเนินการคัดกรองโรคโดยใช้แบบประเมินความเสี่ยง

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 3 ดำเนินการส่งต่อไปพบแพทย์ที่โรงพยาบาลในรายที่มีความเสี่ยงสูงและติดตามผล

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 4 ให้คำแนะนำสำหรับผู้ที่มีความเสี่ยงในการเกิดโรคในอนาคต

   ( ) ทราบ ( ) ไม่ทราบ

   ขั้นตอนที่ 5 จัดเก็บข้อมูลอย่างเป็นระบบ

   ( ) ทราบ ( ) ไม่ทราบ

4. ณ ปัจจุบัน ร้านยาของท่านมีการให้บริการ Disease Screening ในขั้นตอนใดบ้างต่อไปนี้

   ขั้นตอนที่ 1 คัดเลือกบุคคลที่อยู่ในกลุ่มเสี่ยงเพื่อเข้ารับการคัดกรองโรค

   ( ) มี ( ) ไม่มี

   ขั้นตอนที่ 2 ดำเนินการคัดกรองโรคโดยใช้แบบประเมินความเสี่ยง

   ( ) มี ( ) ไม่มี

   ขั้นตอนที่ 3 ดำเนินการส่งต่อไปพบแพทย์ที่โรงพยาบาลในรายที่มีความเสี่ยงสูงและติดตามผล

   ( ) มี ( ) ไม่มี

   ขั้นตอนที่ 4 ให้คำแนะนำสำหรับผู้ที่มีความเสี่ยงในการเกิดโรคในอนาคต

   ( ) มี ( ) ไม่มี

ขั้นตอนที่ 5 จัดเก็บข้อมูลอย่างเป็นระบบ

( ) มี ( ) ไม่มี

5. ท่านมีความตั้งใจที่จะให้บริการการคัดกรองโรค (Disease Screening)ในร้านยาที่ท่านปฏิบัติงานภายในระยะเวลาเท่าใด

( ) 1 เดือน ( ) 6 เดือน ( ) 1 ปี ( ) มากกว่า1 ปี ( ) ไม่คิดที่จะให้บริการเลย

บริการการคัดกรองโรค (Disease Screening)

เป็นบริการคัดกรองโรคในผู้ป่วยกลุ่มเสี่ยงและประเมินความเสี่ยงในการเกิดโรคไม่ติดต่อเรื้อรังที่เป็นปัญหาสำคัญ เช่น โรคความดัน โรคเบาหวาน โรคอ้วนลงพุง เป็นต้น รวมทั้งให้คำปรึกษา แนะนำ ให้ความรู้ ในการดูแลตัวเองในผู้ป่วยที่มีความเสี่ยงที่จะเป็นโรคในอนาคต สำหรับรายที่มีความเสี่ยงสูงหรือพบว่าเป็นโรคจะดำเนินการส่งต่อไปพบแพทย์ที่โรงพยาบาลเพื่อทำการตรวจวินิจฉัยโรคอย่างละเอียดและดำเนินการรักษาต่อไป

<u>ส่วนที่</u> 4 ปัจจัยที่มีผลต่อความตั้งใจในการให้บริการการคัดกรองโรค (Disease Screening) **ในร้านยาที่ท่านปฏิบัติงานอยู่**

<u>คำชี้แจง</u> ท่านมีความคิดเห็นอย่างไรกับข้อความด้านล่างต่อไปนี้เกี่ยวกับการให้บริการการคัดกรองโรค (Disease Screening) ในร้านยา กรุณาทำเครื่องหมาย / ในช่องคำตอบที่ตรงกับความคิดเห็นของท่านมากที่สุด และเติมข้อความในช่องว่างให้สมบูรณ์

