AN EVALUATION ON PENANG HOSPITAL PHARMACISTS, COMMUNITY PHARMACISTS, AND CONSUMERS' PERCEPTION TOWARD THE IMPLEMENTATION OF ZONING OF COMMUNITY PHARMACIES IN PENANG, MALAYSIA

LEONG PUI CHEE

UNIVERSITI SAINS MALAYSIA

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by

LEONG PUI CHEE

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TABLE OF CONTENTS

ACKNOWLEDGEMENT ..... **ii**

TABLE OF CONTENTS ..... **iii**

LIST OF TABLES ..... **vii**

LIST OF FIGURES ..... **viii**

LIST OF ABBREVIATIONS ..... **ix**

LIST OF APPENDICES ..... **x**

ABSTRAK ..... **xi**

ABSTRACT ..... **xiii**

CHAPTER 1 GENERAL INTRODUCTION **1**

1.1 Background 1

1.2 Problem statement 3

1.3 Rationale for the study 4

1.4 Objectives of study 5

1.4.1 Primary Objective 5

1.4.2 Secondary Objectives 5

1.5 Overview of thesis 6

CHAPTER 2 LITERATURE REVIEW **7**

2.1 Community pharmacy services in Malaysia: Current scenario 7

2.2 Distribution of community pharmacy in overseas 9

2.3 Distribution of community pharmacy in Malaysia 11

2.4 Challenges of rural area's community pharmacies 13

2.4.1 Limited pharmacy workforce 14

2.4.2 Low spending power 15

2.4.3 Lack of transportation 15

2.4.4 Low volume purchase / low walk-in customers 16

2.4.5 Slim profit margin 16

2.5 Advantages and disadvantages of pharmacy zoning policy 17

2.6 Zoning policy guideline in overseas 20

2.6.1 Zoning policy in Iran 21

2.6.2 Zoning policy in Australia 21

2.6.2(a) New pharmacy (at least 1.5km) 21

2.6.2(b) New pharmacy (at least 10km) 22

2.6.2(c) New additional pharmacy (at least 10km) 22

2.6.2(d) New pharmacy in a designated complex (small shopping center) 22

2.6.2(e) New pharmacy in a designated complex (large shopping center with no approved premises) 23

2.6.2(f) New pharmacy in a designated complex (large shopping center with approved premises) 23

2.6.2(g) New pharmacy in a designated complex (large private hospital) 23

2.6.2(h) New pharmacy in a designated complex (large medical center) 24

2.7 Zoning guidelines in Malaysia 24

2.7.1 Establishing a new pharmacy 25

2.7.2 Pharmacy in a facility 25

CHAPTER 3 METHODOLOGY 26

3.1 Study Design 26

3.1.1 Study participants and sampling method 26

3.2 Study population and sampling method 28

3.3 Inclusion Criteria 28

3.4 Exclusion Criteria 29

3.5 Data collection 29

3.6 Data analysis 32

3.7 Ethical Considerations 35

CHAPTER 4 RESULTS 36

4.1 Results of qualitative semi-structured interview (consumers' study) 36

4.1.1 Demographic characteristics 36

4.1.2 Thematic content analysis results 37

4.1.2(a) Theme 1: Understanding of zoning 37

4.1.2(b) Theme 2: Current saturation of pharmacies. 38

4.1.2(c) Theme 3: Challenges of pharmacies in rural areas 39

4.1.2(d) Theme 4: Impact (advantages/ disadvantages) of zoning in pharmacies 41

4.1.2(e) Theme 5: Strategies to help the implementation of zoning in pharmacies 43

4.2 Results of qualitative semi-structured interview (community pharmacists' study) 52

4.2.1 Demographic characteristics 52

4.2.2 Thematic content analysis results 53

4.2.2(a) Theme 1: Influence of saturation in pharmacies to the professionalism of community pharmacies 54

4.2.2(b) Theme 2: Challenges of pharmacies in rural areas. 56

4.2.2(c) Theme 3: Impact (advantages/ disadvantages) of zoning in pharmacies 58

4.2.2(d) Theme 4: Community pharmacist's readiness toward pharmacy zoning 60

4.2.2(e) Theme 5: Strategies to help the implementation of zoning in pharmacies 62

4.3 Results of qualitative semi-structured interview (hospital pharmacists) 69

4.3.1 Demographic characteristics 69

4.3.2 Thematic content analysis results 70

4.3.2(a) Theme 1: Understanding of zoning 71

4.3.2(b) Theme 2: Current saturation of pharmacies. 72

4.3.2(c) Theme 3: Challenges of community pharmacies in rural areas 73

4.3.2(d) Theme 4: Impact (advantages/ disadvantages) of zoning in community pharmacies 75

4.3.2(e) Theme 5: Strategies to help the implementation of zoning policy 79

CHAPTER 5 DISCUSSION 89

5.1 Consumers' perceptions and opinions on zoning policy 89

5.2 Community pharmacists' perceptions and opinions on zoning policy 96

5.3 Hospital pharmacists' perceptions and opinions on zoning policy 104

CHAPTER 6 CONCLUSION AND RECOMMENDATION 111

6.1 Conclusion 111

6.2 Study limitations 113

6.3 Recommendations to improve the current practice 114

6.4 Recommendations for future study 115

REFERENCES 116

APPENDICES

LIST OF PUBLICATIONS

LIST OF TABLES

Page

Table 2.1 Distribution of community pharmacies in Malaysia 11

Table 2.2 Number of pharmacy outlets allowed in the facility 25

Table 4.1 Demographics and characteristics of the responding consumers 37

Table 4.2 Summary of the main themes and subthemes in the qualitative study on the perception on zoning in community pharmacies among ten consumers in Penang, Malaysia 45

Table 4.3 Demographics and characteristics of the responding community pharmacists 52

Table 4.4 Summary of the main themes and subthemes in the qualitative study on the perception of zoning in community pharmacies among twelve community pharmacists in Penang, Malaysia 64

Table 4.5 Demographics and characteristics of the responding hospital pharmacists 69

