The 2009/A/H1N1 Pandemic in Australia, Israel and England: A Qualitative Study in General Practice

Marina Kunin
MA

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School of Primary Health Care
Faculty of Medicine, Nursing and Health Sciences
Monash University
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ABSTRACT

Background and Purpose of the Research

The purpose of the research reported in this thesis was to explore the challenges of managing the 2009/A/H1N1 influenza pandemics in primary care in Australia, Israel and England. The influenza pandemic 2009/A/H1N1 was less devastating than originally anticipated; however, its burden on the health systems of many countries was substantial. It affected 214 countries and territories disproportionately afflicting young children and pregnant women. During this influenza pandemic, the main burden of the pandemic response fell on primary care services, and General Practitioners (GPs) were the ones who diagnosed and treated most of the patients.

The prominent role of GPs in the 2009/A/H1N1 influenza pandemic presented an excellent opportunity to investigate the implications of pandemic policies for primary care and to tackle the potential problems that these policies may impose on the ability of GPs to participate effectively in the pandemic response.

Method

The research design consisted of three complementary studies: a systematic review of the literature, a document study, and qualitative semi-structured interviews with GPs.

The systematic literature review (Study 1) was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and applied systematic approach to the literature search, study selection and data extraction. The objective of the systematic review was to examine evidence of challenges that primary care physicians encountered responding to past pandemics or large-scale epidemics.
The document study (Study 2) involved analysis of the documents published by the health authorities in Australia, Israel and England during the 2009/A/H1N1 influenza pandemic. Information pertinent for the research question was separated from non-pertinent applying qualitative content analysis approach. Subsequent thematic analysis involved more focused reviewing of the retrieved data, which involved coding and category construction. The objective of the document study was to compare the approaches for management of the 2009/A/H1N1 influenza pandemic in primary care in these three countries.

Qualitative semi-structured interviews with 65 GPs in Australia, Israel and England (Study 3) were conducted during June-September 2010. Thematic analysis of the qualitative data was applied. The objective was to explore the views of GPs on challenges they encountered managing the 2009/A/H1N1 influenza pandemic in these three countries.

Findings

The systematic review of the literature (Study 1) revealed that GPs from different countries experienced similar challenges during past epidemic or pandemic responses. These included: difficulties of communication with the health authorities; limited supply of Personal Protective Equipment (PPE) and difficulties with its use; challenges in performing public health responsibilities; limited support from the authorities; lack of appropriate training.

However, the review did not allow a full-scale list of possible challenges of the pandemic response in primary care and yielded little systematic information concerning the nature of the identified challenges. The reasons for these were that only 10 studies met the inclusion criteria of the systematic review; the included studies had different objectives and designs; the studies provided little relevant information needed to consider the differences in patterns of the disease spread and GP involvement in the response in different countries.
Study 2 and Study 3 of this thesis were designed to address the identified gap and to investigate the challenges of GP involvement in the 2009/A/H1N1 pandemic response in the selected examples of Australia, Israel and England.

Study 2, document analysis, provided systematic evidence concerning the different approaches for involvement of GPs in the pandemic response in Australia, Israel and England. It showed that the involvement of GPs in the three countries differed in timing and allocated responsibilities.

Study 3 of the thesis, qualitative interviews with GPs in Australia, Israel and England, elicited challenges in providing the pandemic response in primary care from the respective of GPs. The identified challenges were consistent with the findings of the systematic review of the literature. Systematic collection and analysis of the qualitative data from the three countries allowed identification of a full-scale list of challenges in three fields of the pandemic response: treatment of patients, performance of public health responsibilities and communication with the health authorities.

**Contribution of the Research to Knowledge**

This thesis adds to the existing knowledge concerning challenges of the pandemic response in primary care by differentiating between two types of challenges: (i) country specific challenges and (ii) cross country challenges intrinsic to the pandemic response in primary care in general. This was done by collating the data from the document study (Study 2) and qualitative interviews with GPs (Study 3).

(i) Country specific challenges. These challenges were found to be influenced by the timing and severity of the disease spread, level of GP involvement in the response, support provided to GPs by the health authorities, and organization of primary care services in a country.
(ii) Cross country challenges intrinsic to the pandemic response in primary care in general. These same difficulties were evident in each of the three countries and included difficulties in following pandemic guidelines (barriers affecting knowledge, attitudes and behaviour of GPs) and challenges related to the role delineation during the pandemic response that resulted in role ambiguity and role conflict.

Conclusion and Recommendations for Future Pandemic Planning

The experience of the 2009/A/H1N1 influenza pandemic management highlighted the centrality of primary care in the pandemic response. The findings of this thesis showed that GPs were intensively involved in the pandemic response in the three investigated countries, despite the differences in the responsibilities that were allocated to them. The connection of GPs to the populations they routinely serve and trust that these populations have in GPs, positioned them as the pivotal figures when people were concerned about their health or the possibility of getting sick. This situation is not likely to change in the future.

In order to overcome challenges identified in this research, improvements in planning for involvement of GPs in the pandemic response should be introduced. Based on the thesis findings, the following recommendations were made:

First, broader involvement of GPs in the process of planning should be targeted. This includes engagement of GPs and public health representatives in pre-pandemic drills, collaborative meetings and knowledge transfer; engagement of GP representatives and health authorities in pandemic policy evaluation; inclusion of GP representatives in decision making and planning committees.

Second, improvement in clarity and strategy of the pandemic policies and guidelines communication to GPs should be introduced. This includes the establishment of one body that
is responsible for communicating pandemic policy updates to GPs; making policy updates oriented to primary care by engaging GPs in pre-pandemic policy planning committees; engagement with GP professional bodies that develop and distribute guidelines for primary care; and establishment of mechanisms for GP feedback provision during the pandemic response.

Third, planning the support to be provided to GPs during the pandemic response is imperative. This should include planning for rapid distribution of PPE and antiviral drugs in primary care; reimbursement for the pandemic vaccine administration; coordination during the mass vaccination campaign in primary care; and detailed guidelines to treat complicated pandemic cases.
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Name: Marina Kunin

Signature: ---------------------------

Date: ---------------------------
PUBLICATIONS AND PRESENTATIONS ARISING FROM THIS THESIS

Publications


Presentations

Kunin M, The Role of Primary Care Physicians During the 2009/A/H1N1 Influenza Pandemic. Paper section presented at the 2nd International Conference on Preparedness & Response to Emergencies & Disasters, Tel-Aviv, Israel, January 2012

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<table>
<thead>
<tr>
<th>Glossary Item</th>
<th>Definition</th>
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<tr>
<td>Divisions of General Practice</td>
<td>Mid-level health organizations in Australia (at the time of the thesis)</td>
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<tr>
<td>ED</td>
<td>Emergency Department</td>
</tr>
<tr>
<td>FC</td>
<td>Flu Clinics</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>HA</td>
<td>Hemagglutinin – virus’ surface antigens of the influenza virus</td>
</tr>
<tr>
<td>NA</td>
<td>Neuraminidase – virus’ surface antigen of the influenza virus</td>
</tr>
<tr>
<td>HMO</td>
<td>Health Maintenance Organization. HMOs are mid-level health organizations in Israel.</td>
</tr>
<tr>
<td>HPU</td>
<td>Health Protection Unit</td>
</tr>
<tr>
<td>ILI</td>
<td>Influenza-Like Illness</td>
</tr>
<tr>
<td>NHI</td>
<td>National Health Insurance</td>
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<td>NHS</td>
<td>National Health Service</td>
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<tr>
<td>NPFS</td>
<td>National Pandemic Flu Service – was established in England in July 2009 to provide advice and prescriptions of antiviral drugs to patients with flu-like symptoms over the phone or internet.</td>
</tr>
<tr>
<td>PCP</td>
<td>Primary Care Physician</td>
</tr>
<tr>
<td>PCT</td>
<td>Primary Care Trust – mid-level health organizations in England (at the time of the thesis).</td>
</tr>
<tr>
<td>PHU</td>
<td>Public Health Unit</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment. Equipment used by physicians to protect themselves from the infection. Usually included masks (surgical or N95), gloves, gowns, goggles.</td>
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<tr>
<td>PRISMA</td>
<td>Preferred Reporting Items for Systematic Reviews and Meta-Analyses – an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses.</td>
</tr>
<tr>
<td>QL</td>
<td>Qualitative study</td>
</tr>
<tr>
<td>QN</td>
<td>Quantitative study</td>
</tr>
<tr>
<td>RR</td>
<td>Response rate</td>
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<tr>
<td>SARS</td>
<td>Severe Acute Respiratory Syndrome</td>
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<td>WHO</td>
<td>World Health Organization</td>
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CHAPTER ONE

INTRODUCTION

The purpose of this chapter is to introduce the thesis and to outline its significance. It consists of five sections. The first section (Section 1.1) provides the background to the research and states the research problems. The purpose and significance of the research are presented in Section 1.2. Section 1.3 describes the methodological approach applied in this research. The scope of the thesis is defined in Section 1.4. Finally, Section 1.5 details the thesis structure, presenting a brief description of each chapter.

1.1 Background of the Research and Statement of the Research Problems

Influenza is a contagious disease that is responsible for deaths of approximately half a million people around the globe per year (1). Usually, influenza is treated in primary care by General Practitioners (GPs). Influenza pandemics are relatively rare events that cause high morbidity and mortality in the populations that are naïve to the newly appeared influenza virus. The devastating results of the 1918, 1957 and 1968 influenza pandemics, as well as increased emergence and re-emergence of infectious diseases in the last three decades (2), highlighted the importance of preparedness for such events.

From the beginning of the 21st century, considerable efforts to prepare for an inevitable influenza pandemic were undertaken globally. Most countries had developed pandemic preparedness plans by the end of the first decade of the 21st century (3). These plans focused on the early detection of the threat, containment of the disease spread and lessening its impact on the society in terms of mortality, morbidity and economic consequences.
The last global influenza pandemic, the 2009/A/H1N1, showed that, despite these preparedness efforts, the modern world is still vulnerable to the highly contagious virus. Rapid global transportation means that persons infected with highly contagious diseases could potentially travel around the world before they manifest any symptoms as the disease could be still in the incubation period (4). This makes the pandemic response challenging as it may take days or weeks until the disease is detected and the containment steps are taken.

This stresses the importance of health care systems responses in general and the response at the primary care level in particular. As GPs are the main responders to seasonal influenza, it is inevitable that they would be intensively involved in the pandemic influenza response (5). Indeed, during the 2009/A/H1N1 pandemic, the main burden of diagnosing and managing the patients fell on GPs (6, 7), and they were the principal implementers of pandemic policies.

However, previous research has identified numerous gaps in the way GPs have been incorporated in the national pandemic preparedness plans (8). Broad involvement of GPs in the 2009/A/H1N1 pandemic management offered an excellent opportunity to investigate the challenges that GPs encountered responding to the pandemic and to improve these plans.

1.2 Purpose and Significance of the Thesis

This research on the 2009/A/H1N1 pandemic response in primary care was an attempt to better understand the challenges in managing influenza pandemics in the primary care context. It focused on primary care because extant pandemic preparedness efforts have been mostly concentrated on the development of national preparedness plans, stockpiling of antiviral drugs and research into faster ways of production of effective vaccines. Planning at a sub-national level, however, has been rudimentary (3). Moreover, despite the fact that the 2009/A/H1N1 influenza pandemic was largely managed in primary care (9), research on the
GP role during the 2009/A/H1N1 pandemic response and on the challenges they encountered has been scant.

This research is significant because it provides a broad perspective on the barriers and challenges faced by GPs participating in the pandemic responses in three different health systems. This thesis investigates the approaches for GP involvement in the pandemic response in three countries, Australia, Israel and England, and explores the views of GPs, who consulted patients during the pandemic, on the difficulties they encountered.

This thesis adds to the existing knowledge concerning challenges of the pandemic response in primary care by differentiating between two types of challenges: challenges specific to the pandemic situation in a country and cross country challenges intrinsic to the pandemic response in primary care in general.

The current research makes a significant contribution to the emerging field of influenza pandemic preparedness in primary care by identifying issues for improvement of future planning. The thesis findings permitted the development of evidence-based recommendations for pre-pandemic planning of the primary care response. These recommendations related to the broader involvement of GPs in the process of planning; improvement in clarity and strategy of the pandemic policies and guidelines communication to GPs; and planning the support to be provided to GPs during the pandemic response.

1.3 The Research Approach

The research design consisted of three complementary studies. It began with the systematic review of the literature (Study 1) on the challenges that primary care physicians encountered responding to past pandemics or large-scale epidemics. This review highlighted that there are very few studies dedicated to this issue thereby limiting the full exploration of challenges of
the pandemic response in primary care. However, the review showed that GPs from different countries experienced similar difficulties; thus, indicating the usefulness of a comparative international study.

Study 2 investigated the approaches for integration of primary care in the national pandemic responses in Australia, Israel and England. This helped to understand the background for the potential difficulties in GP work during the pandemic. In-depth semi-structured interviews with GPs from the three countries about their experience during the 2009/A/H1N1 pandemic followed (Study 3). The participants in the study were GPs who took part in the 2009/A/H1N1 pandemic response in Australia, Israel and England. Thus, data collection exercises were conducted in addition to the systematic review: secondary data concerning policies and procedures were collected from published documents and primary data were collected from in-depth interviews of GPs.

The qualitative approach in the GPs study was employed because the purpose of this research was to explore the emerging field of science related to pandemic preparedness and response in primary care and to obtain the direct experiences and interpretations of GPs who had practised during the pandemic in the three countries. The field of the pandemic preparedness started to receive scientific attention only about two decades ago, induced by the outbreaks of the virulent A/H5N1 influenza virus and SARS (Severe Acute Respiratory Syndrome). In the circumstances when little is known about the researched field, qualitative research techniques can enable researchers to gain in-depth understanding and capacity to generate hypothesis that can be tested in subsequent studies (10). In addition, this study aimed to understand the problem from the perspective of major stakeholders (11), namely GPs who worked during the 2009/A/H1N1 pandemic response.
1.4 Scope of the Thesis

In analysing key aspects of the challenges for the pandemic response in primary care, this thesis is confined to the experience of GPs who worked during the 2009/A/H1N1 pandemic in three countries: Australia, Israel and England. This thesis was designed to provide analytic generalizations and did not aim to draw quantitative inferences about the population of GPs in large. In other words, providing statistical generalizations is not pertinent for this thesis.

The purpose of this thesis was to open up new ideas and to contribute new findings to the emerging field of the influenza pandemic preparedness. This thesis is focused on the key aspects of the pandemic response in primary care. Thus, to some extent, the findings of the thesis might not be generalizable to other contexts such as pandemic response of the broader health care system (etc. of the hospitals), other health systems or geographic locations, or to the context of the primary care preparedness to respond to hazards other than the influenza pandemic.

1.5 Thesis Structure

This work consists of seven chapters.

**Chapter One** provides an overview of the thesis and its significance. It briefly describes the research approach and points to the limitations of the thesis. The thesis structure is also detailed in this chapter.

**Chapter Two** presents the state of knowledge relevant to the current research. It points to the potential risk of an influenza pandemic emerging and devastating consequences that it can bring. The preparedness efforts for pandemic response in public health and primary care are also described. Further, this chapter presents a systematic review of the literature on challenges that primary care physicians encountered responding to past pandemics or large-
scale epidemics. It concludes with the discussion of the systematic review of the literature and the conclusions inferred from it.

**Chapter Three** explains the rationale for the current research based on the gaps and problems identified in the literature review. Further, the purpose and objectives of the thesis research are stated. This chapter also provides an overview of primary care systems in the three selected for the detailed research countries: Australia, Israel and England, and describes the 2009/A/H1N1 pandemic epidemiology in these three countries.

**Chapter Four** describes the research designs and outlines the methods used to investigate the research problems. It provides detail of the methods of data collection and analytical techniques that were used in the thesis. Self-reflexivity of the candidate, the approaches used to ensure the research rigour, and limitations of the research method are also explained.

**Chapter Five** presents finding of the research related to the two thesis objectives. First, it reports on the findings derived from the documents that were published by the health authorities in Australia, Israel and England during the 2009/A/H1N1 pandemic. Then, data collected from the in-depth semi-structured interviews with GPs from Australia, Israel and England are presented.