การให้บริการ Disease Screening **ในร้านยานั้น** ...	**เห็นด้วยอย่างยิ่ง** ⟷ **ไม่เห็นด้วยอย่างยิ่ง**			
	4	3	2	1
1. ทำให้บทบาทเภสัชกรรมชุมชนของฉันชัดเจนมากขึ้นกว่าเดิม				
2. ทำให้ลูกค้าอยากกลับมารับบริการที่ร้านยาของฉันมากขึ้น				
3. ทำให้ร้านยาของฉันเป็นที่รู้จักของชุมชนมากขึ้น				
4. ทำให้เกิดความยั่งยืนของวิชาชีพเภสัชกรรมชุมชน				
5. ทำให้ร้านยาของฉันมีรายได้เพิ่มขึ้น				
6. สอดคล้องกับเป้าหมายของร้านยาของฉัน				
7. ไม่ขัดแย้งกับการให้บริการจ่ายยาที่ทำอยู่เป็นประจำ				
8. เพิ่มความสะดวกให้แก่ผู้ป่วยที่มาใช้บริการเนื่องจากไม่ต้องเดินทางไปโรงพยาบาล				
9. สอดคล้องกับบทบาทตามพระราชบัญญัติวิชาชีพเภสัชกรรม				

การให้บริการ Disease Screening ในร้านยานั้น ...	**เห็นด้วยอย่างยิ่ง ⟷ ไม่เห็นด้วยอย่างยิ่ง**			
	4	3	2	1
10. ไม่ซ้ำซ้อนกับบทบาทของวิชาชีพด้านสุขภาพอื่นๆตามกฎหมาย				
11. ต้องมีการประสานงานระหว่างร้านยากับโรงพยาบาลซึ่งทำได้ยาก				
12. เป็นการเตือนให้คนไข้ได้ทราบภาวะเสี่ยงในการเกิดโรคของตนเอง				
13. ช่วยให้ผู้ที่มีภาวะเสี่ยงสูงในการเกิดโรคได้รับการรักษาแต่เนิ่นๆ				
14. ช่วยแบ่งเบาภาระงานของโรงพยาบาล				
15. ช่วยลดภาระค่าใช้จ่ายด้านสุขภาพของผู้ป่วยได้				
16. ฉันต้องใช้ความรู้สูงกว่าการให้บริการจ่ายยาที่ทำอยู่เป็นประจำ				
17. ฉันต้องใช้ทักษะสูงกว่าการให้บริการจ่ายยาที่ทำอยู่เป็นประจำ				
18. ฉันต้องผ่านการเข้าอบรมเสียก่อน				
19. ฉันต้องผ่านการสอบเพื่อได้รับใบประกาศนียบัตรเสียก่อน				
ขั้นตอนต่างๆในการให้บริการ Disease Screening ในร้านยาเข้ากันได้กับการให้บริการจ่ายยาที่ทำอยู่เป็นประจำในระดับใด	**เข้ากันได้ดีอย่างยิ่ง ⟷ ไม่เข้ากันอย่างยิ่ง**			
	4	3	2	1
1. การคัดเลือกบุคคลที่อยู่ในกลุ่มเสี่ยงเพื่อเข้ารับคัดกรองโรค				
2. การคัดกรองโรคโดยใช้แบบประเมินความเสี่ยง				
3. การส่งต่อผู้ที่มีความเสี่ยงสูงไปพบแพทย์ที่โรงพยาบาลและติดตามผล				
4. การให้คำแนะนำด้านสุขภาพแก่ผู้ที่มีความเสี่ยงในการเกิดโรคในอนาคต				
5. การจัดเก็บข้อมูลสุขภาพของผู้ป่วยอย่างเป็นระบบ				
ขั้นตอนต่างๆในการให้บริการ Disease Screening ในร้านยามีความยุ่งยากสำหรับท่านในระดับใด	**ยุ่งยากมากที่สุด ⟷ ไม่ยุ่งยากเลย**			
	4	3	2	1
1. การคัดเลือกบุคคลที่อยู่ในกลุ่มเสี่ยงเพื่อเข้ารับการคัดกรองโรค				
2. การคัดกรองโรคโดยใช้แบบประเมินความเสี่ยง				