Table 4.6 Summary of the main themes and subthemes in the qualitative study on the perception of zoning in community pharmacies among hospital pharmacists in Penang, Malaysia 82

LIST OF FIGURES

Page

Figure 3.1 Flow chart of study procedures..... 34

LIST OF ABBREVIATIONS

ACPA	Australian Community Pharmacy Authority
ATLAS	Archiv für Technik, Lebenswelt und Alltagssprache
COVID-19	Coronavirus Disease 2019
FIP	International Pharmaceutical Federation
KKM	Kementerian Kesihatan Malaysia.
MPS	Malaysian Pharmaceutical Society
MREC	Medical Research Ethics Committee
MCPG	Malaysian Community Pharmacy Guild
OECD	Organisation for Economic Co-operation and Development
U.S.	United States
WHO	World Health Organization

LIST OF APPENDICES

Appendix A(i)	Information Sheet and Consent Form (Consumers Interview)
Appendix A(ii)	Borang Sheet Sheet and Consent Form (Consumers Interview) Malay translation
Appendix A(iii)	Borang Sheet Sheet and Consent Form (Consumers Interview) Mandarin translation
Appendix A(iv)	Information Sheet and Consent Form (Community Pharmacists Interview)
Appendix A(v)	Information Sheet and Consent Form (Hospital Pharmacists Interview)
Appendix B(i)	Demographic data and interview guide - consumer interview
Appendix B(ii)	Demographic data and interview guide - consumer interview (Malay translation)
Appendix B(iii)	Demographic data and interview guide - consumer interview (Mandarin translation)
Appendix B(iv)	Demographic data and interview guide - community pharmacist interview
Appendix B(v)	Demographic data and interview guide - hospital pharmacist interview
Appendix C	Ethical approval letter from MREC
Appendix D	Certificate of acknowledgement for previva presentation
Appendix E	Turnitin Report

PENILAIAN PERSEPSI AHLI FARMASI HOSPITAL, AHLI FARMASI KOMUNITI DAN PENGGUNA DI PULAU PINANG TERHADAP PELAKSANAAN PENGEZONAN FARMASI KOMUNITI DI PULAU PINANG, MALAYSIA

ABSTRAK

Selama bertahun-tahun, dasar pengezonan dalam farmasi komuniti telah menjadi topik perbincangan di Malaysia. Amalan dasar pengezonan dalam farmasi komuniti telah meluas di banyak negara. Namun demikian, dasar ini belum diamalkan di Malaysia. Kajian ini bertujuan untuk menilai pendapat secara mendalam ahli farmasi hospital, ahli farmasi komuniti dan pengguna mengenai pengezonan farmasi komuniti di Malaysia. Kajian kualitatif separa berstruktur melalui temu bual bersemuka telah dijalankan pada April hingga September 2021 dalam kalangan 11 ahli farmasi hospital (berumur 31 hingga 40 tahun), 12 ahli farmasi komuniti (berumur 31 hingga 40 tahun) dan 10 pengguna (berumur 27 hingga 48 tahun) di Pulau Pinang, Malaysia. Persampelan secara bertujuan digunakan, dan pengumpulan data dihentikan apabila tiada penemuan baru dicapai. Temu bual telah dirakam dan dicatat secara verbatim. Transkrip telah dikodkan dan disahkan oleh pakar dan data terhasil dianalisis oleh ATLAS.ti versi 8 dengan menggunakan analisis tematik. Hasil kajian menunjukkan bahawa ahli farmasi hospital dan pengguna kurang pendedahan terhadap konsep dasar pengezonan. Ketiga-tiga kumpulan responden menyedari bahawa kedudukan farmasi komuniti adalah lebih padat di kawasan bandar berbanding dengan kawasan luar bandar. Mereka berpendapat bahawa ramai ahli farmasi enggan membuka kedai mereka di kawasan luar bandar kerana sukar untuk mengekalkan perniagaan mereka. Responden juga berpendapat bahawa dasar

pengezonan mempunyai kelebihan dalam meningkatkan kebolehcapaian penjagaan kesihatan di kawasan luar bandar. Walaubagaimanapun, responden mempunyai pendapat yang berlainan dari segi pelaksanaan dasar pengezonan boleh meningkatkan kualiti perkhidmatan profesional farmasi. Ketiga-tiga kumpulan responden mempunyai kebimbangan terhadap kemungkinan berlakunya monopoli di farmasi selepas pelaksanaan dasar pengezonan di kawasan tertentu. Selain itu, beberapa ahli farmasi komuniti dan hospital berasa bimbang bahawa dasar pengezonan akan mengurangkan pilihan kepelbagaian produk dan peningkatan harga produk farmaseutikal. Berkenaan dengan strategi pelaksanaan pengezonan, ketiga-tiga kumpulan responden berpendapat bahawa insentif perlu diberikan oleh kerajaan untuk menyokong farmasi komuniti luar bandar dan kerajaan perlu menetapkan dasar kemasukan farmasi komuniti baharu di kawasan bandar. Sebagai kesimpulan, adalah penting untuk menangani halangan dalam pelaksanaan pengezonan, khususnya mengatasi cabaran yang dihadapi oleh farmasi di kawasan luar bandar, dan meningkatkan kesedaran terhadap konsep pengezonan dalam kalangan ahli farmasi hospital dan pengguna di Malaysia. Namun demikian, adalah penting untuk diingat bahawa pengezonan mempunyai kelebihan dan kelemahannya. Strategi yang sesuai perlu dibangunkan untuk memaksimumkan manfaatnya.

