

**Pharmaceutical Services of Elderly
Patients in Hong Kong: Scoping study to
identify and analyse the nature of
pharmaceutical services provided to the
elderly in Hong Kong**

**Report to the Pharmaceutical Society of
Hong Kong**

January 2013

Report to the Pharmaceutical Society of Hong Kong

Pharmaceutical Services of Elderly Patients in Hong Kong: Scoping study to identify and analyse the nature of pharmaceutical services provided to the elderly in Hong Kong

Ms. Angel Wong, Research Assistant. Centre for Safe Medication Practices and Research, University of Hong Kong.

Ms. Phoebe Chan, Teaching Consultant of Department of Pharmacology and Pharmacy, University of Hong Kong.

Dr. Esther Chan, Assistant Professor of Department of Pharmacology and Pharmacy, University of Hong Kong.

Dr. May Lam, Teaching Consultant of Department of Pharmacology and Pharmacy, University of Hong Kong.

Prof. Ian Wong, Head of Centre for Safe Medication Practices and Research, University of Hong Kong.

Correspondence to:
Professor Ian Chi Kei Wong
Professor and Head of Department of Pharmacology and Pharmacy
Centre for Safe Medication Practices and Research
2/F Laboratory Block, 21 Sassoon Road
Li Ka Shing Faculty of Medicine
University of Hong Kong

Tel: (852) 2819 9460
Fax: (852) 2817 0859
Email: wongick@hku.hk

Contents	Page
List of Abbreviations	6
Definitions	8
Executive Summary	9
Chapter 1: Introduction	
1.1 Background	13
1.2 Polypharmacy among the Elderly	13
1.3 Reported medication incidents in Hong Kong printed news media	13
1.4 Pharmaceutical services	14
1.5 Aims & Objectives	15
Chapter 2: Study A – Systematic literature review to identify types of pharmaceutical services provided to elderly in Hong Kong	
2.1 Introduction	16
2.2 Objectives	16
2.3 Methodology	16
2.4 Results	17
2.5 Discussions	20
2.6 Limitations	23
2.7 Summary	23
Chapter 3: Study B – Qualitative in-depth interviews with pharmaceutical service providing opinion leaders in Hong Kong	
3.1 Introduction	24
3.2 Objectives	24
3.3 Methodology	24
3.4 Results	25
3.5 Discussions	38
3.6 Limitations	43
3.7 Summary	44
Chapter 4: Study C – Ethnographic observations and qualitative semi-structured interviews of elderly pharmaceutical service users and non-users of selected practices	
4.1 Introduction	45
4.2 Objectives	45
4.3 Methodology	45

4.4	Results – Observations	47
4.5	Discussions – Observations	48
4.6	Results – Service users / non-users interview	49
4.7	Discussions – Service users / non-users interview	56
4.8	Limitations	58
4.9	Summary	59
Chapter 5: Overall discussions and future directions		
5.1	Evaluation of frameworks	60
5.2	Discussion of services	60
5.3	Overall limitations	66
5.4	Implications for practice	67
5.5	Recommendations for future research	69
References		70
Acknowledgements		75
List of Figures		
Figure 1.	Self-report figures of medication incidents occurred in OAHs from 2005-2010	76
Figure 2.	Flowchart of the process of study search and selection	77
Figure 3.	Medicine management process	78
Figure 4.	Pharmacist’s Interventions in reducing medication errors in medicine management process	79
List of Tables		
Table 1.	Summary of the articles from the literature, conference, web-based sources and hand search	80
Table 2.	Framework to ensure the medication review follows a systematic way	82
Table 3.	Resources, Facilitators and Barriers of implementation of the services in Hong Kong	84
Table 4.	Previous pharmaceutical services of similar nature and other pharmaceutical services of any nature could be introduced to Hong Kong from other countries	85
List of Appendices		
Appendix 1.	Semi-structured interview guide for interviewing service providers (Chinese version)	86
Appendix 2.	Semi-structured interview guide for interviewing service providers (English version)	90

Appendix 3.	Semi-structured interview guide for users (old aged homes) of pharmaceutical service in Hong Kong (Chinese version)	94
Appendix 4.	Semi-structured interview guide for users (community centres) of pharmaceutical service in Hong Kong (Chinese version)	96
Appendix 5.	Semi-structured interview guide for users (old aged homes) of pharmaceutical service in Hong Kong (English version)	97
Appendix 6.	Semi-structured interview guide for users (community centres) of pharmaceutical service in Hong Kong (English version)	100
Appendix 7.	Semi-structured interview guide for non-service users of pharmaceutical service in Hong Kong (Chinese version)	101
Appendix 8.	Semi-structured interview guide for non-service users of pharmaceutical service in Hong Kong (English version)	103
Appendix 9.	Summary of the services using Donabedian framework	105

List of Abbreviations

A/E	Accident and Emergency
ADE	Adverse Drug Event
BP	Blood Pressure
CGAT	Community Geriatric Assessment Team
DBP	Diastolic Blood Pressure
DH	Department of Health (HK SAR)
EBPS	Enhanced Bought Place Scheme
EN	Enrolled Nurse
GP	General Practitioner
HA	Hospital Authority
HCA	Healthcare Assistant
HHR	Hand Held Record
HKPC	Hong Kong Pharmacy Conference
HMR	Home Medicines Review
IT	Information Technology
MAR	Medication Administration Record
MDS	Monitored Dosage System
MUR	Medicines Use Review
NGO	Non-Government Organisation
NO	Nursing Officer
OAH	Old Aged Home
QoL	Quality of Life
RCBG	Random Capillary Blood Glucose

RN	Registered Nurse
SBP	Systolic Blood Pressure
SFI	Self-Financed Item
SWD	Social Welfare Department (HK SAR)
TCM	Traditional Chinese Medicines
VMO	Visiting Medical Officer
VPO	Visiting Pharmacist Officer
VPS	Visiting Pharmacist Service
WHO	World Health Organisation

Definitions

For the purposes of the study, elderly is defined as people ≥ 65 years of age; and the term pharmaceutical service is defined as all services that improve the well-being of patients via medicine management.

Medication errors are defined according to the US National Coordinating Council for Medication Error Reporting and Prevention as "...any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of health professional, patient or consumer".¹ According to the report from Department of Health in UK, medication errors emerge in the stages of medication process including prescribing, dispensing and administration of medicines.²

A *prescribing error* is defined as "a clinically meaningful prescribing error occurs when, as a result of a prescribing decision or prescription writing process, there is an unintentional significant (i) reduction in the probability of treatment being timely and effective or (ii) increase in the risk of harm when compared with generally accepted practice".³ From the stated definition, prescribing errors consist of two components: errors arisen from prescribing decision making and prescription writing process. The causes of prescribing errors could include inadequate knowledge of the drug, illegible handwriting.²

A *dispensing error* is considered a "discrepancy between a prescription and the medicine that the pharmacy delivers to the patient or distributes to the ward on the basis of this prescription, including the dispensing of a medicine with inferior pharmaceutical or informational quality".⁴ The major causes of dispensing errors could be ambiguity in prescriptions and drug name confusion.²

Lastly, a "discrepancy between the intentions of the prescriber and the treatment actually received by the patient" was used to broadly defined as *administration error*.² It could be due to inadequately trained personnel, excessive workload of staff and laps in individual performance etc.² Apart from prescribing, dispensing and administration errors, drug storage error was also adopted in the medication process, describing improper storage of medications or storage conditions.

Executive summary

Introduction

There is a rapidly growing ageing population in Hong Kong and there is an issue of polypharmacy among the elderly. In order to optimise drug treatments among the elderly, various pharmaceutical services are provided to the elderly in Hong Kong. The aim of this scoping exercise was to identify different kinds of pharmaceutical services currently available to the elderly in Hong Kong and to ascertain opinions from pharmaceutical service users and non-users (i.e. those who are not current users of pharmaceutical services but may be future potential users).

Methods

In this scoping exercise, a systematic literature review was first used to identify published services in the literature, conference materials and the internet (web-based sources).

Qualitative in-depth interviews with service providers were conducted to study the service nature, resources to start and to sustain the services; and the key facilitators and barriers in running the services.

Observational study was carried out to observe the resources and mechanism of the service provided by the service providers at their premises.

Qualitative semi-structured interviews with pharmaceutical service users and non-users were also conducted to determine the perceptions of users on the pharmaceutical services including benefits, shortcomings, economics, potential improvement and long-term future, as well as to identify the current service provision gaps by comparing the opinions of users with non-users.

All interview data was transcribed and analysed separately by two independent reviewers.

Results

All services identified were categorised into the following according to the patient cohorts the services serve:

The elderly living in OAHs

- IT Supported Monitored Dosage System by Pharmacist
- OAH in-house Monitored Dosage System
- IT supported Monitored Dosage System for OAH staff
- VPS

The elderly living in the community

- Pharmacy Outreach Service to the Hidden Elderly

- Pharmacy Outreach Service to the Remote / Immobile Elderly
- Pharmacy Outreach Service to the Elderly Community Centres
- Charity Pharmacy cum Drug Counselling Scheme

All elderly

- Pharmacy Online Drug Enquiry Platform
- Elderly drug counselling programme in a local hospital
- Drug Knowledge Exchange via Mass Media

The qualitative in-depth interviews were conducted with five main pharmaceutical service providers. An observational study has described the material and human resources of the services. Six of the service users and nine non-users were interviewed. The deliverables of the services, services gaps perceived by the users and the gap of understanding pharmacists' roles between users and non-users were identified.

Donabedian framework⁵ was adopted to gather all information from systematic literature review, interviews and observations in order to assess and evaluate the services under "structure/process/outcome" approach to classify the services' quality of care. The model of stages in medication process was also used to examine whether the pharmaceutical services could alleviate/tackle the medication errors that may arise from different processes.

Discussion

We have identified various pharmaceutical services designed to reduce medication errors in Hong Kong. In summary, all the services serving patients in OAHs could not uproot the problems of prescribing error since all the pharmaceutical service providers are not working closely enough with the doctors during the prescribing process. However, most of the services in OAHs could detect (but could not prevent) the discrepancies in the prescription writing process (which could lead to potential medication errors). Although drug administration is a high risk procedure in OAHs, only some of the services such as IT Supported Monitored Dosage System by Pharmacist, OAH in-house Monitored Dosage System, and IT supported Monitored Dosage System for OAH staff could potentially reduce it. In terms of storage and drug dispensing (i.e. re-dispensing) errors, services with dispensing component could reduce storage and administration errors by taking the responsibilities away from non-healthcare professionals.

In addition, services involving re-dispensing cannot address the problem of drug wastage due to duplication of prescription, which arise from the changes in medications between clinic visits, transitions of care and unsynchronised prescribing. As a result of the current practice, drug labels cannot be changed when there is a change in the regimen. Hence, drugs cannot be reused or set aside for later use. This could potentially lead to a significant economic burden on the local healthcare system.

Apart from OAHs, the main goal of all the other services such as outreach services and

charity pharmacy is to enhance education on medication and to offer drug counselling but are less powerful in tackling errors in the medication process.

Besides, the roles of pharmacists are not well recognised, especially by the non-users, and therefore, there is no perceived need to have pharmacists' input in the medication management procedures.

Generalisability and limitations

To our knowledge, this is the first study identifying the pharmaceutical services provided to the elderly in Hong Kong and examining the perceptions of service users and non-users towards those services.

The quality of this scoping exercise heavily relied on the information available from the literature and participating pharmaceutical service providers. In general, major limitations included scarce published literature and refusals of interview participation. However, triangulation was used to cross examine the data collected from multiple sources. There are also limited solid data available concerning the medication errors and effectiveness of the pharmaceutical services in Hong Kong.

The generalisability of study results is limited by the nature of qualitative study design. For the purpose of increasing generalisability, interviews were stopped when there was a saturation of themes. Interviewer bias and the 'Hawthorne effect' might also be induced during the interviews and observations. Efforts were made to ensure the objectivity of the interviewers and reduce the bias from the 'Hawthorne effect' by explaining that their identities would be kept confidential.

Implications for practice

Prescriptions could be sent directly to the local/delegated community pharmacies after the process of prescribing to avoid the duplicated procedures of dispensing process of the current Monitored Dosage System (MDS) packing systems. The community pharmacies can become a point for medication reconciliation when the prescriptions are presented. Community pharmacies may be contracted to specific nursing homes so that there is ownership for the roles of medication reconciliation and medication review. However, a centralised remuneration mechanism for the community pharmacies is required to streamline reimbursement from the government healthcare body. Further, from a clinical perspective, there is a need for consistency with respect to the availability and access to patients' full medical history including the patient's medication records, diagnostic and laboratory reports which are pertinent for complete and thorough pharmaceutical care. This would require the granting of access to patient's information including the upcoming Electronic Health Record, to community pharmacies.

The mandatory printing of discharge and post-clinic summaries for every patient is recommended since it could facilitate the communications during the transition of care and allow the staff at each point of care to have a comprehensive profile of the care plan and medication record. Importantly, any change to the medication list needs to be adequately highlighted, documented and importantly communicated between health-

care providers. There is a need for more consistent procedures with the communication of any changes made to drug management at transitions of care.

Pre- and post- clinic patient and medication record screening can potentially prevent prescribing errors. It can possibly be achieved by several service models, e.g. VPS, outreach services and in-house pharmacist in OAH; however, modification of current service may be necessary. In an ideal situation, the physical presence of a pharmacist on clinic day can prevent prescribing error.

Collaborative efforts among professional pharmaceutical organisations, healthcare workers, social workers, and community centres are fundamental to enhance sustainability of the outreach services in the long term, rather than stand-alone activities organised by individual organisations.

1) Develop a monitoring surveillance system with OAHs, doctors and nurses to systematically record and collect data

Currently, the prevalence of medication incidents in the OAHs of Hong Kong could not be measured systematically due to the sub-optimal record keeping practices among doctors and nurses. There is a need for a monitoring surveillance system for recording the data to measure the prevalence of medication incidents so as to offer an evidence-based view to reflect the condition of medication errors in Hong Kong.

2) Conduct high quality studies to measure the effectiveness of the services

High quality studies such as randomised controlled trials are highly recommended to evaluate the effectiveness of the interventions. Collaboration between the OAHs, pharmaceutical service providers and academics, is of utmost importance for the success of future studies.

3) Conduct an economic study to evaluate the feasibility of the implementation of the services on a large scale

In light of our study, it could be seen that most of the interventions were on a small scale. Therefore, future research should investigate the monetary benefits and costs by measuring the cost-effectiveness of the interventions so as to estimate the feasibility of implementation of larger scale interventions to achieve higher coverage in Hong Kong.

4) Conduct quantitative studies on the volume of drug wastage based on current service models

Similarly, studies can be conducted to quantify the volume of drugs wasted as a result of duplicate dispensing. The financial implications can further be analysed.

CHAPTER 1: INTRODUCTION

1.1 Background

The global population is rapidly ageing. This phenomenon is apparent in Hong Kong which ranks second among all other countries with the longest life expectancy of 82.1.⁶ According to the Hong Kong Population Projections Report in 2010, the proportion of the population with the age ≥ 65 is estimated to rise from 13% in 2009 to 28% in 2039.⁷

This marked increase in elderly population estimated for the upcoming 30 years, is expected to create a heavy burden to the younger generations in their working ages, as seen from the variation of the elderly dependency ratio. The elderly dependency ratio is defined as the number of persons with the age ≥ 65 per 1,000 population with the age between 15 and 64. This ratio is estimated to rise from 171 in 2009 to 454 in 2039.⁷

1.2 Polypharmacy among the Elderly

Aged people usually have multiple co-morbidities. According to the Thematic Household Survey Report No. 40, published in 2009 by the Census and Statistics Department of Hong Kong, there are >70% elderly living at home, and >92.7% elderly living at institution receiving chronic drug treatment.⁸

The issue of polypharmacy, which is commonly defined as the use of 5 or more prescribed medications, is prominent among the elderly and has been associated with poor health outcome. In Hong Kong, currently >42.5% elderly take more than 5 types of chronic medications. The main indications are hypertension, diabetes mellitus, eye problems and cardiovascular diseases.⁸

The harm associated with polypharmacy includes increased risks of the elderly experiencing adverse drug events (ADEs), multiple drug interactions, non-compliance and increased drug budgets.⁹

The rapidly growing ageing population and the corresponding higher demand for drugs have created a great economic burden to the public health budget. The total public expenditure on health policy area group had a steady increase from HKD\$33,623 million in 2007-2008 to HKD\$39,890 million in the 2010-2011 financial-year, but this figure is expected to increase to HKD\$59,217 million in the 2012-2013 financial-year.⁷

1.3 Reported medication incidents in Hong Kong printed news media

Local elderly often obtain medications from multiple sources, including outpatient clinics (both general and specialised) run by the Hospital Authority, hospital discharges, private general practitioners (GPs), Chinese medicines therapists, community pharmacies and many others. During the transition of care, there could be therapeutic duplications, omissions or inappropriateness due to miscommunication(s). These could potentially contribute to an increase in ADEs, hospital admissions and healthcare burden.

The medication incidents that occurred in OAHs were widely reported in local printed news media. According to several newspaper articles, the number of reported suspected cases of medication incidents due to the inappropriate handling of

medication by OAH staff was 100 during the period from 2006 to 2008, as reported by SWD.^{10 11} This figure continued to rise to 126 cases during 2008-2010. The main risk factor for the medication incidents in OAHs was staffing problems such as shortage in manpower¹²⁻³¹, insufficient knowledge and training among staff.^{13 14 32-61}

According to a survey conducted by HA in 2002, 70% of the health workers self-adjusted the dosage and even discontinued the medications for the elderly residents without professional advice.⁶² On the other hand, Hong Kong Association of Gerontology also released the result that 12 OAHs (63.2%) reported that there had not been any incident of incorrect drug administration over the past 5 years, 4 OAHs (21.0%) reported that there had been an increase in the number of incidents, and 3 OAHs (15.8%) reported that there had been a decrease in the number of incidents.⁶³ The results are illustrated in Figure 1. These self-reported figures may be subjected to validity as a total of 36 recommendations to the 19 OAHs for improvement in medicines management were made.⁶³

The main risk factors for medication incidents happen among elderly in the community reported by the local printed news media were due to patient factors including poor drug compliance, lack of drug knowledge, and low literacy.⁶⁴⁻⁶⁸ According to a local study done by the faculty of medicine in a local university, among 86 hidden elderly studied in the Wong Tai Sin District in the year 2009-2012, 60% of the “hidden elderly” did not comply with their medications and 70% of the elderly stored obsolete drugs.⁶⁴⁻⁶⁷ One local hospital also found that 38% of the elderly did not remember the time and method of taking their medications and 16% self-adjusted the doses.⁶⁸

1.4 Pharmaceutical services

Historically, doctors had the entire responsibility for the management of patient’s chronic diseases and complex medication regimens. In the last three decades, pharmacists in developed countries such as the USA, UK and Australia have been much engaged with pharmaceutical care, providing comprehensive medication reviews and educational services for both patients and doctors.⁶⁹ The western societies recognised that pharmacists have a pivotal role in facilitating interdisciplinary communications among healthcare workers regarding patients’ medication related issues.⁷⁰

Following the successful implementation of pharmaceutical services in the developed countries, Hong Kong pharmacists have also started offering different kinds of pharmaceutical services to the elderly in Hong Kong.

This project was commissioned by the Pharmaceutical Society of Hong Kong to identify the nature of different types of pharmaceutical services available to the elderly in Hong Kong. These included services reported in the published and non-published literatures. Non-published services were thought to be significant as it is known that healthcare professionals usually address problems locally, and do not always publicise or share them with others in an academic format.

1.5 Aims and Objectives

Aim:

To identify different kinds of pharmaceutical services currently available to the elderly in Hong Kong including their service natures, key facilitators and barriers in running the services, and opinions from pharmaceutical service users and non-users on the effects of these services on medication safety.

Objectives:

1. To conduct a systematic literature review for identification and description of the types of pharmaceutical services available to the elderly in Hong Kong, and the measurements of service effectiveness.
2. To interview pharmaceutical service providers for identification of the nature of different kinds of services for elderly, the key facilitators & barriers in running the services, and any forthcoming elderly pharmaceutical services in Hong Kong.
3. To observe the practice in the premises of the pharmacists providing pharmaceutical services.
4. To interview both pharmaceutical service users and non-service users, and compare the differences in perceptions towards pharmaceutical services between the two groups.
5. To conduct semi-structured interviews with the pharmaceutical service users to examine the deliverables of the pharmaceutical services.

The project includes four distinct studies and the report is divided into chapters namely:

Chapter 2: Study A - Systematic literature review to identify types of pharmaceutical services provided to elderly in Hong Kong.

Chapter 3: Study B - Qualitative in-depth interviews with pharmaceutical service providing opinion leaders in Hong Kong.

Chapter 4: Study C - Ethnographic observations and qualitative semi-structured interviews of elderly pharmaceutical service users and non-users of selected practices.

CHAPTER 2

Study A: Systematic literature review to identify types of pharmaceutical services provided to elderly in Hong Kong

2.1 Introduction

There are various kinds of pharmaceutical services that are provided by different sectors. However, little is known about holistic overview of all pharmaceutical services (medicine management) to elderly in Hong Kong. Therefore, Study A aimed to identify and describe the types of pharmaceutical services available to the elderly in Hong Kong which were available in the published literature, conference materials, and web-based sources.

2.2 Objectives

- To identify and describe the types of pharmaceutical services available and their reported effectiveness.

2.3 Methodology

Literature searches of databases:

The following databases were searched:

- | | |
|------------------------------------------|------------------|
| • Embase | 1946 – July 2012 |
| • Pubmed | 1946 – July 2012 |
| • Google Scholar | 1946 – July 2012 |
| • International Pharmaceutical Abstract | 1946 – July 2012 |
| • Hong Kong Journals Online [^] | 1946 – July 2012 |

[^] - accessed via University of Hong Kong Library (<http://sunzi.lib.hku.hk/hkjo/browse.jsp>)

MeSH terms, keywords and truncations were used in the search. The search only included studies published in English, as studies carried out regarding the pharmaceutical services in Hong Kong would be highly unlikely to be published in literatures other than English language.

The search strategy used consisted of the following keywords:

("nursing home" OR "aged" OR "long term care") AND ("Hong Kong") AND ("pharm*" OR "medication review" OR "medical error" OR "pharmaceutical services" OR "pharmacist intervention" OR "polypharmacy").

In the search strategy, the use of an asterix (*) indicates a 'wildcard'. It means the root word and all different endings of the root word were searched

After reviewing the results, the reference lists of the final selection of papers were also reviewed in order to identify additional relevant studies.

Hand search of local journal and healthcare journals:

In addition, volumes from the last 10 years (2003-2012) of 1 local non-indexed journal (Hong Kong Pharmaceutical Journal) and 1 local pharmacy related healthcare journal (Physician, Pharmacist, People) were hand searched. Hong Kong Pharmacy Conference (HKPC) abstracts were also searched (2002-2012).

Literature searches using Google:

A search using the world-wide web for qualitative analysis and documentations was carried out, using major search engines “Google” and “Yahoo”. The top 100 search results were reviewed.

The search strategy used consisted of the English keywords mentioned above, and Chinese keywords were also used for the purpose of this search:

(「老人院」 OR 「安老院」 OR 「長者」) AND (「香港」) AND (「藥劑師」 OR 「藥」 OR 「服務」) AND (「錯」 OR 「誤」).