ขั้นตอนต่างๆในการให้บริการ Disease Screening ในร้านยา มีความยุ่งยากสำหรับท่านในระดับใด	ยุ่งยากมากที่สุด ←→ไม่ยุ่งยากเลย			
	4	3	2	1
3. การส่งต่อผู้ที่มีความเสี่ยงสูงไปพบแพทย์ที่โรงพยาบาลและติดตามผล				
4. การให้คำแนะนำด้านสุขภาพแก่ผู้ที่มีความเสี่ยงในการเกิดโรคในอนาคต				
5. การจัดเก็บข้อมูลสุขภาพของผู้ป่วยอย่างเป็นระบบ				
6. โดยรวมแล้วการให้บริการ Disease screening ตามข้อ 1-5 มีความยุ่งยากสำหรับท่านในระดับใด				
ท่านคิดอย่างไรกับข้อความต่อไปนี้ เกี่ยวกับการให้บริการ Disease Screening ในร้านยา	**เห็นด้วยอย่างยิ่ง** ←→ **ไม่เห็นด้วยอย่างยิ่ง**			
	4	3	2	1
1. แพทย์กังวลว่าฉันจะคัดกรองไม่เจอผู้ป่วยที่ไม่แสดงอาการ (False negative) ซึ่งจะส่งผลเสียแก่ผู้ป่วย				
2. แพทย์เห็นว่าแบบประเมินความเสี่ยงที่ใช้ในการคัดกรองโรคของร้านยาไม่ได้มาตรฐาน				
3. แพทย์เห็นว่าการคัดกรองโรคเป็นหน้าที่ของแพทย์เท่านั้น				
4. ผู้ป่วยไม่มั่นใจในการมารับบริการ Disease Screening จากฉัน				
5. ผู้ป่วยเห็นว่าการให้บริการ Disease Screening ไม่ใช่หน้าที่ของฉัน				
6. บุคลากรในโรงพยาบาลไม่สนใจข้อมูลการคัดกรองโรคที่ส่งต่อมาจากร้านยาของฉัน				
7. ขณะนี้ฉันมีความรู้เพียงพอที่จะให้บริการ Disease Screening				
8. ขณะนี้ฉันมีทักษะเพียงพอที่จะให้บริการ Disease Screening				
9. ร้านยาของฉันมีพื้นที่เป็นสัดส่วนสำหรับให้บริการ Disease Screening				
10. ร้านยาของฉันมีบุคลากรเพียงพอในการให้บริการ Disease Screening				
11. ฉันมีเวลาเพียงพอในการให้บริการ Disease Screening				
12. ร้านยาของฉันมีระบบสารสนเทศน์ในการจัดการข้อมูลผู้ป่วยเพื่อรองรับการให้บริการ Disease Screening				

วิธีการใดต่อไปนี้มีส่วนทำให้ท่านตัดสินใจที่จะให้บริการ Disease Screening ในร้านยาของท่านมากที่สุด

( ) เมื่อท่านได้มีโอกาสเข้าร่วมสังเกตการณ์วิธีการให้บริการจากร้านยาอื่นก่อน

( ) เมื่อท่านได้มีโอกาสเข้าร่วมอบรมความรู้ที่เกี่ยวกับการให้บริการ Disease Screening

( ) เมื่อท่านได้มีโอกาสทดลองให้บริการจากการประชุมเชิงปฏิบัติการ (workshop)

( ) เมื่อท่านได้มีโอกาสทดลองให้บริการในโครงการนำร่องของสำนักงานหลักประกันสุขภาพแห่งชาติ

ข้อเสนอแนะอื่นๆ ที่เป็นประโยชน์ต่อการให้บริการ Disease Screening โปรดระบุ

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<u>ส่วนที่ 5</u> ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