**Chapter Six** provides a detailed discussion and assessment of the research findings. It lays the groundwork for understanding the challenges of the pandemic response in primary care by collating the data from the document study and interviews with GPs and putting it in the perspective of the existing evidence. Challenges of the three approaches, investigated in this thesis, for involvement of GPs in the pandemic response are discussed first. Further, challenges that are intrinsic to the pandemic response in general are assessed.
Chapter Seven concludes the thesis providing a brief summary of the research. Contribution of the research to the existing knowledge in the field of the pandemic response in primary care is outlined. Practical recommendations for further pre-pandemic planning, inferred from the analysis of the thesis results, conclude the thesis.
CHAPTER TWO

LITERATURE REVIEW

This chapter presents the background and literature review relevant to the current research. Section 2.1 provides a brief account of the increased emergence and re-emergence of infectious diseases in the past three decades and conditions that were found to favour this trend. Section 2.2 describes the features of the influenza virus that give it the ability to cause pandemics with high morbidity and mortality. Section 2.3 presents an overview of past influenza pandemics highlighting the devastating consequences that these pandemics can potentially cause. The preparedness efforts for pandemic response are described in Section 2.4, detailing pandemic preparedness in public health and primary care. Section 2.5 presents a systematic review of the literature on challenges that primary care physicians encountered responding to past pandemics or large-scale epidemics (published by the candidate in Disaster Medicine and Public Health Preparedness (12)). This section provides a detailed description of the search strategy, study selection criteria and data extraction as well as comprehensive analysis and discussion of the findings. The final part of Section 2.5 presents the conclusion of the systematic literature review.

2.1 Emerging Threat of Infectious Diseases in the 20th Century

The first half of the 20th century witnessed a rapid decline in infectious disease incidence and mortality (13). Introduction of efficient vaccines and antibiotics, coupled with the improvements in urban sanitation and water quality, led to a receding of infectious diseases in the developed world, promising the eradication or, at least, the substantial decrease of the burden of these diseases (14). While the authorship of the famous statement: “It is time to close the book on infectious diseases, and declare the war against pestilence won” is not clear
(15), it nevertheless reflected the years of optimism following World War II, when many believed in a world free of infectious diseases.

However, from 1980s a significant turn-around began to occur and the increase in the emergence and re-emergence of infectious diseases became evident in many parts of the world. The analysis of the emerging infectious disease incidence between 1940 and 2004 showed a significant rise in these diseases over time with the peak incidence in the 1980s (Figure 2-1) (2). This peak in new infectious diseases in 1980s was found to be due to the emergence of diseases associated with the HIV/AIDS pandemic. That research also showed that emerging infectious disease events were dominated by zoonosis (infectious diseases that are transmitted between humans and animals), that originate in wildlife (such as Nipah virus in Malaysia or SARS in China) (2).

Modern social, economic, demographic and environmental conditions were found to favour the spread of infectious disease. Among these facilitating factors are: ecological changes (e.g. climate change); changes in human demographics and behaviour (e.g. population growth and migration); international travel and commerce; technology and industry (e.g. globalization of food supplies, organ or tissue transplantation); microbial adaptation and change; breakdown in public health measures (e.g. reduction in prevention programs) (16). In the World Health Report 1996, the Director-General of WHO, Dr Hiroshi Nakajima proclaimed: "We are standing on the brink of a global crisis in infectious diseases. No country is safe from them. No country can any longer afford to ignore their threat." (17).
Figure 2-1 Increase in emergence and re-emergence of infectious diseases

Amongst threats to public health, influenza pandemics are regarded as the most significant. Their timing cannot be predicted and they potentially can cause significant morbidity and mortality (18). The threat of the influenza pandemic became indubitable when the highly pathogenic avian influenza (A/H5N1) was contracted by humans (19) and sporadic outbreaks of this virus were detected in South-East Asia and the Middle East.

The influenza virus possesses certain features that give it the ability to cause pandemics with high morbidity and mortality. These features will now be outlined.

2.2 Influenza Virus

Influenza is an acute infectious respiratory illness caused by influenza viruses. Influenza virus is classified into types A, B, and C based on the similarity of internal protein antigens (20). The disease commonly occurs in epidemics, sometimes in pandemics, which develop quickly and spread rapidly. In a typical season, the disease affects 5% to 40% of the human population. (21)

Influenza pandemics are caused by influenza virus type A and they affect populations worldwide. This can happen because influenza virus A circulates not only in humans but also in birds, pigs, horses, and sea mammals (22). Another extremely important feature of influenza A virus for the pandemic capability is the segmented nature of its viral RNA genomes which consist of eight pieces of RNA. This feature enables the virus to rapidly produce genetic variations (22). If a host cell is infected with more than one virus, genetic re-assortment may result in substantial change in the virus’ surface antigens called Hemagglutinin (HA) and Neuraminidase (NA). This significant change in surface antigens is called antigenic shift (22). When the antigenic shift occurs, the influenza virus acquires the ability to rapidly spread and cause severe illness since the population does not have any immunity to it (22). It was suggested that a minimum requirement for pandemic appearance is a substantial shift in HA antigen and it occurs when genetic re-assortment with animal influenza A virus takes place (23, 24).

The generation of viruses with pandemic potential relates, therefore, to the transmission of influenza virus from one species (e.g., birds) to the other (22). Pigs have been proposed to the
intermediate animal host or “mixing vessel” for the generation of influenza A viruses re-assortment between humans and birds because they can easily support replication of both avian and human influenza A virus within their cells (24, 25).

As a rare event, influenza pandemics can emerge when influenza A virus jumps species. A wholly species-specific influenza virus from one species (e.g., birds or swine) infects another species (e.g., humans) without undergoing genetic re-assortment. This may have been the mechanism in the case of avian H1N1 virus which caused the “Spanish flu” pandemic of 1918–19 (22, 24, 26). The avian influenza virus A/H5N1 also appears to be taking this route to pandemic capability (27). Avian virus, however, needs to undergo mutations in the process of adapting to mammalian cells (22). Signs of such adaptation emergence were found in the A/H7N9 virus that caused an outbreak of a fatal human infection in China in 2013. This virus was found to possess several characteristic features of mammalian influenza viruses, which raised the concern about its pandemic potential (28).

2.3 Past Influenza Pandemics

“Pandemic” is defined in Stedman’s Medical Dictionary as “a disease affecting or attacking the population of an extensive region, country, continent, global; extensively epidemic. [pan- + G. demos, the people]” (29). Throughout history, there have been a significant number of recorded pandemics, which includes plague, cholera, HIV, etc. In the previous century, three significant influenza pandemics and a number of so-called “pseudo-pandemics” were recorded. The last influenza pandemic was recorded during the twenty-first century. A brief description of the past influenza pandemics will now be provided.
The “Spanish Flu” of 1918-1919 was caused by the exceptionally virulent virus H1N1 of avian origin. The mortality from this pandemic is estimated in the vicinity of 50 million (30), with the case fatality rate approximately 2-3% (23). This pandemic had an unusual pattern of age mortality attacking healthy adults 15-34 years old (30). However, very young children and pregnant women were disproportionately affected as well (31).

The outstanding virulence of the virus was of great interest to researchers for many years. In 2005, H1N1 virus containing all eight gene segments of the 1918’s virus was generated using reverse genetics (32). The ability of this virus to replicate productively, regardless of the presence or absence of trypsin (a digestive enzyme that breaks down proteins in the small intestine), in contrast to other influenza viruses that have been tested, explains its high virulence. In fact, another study showed that HA structure of the 1918 virus was very similar to that found on avian H5 flu viruses, with certain changes enabling it to infect and be transmitted by humans (26). These unique, bird-like properties of the H1N1 1918 virus may have contributed to its extraordinary virulence. The exceptional virulence of the 1918 influenza virus and the mortality and shocking devastation associated with this pandemic explain why the “worst case scenario” of preparedness models used parameters that corresponded to the “worst influenza pandemic on record” (33), the pandemic of 1918-1919.

Medicine’s response to the 1918-1919 influenza was limited as no antivirals, antibiotics or efficient influenza vaccine existed (34). Moreover, the medical personnel that could provide supportive care were in short supply. The response was based on the public health measures such as masks, quarantine and social distancing (34).
“Asian Flu” of 1957-1958

The “Asian Flu” was first identified in February 1957 in China as the H2N2 subtype of influenza A (35). It rapidly spread and by June reached Europe and America (36, 37). The disease spread occurred in two waves – in autumn and in winter. During the first wave, the attack rate of the disease was high; however, many patients experienced only mild symptoms. During the second wave, which peaked in February 1958, the influenza pandemic had decreased in frequency, but the death rate was the same as during the first wave (36, 37). The highest mortality rate was associated with the extremes of age groups – the elderly and infants. Overall it is estimated that “Asian flu” pandemic caused one million to two million deaths (38) having a case fatality rate of <0.2% (23).

The evidence of public health policy during the “Asian flu” in the US suggests that the policy was focused on having supplies of vaccine, whereas the traditional containment measures such as school closure, quarantine and recommendation to wear masks were generally not taken (39). In retrospect, it is disputable whether the availability of the vaccine against the H2N2 virus limited the spread and mortality of the pandemic. In the US, for example, the vaccine became available during autumn 1957 for only 17% of the population, whereas the effectiveness of it was about 60%, which put into question the ability of vaccination to reduce morbidity and mortality during the pandemic (39).

“Hong-Kong Flu” of 1968-1969

The “Hong Kong Flu” pandemic started in summer 1968 and spread swiftly throughout Asia. It was caused by the highly contagious H3N2 virus which probably originated from the H2N2 virus of the 1957 pandemic, but had acquired two new genes, HA and PB1 (35). Similar to the “Asian Flu” pandemic of 1957, the “Hong Kong Flu” pandemic occurred in two waves, and in
most places, the second wave was more devastating, causing a greater number of deaths than the first wave. As in 1957, the most affected groups were the elderly and young children (23). The mortality from this pandemic was estimated at 1-4 million casualties (38), with the case fatality rate at <0.2% (23).

“Pseudo-pandemics”

There have been a number of so-called “pseudo-pandemics” during the 20th century (23, 40). In 1947, the mild influenza pandemic caused few deaths in spite of its global spread. In 1976, the swine H1N1 virus was detected in American recruits of Fort Dix. The subsequent vaccination of 43 million people was associated with Guillain-Barre syndrome complications. In 1977, the “juvenile” “Russian Flu” was affecting only young people aged less than 25. It is assumed that the 1977 pandemic was caused by the human H1N1 virus which was accidentally released from a laboratory (23, 40).

“Swine Flu” of 2009

The most recent influenza pandemic, the “Swine Flu” of 2009 or 2009/A/H1N1, was a major public health event of the 21st century and demonstrated that our society is still vulnerable to potentially lethal respiratory infections spread through modern transportation and high population densities (2, 14, 41). Even though the influenza pandemic 2009/A/H1N1 was less devastating than originally anticipated, its burden on the health systems of many countries was substantial. According to the official data from WHO, this pandemic affected 214 countries and territories and caused more than 18,449 deaths and numerous hospital admissions worldwide (42). However, a recent study has suggested that the actual number of deaths was underreported, because deaths from the virus largely occurred in places where
the access to medical treatment and prevention was limited. That study estimated the real death toll from the 2009/A/H1N1 at between 151,700 and 575,400 (43).

It is believed that initial transmission of the 2009/A/ H1N1 virus to humans occurred at least several months before recognition of the first outbreak (44). First reports concerning the increase in influenza-like illnesses in Mexico appeared in the middle of March 2009 (45). The situation was evolving very rapidly and soon it became obvious from the epidemiological data that there was human-to-human transmission of the virus with the possibility for community level outbreaks. On the 27th of April 2009, WHO changed the phase of pandemic alert from level 3 to level 4; level 5 alert was declared two days later, on the 29th April. At this stage, the virus was founded in Mexico, USA, Australia, Israel, and a few countries in Europe. On the 11th of June, WHO moved the pandemic alert to the highest 6 level (45).

The 2009/A/H1N1 pandemic virus genome emerged in humans following multiple reassortment from several swine viruses (44). The novel mix of genes of the 2009/A/ H1N1 virus have not been previously reported in swine or human influenza viruses. The virus was disproportionately afflicting young children, pregnant women and persons with underlying co-morbidities (44, 46, 47). It is believed that the older population had some cross protective immunity from exposure to related influenza viruses in the past which explained the relatively low morbidity in this population; however, mortality was predominantly borne by the elderly (44, 48).

The 2009/A/H1N1 was the first influenza pandemic that was met with the scrupulous surveillance, international cooperation and pandemic preparedness plans (49). Traditional approaches to reduce the disease transmission, such as school closure, boarder measures and quarantine were applied together with the available antiviral treatment and mass vaccination. Later assessment of these public health strategies suggested that some approaches worked
well, whereas the effectiveness of others was questionable. For example, the border measures were reported as being logistically difficult and effective only in the countries with limited entry points (50). Moreover, in contrast to the broadly used practice, screening airplane passengers as they depart the infected area during the pandemic was found to be significantly more efficient than screening passengers after they arrive at their final destination (51). The usefulness of broad distribution of antivirals was questioned in the face of low adherence in the patients (52). The pandemic vaccine was not available until after the disease wave peak and thus had little impact on the progression of the pandemic (49).

On the 10th of August 2010, the WHO declared the pandemic over and the world moved into the post pandemic phase (53). However, the 2009/A/H1N1 virus remains one of the seasonal influenza viruses in circulation globally (54).

### 2.4 Preparedness for Influenza Pandemics

The description of past influenza pandemics that was provided in the previous section highlights the devastating consequences that these pandemics can potentially cause. In recent history, two smaller incidents – a contraction of a highly contagious avian influenza (H5N1) by humans in 1997 (19) with subsequent outbreaks of this virus in South-East Asia and the Middle East in 2004-2005, and an epidemic of the acute respiratory syndrome (SARS) in 2003 – caused fear of another pandemic occurrence. The spread of these two diseases was contained before reaching catastrophic levels, although the economic impact was considerable (55, 56).

These two incidents served as a wake-up call to recognize that it will be impossible to address the vast array of emerging bio-threats without global coordination and advanced national planning (57). Lessons learned from the SARS epidemic and A/H5N1 outbreaks brought
public health policy makers to formulate strategies for surveillance and containment of infectious disease outbreaks. These preparations will be described in the following two sections. Section 2.3.1 will be dedicated to the public health preparedness for influenza pandemics and other bio-threats at the national and international levels. Section 2.3.2 will detail preparations at the primary care level.

2.4.1 Pandemic Preparedness in Public Health

For the first time, the World Health Organization laid out a set of guidelines for pandemic prevention and containment in national and regional planning in 1999 (58). These guidelines for preparedness were updated and further developed in 2005 (59). The same year, an influenza pandemic preparedness checklist was published and all countries were recommended to use it for development of national pandemic preparedness plans (60). Another important milestone in the global pandemic preparedness was the adoption of International Health Regulations 2005 (IHR 2005) in 2007. These regulations addressed surveillance, reporting, information-sharing, transportation of biological substances and public health measures for travellers (61).

Since 2005, many areas of preparedness and response planning were developed, including stockpiling of antiviral drugs by many countries, strengthening outbreak communications, deeper understanding of disease spread and infection control, and greater insights on past pandemics (62). These led to the additional update of the pandemic guidelines in April 2009 (62), which corresponded with the start of the 2009/A/ H1N1 influenza pandemic.

This update redefined phase descriptions for an influenza pandemic, basing them upon observable phenomena. According to the new phase description, phases 1 - 3 correlated with
preparedness, including capacity development and response planning activities; whereas phases 4 - 6 signalled the need for response and mitigation efforts (62).

In the wake of the 2009/A/H1N1 influenza pandemic, most countries had already developed pandemic preparedness plans which addressed a broad range of pandemic management issues (3). In some countries, these plans were incorporated in broader national security plans as part of an all-hazard concept. This system-level approach emerged at the beginning of the 21st century and referred to the plans that were designed to a broad range of emergency situations, integrating emergency activities at all governmental levels (63). This concept recognized that national security was not restricted to physical destruction. While destruction of elements of a population infrastructure can have a negative impact on the public’s health, pathogens can affect society’s physical well-being causing economic, governance and legal disruptions. Thus, this approach regarded public health as an essential part of national security preparedness (64).

A comparative analysis of the national pandemic preparedness plans that was published by WHO in 2011, showed that national plans were diverse in terms of structure, content and the amount of information provided. Fifty seven per cent (68 out of 119 plans analysed), were developed mainly to respond to the highly pathogenic avian influenza A/H5N1 virus. It was found also, that in the functional area of planning and coordination, most plans had addressed the formation of a pandemic influenza planning committee and defined the responsibilities of various agencies to coordinate the response. However, sub-national planning was an area that required further development (3).

The operational effectiveness of the national plans was subjected to rigorous scrutiny during the 2009/A/H1N1 influenza pandemic. The investigation of the usefulness of the pandemic preparedness planning across countries showed that, while the preparedness activities were
effective and appropriate for the pandemic response, some deficiencies in planning existed (65). These included the following fields that were inadequately addressed during the pandemic planning process: internal communication within the health sector; coordination of vaccine procurement and logistics of distribution and administration; hospital surveillance for severe acute respiratory infection. The lack of flexibility in plans that limited their practical relevance to a milder pandemic was also revealed (65).

2.4.2 Pandemic Preparedness in Primary Care

The unexpected outbreak of the SARS virus in 2003 unveiled the vulnerability of front-line medical workers in general and primary care doctors, or general practitioners (GPs), in particular. Between November 2002 and August 2003, 8,422 cases of SARS with 916 deaths were recorded worldwide. Among these cases, 1725 were health care workers, mostly from China, Hong-Kong, Taiwan and Singapore (66). The vulnerability of the health care workers was especially pronounced at the early stage of the SARS outbreak, when more than half of the first 60 cases were medical professionals who had come into contact with the SARS patients (67).