The inclusion criteria for their selection included that:

- A pharmaceutical-related service provided to the elderly or personnel directly involved in the care of the elderly must be reported
- Service subjects must be elderly living in Hong Kong
- Literature or information must be written in English or Chinese language

Analysis:

The abstracts (in the case of databases, journals and conference abstracts) and the full text (in the cases of internet websites) were reviewed, together by 2 reviewers (R1 and R2) to identify relevant articles. The final list of relevant articles was analysed by a third reviewer (R3) who made a final decision on the relevancy. No attempt was intended to summarise the data statistically, due to the heterogeneity of methodologies and various outcome measures. Instead, the outcomes of the documentations of different pharmaceutical services provided to the elderly and the characteristics of each report were summarised.

2.4 Results

After carrying out the search described above, including the electronic databases, past HKPC abstracts, internet, and hand searches, a total of 40 articles were included. A flowchart of the process of study search and selection is presented in Figure 2.

Major pharmaceutical services identified:

Several on-going pharmaceutical services were identified and the results are summarised in Table 1.

Visiting Pharmacist Service (VPS)

The Visiting Pharmacist Service (VPS) in private old aged homes was widely reported in the search results of the past 10 years. The activities of the Visiting Pharmacist Officer (VPO) includes: carrying out medication reconciliation, conducting medication reviews

for residents, providing education and training to the old aged home (OAH) staff, making sure the OAH practices comply with the guidelines set out by the Social Welfare Department (SWD) on medication safety and documentation. The VPS also provides a 24-hour telephone support service for the OAHs with their respective pharmacists and an electronic platform for computer-generated Medicines Administration Records (MARs) for legible documentation. Services of a similar nature were offered locally by 2 other organisations before, but they were discontinued and the reason(s) were not documented.

One of the studies measured the reductions in i) hospital admission, and ii) number of doctors' visits during the study period.⁷¹ The study also measured the acceptance rate of pharmacists' interventions by doctors and old aged home staff. The study found that over a 3-month period, OAH residents' hospital admission was reduced from 6.6 to 4.7 times, and doctors' visits was reduced from 27.6 to 15.5 times after the VPO service. The acceptance rate from doctors was 28.6% (with 47.6% pending for acceptance) and 77.8% by OAH staff.

Another study described a 7-9 week post-pharmacist intervention evaluation, measuring post-intervention changes in: i) the drug storage conditions, ii) process of drug administration, iii) proper documentation, and iv) the knowledge of the old aged homes staff in 2001.⁷² The study found that the drug knowledge of the OAHs staff was generally poor, the drugs were stored in sub-optimised conditions and the drug administration process had a lot of room for improvement to ensure medication safety in 85 homes. The stated problems had been significantly improved in the 7-9 week evaluation post-pharmacist intervention.⁷²

Five hand searched articles described the activities of the VPS in old aged homes (OAHs) in Hong Kong (numbers not specified).⁷³⁻⁷⁷ One article described the activities and the importance of a pharmacist carrying out a medication reconciliation service and medication review in the community for the elderly.⁷⁸ There were also two governmental websites describing the introduction of VPS service in OAHs reported in 2009 and 2011 respectively.^{79 80}

Pharmacy Outreach Service to the Hidden Elderly

One study described an outreach service to the hidden elderly living in the community.⁸¹ Elderly subjects were identified by local social workers, who were socially inactive, without family support, and were not linked to any existing community support network. They were visited by a nurse and a pharmacist respectively at least 4 times within the study period. The role of the pharmacist was to identify drug-related problems and provide assistance in terms of medication and disease management.

The outcomes measured were: i) non-adherence rate, ii) drug storage issues, iii) elderly patients' drug knowledge, iv) reduction in blood pressure (BP), changes in the score of v) medication adherence scale, and vi) quality of life (QoL). Problems of drug adherence and storage were high, drug knowledge deficits were noticed, pharmacists' intervention had led to reduction in BP and increase in QoL scores. The scores for medication

adherence scale did not show significant change. This study had a follow-up evaluation; however, the duration was not specified.

Pharmacy Online Drug Enquiry Platform

One study and a web-based source described a pharmacists-led online platform for patients to ask about their medicines.^{82 83} This enquiry platform aims at promoting drug education and empowering patients (and carers) with their medication. In order to cater for the needs of the less mobile elders and reach more members of the general public, various means have been developed to contact pharmacists, such as pre-booking web conferences, the use of hotline and emailing services. All enquiries are committed to be answered within 24 hours, and all enquires are to be kept confidential.

This study evaluated the types of questions generally asked and the users' satisfaction of the service. The platform received 6751 hits in its Chinese and 1470 hits in its English site during the 6 weeks study period. Around 50% of the enquiries received were on adverse drug reactions and 40.5% were on drug identification. Each enquiry took 17.53 ± 18.31 minutes to respond to, and a mean lag time of 18.24 ± 15.85 days between the arrival of an enquiry and the delivery of a response. The users of the site were generally satisfied with the platform.

IT Supported Monitored Dosage System by Pharmacist

One HKPC abstract described a pharmacist-led weekly prepacking monitored dosage service.⁸⁴ This system, with strong IT support, aims to minimise the possibility of medication error at the drug administration step in OAHs. Monitored dosage system is used to prepack 7 days of medication in advance. The responsible pharmacist will resolve any pharmaceutical issues by contacting the prescriber directly, and medication reviews will be carried out regularly. IT is used to ensure the 5-rights principle in drug administration is upheld. IT also allows patient record storage, facilitates medicines tracking, patient identity checking and easy access to other healthcare professionals via video-conferencing.

Pharmacy Outreach Service to the Elderly Community Centres

Two web-based articles and one HKPC abstract described outreach pharmacy services visiting the elderly community centres. Services of a similar nature were offered by different organisations, but they were discontinued and the reason(s) were not documented. One of the organisations managed to sustain this service, which started in 2007 and is estimated to have served more than 300 elderly in 5 different districts in Hong Kong. The service is divided into 2 main sections: first section consists of a drug talk and a simple health check-up, and the second section consists of individual drug counselling with a registered pharmacist.

One prospective study and four web-based articles described an outreach service to 7 elderly community centres with similar nature of services aforementioned, where the blood pressures and random capillary blood glucose (RCBG) of 60 elderly subjects were followed after receiving the pharmacy outreach service at their respective community centres, and the latest BP and RCBG were compared to the baseline, but the duration between the baseline and the follow-up measurements were not

specified.^{85 86} The SBP of the subjects decreased significantly from 165.92 ± 18.64 mmHg to 143.78 ± 20.91 mmHg, and the DBP decreased significantly from 79.93 ± 11.01 mmHg to 67.98 ± 8.93 mmHg; however the RCBG did not show significant change, from 8.68 ± 4.32 mmol/L to 8.47 ± 3.09 mmol/L. Study subjects' knowledge on hypertension and diabetes mellitus also showed significant increase ($p < 0.001$ and $p = 0.001$ respectively).

Pharmacy Outreach Service to the Remote / Immobile Elderly

A website of a non-governmental organisation (NGO) was found and its outreach service to the remote or immobile elderly was identified. Elderly patients are visited at their homes and they are provided with drug counselling. It aims to increase the drug knowledge among elderly patients in an attempt to increase their drug adherence.^{87 88}

Charity Pharmacy cum Drug Counselling Scheme

An NGO-run community charity pharmacy was identified. It offers drugs that are self-financed items (SFI) in the Hospital Authority at affordable prices.^{87 88}

Drug Knowledge Exchange via Mass Media

Pharmacists' role in drug knowledge transfer via mass media has been described in articles from the internet. Some of the programmes mainly targeted the elderly audiences.⁸⁹⁻⁹¹

Elderly drug counselling programme in a local hospital

This programme, identified by the internet search, aimed to enhance the basic drug knowledge among elderly. Volunteers were trained and accompanied the elderly to take the dispensed drug. The elderly were offered drug counselling with explanations of the drug labelling after picking up medications in the central dispensary in a local hospital in 2012.⁹² Referrals to the clinical pharmacists could be made if necessary. Investigation on the habits of medicines taking among the elderly was carried out using questionnaires. Among the elderly participants, about 20% belonged to a high risk group and required referrals to hospital clinical pharmacists for more in-depth counselling and follow-up.

2.5 Discussion

The local pharmaceutical services identified in this part of the study were compared with the overseas services of a similar nature.

Visiting Pharmacist Service (VPS)

The VPS scheme was described in many of the articles found.^{71 93-101} The SWD launched the VPS service as a pilot scheme in 2010 and 26 OAHs participated on a voluntary basis.¹⁰² By June 2012, the number of OAHs participating had increased to 46, and this figure is expected to rise to 71 by May 2013. The activities of the VPO includes carrying out medication reconciliation & medication reviews, providing education and training to the OAH staff and advising on medication storage & guidelines compliance.

The activities of VPO have been vastly studied and reported in many overseas countries. The role of pharmacists carrying out medication reviews for residents in OAHs is highlighted in many studies and reviews. In the UK, the National Service Framework for Older People requires an annual medication review for people over 75 years old taking at least 1 medication and a 6-monthly medication review when they take 4 or more medications.¹⁰³ In the USA, it is a legal requirement for nursing homes to employ a consultant pharmacist to carry out medication reviews every 1-3 months, who also advise doctors on prescribing and monitoring issues.¹⁰³ In the Netherlands, the Dutch standard for pharmaceutical care in nursing homes recommends a monthly medication review.¹⁰⁴

Pharmacy Outreach Service to the Hidden Elderly

The Pharmacy Outreach Service to the Hidden Elderly was described by Lee (2012)¹⁰⁵ and Pang *et al.* (2012)⁸¹. In other countries, where prescriptions are dispensed by community pharmacies after doctors' appointments, there is a bigger capacity for pharmacists to stretch their role, especially in the community. In the UK, many community pharmacists carry out Medicines Use Review (MUR) in high risk patients¹⁰⁶, and some community pharmacies have enhanced services that provide home-based MUR services on a by-appointment basis for patients who are immobile or home-bound.¹⁰⁷

Pharmacy Online Drug Enquiry Platform

A Pharmacy On-line Drug Enquiry Platform in Hong Kong was described by Hung *et al.* (2010).⁸² This pharmacy online enquiry service is available in many different countries^{108 109}; such a service is opened to the general public and not specifically tailored for the elderly. These services overseas are maintained by community pharmacists and are able to provide a wide range of services from product identification to thorough medication review. This is likely due to the more elaborated roles of community pharmacists in other countries; or the limited public knowledge of pharmacists' roles and of the availability of such services.

IT Supported Monitored Dosage System by Pharmacists

This service intends to minimise medication errors in ensuring medication safety by pharmacists supervised MDS prepacking and IT supported patient identity checking, but further quantitative studies are required in measuring the effectiveness in minimising drug related problems.⁸⁴ The MDS systems prepared by pharmacists have been widely provided by community pharmacists in many overseas countries.¹¹⁰ The community pharmacists usually dispense the MDS packs for the local OAHs every week upon receiving the prescriptions from the local general practitioners (GPs), and the pharmacy staff will deliver the finished MDS packs to the OAHs. This is feasible mainly due to the separation of prescribing and dispensing in many overseas countries. The GPs and community pharmacies all serve the OAHs locally, hence the logistics are somewhat streamlined.

Pharmacy Outreach Service to the Elderly Community Centres

The Pharmacy Outreach Service to the Elderly Community Centres was described in a press conference (2007), as a poster abstract in HKPC (2010).^{85 86} Services of a similar nature are described in web-based sources in many countries.^{111 112} The format of the service may be different, but they mainly involve drug education sessions/talks and individual medication consultations. This service model is also feasible as there is a Hong Kong Government policy of “Ageing in Place”, which encourages the elderly to remain in the local community.

Pharmacy Outreach Service to the Remote / Immobile Elderly

This local Pharmacy Outreach Service to the elderly living in a remote area or being immobile is currently free-of-charge.⁸⁸ A pharmacist will attend to the elderly at their homes and attend to any pharmaceutical issues and educate patients on disease and drug management. This service is also described in other countries¹⁰⁷, especially where the living spaces in overseas countries are larger, making it more difficult for immobile elderly to access local facilities, thus creating a demand for such a service. This service should be encouraged as this also matches the Government’s elderly policy of “Ageing in Place”.

Charity Pharmacy cum Drug Counselling Scheme

This scheme sponsors elderly patients with limited financial support, offering Hospital Authority self-financed drug items at a discounted price. The pharmacist also offers on-the-spot drug counselling to the patients during drug issuing.⁸⁸ Services of a similar nature are also described in some web-based sources, where the elderly with financial difficulties are offered medicines at lower prices, and drug counselling is provided. Non-government organisations (NGOs) have the highest potential in offering such services as the organisations receive donation and financial subsidies and are therefore able to sustain this charity service in the long run.^{113 114}

Elderly Drug Counselling Services in local hospital

Reported in a local article⁹², this service is offered on a referral basis. Elderly patients with long prescriptions are approached proactively to assess their drug knowledge using a questionnaire, and referred for a counselling session with a pharmacist where drug knowledge is poor. There are no similar services specifically described in other countries as the service is mainly served by volunteers whereas the role of pharmacist’s key duties is emphasised more in overseas countries.

Drug Knowledge Exchange via Mass Media

Pharmacists participated in various series of radio broadcasting programmes, where the target audience were the elderly.^{89 90} Pharmacists have been actively involved in media exposure in both Hong Kong and overseas, to enhance public awareness of the roles of pharmacists, who have historically remained low-profile.¹¹⁵

2.6 Limitations

It is important to bear in mind that most of the articles found in this study were descriptive and mainly from web-based sources, including past newspaper reports, organisation web pages and press conferences and local non-indexed journal and healthcare journals. The sources of information for the majority of these articles were from the service providers themselves, and therefore, it is more likely for them to have publication bias and more likely to report positive results. There were 3 HKPC poster abstracts that documented some quantitative studies, but they did not result in publications, and the study methodologies and results were therefore not formally documented. There was only 1 quantitative study published in literature, which was carried out more than 5 years ago, and the data might not be relevant. Finally, the search results may be subject to time lag bias, which is the delay in the publication of negative research findings and the rapid report of positive research findings.

2.7 Summary

There are a number of descriptive articles found in this study, mainly from web-based sources. This is attributed to the fact that many pharmacists, like other healthcare professionals, usually address problems locally which may not always lead to publications or dissemination of results. In our literature search of the past 10 years, only 1 quantitative study was found via database searches, which was dated more than 5 years ago, and the data might be out of date and the relevance is doubtful.

The types of pharmaceutical services identified from the article searches varied in nature. The majority of them are still on-going and it is difficult to summarise the nature and mechanism of each individual service from the articles found. Thus far there are no qualitative publications offering an insight into the opinion of users (patients or carers) of the different kinds of pharmaceutical services.

CHAPTER 3

Study B: Qualitative in-depth interviews with pharmaceutical service providing opinion leaders in Hong Kong

3.1 Introduction

In Chapter 2, pharmaceutical services for the elderly which have been published in the literature and described in web-based sources or conference materials were reported. Some services provided in OAHs and community centres in Hong Kong were identified for further study. As most articles retrieved from Study A were description and concise, Study B was conducted to interview elderly pharmaceutical service providers and opinion leaders involved in the care of the elderly in Hong Kong in order to acquire more information on these services.

3.2 Objectives

- To obtain further information of the current pharmaceutical service available for the elderly in Hong Kong.
- To assess the future direction of development of these services. The following issues were investigated:
 - i) nature of the service,
 - ii) reasons for developing the service,
 - iii) detailed description of the activities,
 - iv) resources for the service.
 - v) facilitators and barriers in developing and running the service,
 - vi) effectiveness of their service(s); and
 - vii) future direction of development of these pharmaceutical services in Hong Kong.

3.3 Methodology

This was a qualitative study using in-depth face-to-face interviews which were conducted between 20th September and 19th October, 2012.

The interview guide

Study B consists of in-depth interviews of semi-structured open-ended questions.

A large part of the interview guide was based on 'Australian Guidelines for Pharmacists Providing Home Medicines Review (HMR) Services', revised accordingly to suit the purpose of this study and the Hong Kong settings.¹¹⁶ This guideline was developed by the Australian Pharmaceutical Advisory Committee for assisting the pharmacists who are conducting community medication reviews.¹¹⁶ The Australian guideline was therefore adopted as a framework to ensure any medication review activity followed an established structure. All interview tools were originally written in English, followed by a translation into Chinese and back-translated into English. A pilot study was carried out in the first week of September in order to test the validity of the questionnaire prior to the interviews.

The interviewees

Since there were no sampling frames currently available for the recruitment of service providing opinion leaders, interviewees were identified through the literature search in Study A. A total of five service providing opinion parties (INT1-5) were interviewed, either as individuals (INT1-3 & INT5) or as a group (INT4):

- IT supported monitored dosage system by pharmacists (INT1),
- OAH in-house monitored dosage system (INT2),
- Pharmacy outreach services to the elderly community centres (INT3 and 4),
- Pharmacy outreach services to the remote / immobile elderly (INT4),
- Charity pharmacy cum drug counselling scheme (INT4),
- IT supported monitored dosage system for OAH staff (INT5).

The service providing opinion leader for VPS (INT6) refused to be interviewed. Further, the service providing party representative (INT7) for the pharmacy outreach service for the hidden elderly and the pharmacy online drug enquiry platform also declined the invitation for interview.

The interviews

All interviewees received an invitation via email and information about the study background and objectives were provided verbally prior to the interviews. Interviews lasted for approximately 30-90 minutes and were audio-recorded with verbal consent from the interviewees. All interviews were conducted by the same interviewer (R2) in order to ensure consistency, and observers (R3, R5, R6) were present, who remained silent throughout the interview process in order not to affect the information provided by the interviewees.

As the mother tongue of all interviewees is Chinese (Cantonese), all interviews were conducted and transcribed in Cantonese, and were read for the identification of relevant quotes which would then be analysed for thematic codes, conducted manually by 2 reviewers (R2 and R3). All relevant quotes and thematic codes were then translated into English and interpreted for data analysis.

A sample of the semi-structured interview guide is included as Appendix 1 (Chinese) and Appendix 2 (English).

3.4 Results

Part – 1

Findings from the interviews were obtained and categorised so as to achieve an understanding of the pharmaceutical services being provided: the i) nature of each service and ii) reason for developing each of the service. The results of the interviews will be presented according to individual type of service.

INT1 – IT Supported Monitored Dosage System by Pharmacist

The service provided by INT1 piloted in 2000, launched officially in April 2008. It now handles around 250,000 monitored dosage packs annually. INT1 described the service as a “streamlined service” of drug management:

“All the current medications of each elderly resident will be collected from the OAH to the drug management centre, where pharmacists will review all medications for potential interactions and determine that they are safe to be used. Afterwards, an updated comprehensive drug list will be compiled. 7-day medications will be dispensed in monitored dosage system, tailor-designed to suit the local Hong Kong setting. Dispensed medications will be cross-checked before sending back to the OAHs. OAH staff will check the medications again before administration. The OAH staff also has 2 options for giving out medications, one is check patient names and faces against the drug administration record; the other one is to digitally check patients’ identities against the iPad® we prepared for them”

INT1 also described additional services extended from the main service mentioned; one of them is the dispensing of prescriptions written by VMOs:

“OAH staff shall fax the VMO prescriptions over, and we will dispense them. The advantage is that it is convenient. Firstly, we can check for potential interactions with the current regimen and the adequacy of the medicines for the patients. Secondly, all the medications (both VMO medications and patients’ chronic medications) will be packed into the same monitored dosage system, we do it all for them. Thirdly, we do not have to worry about the quality of the medicines had the staff bought it elsewhere where it may have been parallel imported goods or even the wrong drug - in which case we would not be able to identify the drugs. Lastly, this service is efficient for the OAHs.”

Another additional service is they help the OAHs to dispose of extra / expired medications:

“There really are a lot of obsolete medications that they need to dispose of... Drug disposals takes time, there are form(s) that need to be filled in, and secondly, they need to pay (to get the drug disposed), this we can do it for them as well”

INT1 also discussed the service of drug storage and education:

“You can perhaps imagine that if there are 6-month supplies of medications for each patient, it actually takes up a lot of space... and it is difficult for the OAH to contain all the medications in separate cabinet for each patient... so we do this for them.”

Interviewer then asked INT1 to elaborate more on the digital component of the service:

“On the iPad®, it will illustrate clearly the details of each patient, including name, photo, the reference number of the monitored dosage pack, the particulars of every medication together with the photo of each unit dose for easy cross-referencing. The patients also wear a wrist-band containing their name and personal particulars, so that the identity of the patient wearing the write-band could be checked against the photo on the iPad® prior to commencing the drug administration process... By this, the principle of ‘3 checks 5 rights’ can be upheld. The system also accommodates for electronic signatures at the actual time the drug is actually given, which is done by the health-worker touching-in their (staff) card against the sensor.”

When asked of the reason for starting this service, INT1 said:

“The main reason is the concern of medication safety, especially in the elderly patients. As I practice more, I realised the problem is not as simple as I first imagined. In Hong Kong, we have a far more complicated situation than other foreign countries, and the chance of getting things wrong are many times higher. The problems I saw while I worked for 2 years in another country in this medicine prepacking service could not match the problems I encounter here in a day... Our goal is to offer the best healthcare to the patients, and to allow their carers in the health-workers to enjoy their job.”

INT2 – OAH In-housed Monitored Dosage System

INT2 manages a pharmacy, which is an in-house department with the service shared between 3 inter-linked OAH institutions. The pharmacy service started in 2009, and is currently handling around 8,000 solid dosage forms each day:

“We manage all the medications for the OAHs. We keep an updated drug profile every time a elderly resident is prescribed medications following a doctor’s visit. After that, we will dispense the medications in a 7x4 monitored dosage pack for each resident - good enough for a week for health-workers on each floor. We

will also print [a referral note with] the updated drug list for each resident every time when they attend to doctor's appointment, so that the doctors would know what medications the patients currently take."

INT2 also made a special remark on the importance of their medication reconciliation service:

"Actually, every time the medicines come back following doctors' appointments, we will carry out a medication reconciliation for those residents, so that any problems identified could be clarified with the prescribers from the hospitals or GPs as soon as possible"

When asked if there are any other services they provide, INT2 added:

"We sometimes provide training sessions to the HCAs in the OAHs"

The interviewer then asked about the reason for having an in-house pharmacy within OAH, INT2 explained:

"It is difficult to recruit EN to start with, also drug issues are complicated. As a result, the organisation decided to improve the service quality of these OAHs by building a centralised pharmacy, employing both pharmacist and dispensers...Leaving the medication issues to pharmacy, so that the front-line HCAs on each floor can have more contact time with the clients."

INT3 – Pharmacy Outreach Service to the Elderly in Community Centres

The service which runs once a year was provided by the organisation of INT3 and started in 2007. INT3 described this service as a "university-collaborative" medication counselling service:

"The targets had generally been the elderly from the Wong Tai Sin District, who are active users of the local community centres."

INT3 further explained the nature of this service:

"It is a 2-part service. The first part consists of a drug talk on general topics e.g. understanding diabetes or hypertension or general drug knowledge. This part is usually done by Pharmacy students. After the talk we might ask them questions to check their understanding... The second part consists of a drug counselling session. We usually have prior communication with

the community centres to remind the participating elderly, if they are interested, to bring along all their long-term medications for the assessment by the pharmacists... registered pharmacists are responsible for this part, who attend on a voluntary basis... When the elderly show us their medications, we will assess their drug knowledge and check if they feel unwell after taking those medications, then we will provide them a drug counselling service. We will also measure their blood pressure."

Interviewer asked INT3 for the reason for starting this service, and INT3 indicated that there were 3 main reasons:

"The first reason is, we know that many elderly do not have the right attitude or insight into medication use, we also know that drug compliance is generally low among the elderly, especially a lot of our elderly in Hong Kong are illiterate. We are concerned that due to their poor drug compliance and the lack of understanding would compromise their treatment outcome. Therefore, we would like to understand more about the situation, and to improve this situation through the so-called 'community education'."