<u>คำชี้แจง</u> กรุณาทำเครื่องหมาย / และเติมข้อมูลลงในช่องคำตอบตามความเป็นจริง

1. เพศ ( ) ชาย ( ) หญิง
2. อายุ ..... ปี
3. ระดับการศึกษาสูงสุดของท่าน

   ( ) ปริญญาตรี 5 ปี ( ) Pharm.D. ( ) ปริญญาโท ( ) ปริญญาเอก
4. จำนวนปีที่ท่านทำงานในตำแหน่งเภสัชกรประจำร้านยา (รวมทุกที่)

   ( ) น้อยกว่า 1 ปี ( ) 1-4 ปี ( ) 4-6 ปี ( ) มากกว่า 6 ปี
5. ร้านยาของท่านตั้งอยู่บริเวณใดในชุมชน

   ( ) ย่านที่อยู่อาศัย ( ) ย่านที่ทำงาน ( ) แหล่งช้อปปิ้ง
6. ลักษณะของร้านยา ( ) ร้านยาเดี่ยว ( ) ร้านยาลูกโซ่/ร้านแฟรนไชส์
7. เวลาเปิดทำการของร้านยา ตั้งแต่เวลา..... น. ถึงเวลา ..... น. เปิดทำการ .... วันต่อสัปดาห์
8. ร้านยาของท่านผ่านการรับรองเป็นร้านยาคุณภาพจากสภาเภสัชกรรมใช่หรือไม่

   ( ) ใช่ ( ) ไม่ใช่
9. ท่านปฏิบัติงานเป็นเภสัชกรประจำร้านยาและเป็นเจ้าของร้านยาด้วยใช่หรือไม่

   ( ) ใช่ ( ) ไม่ใช่
10. ท่านเป็นเภสัชกรผู้มีหน้าที่ปฏิบัติการตามที่ระบุไว้ในใบอนุญาตขายยาแผนปัจจุบันใช่หรือไม่

    ( ) ใช่ ( ) ไม่ใช่
11. จำนวนเภสัชกรประจำร้านที่ปฏิบัติงานจริงทั้งหมด ..... คน
12. จำนวนชั่วโมงปฏิบัติงานของท่าน ..... ชั่วโมงต่อสัปดาห์
13. จำนวนผู้มารับบริการด้านสุขภาพและการใช้ยาที่ร้านต่อวัน

    ( ) ≤ 50 ราย ( ) 51-100 ราย ( ) 100-300 ราย ( ) > 300 ราย

Appendix B

Additional results

Table 33 Reasons why informants agree or disagree for particular service to be provided in community pharmacy (Phase I study)

Theme	Informants' quotes
Access to service	"...community pharmacy opens beyond hospital office hours" (P2, C3) "...community pharmacy allows patients access anytime at their convenient" (C3, M13, P2) "…hospital is far and the queue is so very long" (P6) "…no need to make appointment" (C2) "…physician have no time to provide consultation, I can consult with nearby community pharmacy instead" (C4) "…I just want to go to hospital only if necessary, and will go only when I fell really sick" (C5) "…It is easier and less complicated than seeing doctor at hospital" (C9) "...some patients scare of physicians, they are more open to discuss with pharmacist" (M12)
Perceived benefits and barriers	
Medicines management service	"...the service helps preventing problems from taking many medicines from many doctors" (C2). "…it is easy for community pharmacist to provide service and monitor patients in their community (C16) "...patient medical record prepare under this service could help patients communicate with their doctors" (C15) "…help checking patient's compliance and adherence" (M5).