Following the SARS outbreak, the state of pandemic preparedness in primary care started to receive particular attention. In fact, primary care was suggested as being one of the three pillars of defence against infectious hazards, along with public health measures and societal and institutional stability (34).

The preparedness of primary care physicians to respond to pandemics and their perceptions of the role they were expected to play has been investigated. Research concerning GPs’ preparedness, which involved data collection from GPs, showed that whereas GPs were willing to discharge their professional duty during a pandemic outbreak (68, 69), they pointed
to a number of barriers to their efficient involvement. These included limited time that GPs could spend on pandemic preparations (70) and dependence on the support from health authorities in terms of education, training and supply of personal protective equipment (PPE) (68, 70, 71). In addition, GPs from different countries expressed uncertainty concerning how primary care clinics would interact with each other and with the broader health system response to a pandemic (68, 72, 73).

It was suggested that, to facilitate pandemic response preparations in primary care, three areas should be addressed: definition of the GPs’ role within the broad health system response and preparation of general practices to perform this role; definition of communication strategies that will enable clinical and administrative data be transferred to and from GPs; and provision of resources to GPs (5).

The comparative analysis of the national pandemic preparedness plans that was done by WHO (3), did not detail the role GPs were intended to play according to these plans. However, a study that analyzed national pandemic preparedness plans of five different countries (Australia, England, USA, New Zealand and Canada), identified numerous deficiencies in the way GPs were incorporated in these plans (8). That study suggested framing the pandemic preparedness in primary care into four functional domains: clinical care for influenza and other needs, public health responsibilities, the internal environment and the macro-environment of general practice. The study reported that not one of the analysed plans addressed all four domains. The main gaps related to limited planning on catering for non-influenza clinical needs during the pandemic response and contribution of general practice to public health beyond surveillance. Most plans did not elaborate on collaborations between general practice and inter-relationships with the broader health system (8).
2.5  Response of General Practitioners to Infectious Disease Public Health Crises: A Systematic Review of the Literature

In light of the deficiencies in the pandemic preparedness in primary care that were discussed in Section 2.3.2, a review of literature on challenges that GPs have faced participating in the responses to the virulent diseases that caused public health crises has the potential to elicit strategies for the efficient response at the primary care level and thus, may help to improve the planning for such crises.

The aim of this integrative review has been to gain a broad perspective on barriers and challenges faced by GPs participating in the response to pandemics or large-scale epidemic.

In light of this aim, quantitative, qualitative and mixed-method studies have been reviewed. Such integrative reviews have previously proved to be useful in policy planning as they enhance the relevance of the review to the decision makers (74). Integration of different types of evidence has been applied recently to review complex public health issues in general (75) and public health issues in the preparedness field in particular (76, 77).

The review describes and analyzes the state of evidence concerning the challenges that GPs faced participating in the response to infectious diseases as causing public health crises.

Two questions guided this systematic review:

What were the challenges and barriers experienced by GPs during public health crises caused by infectious diseases?

Is there evidence of similar challenges and barriers experienced by GPs in various countries and during different public health crises caused by infectious diseases?
In order to achieve this objective, a systematic approach has been applied to literature search, study selection and data extraction, informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (78).

2.5.1 Method

2.5.1.1 Search Strategy

The literature search was performed in three phases.

First, the Scopus database was searched using the initial key words “primary care physicians” and pandemic*. Titles, abstracts and index terms of the relevant articles were analyzed in order to construct the list of search terms. This list is presented in Table 2-1.

Second, database-specific searches using the search terms list were performed in the following databases: MEDLINE, PubMed, Scopus, EMBASE, PsycINFO, and Cochrane Library, ProQuest Dissertations and Theses databases.

Third, reference lists of all studies that were retrieved for appraisal were searched for additional relevant studies.

The search was performed during November 2012 – January 2013.
### Table 2-1 Search Concepts of the Systematic Review of the Literature

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3</th>
<th>Concept 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Primary care”</td>
<td>Influenza OR flu</td>
<td>Epidemic*</td>
<td>Attitude*</td>
</tr>
<tr>
<td>GP*</td>
<td>H1N1 OR “Swine Flu”</td>
<td>Pandemic*</td>
<td>Experience*</td>
</tr>
<tr>
<td>“Family doctor***”</td>
<td>SARS OR “severe acute respiratory syndrome”</td>
<td></td>
<td>“policy implementation”</td>
</tr>
<tr>
<td>“Family pract***”</td>
<td>H5N1 OR “Avian Flu” OR “Avian Influenza”</td>
<td></td>
<td>Challenge*</td>
</tr>
<tr>
<td>“General pract***”</td>
<td>Mesh search: influenza a virus, h1n1 subtype/ or influenza a virus, h5n1 subtype/ influenza, human/ or severe acute respiratory syndrome/</td>
<td>Mesh search: Disease outbreaks/epidemics/pandemics</td>
<td>Role*</td>
</tr>
<tr>
<td>Mesh search: Physicians/</td>
<td></td>
<td></td>
<td>Difficult*</td>
</tr>
<tr>
<td>primary care, general practitioner, family</td>
<td></td>
<td></td>
<td>Response*</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Performance*</td>
</tr>
</tbody>
</table>

#### 2.5.1.2 Study Selection

Following removal of duplicates, the abstracts and titles of all retrieved articles were screened by the candidate for relevance. To minimize selection bias, the full texts of those selected after this first round of screening articles were then independently screened by two reviewers (the candidate and one of the supervisors (ST)) using the study inclusion and exclusion criteria. Disagreements were resolved by consensus after discussion.
Inclusion Criteria

Types of studies:
This review considered empirical studies that involved primary data collection from GPs and draw on their experience during epidemics or pandemics. Studies with the following design were included:

- Qualitative interviews - in-depth, structured, semi-structured, unstructured
- Focus groups
- Surveys - quantitative and qualitative (one that determines the diversity of some topic of interest within a given population (79))
- Mixed-method studies

Type of research reports:
Peer-reviewed research articles, peer-reviewed research abstracts, peer-reviewed summaries of research findings.

Types of participants:
GPs were identified as physicians employed in primary care settings who provide direct patient care. In some countries, primary care physicians include primary care pediatricians, family doctors and general internal medicine doctors. Studies where participants were not exclusively GPs and included, for example, health care workers in general, were included only if data relating to the experience of GPs were reported separately.

Phenomenon of interest:
GPs’ experience working during epidemics or pandemics of contagious air or droplet borne diseases.

Context:
Management of epidemics or pandemics caused by contagious air or droplet borne diseases in primary care.

Exclusion Criteria

- non-empirical reports (that did not involve primary data collection with primary care physicians)
- papers that drew upon the same data sets
- Non-English language publications.

2.5.1.3 Data Extraction

The primary aim of the data extraction process has been to capture the entire range of barriers and challenges that GPs encountered during the response to the infectious disease induced public health crises. The themes were extracted by the candidate and their relevance was discussed with one of the supervisors (ST). Disagreements were resolved by consensus after discussion. All factors that were agreed to present barriers or challenges were coded according to the themes they represented. Different aspects of the main themes have been coded as sub-themes and have been organized under the main theme. The theme tree provides details about the public health crises and the countries that were studied.

2.5.2 Analysis of Findings

The literature search of the databases yielded 522 potential sources (Figure 2.1). An additional 4 studies were identified from the reference lists of included articles and were added to the screening process. Following the removal of exact duplicates, 232 articles remained. During the initial round of title and abstract scanning, the primary reviewer (the candidate) excluded
257 citations. The most frequent reasons for study exclusion during this round were studies that investigated pandemic preparedness rather than the experience during a pandemic; epidemiological studies about the effect of a pandemic or epidemic on overall population; studies about vaccine development or effectiveness; and studies about seasonal influenza outbreaks. The full texts of the remaining 37 articles were separately screened by two reviewers (the candidate and one of the supervisors (ST)), and an additional 27 papers were excluded. The most frequent reasons for study exclusion in this phase were: studies considered to be not based empirically; studies not about GPs; studies with focus on other phenomenon of interest, such as treatment effectiveness or ethical aspects.
Studies identified by electronic database search (n=522)
- EMBASE n=150
- Medline n=127
- Scopus n=117
- PubMed n=102
- PsycInfo n=8
- ProQuest Dissertation and Thesis n=18
Limits: English language articles, Title and Abstract search

Studies identified from reference lists of included articles (n=4)

Exact duplicates excluded (n=232)

Initial Abstract screen (n=294)

Excluded after initial Abstract screening (n=257)

Secondary full-text screening (n=37)

Articles excluded (n=27)
- Non-English publication n=1
- Not GP population n=6
- Non-empirical papers n=8
- Same study dataset n=2
- Other phenomenon of interest or context n=10

Articles Included in review (n=10)
Of the 27 articles that were full-text screened, three (6, 7, 80) were opinion papers written by GPs and describing GPs’ involvement in the 2009/A/H1N1 pandemic response. They presented important evidence of personal experience and although, they were excluded from the systematic review, key issues presented in these papers served as triangulation for the data extracted from the reviewed studies.

Six quantitative surveys (81-86), two mixed-method studies (87, 88) and two qualitative studies (89, 90) met our inclusion criteria (Table 2-2). Of the six quantitative surveys, four (81, 82, 84, 86) included open-ended questions targeted to explore the concerns of GPs during the pandemic/epidemic response and their suggestions for improvement. The mixed-method study of Wong SYS et al. (87) comprised a cross-sectional survey and 10 qualitative interviews with GPs. The mixed-method study of El Emam et al. (88) presented the qualitative results of five focus groups and used descriptive statistics to present the results of the survey administered to the focus group participants. The two qualitative studies (89, 90) employed qualitative in-depth interviews.

All studies that met inclusion criteria were published after 2003 and were dedicated to one of the two infectious diseases that caused public health crises in the 21st century – SARS and the 2009/H1N1 influenza pandemic. The experience of GPs from seven countries was presented in the reviewed studies. Four of the included studies investigated the experience of GPs during the SARS outbreak in Hong-Kong (83), Canada (83), Singapore (84, 89) and Australia (82). The other six focused on the experience of GPs during the 2009/A/H1N1 influenza pandemic in Australia (90), UK (81), Canada (88), Hungary (86), US (85) and Hong Kong (87).

Evidence of various challenges and barriers referred to primary care management of public health crises caused by an infectious disease was found in the reviewed literature (Table 2-3).
### Table 2-2 Overview of Studies Included in the Systematic Review of the Literature in Chronological Order

<table>
<thead>
<tr>
<th>Study Citation</th>
<th>Type of Data</th>
<th>Study purpose</th>
<th>Method</th>
<th>Population, N</th>
<th>Region and epidemic or pandemic studied</th>
<th>Sample Design and RR</th>
<th>Quality considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verma et al. 2004</td>
<td>QN</td>
<td>To examine the psychological impact of SARS on GPs and traditional Chinese medicine (TMC) practitioners</td>
<td>Three self-reported questionnaire s, cross sectional</td>
<td>GPs n= 721; Traditional Chinese Medicine Practitioners n=329</td>
<td>Singapore, SARS</td>
<td>Sample – all GPs and TMC practitioners registered with the Ministry of Health in Singapore</td>
<td>RR: GPs 29%; TMC practitioners 22%</td>
</tr>
<tr>
<td>Herceg et al. 2005</td>
<td>QN</td>
<td>To identify knowledge, attitudes and practices of GPs around SARS and bio-threat preparedness</td>
<td>Two concurrent mail surveys</td>
<td>GPs n=184; practice principles n=74 (included in the GP sample)</td>
<td>Australia, Australian Capital Territory, SARS</td>
<td>Sample – all GPs and all practice principles in ACT Division of General Practice database</td>
<td>RR: GPs 48%; practice principles</td>
</tr>
<tr>
<td>Authors</td>
<td>Journal</td>
<td>Design</td>
<td>Methods</td>
<td>Setting</td>
<td>Sample Size</td>
<td>Results</td>
<td></td>
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<tr>
<td>Tan et al. 2006</td>
<td>QL</td>
<td>To describe the</td>
<td>In-depth interviews</td>
<td>Singapore</td>
<td>All invited family physicians participated</td>
<td>Results are reported to fit into the Becker Health Belief Model</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>experience and behavior of family physicians and the use of PPE in their encounters with SARS patients</td>
<td>Family physicians who have had exposure to SARS patients n=8</td>
<td>SARS</td>
<td></td>
<td>Method of data analysis not clearly stated</td>
<td></td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>One participant read the draft to validate and verify the themes</td>
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<tr>
<td>Wong WC et al. 2007</td>
<td>QN</td>
<td>To compare the response and management of SARS by family physicians in Hong Kong and Toronto in training for SARS, the use of screening tools, an anxiety scale, clinical practices and demographic data</td>
<td>Mail survey</td>
<td>Hong-Kong and Canada, Toronto SARS</td>
<td>Details about the sample design not provided</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RR: family medicine tutors in Hong-Kong 74.8%; family medicine tutors in Toronto 34%</td>
<td>The development of a new instrument is well described and reported to be content tested.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low RR in Toronto</td>
<td></td>
</tr>
<tr>
<td>Bocquet et al. 2010</td>
<td>QL</td>
<td>To describe early experience (4 weeks from first clinic presentation) of frontline general practices</td>
<td>Semi-structured interviews</td>
<td>Australia, Melbourne 2009/A/H1N1</td>
<td>Purposive sampling</td>
<td>Interview schedule was appraised by GPs before the interviews– number of GPs not reported</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All identified practices with high volumes of presentations</td>
<td>Interviews were content</td>
<td></td>
</tr>
<tr>
<td>Study (Year)</td>
<td>Method</td>
<td>Research Question</td>
<td>Participants</td>
<td>Site</td>
<td>Design</td>
<td>Sample</td>
<td>Limitations</td>
</tr>
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<tr>
<td>Caley et al. 2010</td>
<td>QN</td>
<td>To assess GPs’ opinions on how information was communicated to them during the first wave of the A/H1N1 pandemic and the overall response of the NHS and Health Protection Agency</td>
<td>GPs in West Midlands n=367</td>
<td>UK 2009/A/H1N1</td>
<td>Random sample</td>
<td>RR: 36.6%</td>
<td>Limitations acknowledge low RR; non-response bias discussed; reduced risk of geographical response bias discussed</td>
</tr>
<tr>
<td>El Emam et al. 2011</td>
<td>Mixed-method</td>
<td>To understand the privacy barriers which could potentially influence family physicians’ reporting of patient-level surveillance data to public health agencies during the 2009 pandemic</td>
<td>Family physicians participated in Family Medicine Forum n=37</td>
<td>Canada 2009/A/H1N1</td>
<td>Purposive sampling, stratified by gender, years of practice, location (rural/urban), region of Canada</td>
<td>RR: not stated</td>
<td>Theories about information privacy concerns and individual behaviors used to frame data collection and analysis</td>
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<tr>
<td>Study</td>
<td>Method</td>
<td>Objective</td>
<td>Design/Details</td>
<td>Limitations/Notes</td>
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<tr>
<td>Rurik et al. 2011</td>
<td>QN</td>
<td>To evaluate the knowledge, motivation and attitudes of Hungarian family physicians toward pandemic influenza vaccination in 2009</td>
<td>Questionnaire with 20 questions – 16 multiple choice, 4 open-ended</td>
<td>Family physicians participated in medical education courses and other meetings n=198</td>
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<td></td>
<td>Hungary 2009/A/H1N1</td>
<td>Non representative sample RR: 85%</td>
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<td>Limitations acknowledge small sample size</td>
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<td></td>
<td>Instrument developed based on discussions with GPs and public health experts; pilot testing not reported</td>
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<tr>
<td>O'Leary et al. 2012</td>
<td>QN</td>
<td>To determine 1. practices and experiences with delivery of seasonal and pH1N1 vaccines; 2. anticipated and experienced barriers</td>
<td>Two national surveys – before and after vaccination; by mail or internet</td>
<td>Primary physicians, members of the sentinel physician networks (pediatricians, family and internal medicine) n=776</td>
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<td>US 2009/A/H1N1</td>
<td>Results based on population responded to both surveys RR: 62%</td>
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<td>Pilot testing reported</td>
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<td>Non-response and self-report bias as well as possible different experience of physicians that are not part of the sentinel networks, acknowledged</td>
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<tr>
<td>Wong SYS et al. 2012</td>
<td>Mixed-method</td>
<td>To appraise the public primary care response to pandemic 2009 in Hong-Kong</td>
<td>Physicians from 54 general hospital outpatient clinics in Hong-Kong n=126</td>
<td>Physicians from 2 selected</td>
<td>Hong-Kong 2009/A/H1N1</td>
<td>Details about the sample design not provided</td>
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<td>RR: 42%</td>
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<td>Participants for interviews were from 2 randomly selected clinics</td>
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<td>Limitations acknowledge low RR and social desirability bias</td>
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<td>Model for pandemic preparedness in primary care by Patel et al. (8). was used to develop the instrument and to frame data analysis</td>
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<td>Qualitative data reported to be analyzed by two researchers</td>
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<tr>
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<td>general outpatient clinics n=10</td>
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**Abbreviations:**
- GP – general practitioner
- NHS – National Health Service
- PPE – personal protective equipment
- QL – qualitative study
- QN – quantitative survey
- RR – response rate
- SARS – severe acute respiratory syndrome
<table>
<thead>
<tr>
<th>Themes</th>
<th>Sources</th>
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| **Limitations of provided information and guidelines** | **Australia, SARS (Herceg et al.)** - GPs reported using many sources of information – facsimiles and newsletters from the Division of General Practice, websites, the Australian Government hotline, medical journals and newsletters and mainstream media.  
  