The second reason is:

"We would like our local pharmacy students to be able to experience the need in our society. We also see the problem with an ageing population, and so we want our pharmacy students to be exposed to the society at an earlier stage, in particularly the elderly in the community...to allow them to understand that there might be need to adjust what they learnt from university, according to the need of the end-receivers, when they are providing their counselling. All these aim to enhance their experience."

The third reason is:

"We hope our local pharmacy students can be involved so that when they are registered as a pharmacist, they would care more and contribute to their professional body."

INT4 – Charity Pharmacy cum Drug Counselling Scheme

INT4 now manages a community pharmacy funded by an NGO. This pharmacy service started in November 2009, and now handles around 2,000 cases annually:

“We have established our own drug formulary. We offer our drugs, especially those self-financed items from the hospital authority, at a discounted price, but first our social workers will carry out an assessment on the elderly’s financial ability before they can buy the drugs from us... Depends on the drug, we might have different requirements for the elderly patients to be eligible for our offer, but it is not our goal to make money.”

INT4 added that:

“We value pharmacists’ role in providing drug education. For patients who come through to us, we will offer free drug information, including printed materials. In some special cases, e.g. patients on new medications, or sometimes when I think the patient did not understand me too well during counselling session, I would normally follow-up 1-2 days later by telephone to check if the patient is ok. Generally we welcome everybody to call us when they have problems or questions about their medicines.”

Interviewer then asked INT4 the reason for starting this service, INT4 explained:

“Initially, we saw that many elderly patients were much disorganised with their medicines, and they were not aware of what medicines they were taking. Therefore, we think reconstruction and drug knowledge is the most important. We really want to our patients to understand what they were taking and whether their medicines will interact. And by the word ‘reconstruction’, I meant the reconstruction of their medications and their knowledge.”

INT4 – Pharmacy Outreach Services to the Community Centres

INT4’s organisation also provides pharmacy outreach services to the elderly in the community centres. This service started in 2004 and is still running once a week:

“Provision of drug education is our main role, and so we visits local elderly community centres regularly to give drug talks or drug counselling services. In the drug counselling services, elderly members are encouraged to bring along all their medications, we will check if anything about their medicines that

they need to be aware of, whether they are expired and check that the elderly know how to take their medicines.'

When discussing the reason to start these outreach services, INT4 explained:

"The main reason was to reduce the wrong use of medicines in the elderly, and to provide them with information on medication safety, but at the same time we would like to offer our care to our elderly."

INT4 – Pharmacy Outreach Services to the Remote / Immobile Elderly

INT4's organisation also provides pharmacy outreach services to the elderly living remotely or who are immobile. This service started in 2010 and now handles around 50 cases per year:

"We also visit our elderly in their homes, especially those who are restricted by mobility limitations. We can also assess the home situation, whether they can take the medicines themselves, or whether they are keeping many of the expired drugs, and we will follow-up the cases... We might teach them how to take their medicines, and follow-up again regularly thereafter, because these are generally more complicated cases. Right now we only take referrals, from social workers, outreach nurses and doctors. Sometimes they see the elderly living alone, with a lack of social support, and are disorganised with their medicines management, then they would like us to conduct some interventions."

On the reason for starting this service, INT4 explained:

"We realise many of our elderly could not make it to the elderly community centres, and therefore we wish to further assist those immobile elderly. It should be the case where these elderly cannot benefit from this service simply because they could not walk."

INT5 – IT Supported Monitored Dosage System for OAH Staff

Funded by an NGO, the service provided by INT5 started in February 2010. INT5's service is a "medicines management system":

"We have a multidisciplinary team, including not only the pharmacists, but also nurses, social workers and IT people... We have developed this drug administration system; it is a centralised computerised system, allowing OAH staff to effectively cross-check each other at every step during the drug administration"

process, with electronic documentation. Then at a suitable time when it is less busy for them, they can prepack the medicines for the OAH residents into the monitored dosage system, good enough for 1 week. We have added the electronic signature for electronic documentation as well, because nowadays, many OAH are inter-linked. One manager may need to manage 10 OAHs. The management could monitor the running of all homes from one site, with no need to physically go back to the homes when every documentation is recorded electronically. So our system also helps simplify management”

Interviewer then sought clarification whether INT5’s service does not include dispensing process, INT5 responded:

“Our service does not involve medication review, nor do we transfer any liability to ourselves. The main point is to empower the OAH staff to do it themselves. That is, we do not take away anything from the OAH. After we have installed the drug administration system, we will then train the OAH staff to use this system. The programme includes a CD-ROM, which contains drug education materials, e.g. how to pronounce the drug names, pharmacology of the drugs and drug interactions.”

INT5 was then asked the reason for starting the service, the reason was:

“Our idealism was that there has been a shortage of staff in OAHs, and the busy front-line staff still have to do many repetitive procedures. By ‘repetitive procedures’, I mean asking them to sign, for example. If they have to give 10 medications to an elderly, he/she will have 10 signatures to sign afterwards. They will do it in order to fulfil the legal requirements, but they do not understand the meaning for the act. Therefore, we created this drug administration system.”

Part – 2

Interviewees were also asked to iv) describe their activities in detail. These questions were guided by the 'Australian Guidelines for Pharmacists Providing Home Medicines Review (HMR) Services' as a framework, revised accordingly to suit the purpose of this study and the Hong Kong settings. The interview questions were therefore asked according to the revised framework.

The framework intended to ensure that the medication review involves:

- A. Following a systematic procedure for medication review
 - 1. Compiling medication history
 - 2. Utilising patient records
 - 3. Identifying potential medication-related issues
- B. Conducting medication review in a timely manner
 - 1. Regular review
 - 2. Priority for medication review
- C. Maintaining accurate documentation
 - 1. All activities undertaken and strategies developed in the course of a medication review
 - 2. Recommendations for doctors
 - 3. Storage of all documentation
- D. Addressing and following-up issues arise
 - 1. Follow-up for the recommendation
- E. Other Activities
 - 1. Education and training
 - 2. Other medication safety practice

The results are presented in Table 2.

Note: Since INT6 & INT7 did not consent to participate in this study, the detailed activities were identified from Study A, and were presented in Table 2 where possible for comparison.

Part – 3

Interviewees were asked to name the resources and factors contributing to the success and failure of maintaining their services. In order to enhance clarity, the results for iv) resources for the services and v) facilitators and barriers of the services, are presented together across the services.

Notably, although 5 parties were interviewed, the INT4 organisation is currently providing 3 services, hence a total of 7 services. Therefore, the results for this part will be presented in terms of number of services, rather than the number of parties.

Resources to start the services

This part aimed to understand the resources required by the services when the service was initiated. Four out of 7 services required manpower to start, and for three services, manpower was the only requirement. INT4 expressed that:

“Having pharmacist manpower is the most important, you cannot do anything without the pharmacists.”

INT3 also said:

“We need pharmacy students to plan the event, and... recruiting registered pharmacists to participate in this service on a voluntarily basis.”

Three of the 7 services also required capital for suitable hardware to start, and they are all monitored dosage system service providers. INT1 said the service required the monitored dosage packs and suitable machines (e.g. computers); INT2 agreed that the monitored dosage packs were important to start, but also added that the capital for building a pharmacy and decorating & furnishing was a key factor to start. INT5 claimed that suitable computers linked to a network were one of the resources required to start.

Two of the 7 services required a suitable software to start, and they are both of the IT supported monitored dosage system service providers. INT1 recalled:

“... the system need to be adequate for the Hong Kong setting.”

INT 5 also claimed:

“... the system needs to be user-friendly and tailored to their needs.”

Two of the 7 services required certain specific knowledge to start. INT4 indicated that the knowledge in running a pharmacy was essential to start the service, and INT5 said that the service required IT knowledge.

Resources to sustain the services

This part aimed to investigate the resources required in order to sustain their services. Five of seven services agreed that manpower is the key to sustain their services, and all of the five services even regarded that manpower is the only factor.

INT1 and INT2, who are both monitored dosage service providers, claimed that “there is a shortage of dispensers”. INT4 indicated that both of the outreach services “required a lot of manpower in pharmacists... because right now the services are all handled by one pharmacist.” INT5 claimed that the service required a team of members with a variety of skills to handle different kinds of tasks within the service.

Two of the seven services require good network to sustain their services. INT4 explained that the running of their pharmacy required support from the community and donors because their service receives no financial support from the government; INT3 also said that because their service is free of charge, therefore they would need sponsors for little souvenirs to give to the elderly to keep up their interest and support to the service.

Facilitators in developing and running the services

This part aimed to understand what facilitators are present to keep up the current pharmaceutical services for the elderly in Hong Kong. Peer support is the biggest facilitator in 4 of 7 services. INT1 expressed that:

“... their encouragement is to develop our service together, by giving us a lot of feedback along the way.”

INT3 said that:

“Our collaborator thinks that this is a meaningful service, and so they are cooperating with us proactively.”

INT2 stated that:

“Support from other health-workers is important, because the job requires close collaboration.”

INT4 claimed that:

“...influence and coverage of the mass media is a consideration. We do press release regularly, so that more people from the general public will know of our service.”

The demand for the services is another big facilitator in 2 of 7 services. INT3 claimed that there is a need in the community. INT1 even said that:

“We see that ever since our users start using our service, they really like it, and continue to use our service.”

Passion of the pharmacists to the profession is another big facilitator in 2 of 7 services. INT3 said that:

“We have a group of passionate pharmacists, who are willing to participate in this service because they think it is a meaningful one.”

INT1 stated that:

“There is no external facilitator to our service. It is totally depends on our belief and determination.”

Other facilitators include: the knowledge of the pharmacist (1 of 7), good communication with the collaborators (1 of 7), recognition of pharmacists’ roles (1 of 7) and government policy support (1 of 7).

Obstacles in developing and running the services

This part aimed to find out what barriers are present to stop or hinder the running of the different pharmaceutical services for the elderly in Hong Kong. Manpower is one of the biggest obstacles in 3 of 7 services, especially in 2 of the pharmacy outreach services. INT3 recalled:

“Due to the shortage of manpower, there were times when the service could not run, the service was limited.”

OAH staff members’ unwilling to change is also one of the biggest obstacles in 3 of 7 services; it happens in all of the monitored dosage services. INT5 explained that:

“... there are a lot of new things to learn, so the staff start to worry that they might lose their job when their boss starts to use the new system. They would not think that ‘this new system is here to help me with my work’, so there is a lot of work to do to change the mentality. Also, workers in this industry are generally older and not very well educated, so it takes a long time for them to learn new things.”

Difficulty in communicating with the doctor is a big obstacle in 2 of 7 services; it happens in both of the monitored dosage services where the pharmacist(s) would carry out medication review for the elderly patients. INT2 said that:

“When we identify a problem, we would contact the doctor to clarify, but we usually do not get a fruitful response that quickly. This is because the nurses would have blocked our calls to the doctors in HA, hindering our direct communication with doctors. Then we would have to leave a voice mail until the doctors call back when he/she is free.”

INT4’s organisation is an NGO, and they claimed that maintaining funding is a big obstacle for them:

“... we have go bid for funding, or to ask donors for donations in order to maintain the pharmacy service.”

Other obstacles include: status (under-recognition of pharmacists) (1 of 7), financial considerations (1 of 7), the lack of trust from service receiver (1 of 7), sub-optimal cooperation offered by other health institutes (1 of 7), inefficient government policy (1 of 7) and poor strategy in following-up cases (1 of 7).

Possible reasons to stop the services

In this part of the interview, the interviewees were asked to consider a hypothetical to facilitate brainstorming on what could be the possible reasons if the service(s) they are currently providing were to be stopped. This question aimed to find out the biggest threat(s) to their current service(s).

The lack of funding and the lack of manpower are attributed as the 2 biggest threats in 6 of 7 services. Three of the services had specifically linked the 2 factors together, among which, 2 of the service providers (for 2 services) claimed that an inability to maintain salaries was their biggest concern. INT3, whose service is provided on a voluntary basis by the participants, commented:

“With the current environment, it is very difficult to sustain a service which is always free of charge. By that, it is hard to expand the service for broader coverage or deepen the service, then it is very easy to lose the participation of the volunteers, and could possibly lose them.”

The lack of support from government policy is attributed to be a big threat in 2 of 7 services. INT4 claimed should the SFI drug list from HA cease to exist, it will put a threat to their service. INT1 commented that:

“The Government bureaucracy keeps thinking that what we do, could not meet their requirement(s).”

Other threats include: the service causing an untoward event (1 of 7), failure to maintain self-motivation (1 of 7) and the development of a better system/service than the existing one (1 of 7).

Part – 4

The interviewees were asked to provide vi) their perceptions of the effectiveness of their service(s), and vii) their opinion on the outlook of the future in providing pharmaceutical services for the elderly in Hong Kong. Results for vi) shall be described accordingly, while results for vii) shall be tabulated for clarification.

Self-perceived effectiveness of the services

This part aimed for the service providers to subjectively evaluate the effectiveness of the service(s) they are currently providing. They were asked if they perceived their service is sufficient to meet the local demand, the interviewees were also asked to rate on a 5-point scale with “5” being “very sufficient” and “1” being “very insufficient”.

INT1 gave a score of 5, and explained:

“... this type of service has been going on in other foreign countries for a couple of decades. We did not reinvent the wheel, we are only tailor-making a successful service to suit the system in Hong Kong.”

INT2 gave themselves a score of 2, and commented:

“It is difficult to recruit dispensers, and it is impossible to ask the pharmacist to do all the technical tasks, the support from dispensers is needed... so I think we do not have the manpower to handle all the work.”

INT3 did not give their service a score, and explained:

“... put it this way, my organisation has withdrawn from this service, and has officially handed over to our ex-collaborator. Right now, we are looking into how to improve this service, and hoping to do it in other ways.”

INT4 rated all 3 of their services a score of 1-2, and explained:

“Absolutely insufficient. Ours [coverage] is just a ‘tip of an iceberg’, there are still a lot of room for other organisations to participate.”

INT5 only rated 0.5 to their service, and commented:

“... the service is only at its beginning. If it is to be implemented to fill up the needs, then it shall require the policy support from the Government... right now the Government has not funded the OAHs to enable them to install this system.”

Outlook of future pharmaceutical services for the elderly in Hong Kong

This part aimed to find out if the interviewees had been aware of other pharmaceutical services provided to the elderly in Hong Kong. The interviewees were first asked if they knew of any other pharmaceutical services of similar nature to theirs, which had been discontinued previously. Then they were asked if they knew of any other pharmaceutical services for the elderly, of any nature, that are being done in other countries or could be introduced into Hong Kong. For the purpose of clarity, the results are presented in Table 4.

3.5 Discussions

The results from interviewing INT1-5 will be discussed here. Since Part – 1 is an introduction of each service by their corresponding service providers, discussions shall start from Part – 2.

Part – 2

The questions in this part of the interview were guided by the Australian “Guidelines for pharmacists providing Home Medication Review (HMR) services”, in order to ensure the process of medication review is undertaken systematically.¹¹⁶ Therefore, the results were discussed across services.

A. Following a systematic procedure for medication review

In order to maintain the quality of the services where medication review is carried out, it is important to ensure that the process of medication review is to be done following a systematic procedure. All pharmaceutical services have a component of compiling each patient’s medication history in an attempt to generate a complete current medication list.

All pharmaceutical services except 1 use the current physical stock of medications taken by the elderly patients and information on drug labels when compiling the medication history. The IT supported MDS for OAH staff (provided by INT5) provides the OAH with a self-developed software for the OAH staff to type the residents’ medication histories into their own computer, to then be automatically converted into the system. This is likely due to the fact that the service provided by INT5 does not involve the component of conducting medication reviews, and therefore, the compilation of medication histories are for the purpose of documentation and system conversion. As INT5 had commented that the role played by the pharmacist is a “non-traditional” one.

The remaining MDS dispensing services (provided by INT1 and INT2) made use of other patient records (e.g. HA’s patient discharge summaries) when compiling the medication histories. This is because both services involve the activity of actual re-dispensing, and therefore more records would be necessary to ensure the medication histories compiled are accurate and clinically adequate for the patients.

All the pharmacy outreach services (provided by INT 3 and INT 4) only require the current physical stock of the medications when compiling the medication histories for their clients. This is because this type of service mainly focuses on the drug counselling and drug knowledge transfer, therefore the accuracy of the medication histories was not the highest priority for the service providing pharmacist(s).

The identification of potential medication-related issues is assumed to be part of the usual standard of care of pharmacists when compiling medication histories. Upon the checking of patients’ medical records, all pharmaceutical services would have the opportunity to identify potential medication-related issues in patients, albeit to a varying extent.

B. Conducting medication review in a timely manner

It is important to ensure that medication reviews should be carried out regularly. Only the MDS dispensing services (provided by INT1 and INT2) and the outreach service to the remote/immobile elderly (provided by INT4) would review their patients regularly.

This is mainly because the service clients of these services are of higher dependency level than the rest of the clients served.

Patients who are considered “high risk”, include those who are recently discharged from hospital, those who recently started/discontinued a high risk medication, and those who are clinically unstable. It was surprising that only the outreach service to the remote/immobile elderly indicated that these patients would be reviewed regularly by the outreach team. This is because the service providing pharmacist(s) perceived that those patients (especially those who are immobile) are all considered high risk.

C. Maintaining accurate documentation

It is important to document all actions of clinical activities and strategies developed. The IT supported MDS for OAH staff (provided by INT5) does not document any activities or strategy. This is likely due to the fact that the service provided by INT5 does not involve the component of conducting medication reviews, and therefore there would be no activities and strategies developed for the patients during service provision.

Both INT4 (for all of their services) and INT5 do not document the recommendations to the doctors. This is because the services provided by INT4’s organisation mostly involve drug education provisions; and in the case of INT5, the service provided by INT5’s organisation does not involve the conducting of medication review, and therefore, no recommendations were made to doctors.

While documenting the clinical activities, all the documentations should be stored properly. Elderly community centre outreach services provided by INT4 do not store all documentations. This is because the focus of this outreach service is on drug education, and therefore not much documentation requires storage. However, should the goal of providing patients follow-up is to be added to the service, then all documentation of the interventions and suggestions made to the patients should be stored properly.

D. Addressing and following-up issues that arise

If any intervention is made, it is important to follow it up. The outreach service to community centres (provided by INT4) and the IT supported MDS service (provided by INT5) did not indicate their practice for follow-up. This is because the aim of the outreach service in community mainly is drug knowledge provision (in a form of drug talk) with drug counselling; whereas, in INT5’s service, there is no component of providing recommendations to the patients, and therefore is not applicable.

E. Other Activities

All services indicated the inclusion of component of education and training. The targeted audience of all of the outreach services (provided by INT3 and INT4) are the elderly patients (and family/carers if present); whereas the target audience of the rest of the services are the nursing staff. The services have captured the relevant types of audience for the transfer of knowledge and skills in both the patients and staff.

Other medication safety practice

Improving medication safety is one of the major roles of a pharmacist, and therefore the pharmacists might have implemented some additional safety measures to their services. Only the MDS dispensing services (provided by INT1 and INT2) and the charity pharmacy, where actual dispensing work is involved, provide safety measures by removing dispensing procedures from the non-healthcare professionals. These services also included ensuring suitable medication storage, checking expiry dates of the medications and upholding good dispensing practice principles. INT1 also included systems for fire prevention and INT2 provided a separate set of guidelines for dispensers on prepacking medicines into the MDS packs.

Part – 3

The resources and factors that facilitated or inhibited the running of the services are analysed in this section.

In assessing the resources to sustain the services, it was noted that the outreach services provided by INT4's organisation required a lot of manpower for sustainability, whereas INT3 did not indicate that manpower was a significant resource required to sustain the service. On the other hand, INT3 claimed that the main resource required to sustain the service is some useful hardware, including leaflets containing relevant information and sponsored souvenirs as a keep-sake for the elderly who attended the talk to improve their experience. This could be due to the fact that INT3 usually plays a bigger role by being the sole organiser for the events, and therefore had to oversee many different aspects besides manpower issues. On the contrary, INT4 usually focus on the manpower and the transfer of knowledge part of the service, due to a detailed division of labour of the organisation, and therefore would notice the manpower aspects more.

In understanding the facilitators in developing and running the services, it is surprising to find that peer support from other fellow pharmacists made the top list. Four of 7 services stated that peer support is important, and all of the 4 services are of different natures. This shows that although there might be many issues that can affect the development and the continuation of different services, the support from peers (whether actual or spiritual) provides important encouragement to the service providing parties.

In investigating the resources required to sustain a service and the obstacles faced when developing and running a service, researchers' attention as drawn to the point that the factor in maintaining stable funding, is the resource required for sustaining INT4's service, and the lack of it being the major obstacle. This is due to the fact that the organisation that INT4 serves is an NGO and they acquire the funding from donors' sponsorships, which may not be stable at all times.

It was noticed that, among the 2 MDS service providers, INT5 stated that the government policy is a facilitator to the service, whereas INT1 thought that the

government policy is one of the biggest obstacles in developing the service. It was attributed that the service provided by INT5 involves mostly training the OAH staff on using the IT drug administration programme, and therefore by the government allowing the use of MDS in OAHs, this has already facilitated the work of INT5. On the other hand, the services provided by INT1 involves a long process of medication review, dispensing, checking and drug storage, and therefore there are more opportunities where a change (or failure to change) of government policy can create obstacles in the service provided by INT1.

It was also interesting to note that the lack of trust from the service receiver is perceived to be an obstacle to INT5, as commented:

“Monetary considerations are important in the industry of running OAHs. Their bosses always think they are investing their money, and always measure their return from a commercial angle regardless of whether the money has been used in the right way.”

The overall resources required, facilitators and obstacles for each pharmaceutical services are summarised in Table 3.

Other discussions

Some of the comments made by the interviewees were interesting remarks to be brought to discussion.

One of the MDS service provider commented that the root causes of all the medication incidents occurring in OAHs are due to incorrect dispensing and administration of drugs, and that needs to be addressed:

“Our service addresses the root cause of giving the patients the wrong drug... some available services send pharmacists to OAH to check what the patients are taking. That is not addressing the problem of giving the wrong drug, but is helping them to check whether those drugs are the most effective ones. The problem is if they are late, patients might already have taken what they should not have taken, and this is not helping them prevent taking the wrong drugs... the main agenda is to make sure the patients take the right drugs, and the staff administer the right drugs.”

One pharmacy outreach service provider claimed that the biggest limitation of their service is that patients could not be followed-up properly:

“If we found an important pharmaceutical issue, all we can do is try our best to advise the elderly at the time, or suggest the elderly to go back to the doctor. We would tell the elderly how and what to say to the doctor when they see them, those are the things we can do at that time. Or maybe some of the times we think they can

stop taking some drugs, we shall make our patients understand, and if he/she decided to stop taking it, we can advise him/her on the suitability in stopping, or if they need to seek doctors' advice before stopping... we can give advice like this to them. But right now we are still not at the stage where we can follow them up, or speak to the doctors ourselves. This is something we cannot do yet."

INT4 expressed one of the limitations to the charity pharmacy service was lack of adequate manpower. Sometimes it is hard to make sure the cross-checking procedure in the dispensing process was properly done:

"... currently we do not have dispensers, or voluntary dispensers, so I am the only person to follow the dispensing procedures through, and therefore I will be careful to make sure I double check my every step."

3.6 Limitations

As discussed in Chapter 2, the number of services identified through the literature and web-based sources were small. This is one of our limitations as services provided on a smaller scale and on-going services that were unknown to our study interviewees and their respective opinion leaders may have been missed. Despite this, a comprehensive search strategy was used including databases, literatures, web-based sources, conference abstracts, team members' personal contacts and the snowball sampling (when existing subjects recruit future subjects from their acquaintance). As a result, 2 more opinion leaders were identified and successfully interviewed.