AN EVALUATION ON PENANG HOSPITAL PHARMACISTS, COMMUNITY PHARMACISTS AND CONSUMERS' PERCEPTION TOWARD THE IMPLEMENTATION OF ZONING OF COMMUNITY PHARMACIES IN PENANG, MALAYSIA

ABSTRACT

Over the years, the zoning policy regarding community pharmacies has stirred controversy in Malaysia. Despite being widely adopted in many countries, such policies have yet to be implemented in Malaysia. This study aimed to assess in depth opinion of hospital pharmacists, community pharmacists and consumers regarding zoning of community pharmacies in Malaysia. A semi-structured qualitative study utilising face-to-face interviews was carried out in April to September 2021 among 11 hospital pharmacists (aged 31 to 40 years), 12 community pharmacists (aged 31 to 40 years) and 10 consumers (aged 27 to 48 years old) in Penang, Malaysia. Purposive sampling was employed, and data collection was stopped when the saturation point was reached. The interviews were audio-recorded and transcribed verbatim. The transcripts were independently coded and verified by experts with the resultant data analysed by ATLAS.ti version 8 using thematic analysis. The study found that hospital pharmacists and consumers have lack of exposure to the concept of zoning policy. All the three respondent groups were aware about the oversaturation of community pharmacies in urban areas as compared to rural areas. They believed that many pharmacists refused to establish their stores in rural areas because of hard to survive in business. They also viewed zoning policy as having advantage of improving accessibility of healthcare in rural areas. However, the respondents have different opinions on the implementation of zoning policy would

improve the quality of professional pharmacy services. All the three respondent groups expressed worries in the possibility of pharmacy monopoly after implementation of zoning policy in certain areas. Besides, some community and hospital pharmacists were concerned that zoning policy would leads to reduce product variety and increase price of pharmaceutical products. Considering the strategies of implementing zoning, all the three respondent groups advocated incentives given by government to support rural pharmacies and setting policy of new pharmacy entry in urban area. In conclusion, it is imperative to tackle the barriers to zoning implementation, particularly addressing the challenges faced by rural pharmacies, while simultaneously enhancing awareness of zoning concepts among hospital pharmacists and consumers in Malaysia. Nevertheless, it is essential to recognize that zoning comes with both advantages and disadvantages, necessitating the development of effective strategies to maximize its benefits.

CHAPTER 1

GENERAL INTRODUCTION

1.1 Background

In commercial zoning planning, zoning policy in pharmacies has been widely practiced in many countries such as Australia, Canada, United States and Iran (Australian Government Department of Health, 2019; Macdonald, 2021; Zaboli *et al.*, 2016). Zoning, as defined, entails dividing a jurisdiction into districts (zones) with prescribed permissible uses, serving as a policy to safeguard public health and welfare (Bagley, 2013). For instance, according to Malaysian Community Pharmacy Benchmarking Guideline, zoning in community pharmacies involve criteria of a population ratio of 1 pharmacy per 5,000 individuals in urban areas and 1 pharmacy per 10,000 individuals in rural areas, with the nearest pharmacy being at least 300 meters away in linear measurement (Pharmaceutical Services Division, 2015). The law applies to relocation and new pharmacy allocation. In Australia, a new pharmacy must apply to the Secretary of the Department of Health pharmacists to relocate an existing pharmacy and locate a newly opened pharmacy. Applications are considered by the Australian Community Pharmacy Authority (ACPA), which makes a recommendation to the Secretary (Department of Health) whether an application should be approved. ACPA considered an application based on Pharmacy Location Rules. (Australian Government Department of Health, 2021).

In Malaysia, the government discussed the location or zoning policy of community pharmacies at length some years ago. There have been attempts to provide some guidelines on zoning. The most relevant approach to zoning was outlined in the Malaysian Community Pharmacy Benchmarking Guidelines of 2011 and 2015, which

recommended that new pharmacies should be situated at a suitable distance of at least 300 meters from existing ones, taking into account population density as a determining factor. Besides, the ministry could better control the distribution of pharmacies through zoning policy by referring to the mapping service (Wong, 2013). However, zoning guidelines were absent in later editions of the Community Pharmacy Benchmarking Guidelines (2016), indicating that zoning policy might not be a primary concern for the government. This underscored the lack of explicit zoning guidelines for community pharmacies in Malaysia (Malaysian Pharmaceutical Society, 2018).

There were efforts to implement zoning policy in the state of Johor, Malaysia but without much success. The president of Malaysian Community Pharmacy Guild Supreme Council highlighted the reason for the unsuccessful implementation of the zoning policy, citing a legal challenge from a chain pharmacy in Johor. Their argument contended that since the policy was not national in scope, it should not be enforced as policy in Johor either (Foon, 2023). As such, there are instances of new community pharmacies opening close to or just next door to existing ones. It caused excessive medicine prices competition and shrinkage of profit margin following price war (Kho *et al.*, 2017). Besides, the absence of medicinal products price regulations again plays a key role in aggravating the price war. The subsequent erosion of community pharmacies' profit margins will likely reinforce the attention on commercial viability at the expense of professionalism (Hassali *et al*., 2015).

Zoning policy in pharmacies could help in equal distribution of community pharmacies in rural-urban areas. Pharmacists are situated in the community to provide

pharmaceutical services and care, responsible for drug therapy to achieve definite outcomes that improve a patient's quality of life (Heplhr and Strand, 1990). Pharmacists provide essential pharmaceutical services to patients, including dispensing medicines, patients' counselling, and providing pharmaceutical care. The accessibility of community pharmacies are essential determinants of health care access and related quality of the service supplied (Olukemi and Oseni, 2017). Poor accessibility, for example, can cause prescriptions to go unfulfilled, thus leading to the irrational use of medicines. Therefore, ensuring geographical access to community pharmacies through zoning is crucial to guarantee patients' accessibility to essential medication supplies and related professional services.

1.2 Problem statement

In Malaysia, zoning policy has not been implemented in community pharmacies. There was an intention for zoning policy to be implemented and this policy was recommended in Community Pharmacy Benchmarking Guideline 2011 and 2015 but it was not presented in the Community Pharmacy Benchmarking Guideline 2016. Besides, the previous effort of implementing zoning policy among community pharmacies in state of Johor, Malaysia does not bring much success. Zoning of community pharmacies has its important roles, pros and cons. Furthermore, the ways to optimize the benefit of zoning policy are worth studying. Currently, pharmacies distribution in Malaysia was concentrated in urban areas and left in rural and sub-rural areas underserved (Cheng, 2012). Rural and sub-rural residents need to travel far to visit the community pharmacies. In the absence of zoning policy, urban areas often see the proliferation of three to four community pharmacies opening on a single street (Tan, 2019). In the current scenario, the public is over-focused on medicinal products'

prices which leads to price war among pharmacies due to unhealthy competition in high-density pharmacies areas (Tan *et al.,* 2013; Kho *et al.*, 2017). Consequently, neither people nor the pharmacies are focusing on professional pharmaceutical services provided by community pharmacists. To the best of our knowledge, there is currently no study being conducted to evaluate the perspectives of consumers', community and hospital pharmacists' opinions in the implementation zoning policy of pharmacies in Malaysia.