Theme	Informants' quotes
	"…help physicians detecting drug related problems in patients, counseling them with accurate information, change their unhealthy behavior" (M3, M8). "…reduce irrational use of medicine and ensure the continuity of drug use during next appointment [with physicians] particularly for chronic disease patients" (M6) "…optimized medication use in patients" (M10) "... role of community pharmacists become more apparent if provide medicine management service in community pharmacy " (P3, P5) "…gain more trust from patients and other healthcare professionals" (P2) "…medicines management service helps develop good patient-pharmacist relationship, which in returned result in trust and lead to better compliance and clinical outcome (P7, P10) "…good patient-pharmacist relationship lead to returned customer" (P1)
Return of unwanted medicine	"...don't know how to discard expired or unused medicines, normally discard them in garbage" (C9, C12) "or toilet bowl" (C16) "...it would be good if there is a public place where people can drop unwanted medicines like dropping soda can or battery" (C4, C6, C10, M4) "...medicines if wrongly discard will contaminate the environment; both water reservoir and land" (M4, P7)

Theme	Informants' quotes
	"...dispose of unused medicines prevent drug poisoning in children and protecting the elderly from taking wrong pills (C5, M3, M5, P1) "...returned medicines can be donated to those who cannot afford the price" (C2, M6)
Disease screening service	"...particularly worry about false negative result as it will mislead patients. Disease will be more progress, patient will be delay for proper care. (M2) "…hospital usually ignored the screening result from community pharmacy. We usually order another test anyway" (M6)
Alcohol screening, immunization, opioid substitution, and needle and syringe exchange services	"…not sure if pharmacist can inject medicine, usually nurse does" (C14) "…pharmacist must be aware that different vaccines administered differently" (M8) "…vaccine requires special storage temperature for its best efficacy, do community pharmacy well equipped for controlled temperature storage" (M13) "…severe allergic reaction might happen, vaccination should be done only in hospital" (M7) "…providing immunization is not in our (pharmacists) curriculum" (P2) "…by law, we (pharmacists) cannot do any procedure that touch the patient" (P3) "…drug users are felony, drugstore will not be a safe place" (C3,M5, P2) "…it's illegal to legalize such services for drug users" (C20,M1, P4)

Theme	Informants' quotes
	"…scare of unintentional stab myself with possible infected needle" (P4)
System infrastructure readiness	"…communication blueprint between hospital, community pharmacy, and insurer must be identified and IT system must be established" (M1, P6) "…at present, there is no information technology system among hospital and community pharmacy" (M5) "…if there is a communication system between hospital and community pharmacy, patients don't need to request medical record" (C10) "…hospital and pharmacy should communicate with standard forms and documents" (P4) "…provide service without practice guideline might place harm to patients" (M2) "…standard protocol must be clear, agreed upon by the involving healthcare practitioners and must be supported by law" (M2) "…all related documents and checklists must be validated and standardized (P7) "...good collaborative foundation between physicians and pharmacists should be established since they were undergraduate students. (P1) "…medical records are privacy data that must be authorized by a owner before used. (C10)
Service quality assurance	"…community pharmacist needs to pass specific training, or be certified to ensure their special skills" (C9)

Theme	Informants' quotes
	"…to provide service such as *immunization, smoking cessation, weight management, alcohol screening and opioid substitution services* one need to attend workshop, trained, or certified" (P3) "....in medicine, physicians must be certified for their specialties, so do the pharmacists must be certified for each extended service" (M4)
Pharmacy readiness	"…many extended service take time, one pharmacist is not enough" (C14, P6) "…have to investment to set up additional instruments and IT system" (P7) "...no experience managing hazardous and infectious waste" (P5, M5)

Note: Quotations were referenced to informants in each group in which C_i, M_i and P_i represented consumers, physicians and community pharmacists, respectively.

VITA

Ms. Payungjit Kangwol was born April 26th, 1977 in Bangkok, Thailand. She received her Bachelor's Degree in Pharmacy from the Faculty of Pharmaceutical Sciences, Khon Kaen University, Thailand in 2001. She worked as an analyst in the quality control department at Siam Bheasach Co., Ltd. for 7 years. She is currently a regulatory affairs pharmacist at Connell Bros. Co. (Thailand), Ltd. She enrolled in this International Master Program in Social and Administrative Pharmacy, Chulalongkorn University in 2012.