Secondly, there is potential reporting bias since two opinion leaders identified from Chapter 2, who were responsible for two different types of services, had withdrawn from participating in this study. Others who consented to participate might be more likely to report their positive outcomes. However, efforts have been made to lower the reporting bias by minimising the use of questions that might encourage interviewees to rate their own services favourably.

Furthermore, the possibility of recall bias of the interviewees could not be ruled out in this study, especially for one of the interviewees, who is no longer responsible for the organisation of the service. Thus we adopted the method of respondent validation to compare with different subjects to establish the level of correspondence between them.

It is also recognised that the translation of quotes during data-analysis was difficult as some of the wordings in Cantonese Chinese could vary in meanings for the same word, such as "health care workers" and "nurses" are both commonly known as "Ms" in Cantonese Chinese. It was not always easy to distinguish and interpret the actual meaning, and there is potential for data misinterpretation, as a result. Nevertheless, our researchers were native in Cantonese Chinese and fluent in English (written and

spoken) and could therefore identify and estimate the actual meaning when considering the whole transcript in context.

3.7 Summary

In-depth interviews with the current service providing opinion leaders allowed for the understanding of their respective pharmaceutical services thoroughly. It was identified that their services are mainly of a different nature with different points of focus. The resources required by each service, and the facilitators and challenges faced by each service were analysed. The major constraint for the service was found to be the shortage of manpower for carrying out the services.

In the setting of OAHs, spokespersons from the field of the care of the elderly were also interviewed. They were asked about the causes of medication incidents in OAHs, and the major cause identified was also the shortage of manpower to work in the industry. It is therefore concluded that there is a major demand in the industry for manpower.

CHAPTER 4

Study C: Ethnographic observations and qualitative semi-structured interviews of elderly pharmaceutical service users and non-users of selected practices

4.1 Introduction

Study C is a 2-part study. The first part aimed to identify the supporting structure and the process of the service delivered in the real setting so as to compare it with the information obtained from the literature obtained in Study A or the information provided by the interviewees from Study B. The second part consists of semi-structured telephone interviews with the current pharmaceutical service users and the potential service users, in order to understand their perspectives on pharmaceutical services and measures for medication safety.

4.2 Objectives

- To provide a descriptive account of the current practice.
- To determine the perception of users on the pharmaceutical services including benefits, shortcomings, economics, potential improvement and long-term future.
- To identify the current and future needs, as well as the gaps in the current service provision.

4.3 Methodology

The first part of Study C was an ethnographic observation of selected premises of the pharmaceutical service providers interviewed in Study B.

Part 1 – The ethnographic observation

In carrying out Study B, services with a permanent premise would be visited, with permission sought from the interviewees prior to the interview process. Interviewees were informed that the actual work process observed would be reported. The aim of carrying out the ethnographic observation is to deepen the understanding of the actual work process and real life settings, supplementing what was reported by the interviewees in Study B.

Of the 5 interviewees in Study B, 3 of the premises were visited.

Part 2 – The telephone interview

The second part was a qualitative study using semi-structured telephone interviews conducted between 15th and 23rd October, 2012.

The interviewees

A total of 15 interviews were carried out. Six of the interviewees working in the elderly care institutes are current pharmaceutical service users and the remaining nine interviewees work in elderly care institutes that are currently not subscribing to any pharmaceutical service. The participants were usually the nursing heads or person in-charge who was responsible for the medication issues.

For the interviews with the service users, approvals were first sought from the interviewees, who participated in Study B, to allow us to contact some of their service users. If approvals were granted, they were asked to provide lists of current users using their respective pharmaceutical services, which would later be purposively contacted. Approval was only granted by one of the IT supported MDS service providers and one of the pharmacy outreach service to the elderly community centres service providers. As the service provider of VPS decided to withdraw from this study, OAHs were called sequentially according to the contact list provided by SWD. When contacted, they would be asked generically if their institutes are currently receiving VPS service. As a result, 6 service users were identified and interviewed (SU1-6).

For the interviews with the non-service users, only OAHs were chosen but not the community centres. This decision was made due to a more stable and regular service provisions in OAHs than community centres. Data saturation was reached when a total of nine non-pharmaceutical service users were called (NU1-9).

The private OAHs currently under the Enhanced Bought Place Scheme (EBPS) under SWD have increased quality in terms of space standard and staffing due to the strict requirements in the scheme. With those remarks in mind, the potential users were stratified into 3 groups according to their different funding status, as a measure to try to include non-service using OAHs of different quality standards in the study. These 3 groups were: private homes, private homes with EBPS and non-profit, self-financing homes.

The interview guide

Three sets of questions were developed to suit the different backgrounds of the interviewees (namely the community centres, service using OAHs and non-service using OAHs). Service using participants were asked how they perceive the pharmaceutical services their institute received, including the benefits, shortcomings, economics, potential improvement and long-term future. Non-service users were asked about their safe medication practice and reason(s) for not subscribing to pharmaceutical services.

All interview tools were originally written in English, followed by a translation into Chinese and back-translated into English. A pilot study was carried out in the first week of October, 2012 in order to test the validity of the questionnaire prior to the interviews.

The interview

Interviews lasted for approximately 15 minutes and were audio-recorded with verbal consent from all but one of the interviewees, who declined. All interviews were conducted by the same interviewer (R4) in order to ensure consistency.

This part of the study aims to determine the perception of users on the kind of pharmaceutical services their institutes are using, therefore, all institutes (including service users and non-users), when contacted, would be asked generically if their institutes are currently “receiving any kind of service provided by pharmacists”. As the native language of all interviewees is Cantonese Chinese, all interviews were conducted

and/or audio-tape recorded in Chinese. Transcripts were read for the identification of relevant quotes which were then grouped for thematic codes manually by 2 reviewers (R2 and R3). All relevant quotes and thematic codes were translated into English and interpreted for data analysis. Samples of the semi-structured interview guides for service users are included as Appendix 3 & 4 (Chinese) and Appendix 5 & 6 (English), whereas the interview guides for non-service users are included as Appendix 7 (Chinese) & 8 (English).

4.4 Results – Observations

The pharmacies of the following three interventions were visited and observed.

- IT Supported Monitored Dosage System by Pharmacist
- OAH In-housed Monitored Dosage System
- Charity Pharmacy cum Drug Counselling Scheme

IT Supported Monitored Dosage System by Pharmacist – Site 1

Site 1 is a registered pharmacy premise in an industrial building. The service was initially piloted in one OAH in 2000 and thereafter the service was outsourced for expansion. The service in site 1 officially started in April 2008. Four full-time and two part-time pharmacists currently work there. It manages approximately two hundred and fifty thousand MDS packs annually and currently serves 3500 residents of OAHs.

It is an office >1,000 sq. ft. in an industrial building. Inside, there are around 10 office cubicles, where each staff occupies one. The office is equipped with MDS packs, files and computers with network connection. The drugs are stored in lockable, compactable filing cabinets, purposely amended so that medications for each resident can be individually stored in plastic cases with their names computer-generated and labelled on, and filed according to the name of the OAHs. Site 1 only keeps oral solid dosage forms that do not require refrigeration. In the dispensing and prepacking process, the dispensers dispense drugs in their respectable cubicles, and then pass the packed drugs to the pharmacists on duty for checking. The pharmacist will then sign onto the dedicated space provided on the pack. The packed drugs that are ready to be delivered are then put into another cabinet filed according to the names of the OAHs near the entrance, and will be checked again before the drivers pick them up and transport to the OAHs at an agreed time and date of the week.

OAH In-housed Monitored Dosage System – Site 2

Site 2 is a registered pharmacy within the premises of an elderly home service and officially started in early 2009. The dispensary is within an office of approximately 300 sq. ft. The pharmacy dispensary is operated by five pharmacy dispensers and one registered pharmacist. The dispensary is equipped with standard tools and equipment for its supply services, including secured storage for drugs, dose administration containers (Websterpak[®]), counting trays and computer systems.

Medications are dispensed daily and about 8000 solid dosage forms were handled daily, providing a weekly supply of medications for 649 elderly home residents at the time of

the study. Weekly medications are organised into Websterpak[®] for distribution and administration.

New prescription orders from hospital discharge prescriptions are reviewed as per the pharmacist's usual standard of care. Due to the volume of elderly residents at the facility, the pharmacist is not involved in drug consultations, patients' bedside care or other specific programs related to medication safety practices. Approximately sixty residents were chosen for follow-up drug audits for reviewing medication records with the RN.

Charity Pharmacy cum Drug Counselling Scheme – Site 3

Site 3 is a registered pharmacy run by a registered charity, non-profit making, non-governmental organisation that provides a wide range of welfare services to people of different ages and needs. The pharmacy consists of a dispensary and a pharmacist consultation room. Site 3 is located inside their main building of the organisation. This pharmacy service was initiated in November 2009. The pharmacy serves approximately 2,000 person-times per year. Currently, 1 full-time pharmacist works there and is responsible for providing the services.

This pharmacy does not carry a wide range of medications. It only stocks a limited number of medications, mostly SFI medications according to the HA Drug Formulary. The pharmacy is equipped with tools and equipment essential for managing daily dispensing work, e.g. lockable cabinets for storing drugs, and counting trays for drug dispensing. Other supporting facilities such as network connected computers and medical references are also stocked.

Majority of the dispensing work involves the provision of SFI items to people who get financial assistance. In order to be eligible for the discounted medications, these patients would first need to register with a social worker, who would arrange a financial examination before granting the eligibility. Another main role of the pharmacist is to provide drug consultation service by appointment.

4.5 Discussions – Observations

The aim of the first part of Study C was to provide a descriptive account of the true practice in the 3 pharmacy premises.

The three pharmacies have met the basic requirements for suitable drug storage areas. For example, the area is not directly under sun-light illumination at all times and the temperature and humidity is controlled. The sizes of the pharmacies varied. However, due to the different natures of the services they provide, this cannot be compared.

Site 1 was used for storing drugs for the OAH residents the organisation serves, dispensing and prepacking drugs also takes place in the same premise, so it is a large pharmacy and is still anticipated to continue to expand. In contrast to Site 1, Site 3 was a small pharmacy with a counselling room. It can only accommodate two patients at the same time, which seems adequate for the main function of providing drug counselling services to patients on an appointment basis. In contrast to Sites 1 and 3, Site 2 was a

small pharmacy dispensary, serving on-site elderly residents with respect to the supply of medicines.

4.6 Results – Service users / non-users interviews

Findings from the interviews were obtained and categorised so as to achieve an understanding of the perceptions of the elderly care institutes on pharmaceutical services. This part of the study is further divided into 2 sections.

Interviews with service users

In the first section, the pharmaceutical service users were asked about their understanding of the activities carried out by the service providing pharmacist(s) and institute(s), and their opinions on the i) benefits of using their current service, ii) shortcomings and any potential improvement of their respective services, iii) the economic values of the service, and iv) the long-term future for the institutes to continue to subscribe to those pharmaceutical services. In order to avoid duplication, the interviewees' account of the service will not be reported in the results, but will be discussed later on. The results of the interviews are presented according to individual type of service the institutes received.

Institutes receiving community centres pharmacy outreach services

At the time of the interviews, interviewees (denoted as SU1 and SU2) both worked at community centres.

On the benefits:

When asked if the outreach service facilitates their work or benefits the elderly members, both interviewees regarded this service positively. SU1 commented that:

“... in the service, pharmacists would give a drug talk... they would provide drug knowledge to both the elderly and their families by explaining their medicines, and will make recommendations based on their conditions, this helps the elderly understand more [about their medications].”

SU2 added that the pharmacists would provide “some health check” for the elderly.

On the shortcomings and potential improvement:

Interviewees were asked about how they think this service they receive can be improved, SU2 suggested:

“I think that it would be better if the size [of the service] can be bigger with more regular visits to the elderly community centres. Right now the size is a bit small, and the visits are rather irregular.”

SU1 suggested that the administrative work could have been done better:

“...communication and follow-up work could be done better...”

On the economic values:

This pharmacy outreach service is currently free-of-charge, but SU1 added:

“If these services start to charge, then we shall really need to look at whether the service is helpful, and consider them case-by-case, it is difficult to decide right now.”

On the long-term future of using the services:

When asked if their institute would continue using this service, SU2 replied positively as the service is “useful to the elderly”, whereas SU1 was a bit critical:

“The programme is continuing, so we shall wait and see. Right now they only have one service at ours, so if you ask me now, it is difficult for me to give you an answer...”

Interviewer then asked if their institute might consider using other pharmaceutical services that charge, SU2 replied:

“I do not think we would consider using other pharmaceutical services that charge, unless we have extra resources...”

SU1 also hesitated:

“... you asked me if I would consider using other services, if there are free services, then those that charge are a bit...”

Institutes receiving the MDS services provided by pharmacists

At the time of the interviews, interviewees (denoted as SU3 and SU4) both worked at OAHs.

On the benefits:

The investigation on the benefits of receiving the pharmaceutical services in OAHs were further divided into 5 main parts to find out if using the service: i) facilitates the staff's care of residents, ii) improves the clinical conditions of residents, iii) improves the staff's confidence in providing health advice to residents, iv) improves their health knowledge, and v) manages to bring other help to the users.

i) The service facilitates the staff's care of residents

Both interviewees valued the professional advice given by the pharmacists. SU3 added:

“I would not need to have a worker to dispense the drugs a whole morning... it really decreases our workload”

SU4 illustrated how pharmacists are able to advise them:

“Sometimes the doctors’ prescribed drugs at double the dose, they [pharmacists] would remind us, and recommend us to ask the doctors or to reduce the dose... we nurses do not always know about the drugs, we are not as knowledgeable as pharmacists.”

ii) The service improves the clinical conditions of residents

The interviewer asked if the clinical conditions of the residents have been improved since subscribing to the service, SU4 did not provide a direct answer to the question but stated that pharmacists “helped identify clinical problems” and can provide “pharmacological advice”.

On the other hand, SU3 responded:

“They are not related. Hospital admissions are due to the changes in clinical conditions in the residents; problems with the drugs are due to the prescribing by the doctors, and have no relation to the service, same goes with number of falls... drug administration is the role of the nurses and HCAs, and is unrelated to the part for prepacking medicines...”

iii) The service improves the staff’s confidence in health advice provision to residents

Both interviewees responded positively to the question. SU4 added:

“... it increases the authority when I say ‘the pharmacist says so!’”

iv) The service improves the staff’s health knowledge

Both interviewees appreciated that the service helps to improve their health knowledge. SU3 specified that:

“There is a hotline that we can call at any time when we have questions to ask.”

v) The service brings other help to the staff

When asked if the service brings other benefits to the staff and/or their work, SU3 added:

“... sometimes when there are extra stock of medicines, they would help to deal with them.”

SU3 also appreciated that for therapeutic duplication, the pharmacists would help the doctors decide on a treatment plan:

“Our resident follow-up at many clinics, and some doctors may

prescribe the same drug. Sometimes our staff might just dispense it according to the instructions on the bag. The pharmacists would tell us to put some drugs on hold, and they would clarify with the doctors”

SU3 also added an extra role that the pharmacists might do for them:

“... the pharmacists would remind us when there are batches of some drugs that have problems...”

SU4 felt assured that their procedures are regularly monitored by the pharmacists:

“... pharmacists would come and check our drug administration procedures, so there are cross-checking from both parties”

On the shortcomings and potential improvement:

When asked if there are things that they think should improve, SU3 commented:

“I think maybe there is a need for some fine-tuning in communication between the service pharmacists and DH and SWD...”

SU4 claimed:

“Of course there are things that they should improve on. For example, sometimes, the pack become loose and the drugs may fall out; or the delivery time [of the MDS packs], sometimes I think they are a bit late [in delivering].”

On the economic values:

The interviewer asked if they know how much the OAH is paying for this service, and if the value is reasonable. The interviewees were then asked a hypothetical question, where there is a rise in charges, up to which point they would cease to use the service. For the principle of confidentiality, the actual values the OAHs are paying is not reported.

SU3 had refused to answer to this question. SU4 stated the service is “expensive”:

“I suppose it is reasonable, but it is not cheap at the same time, for it is charged per resident per day, so the more residents we have, the more expensive for us... if the charge per resident increased by \$1 [Hong Kong Dollar] then we will cease to use the service.”

On the long-term future of using the services:

When asked if their organisation would continue to use the current service, both interviewees indicated that there is no short-term plan to change to another service.

SU3 added:

“We shall continue using this service, it is safe, and it saves us a lot of time when I can be put more time into taking care of the residents...”

Institutes receiving VPS

At the time of the interviews, interviewees (denoted as SU5 and SU6) both worked at OAHs.

On the benefits:

The investigation on the benefits of receiving the pharmaceutical services in OAHs was further divided into 5 main parts to find out if using the service: i) facilitates the staff's care of residents, ii) improves the clinical conditions of residents, iii) improves the staff's confidence in providing health advice to residents, iv) improves their health knowledge, and v) manages to bring other help to the users.

i) The service facilitates the staff's care of residents

Both interviewees responded positively that the service helps with their care of the residents. SU6 commented:

“At least the nurses would not need to spend so much time on checking whether the drugs have been correctly entered into the computer system, or whether there are problems with the drug records, for they [the pharmacists] will counter-check for us.”

SU5 also added:

“Staff in the OAH have poorer English, [the pharmacist] can help us read the discharge notes, and update us with any changes.”

ii) The service improves the clinical conditions of residents

When asked if the clinical conditions of the residents have been improved since subscribing to the service, SU5 did not really address the question, whereas SU3 commented that:

“Sometimes when the pharmacist recommends something, and wrote it on a memo, but the doctor would do something else, and not follow the advice on the memo...”

iii) The service improves the staff's confidence in health advice provision

Both interviewees thought that the service improves their confidence in giving health advice, but SU6 added that:

“... but sometimes the elderly residents or the family do not buy into the recommendations.”

iv) The service improves the staff's health knowledge

Both interviewees appreciated that their health knowledge can be improved by the service. SU5 enjoyed the drug talks, and SU6 also appreciated the *in-situ* explanation and discussions with the pharmacist.

v) The service brings other help to the users

When asked if there are other benefits from the service, SU5 could not think of any. SU 6 added:

“... the pharmacist would also help us check whether our drug storage conditions comply with the conditions stated by the guidelines.”

On the shortcomings and potential improvement:

When asked if there is anything that requires improvement in the service, SU6 could not think of anything that needs improvement, whereas SU5 simply wanted more drug talks given by the pharmacist.

On the economic values:

The interviewer asked if they know how much the OAH is paying for this service, and if the value is reasonable. The interviewees were then asked a hypothetical question where there is a rise in charges, up to which point they would cease to use the service. For the principle of confidentiality, the actual values the OAHs are paying is not reported.

SU5 refused to answer to the question; SU6 commented that:

“The service charged hourly. If the charge increased by \$100 [Hong Kong Dollar] per hour then of course we will ceased to use the service... how could we afford it!”

On the long-term future of using the services:

When asked if their organisation would continue to use the current service, both interviewees indicated that there is no short-term plan to change to other services. SU6 added:

“We will continue using this service. It is, more convenient to have a pharmacist, because they are more familiar with the drugs after all. Umm... depends on the charge [of other paid services], but we would not consider some services that do prepacking.”

Interviews with non-service users

In the second section, 9 staff members from the OAHs not using the pharmaceutical services were asked by the interviewer on their practises of drug handling, their reasons

for not subscribing to any pharmaceutical services, and if it is for monetary reason, how much they are willing to pay for the services.

Reasons for not subscribing to pharmaceutical services

When asked for the reason for not subscribing to any pharmaceutical services, 6 of 9 interviewees claimed there was not a need to do so. Four interviewees said they “can still handle it”. NU3 commented that:

“These services may be useful in larger OAHs, but ours is a small one. There are so many people coming to check our work already, SWD inspectors, DH inspectors, community nurses etc. Theoretically, so many people checking on us, there should not be any mistake. Not because of money.”

NU5 stated that their organisation has never thought of subscribing to any of the services “right from the start”:

“We do not think they [the services] can really help us, and we are happy with how we are right now.”

Financial concern was the second largest reason that OAHs decided not to subscribe to any pharmaceutical services, 4 of 9 interviewees indicated that funding is an important factor. NU1 expressed that:

“... we can almost employ a nurse with the funding given...”

NU6 commented that:

“... Government does not subsidise us much, if one day we have to pay for it long-term without subsidy, then it will be difficult for us.”

NU8 added:

“... of course it would be better if the service is free... I cannot just transfer the budget onto the family members!”

From the response, 3 of 9 interviewees doubted the ability of pharmaceutical services in reducing medication incidents in OAHs. Both NU1 and NU7 commented:

“... even you might dispense a drug wrongly, human is no robot after all... all human makes mistakes”

The complicated communication cascade made 2 of 9 OAHs hesitate to subscribe to pharmaceutical services. NU1 commented;

“When an elderly is admitted into hospital, and there are changes in the discharged medications, then I will have to communicate the

changes to you, when you shall mark your record. And then the medicines get changed again, and I will have to communicate the changes to you again. This is too time-consuming.”

NU8 added that:

“...the pharmacist cannot follow the many drug changes that only happen too quickly...”

One of the interviewees was afraid that the OAH staff would have “got used to this service mode and reluctant to change back” when the organisation could not afford the service anymore.

Another interviewee simply had not heard of the availability of any pharmaceutical service.

4.7 Discussions – Service users / non-users interviews

The deliverables

This part focused on the account of the service by pharmaceutical service users, and aimed to match their description with the descriptions by the service providers in Chapter 3. Service users were asked to give an account of the pharmaceutical service that was given to their institute. This aimed to find out whether the agenda said to be delivered by the service providers is actually delivered.

SU1 and SU2 were representatives from the service users. Both of them gave a good overall account on what the nature of the service is and the roles of the participating pharmacists in the service.

SU3 and SU4 were representatives from the OAHs that are currently using the MDS prepacking service provided by pharmacists. Both of them gave a good overall account on what the nature of the service is, and SU3 was able to describe some particulars on the MDS packs. Both of them are currently not using the wrist-band service, and hence not relevant to be discussed in the report.

SU5 and SU6 were representatives from the OAHs that are currently using the VPS service. Both interviewees were able to give a good overall account on what the nature of the service is, although SU5 seemed a bit rushed on the telephone and did not describe the service in great detail. Both interviewees were able to highlight how the pharmacist would check for information correctness on MARs and computer records versus patients’ discharge summaries and doctors’ prescriptions. Both were able to point out the educational role of VPOs in OAHs by delivering drug talks and transfer of knowledge *in-situ*. However, none of them were able to describe the 24-hour pharmacist on-call service, the carrying out of medication reconciliation and the medication review, which are considered some of the most important roles for a VPS.

The discrepancies in the descriptions for the VPS are not necessarily due to the VPOs not delivering their services. It could be due to the fact that the VPS is a multi-faceted service, where the VPOs may carry out many different roles at the same visit, and some are more easily recognised, e.g. clerical checking for correctness on the records, delivering drug talks etc. Also, the interviewees do not necessarily have healthcare backgrounds, and therefore might not truly understand the significance of VPS.

The more matching descriptions for the pharmacy outreach service could be attributed to the simpler service model; whereas the more matching descriptions for the MDS prepacking service could be attributed to the higher impact of the service on the staff, e.g. dispense medicines on a weekly basis so that the OAH staff would not need to do so etc.

Identifying the service gaps

The gap of understanding pharmacists' roles

During the interview with non-service users, many of them indicated that they do not perceive the need to have pharmacists' input in the medication management procedures at their premises. This is mainly because the OAH management only see the dispensing roles of pharmacists, which they believe could be easily substituted by other alternatives, e.g. HCAs or nurses. They are unable to recognise other pharmacists' roles, e.g. providing drug knowledge and identifying drug-related problems.