1.3 Rationale for the study

By implementing zoning policy pharmacies, all the pharmacies need to be set up at a certain distance. Distancing pharmacies can reduce the density of pharmacies in the urban area and thus encourage more pharmacies to open in the rural area (Kho *et al*., 2017). Zoning is a crucial step to increase the accessibility of healthcare and pharmaceutical services in rural areas. Without high saturation of pharmacies in urban areas, the unhealthy competition that compete to further reducing the price (price war) among pharmacies will reduce. Community pharmacists and consumers can shift their focus from concerns solely about price to prioritize professional pharmaceutical services (Mathews *et al*., 2020). Thus, this can improve the quality of pharmaceutical services. It is essential to gather diverse perspectives from various stakeholders involved in community pharmacy services, as they directly or indirectly influence the development and implementation of zoning policies. This includes community pharmacists, hospital pharmacists, and consumers. Community pharmacists, as frontline healthcare providers, engage directly with patients in community pharmacies. Additionally, hospital pharmacists often work as locums in community pharmacies, and some may transition to become community pharmacists in the future. Moreover,

consumers are increasingly taking proactive roles in their healthcare. They rely on community pharmacists for advice and counselling, making their input vital in shaping zoning policies.

The state of Penang, Malaysia has high saturation of community pharmacies. Every area in Penang is almost well evenly developed and undergoing rapid urban development (Mok, 2016). Therefore, there is an opportunity for zoning policy implementation among the community pharmacies in Penang. This study will justify the importance of pharmacy zoning policy, its possible impacts and assess the understanding of the subject groups towards zoning policy. The study's findings would also help in identifying implementation strategies and barriers in zoning policy implementation which are valuable in charting the future policies in the country.

1.4 Objectives of study

1.4.1 Primary objective

To evaluate the in-depth perceptions of consumers, community pharmacists and hospital pharmacists in Penang, Malaysia towards pharmacy zoning policy.

1.4.2 Secondary objectives

1. To evaluate the understanding of pharmacy zoning policy among consumers, community pharmacists and hospital pharmacists in Penang, Malaysia
2. To evaluate the opinions of consumers, community pharmacists and hospital pharmacists in Penang, Malaysia on the issues of challenges of community pharmacies in rural areas.
3. To evaluate the opinions of consumers, community pharmacists and hospital pharmacists in Penang, Malaysia on the impact of pharmacy zoning policy.

4. To evaluate the opinions of consumers, community pharmacists and hospital pharmacists in Penang, Malaysia on the possible strategies for implementation of zoning policy in community pharmacies.

1.5 Overview of thesis

Chapter 2, the literature review, starts with the current scenario of community pharmacy services in Malaysia, the distribution of pharmacies in overseas and in Malaysia, and the challenges of rural community pharmacies. The chapter continues with the impact of zoning as in advantages and disadvantages of zoning policy in pharmacies, zoning policy in other countries and in Malaysia.

The methodology, results, and discussion of the study findings are presented in chapters 3, 4 and 5. In chapter 6, conclusion and a set of recommendations to improve the pharmacy zoning policy implementation are provided.

CHAPTER 2

LITERATURE REVIEW

2.1 Community pharmacy services in Malaysia: current scenario

Community pharmacies provide a wide range of healthcare-related services to the public. A survey involving 80 community pharmacists in Penang showed community pharmacists were actively involved in weight management (92.5%), diabetes counselling (91.3%), traditional and complementary medicine counselling (83.8%), nutrition and physical activity (82.5%) and asthma counselling (81.3%). A total of 77.5% of respondents provided health education and promotion programs to the public. However, a significant majority (75.1%) cited a lack of time as the primary barrier preventing their participation in health promotion activities, according to a study by Hassali *et al*. (2009a). Conversely, a minority (28.8%) mentioned a lack of profitability as a deterrent to engagement in these activities. Additionally, another cross-sectional study conducted in Malaysia revealed that over 80% of community pharmacists felt that business concerns had overshadowed the professional aspects of their practice. This shift is attributed to price wars fuelled by intense competition among nearby pharmacies, leading to reduced profit margins and posing threats to their business sustainability. This situation has also been noted to undermine the dignity and professionalism within healthcare settings in Malaysia, as highlighted in studies by Kho *et al*. (2017) and Mathews *et al*. (2020).

There were studies on the perceptions of Malaysian public towards community pharmacists. A survey involving 180 consumers who visited community pharmacies in Selangor revealed that 41% perceived community pharmacists as health professionals who had a good balance between health and business matters. Besides, 47.8% of the consumers perceived community pharmacists as their primary source of solving drug-

related problems. Most of the respondents viewed a pharmacist's medication knowledge (77.2%), and location of pharmacy (73.1%) were the main attractive factors for customers (Nilugal *et al.*, 2015). A cross-sectional pilot study in Sabah involving 647 respondents from the public showed that 61.4% agreed that pharmacists knew more about their medications and side effects and how to use the medications than their doctors. The majority (85.0%) of the respondents hoped that pharmacists could play a greater role in healthcare in the future. Among them, 55.3% of the respondents were willing to pay for pharmacist-provided dispensing services (Cheah, 2018).

The doctors' perceptions on community pharmacies are essential for the development of community pharmacy practice in Malaysia. A cross-sectional study was conducted to assess general practitioners' (n = 160) views on community pharmacies in the Northern Region of Peninsular Malaysia. In the study, a proportion of respondents viewed that general practitioners should consider the community pharmacists' recommendations whenever there is any problem with the prescriptions given by them (46.3%). The general practitioners also viewed that community pharmacists are the best healthcare professionals to educate patients about safe and appropriate use of medications (52.5%), and if dispensing separation is implemented, they will work closely with the community pharmacists in monitoring patients' pharmacotherapeutic outcomes (77.5%) (Hassali *et al*., 2009b).