  **UK H1N1 (Caley et al.)** - free-text comments that the same information was sent from primary care trusts (PCTs), the Royal College of GPs and the Health Protection Agency (HPA)  
  
  **Information being unclear, duplicated and conflicting** | **UK, H1N1 (Caley et al.)** - 45% of free-text suggestions related to reducing information duplication and improving the clarity of information; 61% disagree that advice regarding the management of people with symptoms of the 2009/A/H1N1 was clear.  
  
  **Australia H1N1 (Bocquet et al.)** - Five practices reported that information provided was not synchronous with on-the-ground experience.  
  
  **Rapidly changing, not tailored for primary care guidelines and screening tools** | **Hong Kong, SARS (Wong WC et al.)** - 60.9% agreed that SARS screening tool changed too often.  
  
  **Canada, SARS (Wong WC et al.)** - 40% agreed that SARS screening tool changed too often.  
  
  **Australia, H1N1 (Bocquet et al.)** - 6 practices reported difficulties managing rapid escalation of information flow. Five practices reported that information was not oriented toward practical clinical guidelines.  
  
  **Singapore, SARS (Verma et al.)** - Availability of prompt, accurate and transparent information, updates and guidelines was identified as the most frequent response of GPs to the open-ended question about the issues that would help the most.  
  
  **Limitations in supply and use of personal** | **Singapore, SARS (Tan et al.)** – participants reported shortage and high cost of PPE. Some reported prolonged use or recycling of PPE.  
  
  **Singapore, SARS Verma et al.** - provision of PPE was rated the third most frequent response to the
| **protective equipment (PPE)** | question on what would have helped GPs in the response to SARS  
Australia, SARS (Herceg et al.) – many practices reported problems obtaining PPE, including reduced availability, cost and long waiting times.  
Australia, H1N1 (Bocquet et al.) – 7 practices had inadequate stockpile of PPE; 2 practices reported being unable to access masks from any source within their first 2 weeks of the pandemic.  
UK, H1N1 (Caley et al.) – means of obtaining PPE were significantly less clear than arrangements for obtaining antiviral medication. |
|---|---|
| **Compliance with PPE use** | Singapore, SARS (Tan et al.)- family physicians persisted to use PPE despite high cost and inconvenience.  
Hong Kong, H1N1 (Wong SYS et al.) – 99% of participants reported to wear protective masks.  
Australia, SARS (Herceg et al.)- only 50% of practices bought PPE to deal with SARS. |
| **Inconvenience of use** | Singapore SARS (Tan et al.)- participants reported discomfort in N95 mask use and adverse reaction of patients to the PPE. |
| **Difficulties performing public health responsibilities** | Reporting the surveillance data to the health authorities  
Hong Kong, H1N1 (Wong SYS et al.)- 59% of the doctors had not participated in surveillance activities associated with acute respiratory infections. Among those who had, 58% reported suspected cases of influenza A/H1N1 to the government.  
Canada, H1N1 (El Emam et al.)- the family doctors were reluctant to disclose patient data to public health units due to concerns about the extent to which public health agencies are dependable to protect health information (trusting beliefs) and the possibility of loss due to disclosing health information (risk beliefs).  
Australia, H1N1 (Bocquet et al.)- all practices reported that authorization requirements for swabbing and prescription of antiviral agents were time consuming and compromising of clinical care when managing large number of patients. |
| Prioritization | **US, H1N1 (O’Leary et al.)**-64 % of physicians reported having to prioritize patients for pH1N1 vaccine, even among high-risk groups (due to supply deficiencies)  
**Australia H1N1 (Bocquet et al.)**-5 practices reported conflicts of interest between their public health responsibilities and their capacity to provide clinical care, indicating that their patients took priority. |
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<tr>
<td>Support from the authorities</td>
<td><strong>Hungary, H1N1 (Rurik et al.)</strong> –more than half of family physicians were not satisfied with the support from the health authorities during the vaccination campaign.</td>
</tr>
<tr>
<td>Workload relief</td>
<td><strong>UK, H1N1 (Caley et al.)</strong>-74% agreed that organization of NPFS was necessary to allow primary care services to continue with business as usual; 50% did not feel that NFPS can safely assess and provide treatment for people with flu-like symptoms.</td>
</tr>
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</table>
| Insufficient training and education | **Canada, SARS (Wong WC et al.)** -80% of family doctors had no training in infectious disease control, 73.5% lacked confidence in dealing with SARS.  
**Hong Kong, SARS (Wong WC et al.)**-84% of family doctors had no training in infectious disease control, 68.1% lacked confidence in dealing with SARS.  
**Hong Kong, A/H1N1 (Wong SYS)**-56% of doctors had received training on the use of guidelines. 62% continued to want more professional education regarding how to deal with H1N1 influenza. |
<p>| Need for practical scenario workshops | <strong>Australia, SARS (Herceg et al.)</strong> –GPs comments on how general practices could be assisted included workshops and practical scenario style education. |
| Emotional effects of responding to a disease with unknown | <strong>Singapore, SARS (Verma et al.)</strong>- the fear, uncertainty and stigma caused by SARS are associated with psychological distress in GPs. |</p>
<table>
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<tr>
<th>Characteristics and lethality</th>
<th>Hong Kong, SARS (Wong WC et al.) - 50.7% of doctors were classified in the high-anxiety group</th>
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<tr>
<td>Classified in high anxiety group</td>
<td>Canada, SARS (Wong WC et al.) - 51% of doctors were classified in the high-anxiety group</td>
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**Abbreviations:**
- GP – general practitioner
- NPFS – National Pandemic Flu Service
- SARS – Severe Acute Respiratory Syndrome
Limitations of Provided Information and Guidelines

The issue of access to information and guidelines for treatment and infection control was discussed in relation to SARS and the 2009/A/H1N1 in four countries, while in Australia the experience was discussed in relation to both of these crises. The opinion of GPs on this issue was measured in four quantitative studies and was described as a theme in one qualitative study. Similar challenges included multiple sources of information (evidence from two countries during SARS and the 2009/A/H1N1); information being unclear, duplicated and conflicting (evidence from two countries during the 2009/A/H1N1); rapidly changing and not tailored for primary care guidelines and screening tools (evidence from three countries during SARS and the 2009/A/H1N1).

Australian GPs in the study by Herceg et al. (82) reported being well informed about SARS but their suggestions that were derived from open-ended questions included the need for timely information and detailed guidelines appropriate for primary care. GPs from this study reported deriving information from multiple sources. Multiple sources of information and information being unclear, duplicated and conflicting was also reported in the study about GPs’ opinion of the information and advice provided by the health authorities in the UK (81). Guidelines and screening tools which were rapidly changing and not tailored for primary care were reported in Hong Kong during the SARS outbreak (83) and in Melbourne during the 2009/A/H1N1 flu pandemic (90). Availability of prompt, accurate and transparent information, updates and guidelines was identified as the most frequent response of GPs to the open-ended question about issues that would help the most in the study by Verma et al. (84) about the SARS outbreak in Singapore.
Limitations in Supply and Use of Personal Protective Equipment (PPE)

Problems with the supply of PPE were reported in four studies (81, 84, 89, 90). In Singapore (89) and Australia (90) this issue was discussed in the context of shortage and the high cost of the PPE during SARS and the 2009/A/H1N1 respectively. In the qualitative study by Bocquet et al. (90), inappropriate PPE supply was described as one of the factors that negatively influenced the decision of Melbournian primary clinics to maintain influenza patients’ care. The qualitative study about the SARS outbreak in Singapore (89) described difficulties in procuring PPE due to severe shortages and high costs. In another study, provision of protective gear was identified as the third most frequent response given by Singaporean GPs to the question about the factors that would help in the primary care response during SARS (84).

This same issue of PPE supply was addressed in the UK study in the context of the method of obtaining PPE during 2009/A/H1N1 (81), and GPs reported the means of obtaining the protective gear was not sufficiently clear.

The compliance with the advice to use PPE was measured in two survey studies (82, 87) and discussed in one qualitative study (89). Differing inclinations to comply with the advice to use PPE were found. In Singapore during SARS (89) and in Hong Kong during the 2009/A/H1N1 (87) GPs were reported to have high compliance with the guidelines to wear PPE. On the contrary, in Australia, only half the primary care clinics were reported as complying with the guidelines to buy PPE during the SARS outbreak (82). GPs from this study suggested that PPE should be provided to primary clinics by the authorities.

Inconvenience of PPE use was discussed only in the qualitative study about the SARS outbreak in Singapore (89). This study reported that despite the discomfort, shortage and cost, GPs persisted using PPE as they believed that its effectiveness outweighed these barriers.
Difficulties Performing Public Health Responsibilities

Performance of the public health responsibilities by GPs was discussed in the reviewed studies only in the context of the 2009/A/H1N1 pandemic. Two aspects of this issue were addressed: reporting of the surveillance data to the health authorities and prioritization of the patients.

Reporting of the surveillance data to the health authorities was examined in three studies (87, 88, 90). The study about the 2009/A/H1N1 response in Hong Kong (87) detailed that 59% of GPs were not part of the surveillance activities and among those who were, only 58% reported suspected cases of A/H1N1 to the Government. A qualitative study about the privacy barriers that influenced GPs’ reporting of surveillance data during the 2009/A/H1N1 influenza pandemic in Canada found that GPs were reluctant to disclose patients’ data to public health units due to concerns that private health information may be disclosed to other agencies (88). In the qualitative study concerning GPs experience in Melbourne (90), compulsory surveillance reporting before provision of antiviral drugs and viral swab tests was found to be time consuming and compromised clinical care.

The aspect of prioritization of patients was covered in two studies (85, 90). In US the issue of prioritization was discussed in relation to vaccine shortage during the vaccination campaign. O’Leary et al. (85) reported that GPs faced difficulties prioritizing patients during the 2009/A/H1N1 vaccination in the face of a new influenza strain and inadequate supplies of the vaccine and that the way GPs prioritized high-risk patients needed further exploration. Prioritization in a situation where the capacity to provide clinical care was stretched was identified in the qualitative study concerning GPs’ experience during 2009/A/H1N1 in Melbourne (90). This study found that five out of ten GPs interviewed preferred to provide
care to their own patients rather than consulting other influenza patients who presented
during the outbreak without prior history of attendance in that clinic.

Support From the Authorities

We were looking for the evidence of organizational or financial support provided by the
authorities to GPs to help them to cope with the difficulties of pandemic or epidemic
response.

The support of the authorities during the epidemic/pandemic management was discussed in
two countries. In Hungary, low satisfaction with the support from the health authorities
during the 2009/A/H1N1 vaccination campaign was reported (86). Another study mentioned
an opinion of GPs regarding the special arrangement to provide workload relief to GPs in the
UK during the 2009/A/H1N1 flu (81). The National Pandemic Flu Service (NPFS) was
organized in the UK to ease the pressure on primary care and all symptomatic patients were
directed to seek advice and treatment through it. The UK GPs generally supported this
arrangement but they raised reservations about its diagnostic ability and prescribing safety, as
NPFS provided the advice over the phone or internet.

Insufficient Training and Education

The issue of insufficient training in the field of infectious disease control was raised both in
the context of SARS and the 2009/A/H1N1. Wong WC et al. (83) reported that most GPs in
Hong Kong (68.1%) and Canada (73.5%) were not confident in dealing with SARS patients
and had no training in infectious disease control (80-84.6% respectively). Similarly, 62% of
the GPs in Hong Kong surveyed about their experience during the 2009/A/H1N1 expressed
the desire for more training and education on dealing with the influenza pandemic (87). GPs
who participated in the study concerning the SARS response in Australia suggested that training and education in the field of infectious disease control would be beneficial for them in preparation for responding to future outbreaks (82).

*Emotional effects of responding to a disease with unknown characteristics and lethality*

Two studies (83, 84) assessed the emotional effect of participating in the response during the SARS outbreak and presented the experience of GPs in three countries. In all three countries high levels of psychological distress and anxiety were presented.

Verma et al. (84) found that direct contact with SARS patients was associated with psychological distress, stigmatization and post-traumatic stress symptoms in GPs in Singapore. Similarly, Wong WC et al. (83) reported that approximately 50 percent of each group of GPs surveyed in Canada and Hong Kong right after SARS outbreak, was classified in the high anxiety group.

2.5.3 Discussion of the Systematic Review Findings

This systematic review was conducted to identify and upraise the literature about GPs’ experience during an epidemic or pandemic response. Despite the fact the search criteria did not have time limitations, only 10 studies met the inclusion criteria; all of them were published since 2003 and investigated either SARS or the 2009/A/H1N1 outbreaks. No empirical studies that involved primary data collection with GPs about their experience during influenza pandemics of the 20th century, “Spanish Flu” of 1918-1920, “Asian Flu” of 1957-1958 or “Hong-Kong Flu” of 1968-1969, were found. Moreover, the pandemic flu 2009/A/H1N1 was a recent public health event that, as indicated in Section 2.3, spread widely across the world, causing substantial morbidity and mortality. GPs were the main
responders to this disease (6, 7). Despite this, the analysis of this event generated only six studies that explored the experience of GPs during the pandemic response.

This scant scientific coverage of GPs’ experience in the pandemic response is surprising especially taking into consideration the fact that in most countries GPs play an important role in such public health crises and learning from their experience is crucial for improving future pre-pandemic planning. One reason for this may be the fact that the interest in planning for a pandemic response is a relatively new phenomenon. The global health community and national governments started to be concerned with the spread of a new virulent influenza virus in 1997 (92), when the death of a three year old child in Hong Kong was proved to be caused by a highly pathogen avian influenza (A/H5N1) (19). Sporadic outbreaks of the A/H5N1 virus in the South-East Asia and Middle East recorded in the subsequent years have prompted the development of the pandemic preparedness field. The unexpected outbreak of SARS in 2003 unveiled the vulnerability of front-line medical professionals (67). This generated some interest in research into GPs’ role in the response. This trend was further developed with analysis of GPs’ participation in the 2009/A/H1N1 management. Thus, the preparedness of GPs to respond during pandemics is an emerging field of research that has only recently begun to receive attention.

Another possible reason for the limited number of studies that involve primary data collection from GPs about their experience during epidemics or pandemics could be the difficulties in the recruitment of GPs to participate in such research or research in general. This is evident from the low response rates in most quantitative studies included in this review. This phenomenon has been addressed in the literature and the barriers against the participation of GPs in surveys have been studied (93-95).
Despite the small number of studies included in this review, the prominent role of GPs in the responses to SARS and the 2009/A/H1N1 has been evident. Participation in the response to SARS was found to have an emotional impact on GPs, causing distress and anxiety. While such an emotional effect was not reported in regard to the 2009/A/H1N1, this may be because this issue was not investigated or because analysis of the emotional effect of participating in the pandemic response was not the objective of this review and a literature search was not attuned to this issue.

The review identified important challenges and barriers experienced by GPs in pandemic management. All of the identified challenges were reported in more than one country and thus broadly generalizable. This means that, despite the differences in organization of primary care across countries and differences in spread of the disease, investigating the experience of GPs in different countries constitute transferable learning that can be used to improve preparedness plans. However, it also highlights the fact that some of the challenges were evident during SARS and were also evident during the 2009/A/H1N1 despite the accelerated planning for pandemic response that was undertaken in the years between these two events. This is probably because the data on the GPs’ role and involvement during SARS was limited, as the SARS epidemic itself, and the intensive efforts in the preparedness towards pandemics did not put sufficient emphasis on the GPs.

Communication with the public health authorities was, then, a difficult issue in both cases. The evidence from the reviewed literature indicates that multiple sources of information and frequent updates which were not oriented towards primary care present operational challenges for GPs. The study by Herceg (82) that investigated the preferred ways of GPs to receive updates during SARS found that, amidst multiple sources of information, Australian GPs preferred updates from the Division of General Practice, the mid-level organization with which most GPs in Australia were voluntarily affiliated. This finding, however, was not taken
on board and during the 2009/A/H1N1 pandemic management GPs were confronted with duplicated information. Evidence about duplicated information and guidelines which were not tailored for primary care is also presented in an opinion paper about the experience of general practices in Melbourne during the 2009/A/H1N1 (6).