It was noted that OAH management where financially driven, may consider pharmacy services in a financial sense and perceive that the money may be better spent on the employment of HCAs or nurses as they can provide other forms of services on top of dispensing role. This contrasts with the responses given by the service users, in which most of them were able to recall most of the pharmacists' roles at their premises.

The service gaps perceived by users

The service users from the OAHs stated the current pharmaceutical service was "complicated", especially the process of inter-communications between pharmacists with other healthcare professionals and government bodies, e.g. DH health inspectors. The various pharmacy services provided right now are add-on services and are not well integrated into the multidisciplinary team; therefore a more streamlined communication mechanism should be in place. This will improve when the pharmaceutical services are recognised and supported by the government bodies.

Users from the elderly community centres suggested that the current outreach pharmacy services should be offered more regularly and on a larger scale. This can create huge pressure on the organising bodies if this is to be done as the currently available services rely on the voluntary participation of registered pharmacists, and it would be difficult if the service is to be continued that way to sustain in the long run and carry out more regularly on a larger scale.

4.8 Limitations

Part 1 – The ethnographic observations

The reason for carrying out the ethnographic observation was to observe the real-life practice in its own setting, supplemented with the descriptive accounts provided by the pharmaceutical service providing opinion leaders. Ideally, the observations should be done in OAHs of a different nature (EBPS, private, NGO-funded) and community centres, whether they are pharmaceutical service users or not. However, this was not possible due to limitations on time and resources. It was noted that many service providing opinion leaders worked predominantly in their own respective pharmacies. As there may be a potential for bias, ethnographic observations were deemed an important aspect of the study.

The presence of the observers might lead to observer effects in this part of the study. Subjectivity of the researcher(s) might also induce observer bias into this study. In order to minimise this, triangulation method was used to cross examine the data collected from multiple sources, such as literature reviews in Chapter 2, and perceptions of opinion leaders in Chapter 3. Opinions from current users and non-users were also collected as described in this chapter. This can ensure the comprehensiveness and enhance the validity of data interpretation.

Part 2 – The telephone interviews

In order to assess the perception of pharmaceutical service recipients, telephone interviews using telephones were carried out. Owing to the time constraints and limited resources, not all OAHs and elderly community centres for service users and non-users were interviewed.

Also, approvals were to be sought from the service providing opinion leaders prior to contacting the elderly care institutions, but not all opinion leaders had granted approval, and the information from those users were not obtained.

Despite these challenges, data saturation was met for service users and non-users. Furthermore, the sampling frame of the potential community centres users was unavailable and the outreach service to community centre was usually one-off, therefore, the non-service using elderly community centres were excluded and the community centres were contacted purposely according to the list provided by the service provider.

It is also important to note that, the responses made in the interviews were spontaneous answers from the interviewees without any prior preparation. Therefore, their comments are subjective and may be concise at times. This is unavoidable in carrying out qualitative research, as the questions are open and the subjects are allowed to comment freely on their views.

Moreover, most of the staff in OAHs were very busy and they were not willing to provide very detailed answers to the telephone interviews. It increased the non-response rate and might induce reporting bias. The interviewees might have concerns over

confidentiality issues, although the interviewer had assured him/her that their names and the names of the OAHs would be kept confidential.

Like other qualitative research, the experience of the interviewer in dealing with different situations and/or responses from the interviewees is crucial. The interviewer should also possess good questioning skills and be able to check the understanding and be adequately sensitive to detect potential misunderstanding of the interviewees. This was addressed via the pilot interviews with different scenarios for the interviewer prior to the actual interviews.

4.9 Summary

Some of the different pharmaceutical service models were observed and the settings, material and human resources of the services were understood. Service users and non-users were interviewed and almost all service users could recognise most of the roles of pharmacists besides dispensing; whereas the majority of the non-users believe there is no need for employing pharmacist-led pharmaceutical services. Many service users described the benefits of the services but also indicated that there are still some improvements in inter-communications between pharmacists with other healthcare professionals and government bodies. Implementation of the regular outreach services on a larger scale was also recommended.

CHAPTER 5

Overall discussions and future directions

The aim of this scoping study was to identify the types of pharmaceutical services provided for the elderly in Hong Kong. A comprehensive systematic review and in-depth qualitative interviews were used to identify the interventions, followed by the on-site ethnographic observation and semi-structured qualitative telephone interviews with the current service users and non-users to evaluate effects of the interventions.

Several types of pharmaceutical services were found to be currently available, with an aim in reducing medication incidents among the elderly in the community setting. The prevalence of medication incidents in Hong Kong could not be determined since there was no published data from any authority, health organisation/societies, healthcare workers and journals in Hong Kong.

5.1 Evaluation of frameworks

In order to assess and evaluate the different pharmaceutical services by gathering the information from literature, interviews and observations. The typical Donabedian framework (Table 5) was adopted to classify the quality of care under 'structure, process, and outcome'.⁵ Results in study B-C were combined and summarised in the frameworks in Appendix 9.

Table 5: Framework for services evaluation⁵

	Things to measure:
Structure	<ul style="list-style-type: none">◆ Attributes of material resources: facilities, equipment, money◆ Human resources: number and qualifications of personnel◆ Organization structure: staff organisation, methods of peer review, methods of reimbursement
Process	<ul style="list-style-type: none">◆ Patients' activities◆ Practitioners' activities
Outcome	<ul style="list-style-type: none">◆ Health status of patients or population◆ Improvement in patients' knowledge◆ Changes in patients' behaviour◆ Degree of patients' satisfaction

5.2 Discussion of Services

This study investigated various types of pharmaceutical services available to the elderly in Hong Kong. The nature, the effects on medication safety, the shortcomings and economic values were explored, using literature reviews, descriptive presentations from service providers, ethnographic observations and the descriptive accounts from current service users. The following section evaluates the strengths and weaknesses of each service, in their role in preventing and reducing the medication errors in the medication management process.

The medicine management process in the Hong Kong OAH setting is illustrated in Figure 3,. In order to examine the impact of the main pharmaceutical services identified in the previous chapters on medication errors in Hong Kong, the above medication process would be used as a framework to guide in-depth analysis.

The medicine management process

As illustrated in Figure 3, the process begins from physician prescribing onto a prescription/medication record, which would be sent to the pharmacy for dispensing by pharmacy staff and checking by the pharmacist. The dispensed medications would be issued to the patient. The OAH nurses/health-care assistants would store the medication away, and administer to the patients according to the instructions written on the prescriptions/medication records.

Errors could occur at any stage of the medication management process:

1. Prescribing errors could arise during the prescribing process, which is subdivided into i) errors in prescribing decision, and ii) errors in prescription writing process; both potentially leading to the wrong instructions printed on the prescription/medical record.
2. Dispensing errors could occur when the prescription arrives at the pharmacy, leading to the wrong medication being issued to the patient.
3. Sub-optimal or inappropriate storage conditions of medications at the OAH could adversely affect the efficacy of the medications.
4. Administration errors may occur at the OAH, which may be caused by i) wrong documentation in the medical record (due to incorrect prescription writing process as discussed) or ii) failure to identify the correct patient/drug for administration.

Ideally, the errors that occur at various stages of the medication management process could be prevented by pharmacists, as illustrated in Figure 4.

Pharmacist bed-side patient care

A pharmacist could provide clinical bed-side care on clinic days or clinical rounds together with the on-duty physician(s). This could prevent prescribing errors due to inappropriate prescribing decisions by minimising drug interactions or contraindicated medications being prescribed. Pharmacist could also prevent prescribing errors from the prescription writing procedures by checking the prescriptions prior sending them to the pharmacy for dispensing to ensure correctness and legibility.

Pharmacist supervised MDS system

The MDS system has been widely used both locally and globally, but not all systems would involve the supervision by a pharmacist. Prior to the commencement of the dispensing process, the pharmacist could check the prescriptions for legibility to prevent errors from the prescription writing process. A pharmacist could also oversee the dispensing process to ensure the correctness of the dispensed medications. If the dispensing pharmacy is located on-site or has close collaboration with the OAH, all of the medications could be stored at the pharmacy, where the storage conditions (e.g. temperature and humidity) would be optimised and closely monitored.

Information technology monitored check in drug administration

Drug administration is likely the most risky step of the medicine management process where errors may lead to direct harm to the patient. Measures have been put in place to ensure the administration procedures are monitored and accurate. The use of information technology is the global direction as that off-loads the tedious checking procedures from the nurses/health-care assistants, minimising administration errors secondary to human factors.

As discussed in earlier chapters, the major types of pharmaceutical services serve 2 types of elderly in Hong Kong: those living in the OAHs, and those living in the community. As the medication management process is better applied in the OAH setting, the discussion will mainly focus on the elderly living in the OAHs; and pharmaceutical services serving the elderly living in the community will be discussed separately.

Elderly patients living in old-aged homes

This study has identified 4 main service providers serving the patients living in OAHs, namely IT supported MDS system by pharmacist (provided by INT1), OAH in-house MDS (provided by INT2), IT supported MDS system for OAH staff (provided by INT5) and VPS (provided by INT6).

A. IT supported Monitored Dosage System by pharmacist

This pharmaceutical service features the overseeing of the dispensing procedures of all solid oral drugs, to be packed into MDS systems by pharmacist(s) located off-site.

Strengths: Pharmacists and dispensers take part in the dispensing process of all oral solid medicines to ensure the correctness of the dispensed medications. The premise is also responsible for the storage and appropriate storage conditions of all oral solid dosage forms. Information technology developed by this service is used to ensure that the correct patient/resident is accurately identified, which potentially could reduce administration errors.

Weaknesses: There is limited ability to prevent prescribing error due to incorrect prescribing decisions owing to a lack of communication with doctors. The lack of clinically related information results in limited ability to identify drug related problems and prevent potential prescribing errors secondary to the sub-optimal prescription writing process. There are also difficulties in obtaining a complete and accurate medication list. Further, the dispensing and storage are currently limited to oral solid drugs only. Other dosage forms including inhalers and insulins which require specific instructions for their use and storage are therefore not monitored, and the consequence of inappropriate use could be serious. Administration errors could be reduced considerably if the service users also utilise the wrist-band facility developed by the service provider in the administration process, however that implies an additional cost to the OAH residents, which would be a barrier to be overcome.

B. OAH in-house Monitored Dosage System

This pharmaceutical service features the presence of a full-time pharmacist in the OAHs, overseeing all dispensing procedures and storage conditions.

Strengths: By having the physical presence of a pharmacist on-site at the OAH, it is feasible for the pharmacist to oversee all dispensing procedures and to monitor drug storage conditions.

Weaknesses: Prescribing errors due to inappropriate prescribing decision could be reduced if the pharmacist works closely with the doctors during the prescribing process. This is only possible with the VMOs and CGAT as these doctors see patients at the OAH. In Hong Kong, patients obtain medicines from multiple sources, and it is difficult for the pharmacist in the OAH to work with doctors who are not within the institution. In theory, there are many roles that an in-house pharmacist could fulfil, such as carrying out medication reconciliation, medication review, making clinical bed-side interventions; as well as dispense and store all medications and supervise the overall drug administration process. However, in practice, the pharmacists are too involved in the dispensing process and do not at present work closely with the multi-disciplinary team at the bed-side. Moreover, the ratio of pharmacist to residents was about 1 to 650, therefore it is difficult for a pharmacist to monitor the whole medication process for such a large patient group on a daily basis.

C. IT supported Monitored Dosage System for OAH staff

This pharmaceutical service features an educational CD-ROM compiled by a pharmacist containing essential drug information for the OAH staff as a learning resource, an electronic platform for MAR documentation, and an information technology supported device for the checking of patient identities.

Strengths: The use of a specially designed technology in checking patients' identities could reduce drug administration errors. By providing the OAHs with an electronic platform for legible documentation of the medication histories, it has the potential to also reduce dispensing errors.

Weaknesses: As this service aims to empower the OAH staff to deal with the medications, the pharmacist does not take part in any of the prescribing, dispensing or storage processes. In practice, since the entry of drug information into the electronic platform is by non-healthcare professionals, errors may still arise.

D. VPS

This pharmaceutical service features VPOs to physically visit the OAHs on a once weekly basis to provide consultation support and ensure that the OAHs' medication management complies with the rules and regulations set out by the SWD. The pharmacists also assess the medications.

Strengths: By the physical presence of pharmacists at the OAHs, the pharmacists could minimise the prescribing errors due to illegible prescription writing. The pharmacists could make sure good dispensing procedures are followed, check and advise the OAH

staff on optimised drug storage and administration procedures. The pharmacist could also carry out medication reconciliation for the residents.

Weaknesses: In theory, physical attendance to OAHs by VPOs allow for an opportunity for multiple roles to be fulfilled. However, in practice, the VPO could only visit the OAHs once a week. Unless they timed their visits to the clinic days to be at the point of prescribing to provide on-site support to the physicians, there is limited ability to prevent prescribing error due to incorrect prescribing decision owing to lack of communication with doctors. It is also difficult for VPOs to work with doctors who do not work in the institution. The lack of clinical information results in limited ability to address prescribing errors due to sub-optimal prescription writing process. Furthermore, although VPOs could impact on the dispensing, storage and administration procedures of the OAH staff, they are likely unable to remove the responsibility of 'high risk procedures' away from non-healthcare professionals. Therefore, there may be limited ability in preventing dispensing, storage and administration errors.

Elderly patients living in the community

For the elderly living in the community, prescribing and dispensing processes were mainly provided in hospitals and clinics. Therefore, prescribing and dispensing errors were not addressed by the community pharmaceutical services. Also, since the elderly patients (or their carers) shall be the one to administer the medications, the term "drug administration" shall be defined as drug compliance in this section. The main aim of these services was to improve drug knowledge and compliance by accessing these elderly patients proactively.

This study has identified 3 main service providers serving the patients living in community, namely charity pharmacy cum drug counselling scheme (provided by INT4), pharmacy outreach services to the remote/ immobile elderly (provided by INT4), and pharmacy outreach services to the elderly community centres (provided by INT3).

A. Charity pharmacy cum drug counselling scheme

This pharmaceutical service features a charity pharmacy offering financial support to the elderly by helping them obtain drugs in SFI at an affordable price.

Strengths: As the patients obtain their SFI medications from this pharmacy which are processed by the pharmacist, dispensing errors for SFI drugs could be prevented. In theory, drug knowledge and improper storage of medications may improve to a certain extent by providing advice to the elderly patients.

Weaknesses: In terms of drug compliance, patients may be non-compliant advertently or inadvertently intentionally or unintentionally forget to take the medications despite the advice provided. Furthermore, patients are reminded to take their medications regularly by telephone follow-up. However, there are still many patient factors affecting drug compliance, both advertently and inadvertently.

B. Pharmacy outreach services to the remote/ immobile elderly

These services involve regular visits by pharmacists to homes of the elderly who are living remotely or are immobile with limited access to community services.

Strengths: Pharmacists could help check patient compliance, identify issues of expired drugs, provide advice on discarding drugs appropriately and improving drug storage conditions.

Weaknesses: In practice, the elderly might still refuse to discard the drugs due to personal belief and preference. Pharmacists could only educate but cannot force the elderly residents to comply.

C. Pharmacy outreach services to the elderly community centres

The outreach service to community day centres offer counselling services to the elderly patients and their family in the centres.

Strengths: During the individual counselling sessions, pharmacists could assess drug compliance, identify any expired drugs and suggest the elderly to discard the expired drugs.

Weaknesses: Similar to the other outreach service, pharmacist could only educate the elderly on better practice, but cannot force them to do so.

Summary

In summary, all the pharmaceutical services serving patients in the OAHs could not uproot the problem of prescribing error since all the pharmaceutical service providers are not working closely enough with the doctors during prescribing process. However, most of the services in OAHs could detect the discrepancies in the prescription writing process.

Regarding the drug administration and improper storage (storage error), a 5-year evaluation report of the OAH accreditation scheme by Hong Kong Association of Gerontology was released to report the common problems in medication management in OAHs.⁶³ Drug administration procedures (46.4%) and drug storage procedures (26.1%) were reported to cover significant proportions of recommendations. Despite high proportion of drug administration errors in OAHs, only some of the services could reduce it to an extent, but still could not uproot the problem. In terms of storage and dispensing errors, services with dispensing component could reduce storage and dispensing errors by removing responsibilities from non-healthcare personnel.

Apart from OAHs, the main agenda of all the other services is to enhance education on medication and to offer drug counselling but are less powerful in tackling errors in medication process.

Thus, most pharmaceutical services have some impact on facilitating the medication process and reducing medication errors. As there is insufficient data available for conducting research, the effectiveness of these services could not be quantified.

5.3 Overall limitations

There was limited solid data concerning the medication errors as it is an area of neglect in Hong Kong. It may be due to the lack of research culture in Hong Kong. Thus it can be seen, the system for monitoring medication incidents is still in its infancy and requires future multidisciplinary collaboration. With the scarcity of articles found in this scoping exercise, several opinion leaders were interviewed for the purpose of further understanding of the pharmaceutical services in Hong Kong. However, some of the involved parties refused to participate despite the thorough explanation of the study objectives and design. It certainly became our major limitation due to the refusal of participation and consequently might affect the study outcomes. Despite this, data was collected and analysed using triangulation throughout the chapters in order to lower the bias due to non-responders.

The qualitative research method used in chapter 3-4, is inherently associated with potential interviewer bias. However, this was addressed utilising a standardised interview tool, following the guidelines of presenting and evaluating qualitative research and training manual provided by the National Defence Research Institute in United States.^{117 118} Moreover, there was the presence of an observer in all but one of the interviews to ensure the objectivity of the interviewer in chapter 3. Apart from interviewer bias, the 'Hawthorne effect' might also be created in the ethnographic study in chapter 4 since the observed subject(s) might behave in a different way while under observation. However, the subject(s) were informed that their names would be kept anonymous to reduce potential bias from the 'Hawthorne effect'. All these measures were used to increase the validity of qualitative study.

5.4 Implications for practice

As discussed, currently none of the existing pharmaceutical service is able to prevent prescribing errors. The two MDS packing systems provided by either out-sourcing to a community pharmacy or the in-house pharmacy within the OAH complexes managed to clarify discrepancies in the prescription writing process. This is done by retrospectively comparing the current dispensed medications from HA institutes with the past drug record they kept at their premises. These medications will be re-dispensed and repacked into MDS systems and be delivered to the OAHs. This process can be time consuming, complicated and high risk due to the duplicated procedures of double-dispensing (first in HA institutes, next in the delegated pharmacy). This double-dispensing process could be avoided by sending the prescription directly to the local/delegated pharmacies after the process of prescribing. The community pharmacist would be able to screen the prescription by identifying any discrepancies compared to the past drug record. Any discrepancy would be noted and addressed directly with the doctors prior to the dispensing process. The drugs could then be directly dispensed into MDS packs by the pharmacy staff, with each step closely monitored by the pharmacist on duty. Completed packs would then be transported

directly to the OAHs. In order to screen the prescriptions, there is a need for access to comprehensive patient data via the Electronic Health Record and other means while in the community setting to allow for informed patient care decisions. Databases allowing access to patient information for the purposes of patient care should be adequately secured with sufficient database maintenance and support. Further, there is a requirement for a streamlined centralised remuneration mechanism for the community pharmacies that provide this service to facilitate reimbursement from the government healthcare body.

One of the current barriers faced by the pharmaceutical services providers, particularly those involved in dispensing procedures and carrying out medication reviews is that the secondary and tertiary care institutes do not provide the OAHs with a care summary or clinical communication. Doctors may make changes to the prescriptions upon clinic appointments or hospital discharge without informing the OAH staffs. Staff confusion, dispensing and administration errors could arise after the transition of care due to miscommunication. The mandatory printing of discharge summaries and post-clinic summary for every patient can facilitate the sharing of information during the transition of care and allow the staff at each point of care to have a comprehensive profile of the care plan and medication record. The printing of such summaries also facilitates the prescription screening procedures carried out by both pharmacists and dispensing staff, and would enable them to identify any discrepancy in the prescription writing process and clarify it as soon as possible. The printing of the records could also improve the care provided to the patients, and it is important for healthcare staff at different settings to share information and to promote transparency of information among healthcare settings.

The model of Visiting Pharmacist Service has the potential to develop the roles of clinical pharmacists in the primary healthcare settings as there is the opportunity to provide bed-side care to the patients. Currently, the VPOs only visit the OAHs once a week and the visits normally could not be timed on clinic days. In an ideal situation, the physical presence of a pharmacist on clinic days can potentially reduce prescribing errors by providing bed-side care and advice to the prescribing physicians.

The model of In-house Pharmacist has great potential to provide comprehensive pharmaceutical care to the OAH residents. By having the physical presence of a pharmacist at the premise, the role of pharmacist can be focused on evidence based practice in primary care and the effective application of drug knowledge in a multidisciplinary team. Many services could be provided, including medication reconciliation, medication review, bed-side clinical care and monitoring. The pharmacist may carry out pre- and post- clinical patient and medication record screening and may make him/herself available on clinic days to advise the physicians on identifying drug related problems. The pharmacist could also oversee the dispensing, drug storage conditions and administration processes and tie-in the loop of the medicines management process. Currently, the in-house pharmacist mainly focuses on the daily dispensing duties in packing the MDS system and the potential roles have not been explored.

From the interview with non-service users, it was noted that the gap of understanding the roles of pharmacists in non-service users need to be addressed and bridged by elaborating and promoting the roles of pharmacists in primary care. Many of the non-service using OAH management only see the dispensing roles of pharmacists, which they believe could be easily be substituted by others, e.g. HCAs or nurses. The other roles of pharmacists (e.g. provision of drug knowledge, identification of drug-related problems) are not well recognised. It was noted that OAH management who are financially driven, may consider pharmacy services in a financial sense and perceive that the money may be better spent elsewhere, on the employment of HCAs or nurses. There is immense scope for pharmacists to demonstrate their ability in identifying and addressing drug related issues to improve patient care and further measure their contribution in a cost-savings sense.

In the setting of Pharmacy Outreach Services, the pharmacist is able to discuss any drug related issue, rectify any misconception and fill the deficit in drug knowledge. A solid, reliable social network supported by social workers and community centres for identifying the needy elderly and recruiting them to the services is the key to success. Concern was raised on whether these types of services could remain sustainable if they continue to rely on the volunteer participation of professionals in the long-term. These outreach services might be more likely sustainable if it is to be a collaborative effort of professional pharmaceutical organisations, social workers, and community centres rather than stand-alone activities organised by an individual organisation.

It is recommended that there should be an increase in the research component in each service by encouraging and facilitating systematic data collection by documentation of the work undertaken. All current and future pharmaceutical services are encouraged to measure the effectiveness in the service.

5.5 Recommendation for future research

Based on our studies' results, the following recommendations were made:

1) Develop a monitoring surveillance system with OAHs, doctors and nurses to systematically record and collect data

Currently, the prevalence of medication incidents in the OAHs of Hong Kong could not be measured systematically due to the sub-optimal record keeping practices among doctors and nurses. There is a need for a monitoring surveillance system for recording the data to measure the prevalence of medication incidents so as to offer an evidence-based view to reflect the condition of medication errors in Hong Kong.

2) Conduct high quality studies to measure the effectiveness of the services

High quality studies such as randomised controlled trials are highly recommended to evaluate the effectiveness of the interventions. Collaboration between the OAHs,

pharmaceutical service providers and academics, is of utmost importance for the success of future studies.