All the aforementioned studies indicate that the majority of community pharmacies in Malaysia met the standards of practice for pharmaceutical care, encompassing services such as pharmaceutical counselling, health screening, and medication review, as outlined by the Pharmaceutical Services Division of the Ministry of Health (2016).

While their tireless efforts are valued by both the public and medical experts, the quality of professional pharmaceutical services is under threat due to price wars among neighboring pharmacies. This competition has led to dissatisfaction among community pharmacists and compromised standards of professionalism. To address this issue, zoning in pharmacies is proposed as a solution to ensure fair competition and maintain focus on patient care over price battles.

2.2 Distribution of community pharmacy in overseas

The average population served by a pharmacy could indicate a country's community pharmacy infrastructure and capacity, the accessibility of pharmacy services and medicines. Up to year 2017, there were 1,580,575 community pharmacies worldwide serving 5.549 million people (75% of the world population). At the global level, the median ratio of community pharmacy to population stands at 1: 4182 people (ranging from a minimum of 1: 1,765 in urban Armenia to a maximum of 1: 130,385 in rural Ethiopia, Africa (International Pharmaceutical Federation (FIP), 2017)).

In Surabaya, Indonesia, there are notable disparities in the distribution of pharmacies across urban, suburban, and rural areas. The ratio of pharmacies to population varies considerably, ranging from 1 pharmacy per 1,426 people to 1 pharmacy per 49,806 people, with an average ratio of 1 pharmacy per 2,076 individuals (Wulandar et al., 2022; Setiawan et al., 2022). Similarly, in certain rural areas within the Greater Toronto area, encompassing 25 incorporated municipalities across York Region, Halton Region, Peel Region, Durham Region, and Toronto, approximately 19% of the rural population face underserviced conditions, encountering severe geographic limitations in accessing community pharmacies, with a ratio of pharmacies to

population as low as 1:5,882 (Wang and Ramroop, 2018). In Ujjain, Central of India, 475 private pharmacies were identified in the community, but more than three-quarters (77.7%) distributed in urban areas. The overall ratio of pharmacies in Ujjain was 1: 3571 population (distribution of 1:1712 in urban areas and 1:11904 in rural areas respectively) (Sabde *et al*., 2011). Besides, in Nigeria where Southwest zone is highly concentrated with community pharmacists (41.7%), the rural-urban distribution of community pharmacies revealed that there were primarily concentrated in urban areas (89.9%), leaving the rural areas underserved with a ratio of 1: 36,836 population (Olukemi and Oseni, 2017). The inequitable distribution has led to the irrational use of medicines, non-professionals in practice, a chaotic drug distribution system, poor access to safe medicines and negative effects on health indicators (Olukemi and Oseni, 2017). Meanwhile, in areas with a high density of pharmacies, competition intensifies, often leading to a strategy of price wars among pharmacies. Unfortunately, this focus on undercutting prices can overshadow the importance of service quality, as pharmacies prioritize competitive pricing over delivering excellent customer service (Setiawan *et al*., 2022).

There were studies showed that many countries have laws adjusting pharmacy distribution based on population saturation. These include Saudi Arabia (average one pharmacy for every 4,464 people), Iran (one day-opened pharmacy for every 6,000 people) and South Africa (one pharmacy for 10,000 people) (Zaboli *et al.,* 2016, Najjar, 2003, Gilbert, 1998). While a country may boast a high density of community pharmacies, this does not guarantee an equitable distribution across rural and urban areas. Therefore, implementing zoning policies that strategically allocate community pharmacies between rural and urban

regions is crucial. Such policies ensure that patients can readily access essential pharmaceutical services regardless of their location.

2.3 Distribution of community pharmacy in Malaysia

In Malaysia, the Community Pharmacy Benchmarking Guideline recommended one pharmacy outlet in 5,000 population with a district ratio of 1 in 5,000 (urban area) and 1 in 10,000 (rural area) (Pharmaceutical Services Division, 2015).

In 2012, the former Malaysian Health Minister raised a concern about the inequitable distribution of pharmacies, as there were more outlets in urban areas than in rural places (Cheng, 2012). Up to 25th March 2020, a total of 2544 community pharmacies are incrementing in Malaysia (Tan, 2019). Nevertheless, most of the pharmacies are still concentrated at urbanized states in Penang (n = 229), Johor (n = 330), Melacca (n = 96) and Kuala Lumpur (n = 272), as shown in table 2.1 (Ministry of Health Malaysia: Pharmacy Service Program, 2023). From the distribution observed, community pharmacies are still lacking in suburban and rural areas, while certain urban areas have very dense numbers of community pharmacies. In some places, one single street can have 3-4 community pharmacies in a row, while only 1-2 general practitioner clinics are in the vicinity (Tan, 2019).

Table 2.1 Distribution of community pharmacies in Malaysia

States	Total pharmacies	Total residents	Ratio of community pharmacies resident
Kuala Lumpur	272	1,780,700	1: 6,547
Penang	229	1,774,600	1: 7,749
Melacca	96	930,700	1: 9,695
Sarawak	249	2,812,800	1: 11,296
Johor	330	3,764,300	1: 11,407
Perak	201	2,512,100	1: 12,498

Table 2.1 Continued

States	Total pharmacies	Total residents	Ratio of community pharmacies resident
Negeri Sembila	90	1,130,300	1: 12,559
Kedah	167	2,18,600	1: 13,057
Selangor	476	6,528,400	1: 14,192
Perlis	16	254,400	1: 15,900
Kelantan	103	1,885,700	1: 18,308
Labuan	5	99,300	1: 19,860
Pahang	79	1,674,600	1: 21,197
Terengganu	57	1,245,700	1: 21,854
Sabah	174	3,903,400	1: 22,433
Total	**2544**	**30,297,000**	**1: 11,909**