Access to PPE was another issue that presented a problem in different countries during SARS as well as during the 2009/A/H1N1. While the findings suggest that GPs are willing to use PPE in spite of the inconvenience associated with the use, operational problems of supply, shortage and cost of PPE during the outbreak presented a challenge for GPs. In one of the reviewed studies, GPs compromised their safety by reusing masks (89). Another reviewed study reported that inadequate supply of PPE affected the decision of practices about consulting with suspected patients (90). Problems with the PPE supply were also highlighted in an opinion paper (6).

During the SARS outbreak, GPs felt a lack of confidence dealing with a new, virulent and potentially life-threatening disease (83). The study about the response to SARS in Australia indicated that GPs wanted more workshops and practical scenario-style education (82). Still, during the management of the 2009/A/H1N1, GPs indicated that they needed more professional education on how to deal with the 2009/A/H1N1 patients (87). This is surprising because GPs consult seasonal flu patients routinely and are, thus, very familiar with the disease. Perhaps, the complexity of infection control during the 2009/A/H1N1 influenza presented a particular challenge in managing patients because it was a novel virus.

Problems associated with the performance of public health responsibilities were noted only in studies about the 2009/A/H1N1. Different aspects of these responsibilities were highlighted as follows. In the respect of the surveillance reporting to the health authorities, in Hong Kong the low reporting rates were highlighted (87); in Canada, privacy concerns (88); and in
Australia, the reporting being time consuming (90). The issue of prioritization was investigated in the context of limited supply of the vaccine in US (85) and surges of unwell patients in Australia (90). It is unclear, whether the mixed evidence can be explained by the different organization of the public health versus the primary care in different countries; or whether the small amount of research dedicated to this important issue can construct only a patchy picture.

Evidence relevant to the support of GPs by the health authorities was also reported only in the context of the 2009/A/H1N1. While the analysis of the GPs’ preparedness before the 2009/A/H1N1 pandemic indicated that GPs rely on the support from the health authorities (68, 70, 71), this issue has been patchily presented in the reviewed literature. Only one study reported the special arrangement, NPFS, to provide the workload relief in primary care during the flu patient surges in the UK. This arrangement was supported by GPs, despite the expressed concerns about its safety (81). In the study by Bocquet et al. about the experience of GPs in Melbourne during the 2009/A/H1N1 pandemic, flu clinics were mentioned as places where some general practices decided to divert flu patients because of the inability to apply infection control in the general practice or the lack of PPE. Flu clinics, however, were organized to help Emergency Departments cope with the surges of flu patients after daytime working hours for GPs. During regular daytime hours, GPs remained the first point of contact for the flu patients (96).

2.5.4 Limitations of the Systematic Review

Despite the fact that the comprehensive and systematic search of the published literature has been conducted, there is a possibility that it did not capture some articles. The review was limited to the English language publications and thus would have missed works published in other languages. The search yielded only 10 papers that fulfilled the inclusion criteria. While
the reasons for such a limited number of articles were discussed above, analysis of challenges encountered by GPs during past epidemics or pandemics cannot be exhausted by the current review. Thus, more research needs to be done to understand these challenges. Nevertheless, the difficulties identified present important research-grounded evidence that can serve as a platform for re-evaluating and improving the response of GPs to a range of existing and emerging infectious diseases.

2.5.5 Conclusion of the Systematic Review

Limited amount of relevant research regarding the challenges that GPs experienced responding to past epidemics or pandemics pointed to the gap in the existing knowledge in this field. The mixed nature of the evidence as well as the limited amount of the studies that were dedicated to this issue has not allowed a full-scale list of possible challenges of pandemic response in primary care.

Further research is needed to investigate what types of support can health authorities provide to GPs during pandemics or epidemics. Learning from the experience of different countries in making such support available for GPs may provide an important platform for improvement. The performance of the public health role by GPs also needs further exploration. This new theme started to receive attention only after the 2009/A/H1N1 and its numerous aspects could not be systematically presented in this review. Another question to ask is what are specific problems of infection control in primary care and could these problems be solved by professional training? Concerning communication with the health authorities and PPE provision, it is important to analyze why these issues were still presenting a challenge for GPs during the 2009/A/H1N1 management after lessons learnt from the response to SARS and extensive pre-pandemic planning.
The important finding of the systematic review of the literature was that GPs from different countries experienced similar difficulties responding to past pandemics or large-scale epidemics. This finding indicated that analysis of experience from different countries present a case of transferable learning that could be used for future response planning. Thus, a study that would systematically collect and analyze data about the challenges of the pandemic response in primary care in different countries during the last influenza pandemic (the 2009/A/H1N1) will present an important contribution to the field.
CHAPTER THREE

THESIS RESEARCH AIMS AND RATIONALE

This chapter outlines the purpose, rationale and aims of the thesis. It consists of four sections. Section 3.1 explains the rationale of the research based on the gaps and problems identified in the literature review. The purpose and objectives of the research are spelled out in Section 3.2. Section 3.3 provides an overview of primary care systems in the three selected for the detailed research countries: Australia, Israel and England. Finally, Section 3.4 describes of the 2009/A/H1N1 pandemic epidemiology in these three countries.

3.1 Thesis Research Rationale

The review of literature presented in Chapter 2 has shown that:

- There is a recorded increase in the appearance of emerging and re-emerging infectious diseases in the last three decades and amongst threats to public health, influenza pandemics are regarded as the most significant.

- In relation to the threat of avian influenza, extensive preparedness activities were undertaken in the public health fields of different countries; however, these activities were found to be underdeveloped on the sub-national level and particularly for primary care response.

- The systematic search for evidence concerning challenges that GPs encountered responding to past pandemics or large-scale epidemics showed that analysis of the experience from different countries present a case of transferable learning that could be used to improve future pandemic response planning. However, it was impossible to form a full-scale list of possible challenges of pandemic response in primary care and
to differentiate between difficulties of a situational nature (those relating to the disease spread and the roles allocated to GPs by health authorities), and difficulties that are intrinsic to the pandemic response in primary care in general.

- During the influenza pandemic 2009/A/H1N1, GPs were intensively involved in the pandemic response, their role, however, was not fully investigated. This provided an excellent opportunity to investigate the challenges that GPs encountered managing this response and the implications of different pandemic policies on their role.

The ultimate purpose of the current thesis was to explore the challenges of managing influenza pandemics in primary care in order to improve the pandemic planning in the future. Specifically, this thesis looks into the experience of GPs who participated in the 2009/A/H1N1 influenza pandemic response in the three countries: Australia, Israel and England. The rationale for selection of these three countries was based on the following:

First, all three countries have a high standard of the public health, universal coverage for health services, and high health care accessibility (97-99).

Second, all three countries were in a state of high pandemic preparedness, had developed and published comprehensive pandemic response plans, stockpiled personal protective equipment (PPE) and anti-viral drugs (100-102).

Third, despite stated similarities, linkages between GPs, other ambulatory health services, hospitals and Health Departments in these three countries vary depending on decentralisation of the health system, its financing, and relationship with regulatory and legal system (97-99). This difference in the level of decentralization of the primary care services is expected to ensure greater generalizability of the research findings.
Fourth, the decision to select these three countries for the detailed study was guided by the existence of research links between the research team members who are resident in these countries. Namely, research links between the School of Primary Health Care at the Monash University and between Hadassah Medical Hospital in Jerusalem and King’s College London in London. Existence of these research links enabled to create on-the-ground support for qualitative data collection in the three countries.

3.2 Thesis Research Aims

The purpose of the research reported in this thesis, as stated earlier, was to explore the challenges of managing the 2009/A/H1N1 influenza pandemic in primary care in Australia, Israel and England. The objectives of the thesis research program have been:

- To perform a systematic review of the literature examining evidence of challenges that primary care physicians encountered responding to past pandemics or epidemics that caused public health crises

- To compare the approaches for management of the 2009/A/H1N1 influenza pandemic in primary care in Australia, Israel and England using document analysis

- To explore the views of GPs on challenges they encountered managing the influenza pandemic 2009/A/H1N1 in primary care in Australia, Israel and England using qualitative interviews

The first objective was addressed in the systematic review of the literature (Study 1) that was presented in Chapter Two. To meet the second and the third objectives of the thesis, document study (Study 2) and qualitative interviews with GPs in Australia, Israel and England (Study 3) were conducted. The method applied in these two studies will be presented
in Chapter Four (Method). The findings of these two studies will be reported in Chapter Five (Results).

This thesis aimed to contribute to better pandemic preparedness in primary care through the improvement in pre-pandemic planning. Investigating the experience of GPs during the 2009/A/H1N1 outbreak in three different health systems is expected to contribute to greater understanding of the challenges that the pandemic response present for GPs and will permit to address these during the planning stage.

Detailed description of primary health services organization in Australia, Israel and England will be presented in Section 3.3.

3.3 An Overview of Primary Care in Australia, Israel and England

The aim of this thesis was to explore the challenges of managing the 2009/A/H1N1 influenza pandemic in primary care in the selected examples of Australia, Israel and England.

Some common and distinct features in the health systems in these three countries made the comparison possible and useful. The health systems in all three countries provide universal medical care, have strong public health infrastructures and are mainly financed from public sources (97-99). Nevertheless, primary care in these three systems is delivered differently.

All Australians are covered by a national health insurance scheme – Medicare (98). The predominant form of medical practice is general practice (GP). GPs are commonly the first point of medical contact providing a vast spectrum of general health care, from family planning to minor surgical procedures. They serve as gate-keepers and referral sources for the rest of the health system. They are mostly self-employed and their reimbursement is based on fee-for service paid largely from the public purse (Medicare) often with a co-payment from patients (98). Most of the practices in Australia (44%) consist of 2-5 physicians, whereas the
proportion of solo practices is about 38%. Of the rest, 18% are large practices with more than 6 GPs (103). At the time of the thesis, most GPs were affiliated with 112 local Divisions of General Practice that provided support for GPs at a local level and helped to implement government programs, such as immunization, prevention, screening (for example, screening for breast, cervical or bowel cancer), and care planning for chronic diseases in primary care. The 112 Divisions were funded by the Australian Commonwealth Government and typically consisted of between 100-300 general practitioners (103). The responsibility for pandemic preparedness planning in primary care rested with GP clinics and was supported by the directives from the jurisdictions (State and Territories Governments) (100). For example, in the State of Victoria, a checklist for pandemic response planning in primary care according to the pandemic phases was detailed in the “Preparing for an influenza pandemic: An information kit and workplan for general practice” (104).

In Israel, the population is covered for medical services via the National Health Insurance (NHI) system (99). Primary care is based on regulated competition among four Health Maintenance Organizations (HMOs) – non-profit organizations that provide health services to its members. HMOs employ primary care providers either as salaried employees or as independent physicians. Public funds are not directly transferred to individual physicians but rather distributed among the HMOs according to a capitation formula that primarily reflects the number of members in each HMO and their age mix. Approximately half of primary care physicians in Israel are non-specialist graduates of medical schools, while the other half are board-certified specialists such as specialists in family medicine, paediatrics and internal medicine. Most of the children in Israel receive medical treatment from paediatricians rather than family physicians. Primary care physicians are vested with the HMOs and perform a gate-keeping role only for hospital-based specialists, whereas patients usually have free access to community based specialists (99). The responsibility for pandemic preparedness
planning in primary care was entitled to HMOs that were required to prepare plans in compliance with the “Influenza Pandemic Preparedness Plan for the Health Sector” developed by the Israeli Ministry of Health (101).

Most of the medical care in England is provided through the publicly funded National Health Service (NHS) (97). At the time of this thesis, responsibility for the coordination and delivery of primary care services at the local level rested with Primary Care Trusts (PCTs), each covering a geographically defined population. Most ambulatory care in England is provided by general practitioners (GPs) in group practices who are remunerated primarily through capitation payments with the addition of payments for achieving specified quality targets. They are the first point of contact for general medical needs, usually self-employed, and contracted with PCTs to provide a range of clinical services including preventive care. GPs also play a gate-keeping role since to access NHS specialist care patients require a referral for a consultation from a GP (97). The responsibility for pandemic preparedness planning in primary care was entrusted to the PCTs that were required to develop plans in coherence with the “Pandemic Influenza: Guidance for primary care trusts and primary care professionals on the provision of healthcare in a community setting in England” (105). This document provided guidance for planning outlining a model of care within which local plans had to be developed.

Table 3-1 summarises the key features of the primary care delivery in Australia, Israel and England.
| Key Features of the Health Systems and Primary Care Delivery in Australia, Israel and England |
|---------------------------------|-----------------|-----------------|
| **Medical care coverage**       | Australia       | Israel          | UK                                          |
|                                 | All residents are covered by the national health insurance - Medicare | All residents are covered via the NHI system | All residents are covered by the National Health Service (NHS) |
| **Primary care delivery**       | General practitioners (GPs) are the first point of medical contact. GPs are referral agents for the rest of the health system. | PCPs (general or specialists) are the first point of medical contact. PCPs are referral agents only for hospital based specialists while patients usually have free access to community based specialists. | 1. GPs are the first point of medical contact. 2. GPs are referral agents to access NHS specialist care. |
| **Mid-level organizations**     | At the time of the thesis, most GPs were voluntarily affiliated with Divisions of General Practice, funded by the Australian Commonwealth Government, which provide support for GPs at a local level and help to implement government programs, such as immunization, prevention and etc., in primary care. | PCPs are employed, either as salaried employees or independent physicians, by HMOs – non-profit organizations that provide health services to its members. Membership in HMOs is based on regulated competition and not geographically defined. | At the time of this thesis GPs, usually self-employed, were contracted with Primary Care Trusts (PCTs) on the basis of general or personal medical services contract. PCTs each covered a geographically defined population were responsible for the coordination and delivery of primary care services at the local level. |
| **Employment and remuneration of PCPs** | Mostly self-employed. Remuneration is based on fee-for-service paid largely from the public purse (Medicare) often with a co-payment from patients. | Public funds are not directly transferred to individual physicians but rather distributed among the HMOs according to a capitation formula that primarily reflects the number of members in each HMO and their age mix. | Remuneration is a mix of fixed allowances, capitation fees and fees for a number of specific services. |
Abbreviations:
GP – General Practitioner
HMO – Health Maintenance Organisation
NHI – National Health Insurance
NHS – National Health Service
PCP – Primary Care Physician
PCT – Primary Care Trust
3.4 An Overview of the 2009/A/H1N1 Pandemic in Australia, Israel and England

The epidemiology of the 2009/A/H1N1 pandemic in each of the three countries differed in a number of aspects. In Israel and in England, the disease occurred outside the flu season and was more prolonged compared to a regular flu season (106). In contrast to the Australian experience, in Israel and in England the pandemic flu spread was slowed by school closure over the summer break and then, in Israel, by the autumn festivals’ break (106, 107).

In Australia, the pandemic flu appeared against the background of an autumn Influenza-Like Illnesses (ILI). The first case of the 2009/A/H1N1 was confirmed on the 7th of May 2009. The disease spread fast in the community peaking in the winter months of mid-July and early August. After that, the ILI rate gradually decreased, reaching the normal spring-season rate by mid-October (108). The vaccination program started on the 30th of September 2009 when all the population older than 10 years was offered a free vaccine. The vaccination of children in the age-group from six months till ten years old started on the 4th of December 2009. The vaccine uptake in the population was about 18% (109). Until August 2010, when the pandemic was officially declared over (110), there were 196 deaths associated with the 2009/A/H1N1 in the 21 million population of Australia (108).

In Israel, the first case of the pandemic flu was detected on the 24th of April 2009. The disease spread occurred in three escalating waves: at the beginning of August 2009, mid-September and the third and the largest wave at mid-November. Total duration of the 2009/A/H1N1 influenza season in Israel was 36 weeks compared to an average of 12-18 weeks in the previous four influenza seasons (2005/6-2008/9) that occurred only during the winter months (December-March) (106). The vaccination started on the 29th of October 2009. Population at clinical risk in the age group 3-65 years, excluding pregnant women, health care workers, and relatives and carers of at-risk 0-6 months babies, were offered the vaccine
first. In mid-December 2009, all people older than six months were invited for vaccination (111, 112). The uptake rate of the vaccine in the total population was 9% (113). Until August 2010, there were 96 deaths associated with the 2009/A/H1N1 influenza amongst a 7.5 mill. population of Israel (114).

In England, the first confirmed case of the 2009/A/H1N1 influenza was reported on the 27\textsuperscript{th} of April 2009. The first wave of the disease appeared in mid-July and the second, mildly sloping curve, was recorded in September-December 2009 (115). The vaccine became available from the 21\textsuperscript{st} of October 2009. Only the population at risk was offered the vaccine. These population consisted of hospitalized patients with underlying conditions; health care workers; at-risk population from 6 months till 65 years old; pregnant women; relatives and carers of immunocompromised individuals (116). From the 19\textsuperscript{th} of November 2009, the vaccination program was extended to include healthy children in the age group 6 months - 5 years. The vaccine uptake in the population at clinical risk older than 65 years was 40\%, and in the population younger than 65 years – 35\% (116). Until the end of the pandemic, there were 359 deaths associated with the 2009/A/H1N1 influenza in the 51.5 mill. population of England (115).