3) Conduct an economic study to evaluate the feasibility of the implementation of the services on a large scale

In light of our study, it could be seen that most of the interventions were on a small scale. Therefore, future research should investigate the monetary benefits and costs by measuring the cost-effectiveness of the interventions so as to estimate the feasibility of implementation of larger scale interventions to achieve higher coverage in Hong Kong.

4) Conduct quantitative studies on the volume of drug wastage based on current service models

Similarly, studies can be conducted to quantify the volume of drugs wasted as a result of duplicate dispensing. The financial implications can further be analysed.

Reference

1. US National Co-ordinating Council for Medication Error Reporting and Prevention. What is a Medication Error. 2012 [accessed on: 2012 Oct 30]; Available from: <http://www.nccmerp.org/aboutMedErrors.html>.
2. Jim S. Building a safer NHS for patients: Improving Medication Safety. 2004 [accessed on: 2012 Oct 30]; Available from: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4084961.pdf.
3. Dean B, Barber N, Schachter M. What is a prescribing error? *Qual Health Care* 2000;9:232-37.
4. Cheung K, Bouvy M, De Smet P. Medication errors: the importance of safe dispensing. *J Clin Pharmacol* 2009;67(6):676-80.
5. Donabedian A. The quality of care: How can it be assessed. *JAMA* 1988;260(12):1743-48.
6. United Nations Statistics Division. Table 2a - Life expectancy. 2011 [accessed on: 2012 Aug 30]; Available from: unstats.un.org/unsd/demographic/products/socind/.
7. Census and Statistics Department. Hong Kong Population Projections 2010-2039. Hong Kong, 2010.
8. Census and Statistics Department. Thematic Household Survey Report No. 40. Socio-demographic Profile, Health Status and Self-care Capability of Older Persons. Hong Kong, 2009.
9. Hilmer AN, McLachlan AJ, Le Couteur DG. Clinical pharmacology in the geriatric patient. *Fundam Clin Pharm* 2007;21:217-30.
10. 安老院派錯藥今年 16 宗. *Oriental Daily News* 2009 May 25;A21.
11. 安老院派錯藥 3 年 100 宗. *Ming Pao Daily News* 2009 March 12;A10.
12. 1 護理員對 40 長者 難兼顧易派錯藥. *Wen Wei Po* 2007 Aug 5;A12.
13. 3 院舍派錯藥 9 旬婦命危. *Wen Wei Po* 2006 June 22;A12.
14. 社署不強制安老院聘藥劑師關注派錯藥事件將加強保健員培訓. *Ta Kung Pao* 2006 June 23;A06.
15. 長者猝死八小時無人知. *The Sun* 2009 Nov 15;A07.
16. 安老院缺人手護理員壓力爆煲. *The Sun* 2009 Dec 24;A12.
17. 院舍撥款不足累長者. *The Sun* 2008 May 9;A15.
18. 僱用員工不足提交虛假資料 社署首點名兩違規安老院. *The Sun* 2006 June 23;A04.
19. 老人院護理員薪低工時長. *Sing Tao Daily* 2007 Aug 5;A08.
20. 防長者服錯藥全社會有責. *Sing Tao Daily* 2006 April 26;A06.
21. 院舍人手短缺投訴升 23%. *Oriental Daily News* 2009 Nov 15;A23.
22. Hong Kong Sheng Kung Hui Welfare Council. 醫社合作-攜手共建優質社區照顧. 2006 [accessed on: 2012 Aug 30]; Available from: http://www.google.com.hk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CFIQFjAA&url=http%3A%2F%2Fwww.healthyhkec.org%2Fcluster%2Fnews%2F20060923-SCE2%2Fpresentations%2Fkp_wan.ppt&ei=_OX_T4vkFfCYiAf6lLmqCA&usq=AFQjCNFV0oWqWFBygJqtHUxsjSwPhiOl-w&sig2=mXlZrWkOspgbbOxHxj--mw.
23. 配錯藥又奪兩命. *Oriental Daily News* 2006 April 26;A30.
24. 院舍投訴多檢控少 團體批社署 4 宗罪. *Ming Pao Daily News* 2007 March 19;A09.
25. 安老院又錯藥 社署被斥疏忽 醫院藥劑師學會指巡查虛設. *Ming Pao Daily News* 2006 July 8;A09.
26. 安老院派藥乏監管挨轟. *Hong Kong Daily News* 2006 May 16;A05.
27. 安老院疑餵錯藥 長者事後逝世. *Hong Kong Commercial Daily* 2010 July 17;A16.
28. 安老院吸走人才. *Apple Daily* 2011 Aug 8;A14.
29. 安老院再爆派錯藥事件兩次由親人揭發議員促設管理系統. *Apple Daily* 2008 Nov 16;E05.

30. 長者去世 9 小時始發現 安老院人手不足求助急增 180 院友僅 2 護理當更. *Wen Wei Pao* 2009 Nov 15;A13.
31. 安老院護理員不足 長者留廁格 3 小時. *Ming Pao Daily News* 2009 Nov 15;A12.
32. 保健員英語水平低易派錯藥團體促加強監管安老院. *Ta Kung Pao* 2006 April 27;A04.
33. 保健員英文有限 未能辨藥名 安老院派錯藥無王管. *The Sun* 2006 April 27;A19.
34. 馬太關懷社署安老院私隱. *Sing Tao Daily* 2009 Feb 2;A06.
35. 三月內四宗 長者須送院 安老院又派錯藥. *Sing Tao Daily* 2006 June 22;A19.
36. 涉嫌派錯藥院舍 反疑長者誤服. *Sing Tao Daily* 2006 April 27;A13.
37. 鄧國威：考慮藥劑師駐院舍 保健員派錯藥或除名. *Sing Tao Daily* 2006 May 1;A10.
38. 安老院派藥員英文欠佳 錯漏百出. *Sing Pao* 2006 April 27;A09.
39. 六成安老院自行配藥社署被轟欠監管 屢派錯藥保健員或除名. *Sing Pao* 2012 May 1;A08.
40. 再培訓欠專業 教錯用禁藥. *Oriental Daily News* 2012 Aug 24;A10.
41. 逾七成院舍非護士執藥. *Oriental Daily News* 2007 Nov 25;A19.
42. 兩安老院再揭派錯藥. *Oriental Daily News* 2006 July 8;A25.
43. 六成安老院派藥無王管. *Oriental Daily News* 2006 May 1;A27.
44. 藥劑師促監察院舍配藥. *Oriental Daily News* 2006 April 27;A25.
45. 安老院又派錯藥 鄧國威厚顏卸責. *Oriental Daily News* 2006 Jun 23;A30.
46. 藥劑師學會：核對手鐲姓名最重要. *Ming Pao Daily News* 2010 April 24;A06.
47. 轟社署缺風險意識 團體促公開派錯藥院舍. *Ming Pao Daily News* 2006 June 23;A20.
48. 有關安老院藥物處理的問題. *Ming Pao Daily News* 2006 July 14;A29.
49. 安老院倘再犯錯 梁智鴻促吊銷牌照. *Ming Pao Daily News* 2006 April 27;A18.
50. 港府與安老院舍 檢討派藥程序. *Metropolis Daily* 2006 June 23;P06.
51. 護士難求 資歷低保健員派藥. *Hong Kong Economics Times* 2006 April 26;A24.
52. 六成安老院有員工自行停藥加藥 保健員派錯藥或除名. *Hong Kong Daily News* 2006 May 1;A08.
53. 鄧國威：未必派錯藥. *Hong Kong Daily News* 2006 Jun 23;A05.
54. 聘不合格外勞 蠱惑招避巡查 工會揭私營安老院 良莠不齊. *Hong Kong Commercial Daily* 2010 April 12;A15.
55. 藥學會促安老院聘配藥員. *Headline Daily* 2006 April 27;P06.
56. 當局檢討院舍配藥程序. *Apply Daily* 2006 June 23;A24.
57. 醫藥團體轟社署不管安老院派藥. *Apple Daily* 2006 April 27;A14.
58. 60%安老院派藥後無紀錄. *Apple Daily* 2006 May 1;A11.
59. 11 宗派錯藥社署拒公開名單 血糖過低入院長者 42%來自安老院. *Apple Daily* 2006 Jul 8;A06.
60. 安老院再派錯藥 3 長者送院. *am730* 2006 June 22;M06.
61. 揭職員欠護理常識院派錯藥老人昏迷. *Sing Tao Daily* 2006 April 26;A14.
62. 安老院保健員 屢犯錯將除名. *Wen Wei Po* 2006 May 1;A13.
63. The Hong Kong Association of Gerontology. The Project on Accreditation System for Residential Care Services for the Elders in Hong Kong - Five-year review report (2005-2010). Hong Kong, 2012 1-83.
64. 六成隱蔽長者亂食藥. *Oriental Daily News* 2012 Sep 22;A14.
65. 外展計劃改善隱蔽長者健康問題. *Sing Pao* 2012 Sep 22;A10.
66. 隱蔽長者逾六成胡亂食藥. *Hong Kong Commercial Daily* 2012 Sep 22;A13.
67. 醫知健：外展助隱蔽長者服藥. *The Sun* 2012 Sep 22;A22.
68. 逾三成長者忘記服藥. *Oriental Daily News* 2012 May 3;A24.
69. Chumney EC, Robinson LC. The effects of pharmacist interventions on patients with polypharmacy. *Pharm Pract* 2006;4(3):103-09.

70. Alldred DP, Barber N, Standage C. How pharmacy can improve medicines use in care homes. *Br J Clin Pharmacol* 2010;2:12-14.
71. Reaching Out to the Old Age Homes - What Can Pharmacist Do? [abstract]. Hong Kong Pharmacy Conference; 2003 2003 Oct 11-12; Kowloon Shangri-La Hotel.
72. Lau WM, Chan K, Yung TH. Outreach Pharmacy Service in Old Age Homes: a Hong Kong Experience. *J Chin Med Assoc* 2003;66(6):346-54.
73. So YW. 外展藥劑師. *Physician • Pharmacist • People* 2003 Mar.
74. So YW. 藥物總覽的作用. *Physician • Pharmacist • People* 2009 Aug.
75. So YW. 從「崖上的波兒」想到安老的服務. *Physician • Pharmacist • People* 2009 Oct.
76. So YW. 安老院到訪藥劑師. *Physician • Pharmacist • People* 2010 Aug.
77. Chung WMB. Community-Visiting Pharmacist Services for the Aged People in Elderly Homes. *HKPJ* 2010;17(3):102-04.
78. Yung A. Medicines Management in the Old Aged Homes- A New Leadership Role for Community Pharmacists. *HKPJ* 2010;17(3):90-93.
79. Hong Kong Special Administrative Region. 2009-10 Policy Address Breaking New Ground Together. 2009 [accessed on: 2012 Aug 30]; Available from: <http://www.policyaddress.gov.hk/09-10/eng/p98.html>.
80. Hong Kong's Information Services Department. Homes get help dispensing senior's drugs. 2011 [accessed on]; Available from: http://archive.news.gov.hk/en/news_video/category/html/2010/12/20101229_133741.shtml.
81. The impact of Pharmaceutical Care Outreach Services in Hidden Elders. Hong Kong Pharmacy Conference; 2012; Hong Kong Convention and Exhibition Centre.
82. AMPOULE: Online Drug Information Platform for the Public in Hong Kong. Poster session presented at Hong Kong Pharmacy Conference; 2010 Jan 23-24; Hong Kong Convention and Exhibition Centre.
83. School of Pharmacy of the Chinese University of Hong Kong. Ask My Pharmacist!- Online University-Led Drug Enquiry Platform: About Us. 2009 [accessed on: 2012 Aug 30]; Available from: <http://www.pharmacy.cuhk.edu.hk/ampoule/en/about/>.
84. Use of Technology to Improve Medication Safety in Elderly Homes [abstract]. Hong Kong Pharmacy Conference; 2012; Hong Kong Convention and Exhibition Centre.
85. The Impact of Pharmacy Outreach Service (POS) in Elderly Community. Poster session presented at Hong Kong Pharmacy Conference; 2010 Jan 23-24; Hong Kong Convention and Exhibition Centre.
86. The Chinese University of Hong Kong. CUHK Discovers Poor Drug Compliance among the Elderly. 2007 [accessed on: 2012 Aug 30]; Available from: <http://www.cuhk.edu.hk/cpr/pressrelease/070927e.htm>.
87. St. James' Settlement. Health Bank. [accessed on: 2012 Aug 30]; Available from: <http://www.thevoice.org.hk/jamesev/HealthBank.pdf>.
88. Settlement SJ. 惠澤社區藥房. 2004 [accessed on: 2012 Aug 30]; Available from: <http://www.sjs.org.hk/tc/charityproject/PillShop.php>.
89. RTHK. 長進課程-知藥用藥. 2012 [accessed on: 2012 Aug 30]; Available from: <http://programme.rthk.hk/channel/radio/programme.php?name=radio5/elderlymedicine&p=5163>.
90. RTHK. 長進課程—長者常見疾病. 2012 [accessed on: 2012 Aug 30]; Available from: <http://programme.rthk.hk/channel/radio/programme.php?name=/elderlysick&d=2012-08-20&p=5485&e=172381&m=episode>.
91. Pharmacy & Informatics. 知藥用藥 Elderly Medicine. 2011 [accessed on: 2012 Aug 30]; Available from:

- <http://pharmacyinformatician.wordpress.com/2011/09/10/%E7%9F%A5%E8%97%A5%E7%94%A8%E8%97%A5-elderly-medicine/>.
92. Ming Pao Daily News. 義工「人盯人」教服藥 1/4 長者亂食藥. 2012 [accessed on: 2012 Aug 30]; Available from: <http://hk.news.yahoo.com/%E7%BE%A9%E5%B7%A5-%E4%BA%BA%E7%9B%AF%E4%BA%BA-%E6%95%99%E6%9C%8D%E8%97%A5-1-4%E9%95%B7%E8%80%85%E4%BA%82%E9%A3%9F%E8%97%A5-211449991.html>.
 93. Examples from Practice of Medication Reviews in Nuring Homes [abstract]. Hong Kong Pharmacy Conference; 2006 Oct 21-22; Kowloon Shangri-La Hotel.
 94. Partnering with the Old Age Homes: Lost and Found by the Visiting Pharmacists [abstract]. Hong Kong Pharmacy Conference; 2012; Hong Kong Convention and Exhibition Centre.
 95. Pharmaceutical Care For The Elderly [abstract]. Hong Kong Pharmacy Conference; 2010 Jan 23-24; Hong Kong Convention and Exhibition Centre.
 96. Provision Of Vising Pharmacist Service For Residential Care Home For The Elderly [abstract]. Hong Kong Pharmacy Conference; 2011 Feb 26-27; Hong Kong Convention and Exhibition Centre.
 97. Pharmacy Without Walls - Institutional Pharmacy Practice; Pharmaceutical Service in Old-Aged Homes - Different Models [abstract]. Hong Kong Pharmacy Conference; 2002 Oct 12-13; Golden Mile Hong Kong.
 98. Provision Of Vising Pharmacist Service For Residential Care Home For The Elderly. Presented at Hong Kong Pharmacy Conference; 2011; Hong Kong Convention and Exhibition Centre.
 99. Pharmaceutical Care For The Elderly. Presented at Hong Kong Pharmacy Conference; 2010; Hong Kong Convention and Exhibition Centre.
 100. Partnering with the Old Age Homes: Lost and Found in Medication Reviews by the Visiting Pharmacists. Presented at Hong Kong Pharmacy Conference; 2012; Hong Kong Convention and Exhibition Centre.
 101. Partnering with OAH: Lost and found in drug management. Presented at Hong Kong Pharmacy Conference; 2012; Hong Kong Convention and Exhibition Centre.
 102. Social Welfare Department. 到院藥劑師服務試驗計劃簡介會. 2012 [accessed on: 2012 Nov 22]; Available from: http://www.swd.gov.hk/doc_sc/elderly/VPS_14.pdf.
 103. Furniss L. Use of medicines in nursing homes for older people. *Adv Psychiatr Treat* 2002;8:198-204.
 104. Finkers F, Maring JG, Boersma F. A study of medication reviews to identify drug-related problems of polypharmacy patients in the Dutch nursing home setting. *J Clin Pharm Ther* 2007;32(5):469-76.
 105. Drug related Problems: Hidden in the Elderly Population [abstract]. Hong Kong Pharmacy Conference; 2012; Hong Kong Convention and Exhibition Centre.
 106. Royal Pharmaceutical Society. Support for Targeted Medicines Use Reviews. 2012 [accessed on: 2012 Oct 30]; Available from: <http://www.rpharms.com/nhs-community-pharmacy-contract-england/targeted-murs.asp>.
 107. Green Light Pharmacy. Services Available At Branches. 2012 [accessed on: 2012 Oct 30]; Available from: <http://www.greenlightpharmacy.com/branch-services.php>.
 108. Mass Resources. ORG. MCPHS Pharmacy Outreach - Drug Information Programs. 2012 [accessed on: 2012 Oct 30]; Available from: <http://www.massresources.org/massmedline.html>.
 109. Medication Technologies. Patients and Carers. 2008 [accessed on: 2012 Oct 30]; Available from: http://www.mts-mt.co.uk/patients_and_carers.htm.
 110. Barber N. Medication errors in care homes. 2009 [accessed on: 2012 Oct 30]; Available from: <http://www.birmingham.ac.uk/Documents/college-mds/haps/projects/cfhcp/psrp/BriefingPaperPS025-03-10-Barber.pdf>.
 111. Allen J. Senior Center Events Link Elderly to Services. [accessed on: 2012 Oct 30]; Available from: <http://www.unitedwaydanecounty.org/2012/08/senior-center-events-link-elderly-to-services/>.

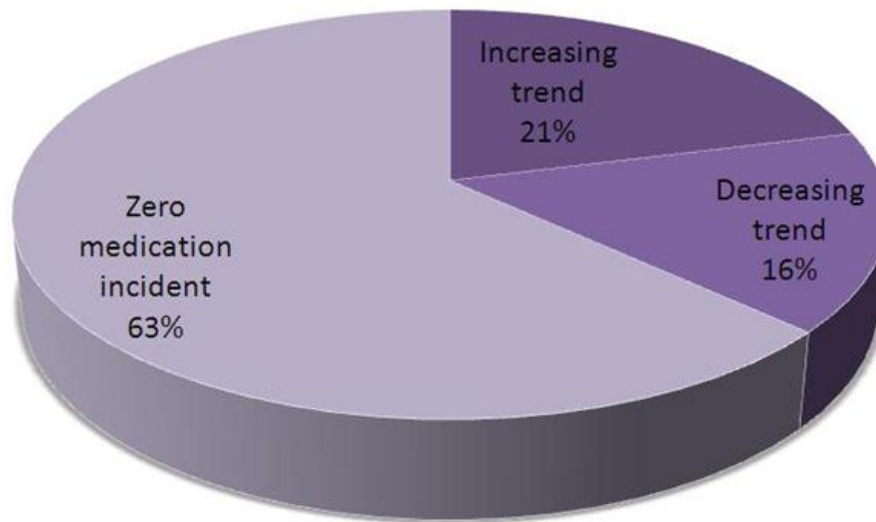
112. Mitchell L. Prescription Drug Plan counseling at Senior Center. 2012 [accessed on: 2012 Nov 1]; Available from:
<http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadname1=Content-Disposition&blobheadname2=Content-Type&blobheadvalue1=inline%3B+filename%3D%22Prescription+Drug+Plan+Counseling.pdf%22&blobheadvalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251831287472&ssbinary=true>.
113. U.S. Virgin Islands. Pharmaceutical Assistance to the Aged. 2012 [accessed on: 2012 Nov 1]; Available from: <http://www.dhs.gov.vi/seniors/pharmaceutical.html>.
114. Center SJWCF. Pharmacy Services. [accessed on: 2012 Nov 1]; Available from: <http://www.wellchild.org/pharmacy.html>.
115. Hicks R. BBC Health: Pharmacists. 2012 [accessed on: 2012 Oct 30]; Available from: http://www.bbc.co.uk/health/support/talking_to_your_doctor/highstreet_pharmacist.shtml.
116. Pharmaceutical Society of Australia. Guidelines for pharmacists providing Home Medicines Review (HMR) services [internet]. 2011 [accessed on: cited 2012 Aug 30]; Available from: <http://www.psa.org.au/download/practice-guidelines/home-medicines-review-services.pdf>.
117. Anderson C. Presenting and evaluating qualitative research. *Am J Pharm Educ* 2010;74(8):141.
118. Margaret CH, Melissa AB. Training Manual: data collection methods. Semi-structured interviews and focus groups. 2009 [accessed on: 2012 Aug 30]; Available from: http://www.rand.org/content/dam/rand/pubs/technical_reports/2009/RAND_TR718.pdf.
119. The Impact of Visiting Pharmacists' Interventions on the Provision of Pharmaceutical Care in Private Old Age Homes. Poster session presented at: Hong Kong Pharmacy Conference; 2011 Feb 26-27; Hong Kong Convention and Exhibition Center.
120. Pharmacy & Informatics. SHPHK x St. James' Settlement : Free Counseling Service at HK Senior Fair. 2011 [accessed on: 2012 Aug 30]; Available from: <http://pharmacyinformatician.wordpress.com/2011/05/25/shphk-x-st-james-settlement-free-counseling-service-at-hk-senior-fair/>.
121. Sai Kung District Council. Sai Kung Elderly Service coordinating Committee 2011 [accessed on: 2012 Aug 30]; Available from: <http://www.saikunghsc.org.hk/eng/partner/elder.php>.
122. So YW. Visiting Community Pharmacists Project. *Hong Kong Med J* 2007;13(1):86.

Acknowledgements

We thank The Pharmaceutical Society of Hong Kong for their funding and support, and the interviewees for their input and participation in this scoping study. We also thank Professor Terry Lum from the University of Hong Kong for his kind advice in the development of the report.