Note: Adapted from Farmasi Komuniti di Malaysia - Program Perkhidmatan Farmasi, KKM | Tableau Public, 2023

Currently, most of the community pharmacies were situated in urban areas. Thus, the former Malaysian Minister of Health called on the pharmaceutical community to open more outlets in less concentrated areas (Cheng, 2012). According to the Malaysian Community Pharmacists Association, about 30 rural districts were without a private community pharmacy. Furthermore, almost half (54%) of private pharmacists preferred to work in urban areas of Kuala Lumpur, Selangor and Johor (Cheng, 2012). Therefore, it is necessary to re-look into incorporating the zoning statement back into the Community Pharmacy Benchmarking Guidelines or even implementing zoning policy in community pharmacies. Many factors such as population density, clinics and hospitals nearby need to be investigated for zoning policy implementation in Malaysia regarding locations in big cities, small towns, and rural areas. Some criteria need to be developed for these types of places. More importantly, adequate baseline data are required to assist the health care policymakers in implementing the zoning policy of pharmacies to ensure equitable distribution and access to medicine for the public.

2.4 Challenges of rural area's community pharmacies

Community pharmacists play a critical role in medication dispensing, educating patients, and ensuring patient medication safety. The demand for pharmaceutical care services in rural areas is high. The increased demand for pharmaceutical care in rural areas is partly attributed to higher populations of older patients than urban areas (Gangeness, 1997). This group of patients uses more substantial amounts of medicines. A study in Ohio, United States found that 40.6% of elderly visited multiple pharmacies for medicine and 35.6% had polypharmacy (five or more prescription medications). Of all seniors with polypharmacy, about 57% had contraindicated drug combinations and nearly 50% took one or more medicines that are not medically necessary (Martin *et al.*, 2015). Thus, these further addressed the need for community pharmacies in rural areas.

Despite the high demand for pharmacies in rural areas, pharmacists opt not to start a retail business in rural areas. Rural pharmacies encounter numerous obstacles in maintaining their viability. Typically, pharmacies gravitate towards densely populated areas due to their higher profitability, thereby leaving sparsely populated rural regions underserved in terms of accessible medication sources. This phenomenon has been highlighted in studies such as Cheng (2012). Moreover, research indicates that governmental initiatives have not effectively incentivized pharmacists to establish and operate in rural communities, leading to a shortage of pharmacies in these areas, as identified by Ward et al. (2014).

The challenges faced by rural pharmacies encompass a multitude of factors, including low purchasing volume and foot traffic, narrow profit margins, transportation limitations, adverse insurance practices, diminished spending power among rural residents, and a scarcity of pharmacy professionals (Haggan, 2017). The combined impact of these

hurdles can significantly jeopardize the sustainability of rural community pharmacies, often culminating in their closure. Notably, there is a dearth of existing research on the specific challenges confronting rural communities in Malaysia. Therefore, this study aims to fill this gap in knowledge, providing valuable insights to address this pressing issue.

A strategic approach to pharmacy mapping, including zoning considerations, serves as a proactive measure to incentivize pharmacists to establish and maintain rural community pharmacies. Zoning strategies can be implemented through various means, such as the licensing of new community pharmacies contingent upon demographic thresholds (ensuring a minimum number of inhabitants per new pharmacy), geographical parameters (managing the distance between planned pharmacies and existing ones), or through the provision of economic incentives. As highlighted by Besancon (2019), these zoning initiatives play a pivotal role in fostering the accessibility and viability of rural pharmacy services.

2.4.1 Limited pharmacy workforce

There is a shortage of pharmacists in rural areas and high cost in recruiting pharmacists to isolated rural areas (Waterman, 2018). A study examining the challenges within rural pharmacy practices revealed that rural pharmacists often endure extended work hours, compounded by the fact that they frequently operate as the sole pharmacist without any replacements, thereby significantly impacting their work-life balance (Hays et al., 2020). Consequently, this imbalance contributes to a higher closure rate of rural pharmacies, a trend observed not only in metropolitan areas of the United States but also evident in Malaysia (Lazaro et al., 2022).

In Malaysia, rural pharmacies encounter additional hurdles in recruiting competent staff, with a notable 54% of pharmacists expressing a preference for employment in urbanized states such as Kuala Lumpur, Selangor, and Johor (Kho et al., 2017). This preference underscores the challenges of staffing rural pharmacies. Moreover, Malaysia's national policies mandating that pharmacies must be staffed by pharmacists further exacerbate the reluctance to establish rural pharmacies, serving as an additional deterrent under zoning regulations.

2.4.2 Low spending power

Many rural economies have a slow growth (Rural Health Information Hub, 2020). Studies from both the United States and Switzerland underscore poverty as a significant determinant of adverse health outcomes, with rural areas exhibiting a higher prevalence of poverty compared to their urban counterparts, a trend observed in both developed nations such as the United States and developing countries like Cambodia. The combination of lower health awareness and socioeconomic status in rural regions has resulted in reduced purchasing power, particularly among elderly residents residing in these areas (Agriculture and Rural Development, 2017; Xenia, 2015). Hence, rural residents are more likely to report unmet health needs and less likely to receive preventive health care (Van Dis, 2002).

2.4.3 Lack of transportation

A previous report in Canada highlighted that transportation is the forgotten issue in rural areas, and research on the transportation mobility of older persons living in low-density rural areas has been relatively neglected (Sylvestre *et al.*, 2006). The absolute reliance on private cars is a disadvantage because a high percentage of a low-income family is unable to own a vehicle and an aging individuals can no longer drive (Henning-Smith *et al*., 2017; Sylvestre *et al*., 2006). Furthermore, there is a significant lack of spatial coverage of 70%

of the rural area by public bus transportation services as reported by a study in the rural area of Croatia (Sipus and Abramovic, 2017). Thus, these disabled rural residents who need to rely on public transportation, will cause unnecessary logistic problems to access to pharmacy (Kenny and Madhavan, 2018).

2.4.4 Low volume purchase or low walk-in customers

Many independent, rural pharmacies are struggling to survive due to declining rural populations (Rural Health Information Hub, 2020). Generally, lower population density in rural areas causes a lower customer volume in pharmacies (Agriculture and Rural Development, 2017; Smailes *et al.*, 2002).