Table 3-2 summarises the vaccination policies in Australia, Israel and England
**Table 3-2 The 2009/A/H1N1 Vaccination Policies in Australia, Israel and England**

<table>
<thead>
<tr>
<th>Vaccination stages</th>
<th>Australia (109)</th>
<th>Israel (111, 112)</th>
<th>England (116)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>30.09.09</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All population ≥10 years</td>
<td></td>
<td>Clinical at-risk groups 3-65 years excl. pregnant women;</td>
<td>Clinical at-risk groups &gt; 6 months;</td>
</tr>
<tr>
<td><strong>04.12.09</strong></td>
<td></td>
<td>health care workers;</td>
<td>health care workers; pregnant women;</td>
</tr>
<tr>
<td>Children 6 months - 10 years added</td>
<td></td>
<td>relatives and carers of at-risk 0-6 months</td>
<td>relatives and carers of immunocompromised individuals</td>
</tr>
<tr>
<td><strong>13.12.09</strong></td>
<td></td>
<td>All population ≥6 months</td>
<td><strong>19.11.2009</strong> healthy children 6 months - 5 years</td>
</tr>
<tr>
<td>Cost for the vaccine</td>
<td>free</td>
<td>free</td>
<td>free</td>
</tr>
<tr>
<td>Vaccine suppliers</td>
<td><strong>Panvax</strong> – CSL (without adjuvant)</td>
<td><strong>Pandemrix</strong> – GSK (with adjuvant)</td>
<td><strong>Pandemrix</strong> – GSK (with adjuvant)</td>
</tr>
<tr>
<td></td>
<td><strong>Focetria</strong> – Novartis (with adjuvant)</td>
<td></td>
<td><strong>Celvapan</strong> – Baxter (without adjuvant)</td>
</tr>
<tr>
<td></td>
<td><strong>Panenza</strong> – Sanofi-Pasteur (without adjuvant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccine uptake</td>
<td>18 % of the total population</td>
<td>9% of total population (113)</td>
<td>40% of clinical risk &gt; 65 years</td>
</tr>
<tr>
<td></td>
<td>35% of clinical risk &lt; 65 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER FOUR

METHOD

This chapter discusses the research design and methods of data collection and analysis. The rationale for using the procedures and techniques is also elaborated.

Section 4.1 describes the nature of the research and its design. Section 4.2 is dedicated to the method used for the systematic review of the literature and it elaborates on the literature search strategy, criteria for study selection and process of data extraction. Section 4.3 details the method used for the document study. It provides a rationale for the document analysis in the context of this research, describes the document inclusion criteria and the process of the document analysis. Section 4.4 is dedicated to the method used to collect and to analyse data from the qualitative in-depth interviews with GPs. It presents the rationale for using a qualitative research approach, and describes in detail research participants, research tools and the process of data analysis. Further, this section includes the self-reflexivity of the candidate, providing details about the candidate’s personal and professional experience, and considerations and concerns encountered during the research. The final part of this section states how the research rigour was ensured.

4.1 Research Design

The purpose of the thesis research was to explore the challenges of managing the 2009/A/H1N1 influenza pandemic in primary care.

The research design consisted of three complementary studies: a systematic review of the literature, a document study, and qualitative semi-structured interviews with GPs. Figure 4.1 summarises the thesis design, objectives and methods used.
4.2 Systematic Review of the Literature

A systematic approach was applied to the literature search, study selection and data extraction was informed by the PRISMA guidelines (78). The search strategy, inclusion and exclusion
criteria for study selection and the process of data extraction were detailed in Section 2.5 of Chapter Two.

4.3 Document Study

4.3.1 Overview

The objective of the document study was to compare the approaches for management of the 2009/A/H1N1 influenza pandemic in primary care in Australia, Israel and England. The rationale for this was that it was necessary to put the experience of GPs in the context of national pandemic policies and recommendations for practice. Secondary data collection from the documents was employed. All the documents were available in the public domain; thus Ethics Approval was not sought.

Due to the differences in pandemic spread and, consequently, in timing of policies between the states in Australia, the State of Victoria was chosen to demonstrate pandemic response in Australia. Australia is a Commonwealth of states and territories with separate and slightly different health service delivery. However, the key arrangements for primary care service delivery are universal throughout Australia. This analysis is based upon the Victorian system as representative of Australian jurisdictions, while noting there are some differences in the pandemic management across the states. England was chosen to demonstrate the response in the UK. In Israel, the pandemic response was managed by a single policy making body. This decision was supported by the role taken on by these areas in leading the pandemic response following rapid spread of the disease.

4.3.2 Document Inclusion Criteria
Pertinence to the 2009/A/H1N1 Pandemic in the Three Target Countries

Only documents published in the three target countries in relation to the A/H1N1 policies were included in this study.

High-level Government Authorities

All documents released during the mentioned timeframes by the national or, in the case of Victoria, the regional bodies with over-arching responsibility for directing and managing primary care were analysed. These documents were available though the official internet sites of the mentioned authorities and are presented in Table 4-1.

Establishing Commencement and Cut off Dates

The commencement date for document inclusion was April 24, 2009, when WHO announced detection of novel human influenza in Mexico. The termination dates for inclusion were when official surveillance sources in the studied countries reported that ILI had reached regular seasonal level:

Australia - week 43, 2009 (108)

Israel - week 7, 2010 (114)

England - week 4, 2010 (115)
<table>
<thead>
<tr>
<th>Australia</th>
<th>Israel</th>
<th>England</th>
</tr>
</thead>
</table>
| **Letters from the Chief Medical Officer of the Australian Department of Health and Ageing:**
  4.05.09; 24.05.09; 17.06.09 (CMO Update); 17.06.09 (CMO discussion); 21.09.09. | **Circulars of the Chief Officer of the Ministry of Health:**
  24.04.09; 27.04.09; 28.04.09; 29.04.09; 3.05.09; 4.05.09; 11.05.09; 12.06.09; 18.06.09; 1.07.09; 21.07.09; 17.08.09; 1.09.09; 29.10.09; 16.11.09; | **Letters from the Chief Medical Officer of the Department of Health:**
  30.04.09; 1.05.09; 6.05.09; 2.07.09; 23.07.09; 13.08.09; 16.09.09; 24.09.09; 15.10.09; 20.11.09 (Ref. 13032); 20.11.09 (Ref. 13043); |
| **Alerts of the Chief Health Officer of the Department of Human Services of Victoria:**
  26.04.09; 30.04.09; 7.05.09; 23.05.09; 25.05.09; 26.05.09; 5.06.09; 10.06.09; 11.06.09; 12.06.09; 19.06.09; 23.06.09; 25.06.09. | | **Letters of the Chief Executive of the NHS in England:**
  02.07.09; 16.07.09; 23.07.09; 13.08.09. |
| **Victoria Government Gazette:**
  25.05.09; 5.06.09. | | **Letters of the National Director of NHS Flu Resilience, Department of Health:**
  16.07.09; 13.08.09; 20.08.09. |
4.3.3 Document Analysis

The analysis presented an iterative process which combined elements of content analysis and thematic analysis and involved skimming (superficial examination), reading (thorough examination), and interpretation of the documents (117).

The content analysis approach used in this study (Study 2) was distinct from the quantitative content analysis approach frequently used in the social communication field. While the later approach aims to provide a crude picture of the reviewed material by identification of the term frequency (118), this study employed a qualitative approach identifying meaningful and relevant passages of text related to the research question (117).

Information pertinent for the research question was separated from non-pertinent (119) and retrieved for further thematic analysis. The selection of the information from the documents was limited to guidelines that targeted or influenced the work of GPs. The documents were analysed in chronological order according to the publication date.

Subsequent thematic analysis involved more focused reviewing of the retrieved data, which involved coding and category construction (118). The data were coded manually applying pre-defined categories (120): case definition; testing for H1N1; antiviral treatment; quarantine measures; GP involvement; additional arrangements to treat flu patients; vaccination. The data were compared across the three countries.

4.4 Qualitative In-depth Interviews

4.4.1 Rationale for Using a Qualitative Research Approach
This involved exploratory research of a relatively novel field (preparedness for emerging infectious disease response); therefore, the focus of the analytical approach was to describe the facts and the meaning that the participants attribute to these facts. This led to the decision to use a qualitative descriptive research approach in investigation of challenges that GPs from Australia, Israel and England faced responding to the 2009/A/H1N1 influenza pandemic. According to Sandelowski, this approach aims to provide a “comprehensive summary of events in the everyday terms of those events” (121).

Given the objective of this study (Study 3) was to explore the experience of GPs as they implemented pandemic policies, it was important to understand the situation from the perspective of GPs and to interpret the significance of their experience as it is reported in their own language (11). Therefore, in-depth semi-structured interviews were chosen as the data collection method. This enabled systematic data collection, important for cross country comparison (10). This also allowed issues that acknowledged the differences in the health systems and in the pandemic management policies in the three countries, to emerge (10).

4.4.2 Ethics Approval and Considerations

Ethics Approval was obtained for Study 3 as it included face-to-face interviews. In Australia, the Ethics Approval was obtained from the Monash University Ethics Committee, in Israel from Hadassah Hospital Ethics Committee and in England from the South West London Research Ethics Service and from NHS Lambeth and Southwark.

De-identification of the Data

To ensure anonymity but at the same time to identify the record, a consistent numbering system was applied. All audio-taped data were identified by a number linked to a sheet with
identifying features stored at a secure location. The candidate was the only person to be able to match the audio-tape with the names of those interviewed. Storage of the tape-recording and the transcriptions adhere to the University regulations and will be kept on University premises in a locked cupboard/filing cabinet for 5 years. In the thesis report individual participants were not identified rather than by a code number.

4.4.3 Pilot Study

Following the Ethics approvals and clearances, the pilot study was conducted.

Aims of the Pilot Study:

- To verify whether themes to be offered to the interviewees for the discussion were meaningful and appropriate in relation to the thesis topic. These themes emerged from the results of the systematic review of the literature and the analysis of the documents that were published by the health authorities in the studied countries during the pandemic period.
- To gauge the timing and flow of discussion to be generated during the interviews.
- To check the wording of questions, consider how participants responded to the way questions were phrased, and identify issues with clarity of the questions.
- To familiarise the candidate with the interview process and to enhance her experience in interviewing.

Recruitment and Interview Procedures

Five pilot interviewees were recruited from the GPs working at the School of Primary Health Care at Monash University and clinical general practice.
The pilot participants were first presented an overview of the research followed by the Explanatory Statement (Appendix 2). Any queries were clarified prior to obtaining written consent (Appendix 3). All sections were audio recorded with permission.

Demographic details were obtained prior to the interviews through the questionnaire that was sent to the pilot participants prior the interview. All pilot interviews were held at the School of Primary Health Care at Monash University.

**The Pilot Outcome**

The five pilot interviewees had substantial clinical experience in primary and academic research, and contributed their insight to the development of the interview topics. The interview schedule was slightly revised based on these initial insights.

The revisions that were made as a result of the pilot interview were related to revising:

- the wording of interview questions to enhance the clarity.
- prompt questions to facilitate elaboration of responses.
- the strategy of the interviewer to follow the interview schedule. To encourage participants to freely share their experience it was decided to introduce more flexibility in conduct of the interviews. At the end of the interviews the candidate would check if all the topics were covered.

No new themes were added to the interview schedule. The candidate gained valuable experience in guiding in-depth interviews.

In spite of the fact that all five pilot interviewees were recruited at the University, it was decided to add the data collected during the pilot interviews to the main study as the GPs involved were fully licensed and active practitioners working in in-scope practices. The quotas were retained at their original level i.e. 20 for each country so the Australian data
included 25 participants. Inclusion of pilot data as part of the main study is not uncommon in qualitative research. In contrast to the quantitative approach, qualitative data collection and analysis is often a progressive process where researchers gain insights from the data already collected (122). Some researchers even argue that in qualitative studies pilots are not necessary because the first 1-3 sessions of data collection (interviews or focus groups) are often used by researchers to improve interview schedules and specific questions (123). In this research, while the experience of the pilot interviewees might be different from the experience of the participants recruited to the main study, it was thought that the inclusion of this data in the larger project will enrich the evidence available to answer the research question.

4.4.4 Main Study

4.4.4.1 Research participants

Sampling

The sampling strategy was directed towards recruitment of “information-rich” cases (10):

- GPs who practised in areas with substantial 2009/A/H1N1 activity and/or started to consult the 2009/A/H1N1 patients early in the pandemic outbreak.
- GPs who were more involved in implementing practice policy (for example, GPs who directed the response of their practice to the pandemic).

Every effort was made to ensure the sample diversity in terms of age, gender and clinical experience representation.
Sample Size

To meet the objective of this study, qualitative interviews were conducted with GPs from the three countries. In each country, 20 GPs were interviewed. In addition, as discussed, there were five additional from the Australian pilot interviews, so n=65.

As qualitative research does not aim to generalize the findings from the research sample to the population, but rather to study a phenomenon in depth and detail, the sample size cannot be simply calculated. According to Patton, “there are no rules for sample size in qualitative inquiry” (10). It is well accepted, however, that the sample should be large enough to generate rich information to explore the research question (10, 124) and to generate hypotheses.

Sample size can also be guided by the concepts of “theoretical saturation” (119) or “redundancy” (125). These approaches allow the decision about the sample size to be made in the process of data collection and to be guided by the richness of data already collected. In the current study, however, these approaches were not applicable. First, the timetable for the meetings with interviewees was arranged in advance due to constraints related to the necessity to travel and to stay during the data collection in Israel and London. Second, the limited time spend in each country for interviewing did not allow time for initial data analysis between the interviews to assess whether the saturation was reached.

Participant recruitment

Recruitment in Australia

The first group of doctors was selected from primary care physicians in Melbourne. General Practitioners were recruited using the School of Primary Health Care at Monash University research links with the Divisions of General Practice in Melbourne. An invitation to participate in the research (Appendix 1) was published in the newsletters of the Divisions of
General Practice in Melbourne. In addition, a number of GPs were recruited using the “snowball” sampling method (124) when the participants indicated GPs who might be interested to participate in the research. The interviews were conducted during June, August and September 2010.

Recruitment in Israel

The second group was selected from the primary care physicians in Israel using the research links of Hadassah Hospital with the Organization of Family Practitioners and the Organization of Child Practitioners in Israel. One of the supervisors (DE), advised on potential participants based on the familiarity with GPs who directed the pandemic response of their practice and information about areas with substantial 2009/A/H1N1 activity. GPs were contacted over the phone by the candidate (practices’ phone numbers are in the public domain of the Organization of Family Practitioners and the Organization of Child Practitioners) and, after an explanation about the research, were invited to participate. Six GPs decline the invitation to participate in the research because of time constrains. The interviews were conducted during July 2010.

Recruitment in England

The third group was selected from the primary care physicians in London using Kings College research links with GPs of Lambeth and Southwark PCTs in London. The research was advertised in the surgeries of these two PCT with the support of Dr Mark Ashworth who is a Clinical Senior Lecturer at the Kings College London and a practising GP and GP trainer. GPs, who expressed interest in the research, were contacted by the candidate and, after an additional explanation about the research, invited to participate. The interviews were conducted during July 2010.
A personal invitation and an Explanatory Statement (Appendix 2) about the research were sent to the chosen practitioners by e-mail. GPs, who did not practice during the 2009/A/H1N1 influenza pandemic, were excluded. For each country, a separate version of the invitation letter and the Explanatory Statement were prepared, as the guidelines of the Research Ethics Committee for preparation of these documents in England were substantially different from the guidelines in Australia. In Israel these documents were written in Hebrew.

4.4.4.2 Research Tools

All interviews had to be conducted in a timeframe as close as possible to the 2009/A/H1N1 pandemic to improve data quality and comparability and to avoid recall bias (Table 4-2).

Table 4-2 Time and Place of the Qualitative Data Collection

<table>
<thead>
<tr>
<th>Place of data collection</th>
<th>Australia (Melbourne)</th>
<th>Israel (Central, Tel-Aviv and Jerusalem districts)</th>
<th>England (London)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviation in data presentation</td>
<td>M, M(p) for pilots</td>
<td>I</td>
<td>L</td>
</tr>
<tr>
<td>Time of data collection</td>
<td>June, August and September 2010</td>
<td>July 2010</td>
<td>July 2010</td>
</tr>
<tr>
<td>Number of interviewees</td>
<td>20 - main study 5 - pilots</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
Interview Schedule and Procedures

Following the invitation letter and obtaining written consent (Appendix 3), all the participants were asked to complete a short questionnaire with closed questions (Appendix 4), which was sent by email prior to each interview. This strategy served two main objectives: to receive answers to basic informative questions which otherwise should be answered during the interview; to help interviewees to recall specific issues related to the pandemic and this n way to help in the general recall process. For each country, slightly different versions of the questionnaires were administered in order to tackle the unique situation in a country.