Figure 1: Self-report figures of medication incidents occurred in OAHs from 2005-2010⁶³

Trends of self-reported medication incidents in 19 OAHs



Statistical method: comparison between the number of cases in the first year and the mean of second and third year of accreditation

Figure 2: Flowchart of the process of study search and selection

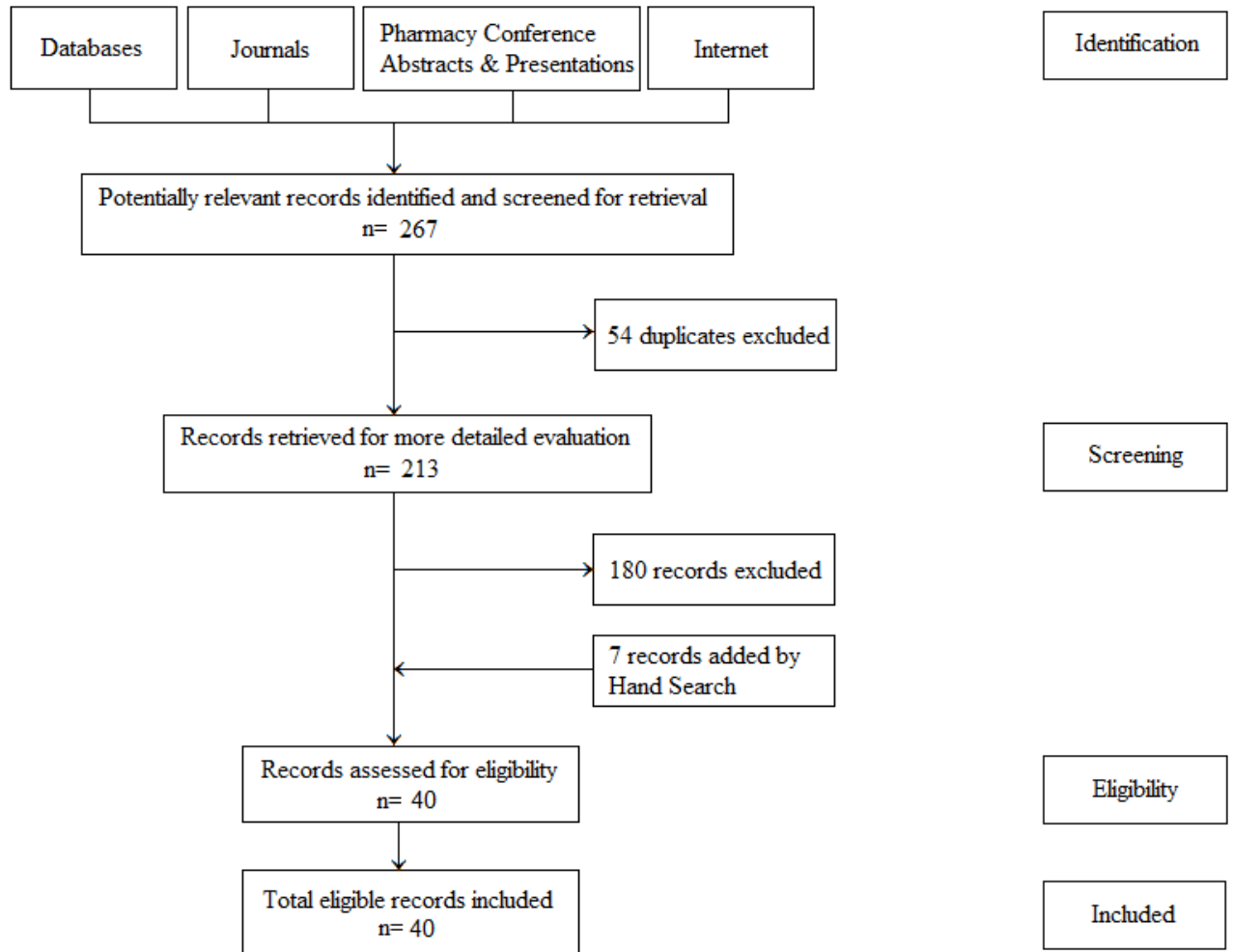


Figure 3: Medicine management process

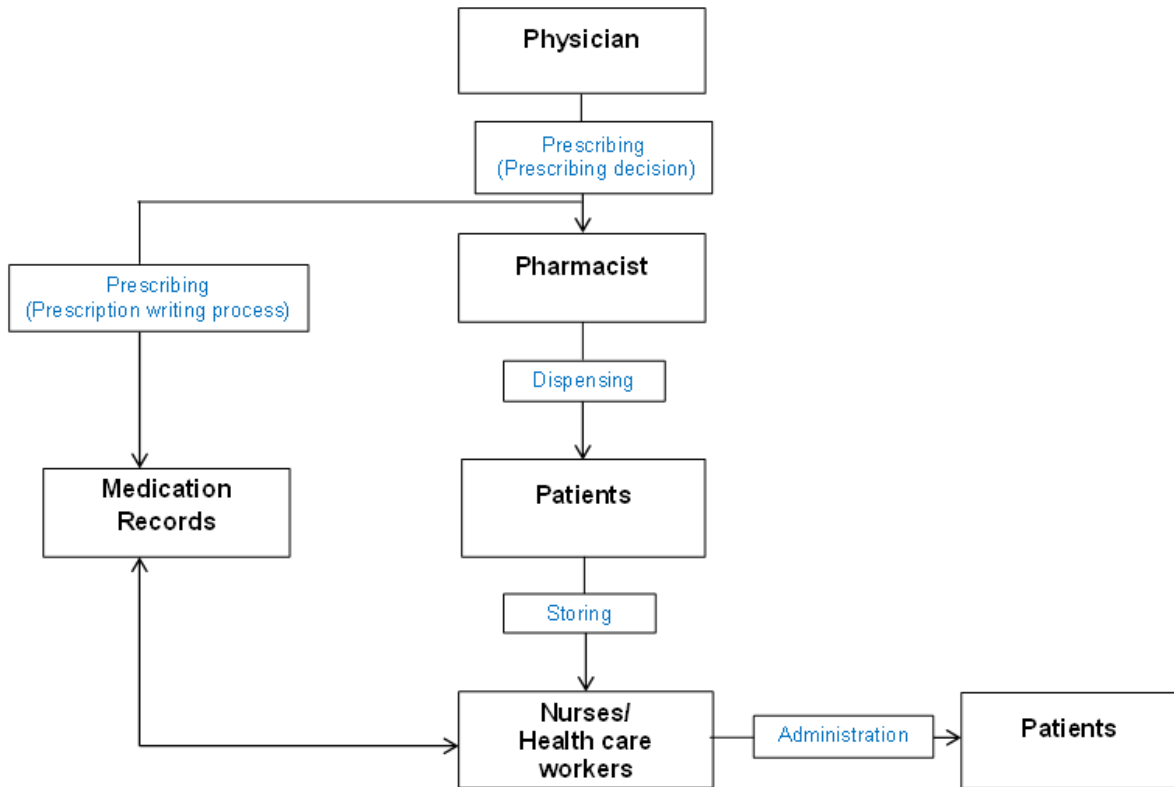


Figure 4: Pharmacist's Interventions in reducing medication errors in medicine management process

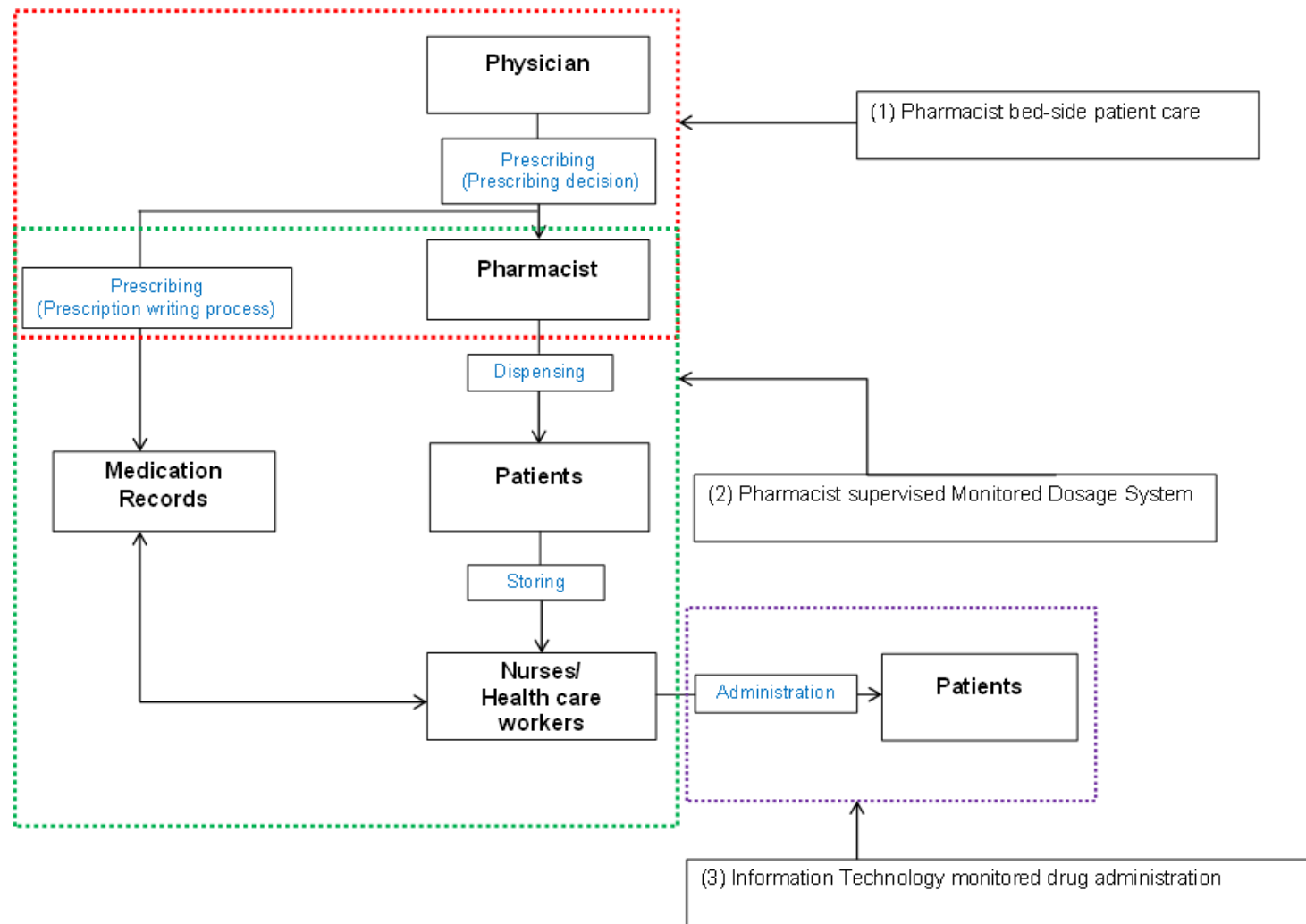


Table 1: Summary of the articles from the literature, conference, web-based sources and hand search

<i>Literature search</i>					
Author	Year	Setting	Duration	Nature of services	Who was involved
Lau et al ⁷²	2003	85 OAHs	2/2001-10/2001	Assessment and identification of problems in the drug management system in OAHs through outreach pharmacy service	Pharmacists
<i>Conference search</i>					
Author	Year	Setting	Duration	Nature of services	Who was involved
Chiu P ⁹⁷	2002	OAH	Unknown	Full-time pharmacist in a OAH	Pharmacist
Hung WH ⁸²	2010	Internet	Unknown	Online interactive drug enquiry platform for communicating with pharmacists	Pharmacists
Lee V ¹⁰⁵	2012				
Chan KH ⁸⁵	2010	Elderly in the community centres in Wong Tai Sin	2008-2009	Elderly outreach program for presentation on the proper use of medications, health check-ups and individual medication consultations	Pharmacists
Lee V ¹⁰⁵	2012		Unknown		
Pang KW ⁸¹	2012	Homes of the hidden elderly in Wong Tai Sin	Unknown	A monthly outreach service for the hidden elderly using a multidisciplinary team to offer medication counselling and medication and disease management assistance	Nurses & pharmacists & social workers
Chung B ⁹⁵	2010	OAHs	2007-unknown	Visiting pharmacists services for conducting medication reconciliation service, making updated residential medication profile, perform medication review, provide supervision to medication related issues, training and telephone hotline.	Pharmacists
Lau SW ¹¹⁹	2011				
Chung B ⁹⁸	2011				
Ho S ⁹⁴	2012				
Suen P ⁸⁴	2012	OAHs with a single pharmacy	2008-unknown	Design of local medication management software and provision of monitored dosage system for efficient administration using iPad2 with RFID technology	Pharmacists
<i>Internet search</i>					
Author	Year	Setting	Duration	Nature of services	Who was involved
Hong Kong Sheng Kung Hui Welfare Council ²²	2006	Seven community centres in Wong Tai Sin in 2005	2004-unknown	Workshops and health talks about correct use and drug knowledge for elderly in community centres	Pharmacists
	2006	Health workers in OAHs	2004-unknown	Trainings for health workers working in OAHs about basic medication management, knowledge on drugs relating to chronic diseases, sides effects etc.	
The Chinese University of Hong Kong ⁸⁶	2007	Elderly in five community centres in Wong Tai Sin	2007	Same service described as above [Chan KH ⁸⁵ & Lee V ¹⁰⁵]	Nurses & pharmacists
School of Pharmacy of CUHK ⁸³	2009	Internet	2009-Now	Same service described as above [Hung WH ⁸² & Lee V ¹⁰⁵]	Pharmacists
Hong Kong Special Administrative Region ⁷⁹	2009	OAHs	2010-Now	Same service described as above [Chung B ⁹⁵ & Lau SW ¹¹⁹ & Chung B ⁹⁸ & Ho S ⁹⁴]	Pharmacists
Hong Kong's Information Services Department ⁸⁰	2011				

Pharmacy & Informatics ¹²⁰	2011	The Hong Kong Senior Fair	2011 3 days	Free medication review, domiciliary visits, and counselling services for elderly at the Hong Kong Senior Fair	Pharmacists
Sai Kung District Council ¹²¹	2011	Community in Sai Kung	2001-Now	Education relating to the correct use and handling drugs taught by pharmacists for elderly, volunteers, and carers	Pharmacists
Pharmacy & Informatics ⁹¹	2011	Hong Kong radio broadcasting	2011-2012	Education on medications for the elderly in Hong Kong through radio broadcasting programmes	Pharmacists & disc jockeys
RTHK ⁸⁹					
RTHK ⁹⁰	2012	Hong Kong radio broadcasting	2012		
St. James' Settlement ^{87 88}	Unknown	Charity pharmacy	Unknown	Drug counselling and follow-ups for the elderly	Pharmacists
		Drug counselling in community centres		Individual drug counselling for the elderly patients and their family	
		Homes of the elderly		Outreach services for the remote and immobile elderly for educating elderly patients and their carers about the drugs	
		Telephone reminders for medications		Regular telephone reminders for taking medications, attending follow-up consultations, and making referrals	
Ming Pao Daily News ⁹²	2012	Beside the central dispensary in a local hospital	2008-Now	Volunteers trained for counselling and medication knowledge-based service for elderly after taking medication in central dispensary in a local hospital, as well as making referrals to clinical pharmacists if necessary	Volunteers & clinical pharmacists
Hand search					
Author	Year	Setting	Duration	Nature of services	Who was involved
So YW ⁷³	2003	OAHs	2003-Unknown	Outreach pharmacists services for OAH staff to strengthen the use and management of medication	Pharmacists
So YW ⁷⁴	2009	Residential Care Homes for the Elderly in Hong Kong	2010-Now	Same service described as above [Chung B ⁹⁵ & Lau SW ¹¹⁹ & Chung B ⁹⁸ & Ho S ⁹⁴]	Pharmacists
So YW ⁷⁵	2009				
So YW ⁷⁶	2010				
Chung WMB ⁷⁷	2010				
So YW ¹²²	2007	OAHs in the Hong Kong West Cluster	2006-unknown	Visiting pharmacists services for OAHs to promote drug safety and drug management systems by conducting medication reconciliation services and reviewing medications.	Pharmacists

Table 2: Framework to ensure the medication review follows a systematic way

Types of services	IT Supported Monitored Dosage System by Pharmacist (INT1)	OAH In-housed Monitored Dosage System (INT2)	Pharmacy Outreach Service to the Elderly in Community Centres (INT3)	Charity Pharmacy cum Drug Counselling Scheme (INT4)	Pharmacy Outreach Services to the Community Centres (INT4)	Pharmacy Outreach Services to the Remote / Immobile Elderly (INT4)	IT Supported Monitored Dosage System for OAH Staff (INT5)	VPS (INT6)	Pharmacy Outreach Services to the hidden Elderly (INT7)
Checklist									
Following a systematic procedure for medication review									
1. Compile medication history	√	√	√	√	√	√	√	√	NA
2. Utilise patient record(s)	1.Current medication 2.Hospital Authority's discharge summary 3.MAR 4.Information from health care providers	1.Current medication 2.Hospital Authority's discharge summary 3.Hospital Authority's medication summary	1.Current medication	1.Current medication 2.Hardcopy prescription 3. Full Medication profile	1.Current medication	1.Current medication	Records were directly converted from CNA, or PrintClick	1.Resident demographic record 2.Medication history 3.Discharge summary 4.MAR	NA
3. Identifying potential medication-related issues	√	√	√	√	√	√	√	√	√
Conducting medication review in a timely manner									
4. (a) Regular review	√	√	X	√	X	√	X	√	NA
(b) Frequency of the review	Whenever change in care of the patients	Once a month	NA	Whenever the patients visit the pharmacy	NA	Once in a quarter	NA	Once a month	NA
5. (a) Priority for medication review	X	X	X	X	X	√	X	NA	NA
(b) How prioritised	NA	NA	NA	NA	NA	Patients with limited mobility	NA	NA	NA
Maintaining accurate documentation									
6. All activities undertaken and strategies developed in the course of a medication review	√	√	√	√	√	√	X	√	NA

7. Recommendations for doctors	√	√	√	X	X	X	X	√	NA
8. (a) Store all documentation	√	√	√	√	X	√	√	√	√
(b) Where and how?	Kept patient medication record and be filed	Be filed in the pharmacy and doubling filing in kardex	Other organization handled	Hardcopy stored in pharmacy with softcopy	NA	All individual patient profile stored in the pharmacy	Electronically stored in the dispensing system	Electronically stored in web based drug management system	NA
Addressing and following-up issues arise									
9. Follow-up for the recommendation	√	√	√	X	X	√	X	√	√
Other Activities									
10. (a) Education and training	√	√	√	√	√	√	√	√	√
(b) Target group(s) of the educational activities	1.Nursing staff 2.Family of the elderly patients	1.Nursing staff	1.Elderly patients	1.Elderly patients	1.Elderly patients 2.Staff of the community center	1.Elderly patients	1.Nursing staff	1.Nursing staff 2.Residents 3.Health workers	1. Elderly patients
11. (a) Other medication safety practice	√	√	X	√	X	X	X	√	√
(b) Examples of the practice(s) for medication safety	1.Suitable storage condition and usage of compacter 2.Expiry date checking 3.Good dispensing practice 4.System for fire prevention	1.Suitable storage condition 2.Expiry date checking 3.Good dispensing practice 4. Guidelines for dispensers to prepack medication	NA	1.Suitable storage condition 2.Expiry date checking 3.Good dispensing practice	NA	NA	NA	1.Suitable drug storage condition 2.Record keeping 3.Drug distribution system	1.Suitable storage condition 2.Expiry date checking

NA: Not Applicable

Table 3: Resources, Facilitators and Barriers of implementation of the services in Hong Kong

Types of services	IT Supported Monitored Dosage System by Pharmacist (INT1)	OAH In-housed Monitored Dosage System (INT2)	Pharmacy Outreach Service to the Elderly in Community Centres (INT3)	Charity Pharmacy cum Drug Counselling Scheme (INT4)	Pharmacy Outreach Services to the Community Centres(INT4)	Pharmacy Outreach Services to the Remote / Immobile Elderly(INT4)	IT Supported Monitored Dosage System for OAH Staff (INT5)
Resources for starting the services	1.Dosage packs 2.machines 3.software 4. Manpower	Capital for dosage packs & decoration of the pharmacy	Manpower	Knowledge for running a pharmacy	pharmacists	Manpower	1.Willing to serve 2.nursing home's network 3. Computer upgrade system 4.Health care workers' IT skills
Resources for sustaining the services	Manpower	Manpower	1.leaflets 2.souvenirs	1.Capital 2.Social support 3.Donor support	Manpower	Manpower	Group spirit of team
Facilitators	1.Own faith and determinant 2.Encouragement from PSHK and OAHs 3.Support from OAHs	Support and co-operation from OAHs' health workers	1.Social demands 2.Passion of pharmacists 3.Co-operation with university	1.Professional knowledge of the pharmacist 2. Media	Well communication with the community centers and the elderly	Education for recognizing the role of pharmacist in the community	Obtain the recognition of SWD and guidelines of using the prepacking were approved in 10/2010
Obstacles	1.Untimely bureaucracy 2.Staff reluctance to change 3.health workers/staff only follow doctors' instruction 4.Without discharge summary from private healthcare sector 5.Hard to find doctor to clarify 6.No documentation on medical records	1.Staff reluctance to change 2.Big turnover 3.Hard to find doctor to clarify 4.Inadequate manpower, esp dispenser	1.Lack personnel 2.Not systematic to follow-up the cases	1.Low media coverage and need time to spread the news 2.Lack money and rely on the unstable funding	None	Inadequate manpower	1. Head of the nursing home: commercial angle 2.Staff of the nursing home: reluctance to change and worry to be replaced by technology 3.Staff: old and low literacy, spend much time to teach the programme

Table 4: Previous pharmaceutical services of similar nature and other pharmaceutical services of any nature could be introduced to Hong Kong from other countries

Types of services	IT Supported Monitored Dosage System by Pharmacist (INT1)	OAH In-housed Monitored Dosage System(INT2)	Pharmacy Outreach Service to the Elderly in Community Centres (INT3)	Charity Pharmacy cum Drug Counselling Scheme(INT4)	Pharmacy Outreach Services to the Community Centres(INT4)	Pharmacy Outreach Services to the Remote / Immobile Elderly(INT4)	IT Supported Monitored Dosage System for OAH Staff(INT5)
Previous pharmaceutical services of similar nature provided in Hong Kong for elderly but have discontinued	None	Uncertain, but heard that another OAH is short of manpower	Yes, many are one-off services, it is hard to maintain a free service	None	Uncertain - also run by other pharmacists' professional bodies	Uncertain - maybe also run by another organisation	Uncertain
Services provided in overseas that could be added in Hong Kong	1.Government funds for medication reviews conducted by pharmacists 2.Robot dispenses medication 3.Drug lists directly link to the electronic pharmacy	None	Expand/improve service: 1.Monitoring dose 2.Community and hospital setting: reconciliation service	None			1.Introduce pharmacist-run clinics to share the workload with other health care workers 2.Adopt Medication Therapy Management (MTM) for remote/ immobile elderly 3.Government: can introduce policies to recognise the role of a pharmacist on prevention and treatment

Appendix 1: Semi-structured interview guide for interviewing service providers (Chinese version)

(I) 藥物服務的性質	
	結果
<p>1) (a) (你的組織) 現於香港提供那類型的藥物服務予長者？</p> <p>請簡述。</p>	
(b) 在過去一年 (2011)，此服務平均次數是？	
(c) 何時開始正式投入此服務	
(d) 現提供此服務的藥劑師數目	
(e) 參與此服務的安老院數目	
2) (你的組織) 提供此服務的目的是什麼？	
3) (a) 起初投入此服務時，當時 (你的組織) 需要和擁有什麼資源？	
(b) 那麼，(你的組織) 需要和擁有什麼資源去維持此服務的運作？	

(II) 服務內容					
	結果				備註
A. 遵循系統性藥物審查					
4) 藥劑師會否匯集每一位長者的用藥紀錄？					
5) 續上題，當藥劑師匯集用藥紀錄時，會否利用...？	<input type="checkbox"/> 長者目前用藥的藥物	<input type="checkbox"/> 長者個人用藥紀錄	<input type="checkbox"/> 藥物電子紀錄	<input type="checkbox"/> 其他醫療服務提供者的資料	<input type="checkbox"/> 其他：
6) 藥劑師會否評估長者的用藥方案，並確定用藥相關的潛在問題？					
B. 定時藥物紀錄審查					
7) 藥劑師會否定期審查每一位長者的用藥紀錄？					定期審查次數：
(a) 定期審查的次數					
8) 高危長者病友會否優先給予藥物審查？					
(a) 如何優先？					
C. 保留準確紀錄					
9) (a) 藥劑師會否把活動及發展出的策略記錄下來？					
(b) 藥劑師會否紀錄曾向醫生提出的建議？					

10) 藥劑師會否把所有藥物審查紀錄歸檔？				
(a) 如有，在那裡儲存及如何儲存？				
D. 提出及跟進問題				
11) 藥劑師會否把作出的建議進行跟進？				
E. 其他服務				
12) (你的組織) 會否提供藥物教育？				
(a) 如有，會給予...？				
<input type="checkbox"/>	護理人員	<input type="checkbox"/>	長者病友	<input type="checkbox"/>
			藥劑師作內部培訓	<input type="checkbox"/>
				其他：
13) (你的組織) 會否以作確保藥物安全而作出行動並檢查...？				
<input type="checkbox"/>	適當儲存環境	<input type="checkbox"/>	保存期限	<input type="checkbox"/>
			良好配藥流程	<input type="checkbox"/>
				其他：
(III) 促成及障礙因素				
結果				
14) 當實施此服務時，會有什麼促成因素？				
15) 當實施此服務時，會有什麼障礙因素？				
<input type="checkbox"/>	位置	<input type="checkbox"/>	工作人員	<input type="checkbox"/>
			資金	其他：

16) 假如你現正提供的服務被停止，你認為會是什麼原因導致？					
(IV) 過去及將來方向					
	結果			備註	
17) (a) 以往香港會否有類似但現被停止的藥物服務提供給長者？ (如答否或不知道，請跳到第十八題)	<input type="checkbox"/> 是	<input type="checkbox"/> 否	<input type="checkbox"/> 不知道		
(b) 續上題，為什麼該服務被停止？					
18) (a) 你認為你現正提供的服務能足夠應付本地需求嗎？	<input type="checkbox"/> 1 非常不足夠	<input type="checkbox"/> 2 不足夠	<input type="checkbox"/> 3 一般	<input type="checkbox"/> 4 足夠	<input type="checkbox"/> 5 非常足夠
(b) 續上題，為什麼？					
19) 你認為會否有其他在外國實行中的藥物服務可以被引入香港？					

Appendix 2: Semi-structured interview guide for interviewing service providers (English version)

(I) Nature of pharmaceutical services	
	Result
<p>1) (a) What kind of pharmaceutical services are you currently providing for elderly in Hong Kong?</p> <p>Please describe the service.</p>	
<p>(b) Frequency of the services in the past year (2011)</p>	
<p>(c) When did the service officially start?</p>	
<p>(d) Number of pharmacists currently involve</p>	
<p>(e) Number of nursing homes</p>	
<p>2) What is the purpose of providing this service?</p>	
<p>3) (a) What are the resources for starting the services?</p>	
<p>(b) What are the resources for sustaining the services?</p>	

(II) Types of activities					
	Result				Remarks
A. Following a systematic procedure for medication review					
4) Would the pharmacists compile a medication history for each elderly?					
5) Would the pharmacists utilize the followings while compiling the medication history?	<input type="checkbox"/> Current medication	<input type="checkbox"/> Elderly case files	<input type="checkbox"/> Pharmacy electronic records	<input type="checkbox"/> Information from health care providers	<input type="checkbox"/> Others:
6) Would the pharmacists assess the elderly's medication regimen and identify potential medication-related issues?					
B. Conducting medication review in a timely manner					
7) Will there be a regular review for each elderly patient? (a) Frequency of the review					Frequency:
8) Are high risk patients given a priority for medication review?					
C. Maintaining accurate documentation					
9) (a) Are activities undertaken and strategies developed in the course of a medication review documented?					