Another reason of low walk-in customers in rural pharmacies is the lower health awareness of rural residents. This issue was described in western China, whereby the primary way to receive health knowledge in rural residents was through traditional doctors (80.45%) (Yuan *et al*., 2015). Besides, there was another report which stated that 14% of rural residents were lack of interest in getting medication counselling in rural pharmacists of Nevasa Taluka, India (Ugale *et al*., 2011). Rural residents often lack awareness of the vital role rural community pharmacies play, dissuading their establishment under zoning policies. Limited understanding stems from sparse access to healthcare information and services, hindering rural pharmacy viability. Addressing this gap requires targeted education efforts to underscore pharmacy importance in rural health (Ugale *et al*., 2011).

2.4.5 Slim profit margin

Discriminatory pricing from drug manufacturers was cited as a significant cause of the financial difficulties experienced by independent and small pharmacies (Kho *et al*., 2017).

Pharmaceutical companies and suppliers even require pharmacies operating in rural areas to take larger stock quantities to offset transportation costs in a rural area (Kho *et al.*, 2017). However, there is limiting factor for buying high stock quantities in rural areas particularly the purchase power in rural areas is too small to ensure profitability (Agriculture and Rural Development, 2017). Thus, when rural pharmacies are unable to buy a bigger lot of stocks, the cost of stock can be further increased by higher transportation cost, deployment costs, and cost of recruiting pharmacists to isolated rural areas (Agriculture and Rural Development, 2017). Moreover, longer operation time in rural pharmacists than urban counterparts, as reported in Columbia, also burdens rural pharmacies' operational costs. The possibility of higher selling prices could affect the affordability of the consumers, and distant customers might switch to competitors. These reasons are hindering the new pharmacies from starting retail business in rural areas.

2.5 Advantages and disadvantages of pharmacy zoning policy

Understanding the advantages and disadvantages of zoning policies in community pharmacy is crucial for effective implementation. Research addressing this gap can inform policymakers and stakeholders, facilitating the development of policies that better meet the needs of both pharmacies and communities. Zoning policy has its advantages of providing systematic lot arrangement to prevent overcrowding of similar business in the specified area. Zoning promotes mixed-use development or development that serves multiple uses, such as a pharmacy on the first floor of a building and other commercial office on the second floor. Some economic benefits of mixed-use spaces are: promoting a mix of retail, restaurants, offices, civic uses, and multi-family housing and increasing format variety (Datta and Sudhir, 2012).

Besides, zoning has benefit of ensuring sustainability of pharmacies as well as improving the services of pharmacies. Zoning can control economic competition when competitors of the same business are required to locate at a specified distance from established, similar use (Organisation for Economic Co-operation and Development, 2008). A previous interview involving 20 community pharmacists in Sarawak, Malaysia found that some of the respondents advocated for the enactment of zoning rules to prevent new community pharmacies from opening near an existing pharmacy (Kho *et al.*, 2017). However, the study in Sarawak solely focuses on price competition among pharmacies, neglecting to assess pharmacists' opinion on strategies for implementing zoning. This oversight fails to address crucial aspects of zoning policy implementation, limiting comprehensive insights into optimizing pharmacy services in the region.

Without zoning, there are increasing numbers of new community pharmacies opening new shops around the same area. The consumers tend to compare the prices of medicines provided at nearby pharmacies. Eventually, all nearby pharmacies will indulge in a price war and undercut the market to gain a foothold in the sector (Kho *et al.*, 2017). Besides, the absence of medicine price control policy in Malaysia further enhanced the medicine prices competition between pharmacies. This medicinal products' prices war has reduced the pharmacist's mark-ups and affected their incomes, in turn affected the sustainability of the community pharmacies in the same area. In order for pharmacies to survive in the aggressive competition, community pharmacies will concentrate on stock management, price adjustment, narrow the profit margins and increase sales volume (Chong, 2010). Consequently, price war in aggressive competition caused the pharmacists have lesser time to focus on professional services provision.

Generally, community pharmacies in Malaysia's rural areas are lacking in numbers as compared to urban areas as pharmacists are reluctant to operate a new pharmacy in rural areas where the population is too small (Gan, 2014). Zoning policy has another advantage of encouraging more pharmacies opening in rural areas which will increase the accessibility of pharmaceutical services to the public. It reduces driving distances and makes it easier for people to walk or bike to their daily destinations because pharmacies are closer to houses. Besides, directing commercial development to existing villages helps encourage residential growth and reduces the likelihood of scattered businesses in rural areas that encourage more spread-out development and fragmented land (Nelson, 2012).

Besides, increasing more pharmacies in rural areas will benefit to dispensing separation implementation between private clinics and community pharmacies. There was an interview with 350 public regarding their views on implementing dispensary separation in Malaysia. A total of 345 respondents (98.6%) strongly felt that Malaysia was neither logistically nor strategically prepared to implement a dispensing separation system. When dispensing separation policy was implemented, pharmacy outlets should be located in near proximity to clinics to avoid inconveniencing the public. However currently, many rural areas in Malaysia do not have enough community pharmacy outlets (Kenny and Madhavan, 2018). The implementation of dispensing separation policy requires an adequate number of community pharmacies in rural areas. Implementing zoning regulations in community pharmacies could significantly enhance the presence of rural pharmacies, thereby effectively addressing the challenges associated with dispensary separation. This is especially crucial in rural regions where access to community pharmacies is limited. By facilitating the establishment of more pharmacies in these areas,

zoning initiatives can effectively mitigate the persistent issue of inadequate access to essential pharmacy services.

Zoning policy has disadvantages of limiting the entry of new pharmacies into an area. This will leads to decrease in competition due to the decline in the number of competitors and market dominance, which subsequently created monopoly particularly by certain big chain pharmacies (Nilsson, 2017). Varian (1992) argues that the profit possibilities are largest in a monopoly market and smallest in competitive markets (Wang and Ramroop, 2018). Thus, there are possibility of adjusted higher price if a company monopoly the market or even providing sluggish services with maintained price level. However, competition is supposed to be good for consumers. When more competitors are available in the market, they would decrease the price level and increase quality of services to compete for customers (Nilsson, 2017).