All interviews were held at primary health clinics where the participants worked, except one interview in Israel and one in Australia when the participants preferred to be interviewed at their home.

The interviews lasted about 30-45 minutes and the schedule included a standard set of topics presented by the candidate which included:

- Clinic responses in order to manage the A/H1N1 2009 pandemic
- Expectations from the health authorities
- GPs’ view on the role of the primary care during a pandemic outbreak
- Successes and challenges in managing the 2009/A/H1N1 pandemic.

These general topics were developed into more specific questions and themes in the process of the discussion.

The interviews were conducted in English in Australia and England and in Hebrew in Israel. All interviews were audio recorded and then transcribed verbatim. The data from the Israeli interviewees were transcribed in Hebrew and coded to the “English” code tree used for
coding data from Australia and England. The ability of the NVivo9 program to accept texts in different languages facilitated this process. This helped to avoid a time-consuming translation process and allowed better connection with the authentic words of the participants. Citations included into the findings report were translated from Hebrew into English by the candidate, who is fluent in both languages. The fact that the candidate conducted all interviews and had a clear understanding of the interview context reduced potential bias associated with the translation process.

**Member Checking**

The participants were invited to read the transcripts and to confirm that the text represented their ideas. Six interviewees added or clarified points after they read the transcript.

**4.4.5 Data Analysis**

The data was analyzed thematically for the purpose of providing an overall description of the predominant themes that represented the views of GPs. The analysis process was informed by the six-phase approach of Braun and Clarke (126). Organization of the data was assisted through the computer program NVivo9.

**Phase 1** of the analysis involved familiarization with the data through active reading and re-reading of all the interview transcripts (126). Since the interviews were professionally transcribed due to the time-consuming nature of this process, every transcript was checked by the candidate for any mishearing of the data as the candidate read through it for the first time while listening to the original audio-record of the interview. Every complete and corrected transcript was re-read at least once, this time without audio-record, while initial ideas for coding were jotted down.
Phase 2 of the analysis was dedicated to the generation of initial codes by the means of organizing the short segments of data into meaningful groups (127). This phase was similar to the “open coding” phase described by Corbin and Strauss (119). This analytical approach was inductive, which allowed the codes to be developed “on the go”. In this way, a new code was created every time a feature of the data appeared which was relevant to the research question as the researcher systematically worked through the data giving equal attention to each data item (117). The process of initial coding was accompanied by the “memoing” process of writing remarks about the data, questions for further clarification and theorising (127). The memos were used for later reflection about the data.

Phase 3, searching for themes, according to Braun and Clarke’s (126) approach, begins when all data has been initially coded. However, during this study the overarching themes were noticed approximately half way in the coding process. As the candidate went on with the coding process, “old” codes were renamed, reorganized and collapsed and broader themes were generated. When all the data was coded, all these concepts were further reviewed and organized into overarching themes and sub-themes applying the principle of constant comparative analysis (119) - grouping concepts together on the basis of certain similar phenomena thus producing different categories.

Phase 4 involved reviewing of the themes for validity of coded data and reviewing of the “theme tree” structure. The first stage of this process was dedicated to reviewing of coded data extracts. All collated text for each theme was read, considering whether it formed a coherent pattern. At this stage, some codes were moved under other themes and new themes appeared when existing themes did not adequately capture the meaning of the text extracts. In this way, for example, the theme “role delineation” (during the pandemic response) was divided into two sub-themes - “role ambiguity” and “role conflict”. The second stage of this validation process was considering whether the “theme tree” accurately presented the initial
data set. The whole data set was re-read for the purpose of rechecking if the proposed themes reflected it. Minor changes were made. The emergent “theme tree” is presented in Section 5.2.

**Phase 5** was dedicated to defining and naming themes. During this phase the themes were organized under two broad categories: challenges of the pandemic response in each of the studied country and challenges that were shared by GPs from the three countries.

**Phase 6** involved providing an analytic narrative of the data in relation to the research question (117). This analytic narrative is presented in Section 5.2 of the thesis.

### 4.5 Self-Reflexivity

#### 4.5.1 Personal and Professional Experience of the Candidate

In qualitative research, the researcher is an active participant in the data collection and analysis processes. The concept of the researcher being “an instrument” of the research process is widely acknowledged in qualitative investigation (124, 128-130). It is assumed that researchers, while maybe authoritative in terms of their knowledge, still bring into the study their motives, expectations and experiences. Recognition of the researcher’s self-reflexivity through her underlying conceptual paradigm in shaping the research findings and their interpretation, is seen as imperative to insure rigorous qualitative research (124). Self-reflexivity involves the acknowledgement of how the thoughts, feelings, culture, environment and social history may affect the way the researcher communicates with the research participants and makes sense of the collected data (131).
The purpose of this section is to acknowledge my personal and professional experiences and beliefs that shaped the decision-making process during collection and analysis of the research material and to describe how self-reflection influenced data collection and vice versa.

I am a public policy researcher with a special interest in health policy. While I was born in Kazakhstan and my native language is Russian, my entire professional career was developed in Israel. During my research career, I investigated the Israeli government public policies, analysing how these policies were supported by proper financing, and the measurable outcome these policies yielded. I have prior training in social sciences, epidemiology, and health economics. However, I have never been involved in disaster preparedness research, and my interest in the preparedness of primary care to respond to an infectious disease with unknown characteristics and lethality appeared when a new influenza virus, the 2009/A/H1N1, was swirling around the globe. Fully aware of the numerous difficulties and barriers in implementation of public policies in general and health policies in particular, I was intrigued how it would be possible to instantly implement complicated pandemic response policies in primary care, where rapid implementation of policies is unusual.

However, it was a lucky chance that allowed me to perform this research in three countries. The interests of three people, my supervisors, Professor Piterman in primary care research, Professor Engelhard in infectious diseases and management of epidemics, and Professor Thomas in policy implementation, made this project possible.

The way for this international project was paved by a meeting that was organised by Professor Piterman in Melbourne in November 2009 with the key stakeholders involved in the 2009/A/H1N1 influenza pandemic response in Australia and Israel. At the meeting, Professor Engelhard, who was responsible for coordinating the Israeli response to the 2009/A/H1N1 pandemic, presented the Israeli approach, while the Australian approach was
presented by the key stakeholders from the Australian Department of Health and Aging and Victorian Department of Health. Other stakeholders from primary care and hospitals in Victoria presented their perspectives on the pandemic management.

An interesting discussion during the meeting unveiled the obvious gap between the perspectives of the primary care doctors and the public health policy approach to the pandemic management. Some policies that were perceived as successful by the public health policy makers were not seen in the same light by the representatives of primary care. The challenges described by the primary care providers were not necessarily acknowledged by the public health representatives.

This brought me to wonder whether the challenges that primary care physicians experienced during the pandemic response in 2009 were investigated enough to incorporate the lessons learned in the preparedness plans for future responses. Were these challenges generic to the primary care doctors in different countries or whether they were result of the specific position of the doctors in different countries?

This suggested pressing questions for the research. Discussions with my supervisors brought together the plans of the current project. It was decided to investigate the pandemic management policies and their implementation in primary care in three countries in order to elicit the challenges primary care doctors encountered. Three countries, Australia, Israel and England, with differences in primary care delivery systems, were chosen. The existing research links in these countries were also an important factor needed to facilitate the logistics of data collection.
The thesis with this scope, required data collection in the three countries including in-depth interviews with primary care physicians in these countries. However, I was very keen to investigate implementation of policies on a broader scale than I had before.

4.5.2 Considerations and Concerns during the Research

Throughout this thesis I was cognisant of bringing my prior knowledge of public policy implementation in Israel to the interviews and to the analysis. I have tried to be explicit about the decisions that were made during the data collection and interpretation, and how this interpretation informed the conceptualisation of the findings. My main considerations and concerns during the research will now be presented.

Inductive Approach

It is important to note, that although the interview process was informed by the literature review that identified difficulties in the pandemic management in primary care in the past, no specific theory or hypothesis drove the research. In contrast to the deductive approach that seeks to confirm hypotheses about phenomena, my aim was to explore the emergent phenomenon of the pandemic response in primary care (124). Thus, it has been my intention to ask GPs directly, through semi-structured interviews, about their own perceptions and definitions of the difficulties they encountered participating in the pandemic response because this has not been investigated previously.

Similarly, the approach for the data coding and analysis was inductive. This process was data-driven rather than theory-driven (132). My aim was to stay close to interviewees’ concepts, language, and sense-making practices in order to give full representation to their experience, rather than trying to fix their experience to an existing pre-conception. This
approach has enabled me to answer the research questions by providing a rich picture of the actual conditions surrounding GPs during pandemics.

Concerns Arising

During the process of data collection and analysis I had a number of concerns which I tried to address that are nonetheless important to reflect on in order to provide a comprehensive description of the research process.

First, I was worried about my ability to recruit comparable samples in three different countries. The necessity to conduct face-to-face interviews in three different countries presented a major logistic difficulty during the data collection. Second, having analysed the documents that were published during the pandemic by the authorities in Australia, Israel and England, I was aware that the approaches for GP involvement in the pandemic response were different in the three countries. Thus, I was concerned that I would find only differences across the countries and would not be able to make a generalisable conclusion about the challenges of the pandemic response in primary care/general practice globally.

These concerns were addressed during the later stage of the research, when the research findings revealed that, along with the challenges specific to each of the three approaches, there are themes that were shared by GPs from the three countries. This meant that the samples in the three countries produced rich data that was useful to compare. In addition, this showed that despite differences in the organization of the primary health system in different countries and varied approaches for the involvement of GPs in the pandemic response, the research findings might be useful to generate recommendations for the pandemic response in primary care in general.
Another concern was that being a novice in qualitative research, I was initially unsure whether the lack of the clinical education or my “non-native” English would present an obstacle in conducting in-depth interviews with GPs. However, already during pilot interviews I realized that the genuine interest of my interviewees in the subject and my empathic attitude yielded a great amount of relevant data. The multi-cultural nature of the three countries, where different accents and backgrounds were incorporated, assisted my acceptance by the interviewees. The fact that neither Hebrew nor English is my native language, and the fact that I was not a clinician and had never worked in the health system of either country, made my role as an interviewer and interpreter of the data in each of the studied countries more or less consistent and free of preconceptions. Reflecting back, my experience of collecting and analysing data for this thesis was enlightening and rewarding.

### 4.6 Ensuring Research Rigour

There is an ongoing discussion in methodological circles about the ways to test the quality of qualitative research (133). While no agreement has been reached on whether the terms “reliability” and “validity” are useful in assessing qualitative research, alternative criteria, “that more accurately capture the complexity and texture of qualitative research” (134) have been suggested to evaluate qualitative research rigour. Usual quantitative criteria of research assessment that include internal and external validity, reliability and objectivity are replaced by assessment of credibility, transferability, dependability and confirmability of the research (135).

Table 4-3 presents the techniques applied in this study to ensure research rigour.
Table 4-3 Techniques Applied to Ensure the Trustworthiness of Qualitative Research (136)

<table>
<thead>
<tr>
<th>Traditional (quantitative) criteria</th>
<th>Qualitative trustworthiness criteria</th>
<th>Meaning</th>
<th>Strategy suggested</th>
<th>Strategies adopted in this study</th>
</tr>
</thead>
</table>
| Internal validity                  | Credibility                         | Trustworthiness of the conclusions from the data set and the match of these conclusions with reality. Credibility depends less on sample size than on the richness of the information gathered and on the analytical abilities of the researcher (10) | Prolonged engagement in the field  
Cross checks through member checking (134) | Extended engagement through long (30-45 min) face-to-face interviews  
All participants were invited to read the interview transcript and to comment  
Triangulation of data through document analysis and systematic review of the literature |
| External validity                  | Transferability                      | Generalising across different settings and organisations (137) | Provide thick description through deep, dense and detailed accounts.  
Provide contextualisation of the people or sites (138) | Thick description of different themes emerged in three different health systems  
Contextualisation provided through the document analysis |
| Reliability                        | Dependability                        | The study can be repeated by others with same results (139) | Purposive sampling  
Inquiry audit of data collection, management and analysis process  
Informants’ confidentiality protected | Purposive sampling to find information “rich” participants  
Inquiry audit by the supervisors of the research  
Interview schedule assessed during pilot interviews |
| Objective | Confirmability (neutrality) | The findings and concepts described were founded in the data and not a result of poor analysis or preconceived assumptions | Verbatim transcription of interviews. Practice reflexivity—continuous and systematic attention to the process and context of knowledge creation. Triangulation | Transcription was done verbatim. Reflexivity practised. Triangulation through document analysis and systematic review of the literature |
CHAPTER FIVE

RESULTS

This chapter comprehensively reports findings on Study 2 and Study 3 of this thesis. The objective of Study 2 was to compare the approaches for management of the 2009/A/H1N1 influenza pandemic in primary care in Australia, Israel and England. The objective of Study 3 was to explore the views of GPs on challenges they encountered managing the influenza pandemic 2009/A/H1N1 in primary care in Australia, Israel and England.

Section 5.1 presents data related to the first objective of the two mentioned above. First, this section addresses the main policy measures that influenced GP involvement in the pandemic response in the three studied countries. These are presented in Section 5.1.1. Then, in Section 5.1.2, involvement of GPs in the pandemic response is described and depicted graphically on the timeline of the pandemic period.

Section 5.2 reports on the data collected from the in-depth semi-structured interviews with GPs from Australia, Israel and England, and it addresses the second objective stated above. The findings from the in-depth interviews cover a range of topics discussed in relation to the difficulties of the pandemic response in primary care. A significant number of GPs interviewed for this study provided valuable description of their unique experience participating in the 2009/A/H1N1 pandemic response. The findings presented in three different sub-sections are organized thematically. They report comprehensively on the challenges related to the treatment of patients during the pandemic (Section 5.2.1), performing public health responsibilities (Section 5.2.2), and communication with the health authorities (Section 5.2.3).
5.1 Outcomes of the Pandemic Policy and Procedures Documents Study

This section presents findings from an analysis of the pandemic policy and procedures documents published by the health authorities in Australia, Israel and England during the 2009/A/H1N1 pandemic. These findings were published by the candidate in the Australian Health Review (140). The list of the documents analyzed, as well as the document inclusion criteria, were presented in the previous chapter (Chapter 4), in Section 4.3.

As it became evident from the document analysis, the policies for pandemic management in the three studied countries were divided into two phases: containment and mitigation (141). Containment phase was dedicated to the efforts to delay the appearance of the disease and to contain its spread. A range of policy measures, such as active epidemiological investigation, isolation of cases and school closure were used during containment. This phase, from the first confirmed case of the pandemic flu until the official announcement about the change in the response strategy, lasted 4 weeks in Victoria, 8 weeks in Israel and 9.5 weeks in England.

The second phase, mitigation, was characterized by the understanding that there was substantial transmission of the disease in the community and that containment was no longer a viable strategy, and resources were then turned to mitigate the consequences of the outbreak. In Australia and England, official statements were made when the health authorities decided to change the response approach as these countries moved to the mitigation phase which was called “Protect” in Australia and “Treatment” in England) (96, 142). In Israel, an official statement using the terminology of mitigation was not made. However, in effect this happened when it was decided to transfer the management of pandemic flu patients from hospitals to primary care.