(b) Are recommendations for doctor documented?				
10) Do the pharmacists store all medication review documentation? (a) If yes, where and how?				
D. Addressing and following-up issues arise				
11) Is there any follow-up for the recommendations?				
E. Other activities				
12) Is there any provision of educational activities? (a) If yes, they are for...?				
	<input type="checkbox"/> Nursing staff	<input type="checkbox"/> Elderly patients	<input type="checkbox"/> pharmacists in-house training	<input type="checkbox"/> Others:
13) Any practice for ensuring the medication safety by checking...?	<input type="checkbox"/> Suitable storage condition	<input type="checkbox"/> Expiry date	<input type="checkbox"/> Good dispensing practice	<input type="checkbox"/> Others:
(III) Facilitators and Barriers				
	Result			
14) What are the supporters/ facilitators that help implement the services?				

15) What are the obstacle(s) when implementing the services?	<input type="checkbox"/> location	<input type="checkbox"/> personnel	<input type="checkbox"/> funding	Others:	
16) If for any reason the service(s) currently provided were to be discontinued, what would be the reason(s) for that?					
(IV) Past and future directions					
	Result			Remarks	
17) (a) Were there any previous pharmaceutical services of similar nature provided in Hong Kong for elderly but have discontinued already?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Do not know		
(b) Why were those services discontinued?					
18) (a) Do you think your current services suffice to meet the local demand?	<input type="checkbox"/> 1 Very deficit	<input type="checkbox"/> 2 Deficit	<input type="checkbox"/> 3 Neutral	<input type="checkbox"/> 4 Sufficient	<input type="checkbox"/> 5 Very sufficient
(b) Why?					
19) Any services provided in overseas that you think could be introduced to Hong Kong?					

Appendix 3: Semi-structured interview guide for users (old aged homes) of pharmaceutical service in Hong Kong (Chinese version)

電話訪談指引 (訪問對象: 老人院負責人)

1. 其實藥劑師有沒有幫助你們院舍設立機制以減低院內藥物事故的機會？
(如訪問者不清楚問題：每一間院舍都應該有一本社署的手冊，內容應該有提及一些措施用來減低院內藥物事故的機會，請問藥劑師有沒有基於這本手冊再幫助你們院舍作**其他**措施是關於長者藥物的管理？)

(a) 如有，可不可以具體形容機制的運作流程呢？

(b) 如否，那麼你們現在怎樣處理長者的藥物呢？

2. 以下有四題問題 (都係 1-5 分，5 分是最高分) 你認為有藥劑師的藥物服務後，可不可以...

	非常不同意	不同意	中立	同意	非常同意
(a) 幫助你照顧院友	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
原因:					
(b) 幫助改善到院友／長者的病情控制	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
原因:					
(c) 令你起提供健康建議俾院友時更有信心	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
原因:					
(d) 改善你的藥物知識	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
原因:					

3. 除了以上之外，你覺得有藥劑師的藥物服務對你的工作或長者有什麼其他的幫助呢？

4. 現時這項服務的價錢是多少？

5. 你認為這項服務的價錢合理嗎？如果這項服務加價，你認為加到幾多錢你就會停止使用這個服務？

6. 你認為這項服務有什麼需要改善的地方嗎？

7. 你認為你們未來會繼續使用你目前用的服務嗎？為什麼？

8. 你未來會考慮使用其他的藥物服務嗎？如有可否舉例？

Appendix 4: Semi-structured interview guide for users (community centres) of pharmaceutical service in Hong Kong (Chinese version)

電話訪談指引(訪問對象: 社區中心負責人)

1. 你覺得有藥劑師的藥物服務對你的工作或長者有沒有幫助呢？會是什麼幫助？

2. 你認為這項服務有什麼需要改善的地方嗎？

3. 你認為你們未來會繼續使用此服務嗎？為什麼？

4. 你未來會考慮使用其他要俾錢的藥物服務嗎？如有可否舉例？

Appendix 5: Semi-structured interview guide for users (old aged homes) of pharmaceutical service in Hong Kong (English version)

Telephone interview guide (Interviewees: person in-charge of the old aged homes)

1. Do pharmacists assist your old aged home to establish any mechanisms to reduce the chance of medication incidents? (If the interviewee does not understand the question: There is a handbook containing guidelines provided by Social Welfare Department for every old aged home. The guidelines should mention some measures to reduce the chance of medication incidents. Therefore, do the pharmacists assist your home to set up other measures about elderly's medication management based on this guideline?)
 - (a) If yes, could you describe the process of the mechanism?
 - (b) If not, could you describe how your old aged home handles the residents' medication now?

2. After prescribing the pharmacist-led pharmaceutical service, does this service help...?

	Totally disagree	Disagree	Neutral	Agree	Totally Agree
(a) Help in managing elderly	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Reason:					
(b) Help in improving clinical outcomes of the residents	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Reason:					
(c) Enable you to be more confident in giving advice to residents	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Reason:					
(d) Gain drug knowledge	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Reason:					

3. Apart from the above, what other benefits can you think of regarding to your work and the residents?

4. What is the current price of this pharmaceutical service?

5. Do you think the current price is reasonable? If this service increases in price in the future, what is the maximum price that you cannot afford and cause you to stop using this service?

6. Can you think of any potential improvements in this pharmaceutical service?

7. Do you think you will continue to use this medication service in the future? Why?

8. Will you consider using other medication services in the future? If yes, could you give any examples?

Appendix 6: Semi-structured interview guide for users (community centres) of pharmaceutical service in Hong Kong (English version)

Telephone interview guide (Interviewees: the person in-charge of community centres)

1. Do pharmacists-led pharmaceutical services provide any benefits regarding to your work and the elderly? What are the benefits?

2. Can you think of any improvements in this pharmaceutical service?

3. Would you consider using this pharmaceutical service in the future? Why?

4. Would you consider using other paid pharmaceutical services? Can you give any examples of them?

Appendix 7: Semi-structured interview guide for non-service users of pharmaceutical service in Hong Kong (Chinese version)

電話訪談指引(訪問對象: 老人院負責人)

1. 你們院舍有沒有設立機制以減低院內藥物事故的機會？(如訪問者不清楚問題：每一間院舍都應該有一本社署的手冊，內容應該有提及一些措施用來減低院內藥物事故的機會，請問你們有沒有基於這本手冊再作其他措施是關於長者藥物的管理？)

a. 如有，可不可以具體形容一下機制的運作流程呢？(請跳到第二題)

b. 如否，那麼你們現在是怎樣處理長者的藥物呢？

c. 那麼其實是什麼原因令你們當時決定不設立措施／機制呢？

2. 你們院舍有沒有曾經聽過現時有藥劑師會為院舍提供不同的藥物服務嗎？

(a) 如曾聽過，那麼其實是什麼原因你們現在沒有使用藥劑師的藥物服務呢？

(b) (如上題原因是關於金錢) 你認為院舍願意付最多幾多錢去買這些藥物服務？

Appendix 8: Semi-structured interview guide for non-service users of pharmaceutical service in Hong Kong (English version)

Telephone interview guide (Interviewees: the person in-charge of old aged homes)

1. Has your old aged home established any mechanism to reduce medication incidents? (If the interviewee does not understand the question: There is a handbook containing guidelines provided by Social Welfare Department for every old aged home. The guidelines should mention some measures to reduce the chance of medication incidents. So, have your old aged home set up any measures relating to elderly medication management based on this handbook?)

(a) If yes, could you describe the process of the mechanism?
(Jump to question 2)

(b) If not, could you describe how your old aged home handles the residents' medication?

(c) What is/ are the reason(s) that you decided not to set up measures or mechanism now?

2. Have you heard of various pharmacist-led pharmaceutical services currently available for old aged homes?

(a) If yes, what is/ are the reason(s) of not using those pharmacist-led pharmaceutical services?

(b) (If the answer above relating to costs) What is the maximum price are you willing to pay for these medication services?

Appendix 9: Summary of the services using Donabedian framework⁵

Donabedian Framework Types of services	Structure	Process	Outcome
IT Supported Monitored Dosage System by Pharmacist	<p><u>Setting</u></p> <ul style="list-style-type: none"> It is an office >1,000 sq. ft. in an industrial building. Each staff occupies an office cubicle; total of 10 cubicles. <p><u>Material resources</u></p> <ul style="list-style-type: none"> The office is equipped with MDS packs, files and computers with net-work connection. The drugs are stored in lockable, compactable filing cabinets. It only keeps oral solid drugs that do not require refrigeration. Medications for each resident can be individually stored in plastic cases with their names computer-generated and labelled on. <p><u>Human resources</u></p> <ul style="list-style-type: none"> Four full-time and two part-time pharmacists. 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> The service starts from collecting current medications of each elderly from the OAHs to the drug management centre. Pharmacists then review all medications for potential interactions and drug safety. Afterwards, an updated comprehensive drug list is compiled. The medications in 7-day packs are dispensed by dispensers in their respectable cubicles, and then are passed to the pharmacists on duty for cross checking. The packed drugs that are ready to be delivered are put into other cabinets near the entrance of the drug management centre. The drivers pick the packed drugs up and transport to the OAHs at an agreed time and date of the week. Finally, the OAH staff will check the medications again before administration. The patients wear the wrist- 	<p><u>Service outcome</u></p> <ul style="list-style-type: none"> It manages approximately two hundred and fifty thousand MDS packs annually and currently serves 3500 residents of OAHs. <p><u>Self-perceived effectiveness of the services</u></p> <ul style="list-style-type: none"> The service provider indicated that the service sufficiently meets the demand since this type of service has been going on in other foreign countries for years. They did not reinvent the wheel but simply tailored the system to suit the Hong Kong setting. <p><u>Service users' satisfaction</u></p> <ul style="list-style-type: none"> All interviewees valued the professional advice given by the pharmacists since the pharmacists could decrease the workers' workload and were also able to advise the health workers in OAHs. One interviewee did not directly answer whether the service improved the clinical conditions of residents but still acknowledged that pharmacists could help identify clinical problems and provide pharmacological advice. Another interviewee believed there is no association between the service and the

	<p><u>Facilitators</u></p> <ul style="list-style-type: none"> • Own faith and determinant • Encouragement from PSHK and nursing homes • Support from OAHs 	<p>bands containing their identity with photo on the iPad® before starting the drug administration process.</p> <p><u>Other services</u></p> <ul style="list-style-type: none"> • This service also helps to discard obsolete medications • VMO prescriptions can be dispensed. • It also provides function of drug storage and education to nursing staff and elderly residents in OAHs. 	<p>clinical conditions of the residents</p> <ul style="list-style-type: none"> • All interviewees responded positively to improving the staff's confidence in health advice provision to residents due to the increase in the authority. • All interviewees appreciated that the service helps to improve their health knowledge such as the 24-hour hotline. • All interviewees agreed that pharmacists were able to assist in managing extra stock of medicines, contacting physicians to come up with treatment plan and checking their drug administration procedures especially cross-checking from both parties • One interviewee felt the price of this service was reasonable, though was not cheap. <p><u>Service users' opinions on improvement:</u></p> <ul style="list-style-type: none"> • One interviewee thought some fine-tuning in communication between the service pharmacists and DH and SWD should be made. • Another interviewee suggested the MDS packing and the delivery time of the MDS packs should be improved.
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Pharmacy Outreach Service to the Elderly in Community Centres</p>	<p><u>Material resources</u></p> <ul style="list-style-type: none"> • Leaflets and sponsored souvenirs for the elderly <p><u>Human resources</u></p> <ul style="list-style-type: none"> • 3-4 pharmacists per visit <p><u>Facilitators</u></p> <ul style="list-style-type: none"> • Social demand of pharmaceutical services for elderly is available in the community. • Passion of the pharmacists drives them to participate in volunteer works. • Liaison with universities can facilitate the service. 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • In every summer, there is a outreach service to several community centers. • The first part consists of a drug talk on general topics done by Pharmacy students. • The second part consists of a drug counselling session. Community centres recruit the participants and remind them to bring along all the medications for the assessment by the pharmacists and it is responsible by voluntary registered pharmacists • Pharmacists assessed drug knowledge, assessed the medications taken and provided drug counselling to the elderly. <p><u>Other services</u></p> <ul style="list-style-type: none"> • The blood pressures of the elderly are also measured. 	<p><u>Service outcome</u></p> <ul style="list-style-type: none"> • Five to six community centres were offered this service in every summer. <p><u>Service user satisfaction</u></p> <ul style="list-style-type: none"> • All interviewees regarded the service positively due to the provision of health checks for the elderly and drug knowledge to both the elderly and their family from drug talks. <p><u>Service users' opinions on improvement</u></p> <ul style="list-style-type: none"> • One interviewee suggested the larger scale and regularity of the service. • Another interviewee recommended that the administrative work could have been done better.
----------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>OAH In-housed Monitored Dosage System</p>	<p><u>Setting</u></p> <ul style="list-style-type: none"> • A registered pharmacy within the premises of an elderly home service. • The dispensary is within an office of approximately 300 sq. ft. <p><u>Material resources</u></p> <ul style="list-style-type: none"> • The dispensary is equipped with standard tools and equipment for its supply services, including secured storage for drugs, dose administration containers (Websterpak[®]), counting trays and computer systems <p><u>Human resources</u></p> <ul style="list-style-type: none"> • One full-time pharmacist and five dispensers. <p><u>Facilitators</u></p> <ul style="list-style-type: none"> • It requires the support and co-operation from OAHs' health workers 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • The updated drug profiles are kept and updated every time the residents were prescribed medications following a doctor's visit. • After that, the medications in a 7x4 monitored dosage pack for each resident are dispensed • A medication reconciliation is also made for the residents, so that any problems identified could be clarified with the prescribers from the hospitals or GPs • Packed medications are administered by the health-workers on each floor. • A referral note with the updated drug list is also printed for each resident every time when they attend to doctor's appointment • Training sessions for the HCAs in the OAH are also offered. 	<p><u>Service outcome:</u></p> <ul style="list-style-type: none"> • It manages approximately 8000 solid drug per day and serves 639 residents in three OAHs. <p><u>Self-perceived effectiveness of the services</u></p> <ul style="list-style-type: none"> • The key opinion leader thought this service is insufficient to meet the local demand since it was difficult to recruit dispensers, and it is impossible to ask the pharmacist to do all the technical tasks. Manpower is inadequate to handle all the work.
----------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>Charity Pharmacy cum Drug Counselling Scheme</p>	<p><u>Setting</u></p> <ul style="list-style-type: none"> • A registered pharmacy run by a registered charity • Located inside their main building of the organisation. • Consists of a dispensary and a pharmacist consultation room. <p><u>Material resources</u></p> <ul style="list-style-type: none"> • Stocks a limited number of medications according to the HA Drug Formulary. • Equipped with equipment essential for managing daily dispensing • Other supporting facilities such as net-work connected computers and medical references. <p><u>Human resources</u></p> <ul style="list-style-type: none"> • One full-time pharmacist. <p><u>Facilitators</u></p> <ul style="list-style-type: none"> • Funding support is necessary for this service. • Service relies on the professional knowledge of the pharmacist • Media coverage to the public is important 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • A specific drug formulary was established and drugs which are self-financed items from Hospital Authority, are sold at a discounted price. • First, social workers carry out an assessment on the elderly's financial ability. • After the financial assessment, elderly patients are offered drug issuing and on-the-spot drug counselling on an appointment basis. 	<p><u>Service outcome</u></p> <ul style="list-style-type: none"> • It serves approximately 2,000 person-times per year. <p><u>Self-perceived effectiveness of the services</u></p> <ul style="list-style-type: none"> • The service provider believed the service absolutely insufficient since their services' coverage was just a 'tip of an iceberg', and there were still a lot of room for other organisations to participate.
-----------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Pharmacy Outreach Services to the Community Centres	<p><u>Human resources</u></p> <ul style="list-style-type: none"> • 40-50 volunteers. <p><u>Facilitators</u></p> <ul style="list-style-type: none"> • The service should communicate well with the community centers and the elderly about the aim of the service and also the role of the pharmacists. 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • Provision of drug education as main role, provides visits for local elderly community centres regularly for drug talks or drug counselling services. • Elderly members are encouraged to bring all their medications for assessment. 	<p><u>Service outcome:</u></p> <ul style="list-style-type: none"> • Unknown number of community centers is visited once a week. <p><u>Self-perceived effectiveness of the services</u></p> <ul style="list-style-type: none"> • The service provider believed the service severely insufficient; coverage was just at the 'tip of an iceberg', with much room for improvement.
Pharmacy Outreach Services to the Hidden Elderly	<p><u>Human resources</u></p> <ul style="list-style-type: none"> • One full-time pharmacist and few volunteers who are also registered pharmacists. <p><u>Facilitators</u></p> <ul style="list-style-type: none"> • More education should be provided for the community about the recognition of the role of pharmacists. 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • First, elderly subjects were identified and referred by local social workers outreach nurses and doctors. • Pharmacists visited elderly who have limited mobility. • Pharmacists assess the environment of their homes, such as whether they can take the medicines themselves, and whether they are keeping expired drugs. • The cases are also followed up • Patient education about medicines, follow-up regularly thereafter. • Referrals from social workers, outreach nurses and doctors. 	<p><u>Service outcome</u></p> <ul style="list-style-type: none"> • It serves approximately 50 person-times per year. <p><u>Self-perceived effectiveness of the services</u></p> <ul style="list-style-type: none"> • The service provider believed the service absolutely insufficient since their services' coverage was just a 'tip of an iceberg', and there were still a lot of rooms for other organisations to participate.

<p>IT Supported Monitored Dosage System for OAH Staff</p>	<p><u>Human resources</u></p> <ul style="list-style-type: none"> • There is only one pharmacist in the team of developing the IT supported system for OAHs. <p><u>Material resources for OAHs</u></p> <ul style="list-style-type: none"> • All OAHs should install computer upgrade systems with network connection. <p><u>Facilitators</u></p> <ul style="list-style-type: none"> • Group spirit of team is important for the development of advanced technology system. • Recognition of the government should be obtained. • Health care workers' IT skills should be trained for using the system. 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • The drug administration system was developed as a centralised computerised system - allows OAH staff to effectively cross-check each other at every step with electronic documentation. • Then 1-week medicines of the OAH residents are prepacked by the OAH staff into the monitored dosage system. • Electronic signature for electronic documentation is also developed for OAH staff to administer drugs. • Training is provided for the OAH staff to use the system. The training programme includes a CD-ROM, which contains drug education materials. 	<p><u>Service outcome</u></p> <ul style="list-style-type: none"> • It serves approximately 10 OAHs. <p><u>Self-perceived effectiveness of the services</u></p> <ul style="list-style-type: none"> • The service provider rated the service as significantly insufficient to meet the load demand since the service was only at its beginning and it required policy support for filling up the needs.
<p>VPS</p>	<p><u>Human resources</u></p> <ul style="list-style-type: none"> • In 2001, there were three full-time pharmacists and more than 30 part-time pharmacists.⁹⁸ 	<p><u>How it works in practice</u></p> <ul style="list-style-type: none"> • Pharmacists visit OAHs and carry out medication reconciliation, conduct medication reviews for residents, and make sure the OAH practices comply with the guidelines set out by the SWD on medication safety and documentation.⁹⁹ • Pharmacists afterwards maintain proper documentation of all the drug or non-drug interventions made with the OAH staff and 	<p><u>Service outcome</u></p> <ul style="list-style-type: none"> • It served more than 50 OAHs in 2009-2010⁹⁹ • At least one medication reconciliation and medication review is completed per resident⁹⁸ • Over 60% of anticipated visiting hours was achieved by the end of 2010⁹⁸ • Number of calls grew in using drug hotline service⁹⁸ • The barriers were overcome in self

		<p>health care professionals.⁹⁸</p> <ul style="list-style-type: none"> • Adverse drug events and medication incidents are reported via proper channels when necessary.⁹⁸ • Education and trainings are also provided to the OAHs staff such as publishing handbooks for healthcare professionals and organising drug management education program for health workers⁹⁸ <p><u>Other services</u></p> <ul style="list-style-type: none"> • Apart from the visits to OAHs, this service assists OAHs to set up an in-house pharmacy.⁹⁹ 	<p>reporting by home staffs on “near misses” leading to drug incidents⁹⁸</p> <p><u>Service user satisfaction</u></p> <ul style="list-style-type: none"> • All interviewees responded positively that the service helps with their care of the residents such as spending less time on checking drugs since the pharmacists counter-check for them and help reading the discharge notes, and update them with any changes. • An interviewee commented the doctor would not follow on the memo written by the pharmacists in aspect of improving the clinical conditions of residents. • All interviewees thought that the service improves their confidence in giving health advice but sometimes the elderly residents or the family do not buy into the recommendation. • All interviewees appreciated that their health knowledge can be improved by the service such as drug talks and the <i>in-situ</i> explanation and discussions with the pharmacist. • An interviewee added that the pharmacist also help them to check whether the drug storage conditions comply to the conditions stated by the guidelines. <p><u>Service users’ opinions on improvement</u></p> <ul style="list-style-type: none"> • An interviewee suggested more drug talks should be given by the pharmacist.
--	--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------