2.6 Zoning policy guidelines in overseas

Several Asian countries, including the Philippines, Singapore, Indonesia, India, and Thailand, lack zoning policies in their pharmacy regulations. Among these countries, only Indonesia and India have implemented dispensing separation policies without accompanying zoning regulations (Kenny and Madhavan, 2018; Setiawan et al., 2022; Bhargawa and Ojas, 2021). In Malaysia, the absence of a clear description of zoning policy in the community pharmacy benchmarking guideline is notable. In contrast, Iran and Australia serve as examples of countries with well-defined zoning policy guidelines, which are more detailed compared to Malaysia's approach.

2.6.1 Zoning policy in Iran

The Iranian Ministry of Health has introduced zoning regulations stipulating that in cities with populations exceeding one million, the minimum distance between two pharmacies operating during daytime hours (9 am to 9 pm, closed on public holidays and weekends) must be at least 300 meters. Meanwhile, the distance between two 24 hours/7 days operating pharmacies should not be less than 1000 m. Besides, the distance between a day opened pharmacy and a 24-hour/7 days operating pharmacy must be at least 240 m. This regulation is implemented to ensure accessibility in different parts of a city rather than a concentrated pattern of pharmacy distribution (Kebriaeezadeh *et al.*, 2009).

2.6.2 Zoning policy in Australia

In Australia, the registration of a new pharmacy is submitted to the Department of Health, which is responsible for secretarial services to the Australian Community Pharmacy Authority. The application of a new pharmacy or the relocation of an existing pharmacy is subject to the Pharmacy location rules. The Rules are legislated under the National Health (Australian Community Pharmacy Authority Rules) Determination 2018 (PB 46 of 2018) (the Rules), made under section 99L of the Act. The Rules set out location-based criteria that must meet for the Authority to recommend approval of a pharmacy (Australian Government Department of Health, 2019).

2.6.2(a) New pharmacy (at least 1.5 km)

An application made under this item of the Rules must meet all of the requirements listed below.

(a) the proposed premises are at least 1.5 km, in a straight line, from the nearest approved premises; and

(b) there is within 500 m, in a straight line from the proposed premises, either:

(i) both the equivalent of at least one full time (services of a prescribing medical practitioner for 38 hours in a week) prescribing medical practitioner; and a supermarket with a gross leasable area of at least 1,000 m^2; or

(ii) a supermarket that has a gross leasable area of at least 2,500 m^2

2.6.2(b) New pharmacy (at least 10 km)

The proposed premises are at least 10 km from the nearest approved premises by the shortest lawful access route.

2.6.2(c) New additional pharmacy (at least 10 km)

An application must meet the requirements listed below.

(a) the proposed premises are:

(i) in the same town as approved premises; and

(ii) at least 200 m, in a straight line, from the nearest approved premises; and

(iii) at least 10 km, by the shortest lawful access route, from any approved premises other than the approved premises mentioned at (ii) above; and

(b) the Authority is satisfied that, at all relevant times, in the same town as the proposed premises are:

(i) the equivalent of at least four full-time prescribing medical practitioners practicing; and

(ii) one or two supermarkets that have a combined total gross leasable area (the total floor area of the supermarket, small shopping centre or the large shopping centre excluding loading docks and car parks) of at least 2,500 m^2.

2.6.2(d) New pharmacy in a designated complex (small shopping centre)

An application made must meet the requirements listed below.

The proposed premises:

(a) are in a small shopping centre; and

(b) are at least 500 m, in a straight line, from the nearest approved premises, other than approved premises in a large shopping centre or private hospital; and

(c) there are no approved premises in the small shopping centre.

2.6.2(e) New pharmacy in a designated complex (large shopping centre with no approved premises)

An application made must meet the requirements listed below.

(a) the proposed premises are in a large shopping centre; and

(b) there are no approved premises in the large shopping centre.

2.6.2(f) New additional pharmacy in a designated complex (large shopping centre with approved premises)

An application must meet the requirements listed below.

(a) the proposed premises are in a large shopping centre; and

(b) if the large shopping centre contains:

(i) at least 100, but fewer than 200, commercial establishments – there is only one approved premises in the large shopping centre; or

(ii) at least 200 commercial establishments – there are at least one but no more than two approved premises in the large shopping centre; and

(c) no approved premises had relocated out of the large shopping centre in the 12 months immediately before the day the application was made.

2.6.2(g) New pharmacy in a designated complex (large private hospital)

An application made must meet the requirements listed below.

(a) the proposed premises are in a large private hospital; and

(b) there are no approved pharmacies in the large private hospital

2.6.2(h) New pharmacy in a designated complex (large medical centre)

An application made must meet the requirements below.

(a) the proposed premises are in a large medical centre; and

(b) there are no approved premises in the large medical centre; and

(c) if the large medical centre is:

(i) in a small shopping centre, a large shopping centre or a private hospital – the proposed premises are at least 300 m, in a straight line, from any approved premises, other than approved premises in a different large shopping centre or private hospital; or

(ii) not in a small shopping centre, a large shopping centre or a private hospital – the proposed premises are at least 300 m, in a straight line, from the nearest approved premises, other than approved premises in a large shopping centre or private hospital; and

(d) the Authority is satisfied that, during the two months before the day on which the application is made and until the day the Authority considers the application, the number of prescribers at the medical centre is equivalent to at least eight full-time prescribers, of which at least seven prescribers must be prescribing medical practitioners; and

(e) the Authority is satisfied that the applicant will make all reasonable attempts to ensure that the operating hours of the proposed premises will meet the needs of the patients of the medical centre.

2.7 Zoning guidelines in Malaysia

The Zoning policy is currently not implemented in Malaysia but it was described in the Malaysian Community Pharmacy Benchmarking Guideline 2015 (Pharmaceutical Services Division, 2015). The guideline gives an overview on benchmarking of proper distance between community pharmacies in rural and urban areas as further described in the subsections below.