5.1.1 Policy Measures that Influenced GP Involvement in the Pandemic Response
The main policy measures that influenced GP involvement in the pandemic response in the studied countries are presented in Table 5-1.
Table 5-1 Main Policy Measures and the Involvement of GPs in the 2009/A/H1N1 Pandemic Management in Australia, Israel and England

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>Israel</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Delay and containment phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Case definition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• clinical criteria and travel or contact history</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Testing of all suspected cases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• epidemiological connection needed</td>
<td>Yes (in Victoria except the last 1.5 weeks of the containment)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Treatment with antivirals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• all suspected and confirmed cases</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>• prophylaxis for contacts</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Isolation of confirmed and suspected cases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• hospitalization for isolation</td>
<td>No</td>
<td>Yes (weeks1-2)</td>
<td>No</td>
</tr>
<tr>
<td>• home isolation</td>
<td>Yes</td>
<td>Yes (from week 3)</td>
<td>Yes</td>
</tr>
<tr>
<td>5. <strong>GP involvement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>• examining of flu patients</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>• testing and treatment of flu patients</td>
<td>Yes (after the local PHU approval)</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>• referral of all suspected cases to hospitals</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. <strong>Additional arrangements to treat flu patients</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (last week of containment in Victoria FCs were organized to support ED after daytime working hours for GPs)</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. <strong>Selective school closure</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Mitigation phase**

<table>
<thead>
<tr>
<th>1. <strong>Case definition</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• clinical criteria and travel or contact history</td>
<td>No</td>
<td>Yes (weeks 1-5 of the mitigation)</td>
</tr>
<tr>
<td>• clinical criteria only</td>
<td>Yes</td>
<td>Yes (from week 6 of the mitigation)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. <strong>Testing</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• all suspected cases</td>
<td>No</td>
<td>Yes (weeks 1-2 of the mitigation)</td>
</tr>
<tr>
<td>• only patients at risk</td>
<td>Yes</td>
<td>Yes (weeks 3-5 of the mitigation)</td>
</tr>
</tbody>
</table>
- only hospitalized patients | Yes | Yes (from week 6 of the mitigation) | Yes  

3. Treatment with antivirals  
- all flu patients  
  - No | No | Yes | Yes  
  - Yes | Yes | Yes | Yes  
  - No | No | No | No  
- patients at-risk and with severe symptoms  
  - Yes | Yes | Yes | Yes  
- prophylaxis for contacts  
  - No | No | Yes | Yes  

4. Additional arrangements to treat flu patients  
  - Yes (FCs to support ED after daytime working hours for GPs; worked during intensive pandemic months) | Yes (FCs worked weeks 1-5 of the mitigation: weeks 1-2 treating all the patients, weeks 3-5 only at risk and with severe symptoms) | Yes (from week 3 in mitigation NPFS was organized; most of the patients were assessed and received treatment through it)  

5. GPs involvement  
- treatment of patients with mild flu  
  - Yes | Yes (week 3-5 of the mitigation, beforehand – in FCs) | Yes (weeks 1-3 of the mitigation, then through NPFS)  
  - Yes | Yes (from week 6 of the mitigation, after the FCs were cancelled) | Yes  
- treatment of patients at-risk and with severe symptoms  
  - Yes | Yes | Yes | Yes  

6. Vaccination  
- first target of free vaccination  
  - At-risk population | At-risk population | At risk population (later healthy children aged 6 months to under 5 years were added)  
  - Yes | Yes | No  
- vaccination offered to the overall population  
  - At-risk population | At-risk population | At risk population (later healthy children aged 6 months to under 5 years were added)  
  - Yes | Yes | No
**Abbreviations:**
NPFS – National Pandemic Flu Service
HPU – Health Protection Unit
PHU – Public Health Unit
FC – Flu Clinic
ED – Emergency Department
During the containment phase, the similarities in case definition informed the approach for testing and isolation of all suspected cases with travel or contact history. The patient treatment approach was also similar – in each of the studied countries antiviral treatment was available and was provided free of charge to all suspected and confirmed cases (143-145).

However, the Israeli approach differed in a number of community containment measures. For the first 2 weeks of the disease outbreak, Israeli health authorities conducted a rigid quarantine policy: all suspected cases were hospitalized in isolation until negative test results were available (144). This policy was changed to home isolation from the third week of the containment; however, patients were transferred to the hospital for examination, laboratory testing and antiviral treatment during the whole containment period (146). Unlike in Australia (147) and England, in Israel no prophylaxis policy for case contacts was applied and schools were not closed.

During the containment phase, nine documents with updates and protocol changes relevant to GPs were released in Australia (during 4 weeks in Victoria), nine in Israel (during 8 weeks) and five in England (during 9.5 weeks).

With the introduction of the mitigation strategy, the case definition was amended to include clinical criteria only. At this stage, viral tests were performed only on at-risk patients and those with severe symptoms (Australia) (96, 148) or only on hospitalized patients (England) (142). In Israel, the change in testing policy occurred gradually – 2 weeks into the mitigation phase, the policy was changed to test patients at-risk and those with severe symptoms; 2 weeks later it was amended to test hospitalized patients only (149, 150).

The guidelines for prescribing antivirals during the mitigation phase were similar in Australia and Israel: only patients at-risk and with severe symptoms were treated with antivirals (148, 149). In England, in contrast, all of the patients diagnosed through the National Pandemic Flu
Service (NPFS) with pandemic flu could receive antivirals at the Antiviral Collection Point (ACP) without seeing a GP (151).

WHO recommended countries to develop strategies for the 2009/A/H1N1 vaccination campaigns based on the epidemiological situation, resources and ability to access the vaccine. Three approaches were suggested: (i) to protect the integrity of the health-care system and the country's critical infrastructure; (ii) to reduce morbidity and mortality; (iii) to reduce transmission of the pandemic virus within communities (152).

In the studied countries, free vaccination was available and was provided via primary care. Vaccination policy approaches were similar in Australia and Israel: although the vaccine was offered to the overall population, the at-risk population was targeted first (111, 153). In England, vaccination was offered only to at-risk patients. Healthy children aged 6 months to 9 years were added later on (154). Vaccinations were a late stage intervention as they were offered well into the mitigation phase in Israel and England and at the end of the mitigation phase in Australia (see Figure 5-1).

5.1.2 Involvement of GPs in the Pandemic Response

The role of GPs in the studied countries differed in the timing of their involvement and in the responsibilities allocated as shown in Figure 5-1.
Figure 5-1 Involvement of GPs in the Pandemic Response

**Australia**

- **GP involvement:** Examining, testing and treating flu patients
- **Flu Clinics were organized to support Emergency Departments after daytime working hours for GP during the intensive period of the pandemic**
- **GP involvement:** Treatment of all flu patients
- **Free vaccine was offered to overall population**

**Israel**

- **GP involvement:** Referral of all suspected cases to hospitals and later to Flu Clinics for examination, testing and treatment
- **Flu Clinics were organized by HMOs where patients were tested and treated**
- **Flu Clinics were cancelled**
- **GP involvement:** Assessment and treatment of flu patients after the Flu Clinics were cancelled
- **Free vaccine was offered to overall population**

**England**

- **GP involvement:** Examining, testing and treating flu patients
- **The NPFS was organized—most of the patients were assessed and received treatment through it**
- **GP involvement:** Treatment of all flu patients for the first 3 weeks in the mitigation period, then treatment of patients at-risk and with severe symptoms
- **Only population at-risk was offered the vaccine. Healthy children aged 6 months to under 5 years were added later on**
In Australia, GPs served as diagnosing and treating authorities from the very beginning and during the whole pandemic period. With slight differences in the arrangements across the different Australian jurisdictions, Flu Clinics were organized at the end of the containment period. The purpose of these Clinics was to help Emergency Departments cope with the surges of flu patients after daytime working hours for GPs. During regular daytime hours, GPs remained the first point of contact for the flu patients (96).

In Israel, GPs were not involved in the pandemic response during the containment period, referring all suspected cases to hospitals for testing and treatment without examining them. The transition to managing the pandemic patients in primary care occurred gradually. Flu Clinics were organized in the middle of June 2009 using existing Health Maintenance Organizations’ (HMOs’) large primary care clinics. Once organized, GPs were advised to refer all suspected patients to these clinics instead of hospitals (155). The guidelines were changed 2 weeks later, and only at-risk patients and those with severe symptoms were sent to Flu Clinics for testing and treatment. At this stage, GPs provided supportive treatment only for mild cases without testing them (149). This arrangement lasted for about 2 weeks, then the Flu Clinics were cancelled and GPs started to treat all patients (150). Virological testing was not required at this stage, and antiviral treatment was provided to at-risk patients and those with severe symptoms.

GPs in England were the first port of call from the very beginning of the outbreak, usually consulting and testing the suspected patients during home visits. When the pressure on primary care increased, the NPFS was established to provide advice and prescriptions for antiviral drugs over the phone or internet (151). People, who fulfilled the criteria according to the symptom-based clinical algorithm, were given an authorisation code that a ‘flu friend’ – someone who did not have H1N1 – could use to collect antivirals from an ACP. Only at-risk
and patients with severe symptoms were advised to consult GPs so that the majority were kept out of GP clinics (151).

5.2 Outcome of the Qualitative Interviews

This section reports on the data collected from the in-depth semi-structured interviews with GPs from Australia, Israel and England. Part of this data was published in Australian Family Physician (156). As it was stated in Chapter 4, the data collected during the pilot interviews was subsequently added to the main study. Thus, this section presents combined results of interviews with GPs from the pilot and main study.

Characteristics of the study sample and time of data collection are presented in Table 5-2.
### Table 5-2 GP Sample Characteristics

<table>
<thead>
<tr>
<th>Place of data collection</th>
<th>Australia (Melbourne)</th>
<th>Israel (Central, Tel-Aviv and Jerusalem districts)</th>
<th>England (London)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviation in data presentation</td>
<td>M, M(p) for pilots</td>
<td>I</td>
<td>L</td>
</tr>
<tr>
<td>Time of data collection</td>
<td>June, August and September 2010</td>
<td>July 2010</td>
<td>July 2010</td>
</tr>
<tr>
<td>Number of interviewees</td>
<td>25 (5 pilots, 20 main interviews)</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Age:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-30</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>30-39</td>
<td>1</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>40-49</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>50-59</td>
<td>15</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>60-69</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Vaccination status of GPs:</td>
<td></td>
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<tr>
<td>Yes</td>
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<td>No</td>
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<td>N/A</td>
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In organizing data thematically, 10 themes emerged as the main concerns of GPs with the burden on primary care during the 2009/A/H1N1 pandemic. These 10 themes, each represented by 1-3 sub-themes, were further regrouped under three broad categories (Table 5-3). Findings from the three countries are presented for each of the 10 themes and supported by the participant citations. Special attention was given to represent differences, as well as similarities, in the responses of the interviewees from the three countries.
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5.2.1 Treatment of Patients

GPs reported that during the pandemic response they consulted numerous flu patients and worried-well. The consultations included an assessment, provision of antiviral or supportive treatment, reassurance of worried-well and provision of information in the form of personalised advice. Given the high level of anxiety in the society that induced the flow of patients, some instances of staff absenteeism, and unfamiliar to GPs antiviral treatment, GPs described this period as rather challenging. Provision of the A/H1N1/2009 pandemic vaccine as a late stage intervention presented additional difficulties as GPs had to aim for wide coverage of the population in the atmosphere of anti-vaccination messages in the media, when they themselves had not enough information about the vaccine and harboured doubts about the mass vaccination policies.

5.2.1.1 High flow of Flu Patients and Worried-well

GPs were unanimous that management of “worried well” patients was one of their key roles during the 2009/A/H1N1 pandemic. They described media induced anxiety which imposed resource constraints on the primary care in each of the studied countries. However, the level and type of difficulties GPs encountered were different in the three countries.

In Australia, where the spread of the pandemic flu appeared early, GPs spoke emphatically about the burden of high flow of patients. Australian GPs struggled to manage the pandemic patients concurrently performing public health responsibilities of reporting suspected cases to the health authorities, making special arrangements for swabbing and antiviral treatment, as well as managing the worried-well:

“…obviously people come with their children who might have just an
ordinary viral infection and they may not normally come, but because of the swine flu they were coming in increased numbers.” (M9)

“We managed poorly, we struggled, we were overwhelmed ...we were juggling all these delivery issues, approval process issues, lab results...we tried as best we could...” (M2)

Even practices that had a “luxury” of extra staff triaging patients on the phone experienced difficulties managing a flood of concerned patients:

“The busiest day I took 42 outcalls... I was filtering people who didn’t need to be swabbed and that took so much time, the frantic people ringing up worried that their children were going to die.” (M3)

In England, GPs described how assessing suspected cases during home visits put a strain on their work during the early stage of the pandemic. They indicated a high flow of patients who were concerned they might get sick:

“...we were expected to visit everybody at home ... take swabs with masks and gowns which was hideously impractical.” (L12)

“...a lot of that was probably media driven but there were... lots of very concerned mothers of young children ... concerned ladies who were pregnant and we serve quite a large HIV population here and people who obviously have concerns about their level of immunity.” (L9)

English GPs noted a decrease in the flow of patients when the National Pandemic Flu Service (NPFS) was launched. Generally, English GPs expressed their support for the NPFS organization; however, concerns with the safety of the NPFS phone consultations were raised. In particular, the fact that the NPFS was staffed with people with no prior clinical
training, was mentioned as a concerning issue by many GPs. They pointed to the fact that phone consultations are challenging practice for GPs themselves, which require experience in making a correct diagnosis based on a phone conversation, without seeing a patient. They expressed doubts about the usefulness of the clinical algorithm, used as the basis for the NPFS consultations, for making diagnoses leading to the medication prescriptions. In addition, GPs from England reported assessing numerous patients who sought reassurance and professional opinion after having consulted the NPFS:

“I think telephone consultations themselves are difficult entities for GPs anyway. . . So you do already strip away a layer of understanding between yourself and your patient so let alone for Swine Flu... I do think they are (NFPS) limited to having a very algorithmic response because you’re trying to mitigate that loss of actual true understanding of the person. You’re trying to treat the disease, not the person at that stage. I think most GPs find that awkward.” (L11)

“I am feeling very uneasy about non-clinically trained people making decisions to treat people with drugs. It’s definitely not safe.” (L17)

“...it (NPFS) was so algorithmic that a lot of our patients came back and said, well I'm not sure I really do have this and should I really still take it, and we'd have to have another conversation, so I don't know if it really decreased the numbers that we saw, but I think it decreased the numbers that we spoke to on the phone.” (L11)

In Israel, the same level of anxiety did not concur with the spread of the disease in the community. The flow of worried-well ended before the 2009/A/H1N1 patients started to appear in primary care in increased numbers:
“At the beginning patients were very anxious because of the reports about deaths and the pictures of masked people in the airport... but at the peak of the second wave, when the schools were involved, it was clear that here it is not so bad... so it was less anxiety. The anxiety was mainly in June-July because of the terrifying pictures from overseas that were broadcasted.”

(I17)

Out of the three countries, only Australian GPs reported the problem of staff absenteeism that influenced the ability of the practice to deal with the high flow of patients. In all reported cases (three such cases were reported), this was due to the necessity to quarantine a staff member who consulted a probable case of the 2009/A/H1N1 early in the pandemic, when the severity and contagiousness of the disease were unclear:

“...the night that we had our first case, the doctor who was in there spent, you know how long with them, rang up the Health Department, said I think I might have something here, can I do a swab? Organised a swab, sent the family home and then in the morning we were rung, he was told to go into quarantine because, at that stage, anyone who was in contact was in quarantine for seven days. So we lost a doctor in the middle of the flu campaign.” (M3)

5.2.1.2 Provision of Information

GPs were the main channel for delivering the pandemic policies to patients, usually in a form of specific clinical advice and treatment. Although the health authorities in the three countries made a considerable effort to provide information about the disease, infection control, treatment and vaccination to the public, GPs saw themselves as a “natural source of
information for the patients” (I14). GPs form the three countries reported that the main concern of the patients in this respect was the applicability of the general information, available through the mass media, to their specific situation. Even in England, where the NPFS was providing advice over the phone, GPs still reported surges of patients who were seeking GP advice. The provision of information took a great amount of time, taking into consideration the anxiety of the patients, which created challenges for GPs:

“The vast majority just needed checking out and reassurance... I went over how flu is very different clinically from a bad cold, and symptoms for both, millions of times.” (M7)

“People came in and asked a lot of practical questions: whether to get vaccinated, what about my mum, what about my dad, my neighbour got it what if the kids will be exposed? ... The doctor that you know and trust is the natural source of information for you” (I14)

“... I think most of our patients did request advice even if there was kind of general published advice around. I think they valued speaking to someone, so we did have a large influx at that time, and that continued even after the telephone line (NPFS) came on line.” (L11)

5.2.1.3 Antiviral Treatment

Many GPs reported that they did not use antiviral drugs to treat flu patients prior to the 2009/A/H1N1 pandemic and were generally unfamiliar with these drugs (Tamiflu and Relenza). This contributed to their confusion regarding the treatment and concerns with its safety and necessity:
“I’ve never prescribed Tamiflu until the swine flu season ...Again, it was a bit nerve wracking, because you’re prescribing a drug you don’t really know much about, new territory, you don’t know the risks, you don’t know the pros, and it was a bit unsettling.” (L18)

“I do not believe in it... I’ve got an impression that it (Tamiflu) was advised to pacify the public: get Tamiflu and everything will be all right. Because it is hard to say that there is a disease that has no treatment, even though this was the case.” (I8)

Strict guidelines provided for prescription of the antiviral drugs created clinical practice difficulties. This was especially so during the initial period of the pandemic in Australia and England, where the first cases were treated in primary care. During this initial stage, GPs in Australia and England were required to seek permission from the health authorities to prescribe the drug and in this respect they felt that the health authorities did not rely on their clinical judgment:

“There were rules (to prescribe the drug), but I think this is where the government’s got to realise that GPs are not stupid. I am sure they (GPs) are going to usually make decisions in the best interest of the population... They (government) don’t have any confidence in the people that treat people all the time.” (M3)

“And we just felt very angry that we were being forced into a position where we had to prescribe a potentially dangerous drug, well to anyone but particularly to children and babies.” (L8)

Some GPs felt pressure from patients to prescribe Tamiflu. They described that patients,
who received information about the drug from the media, expected GPs to prescribe the drug even if there was no clinical indication for it. Others indicated familiarity to pressure from patients to prescribe even if the outcome is refusal.

“They were told not to go to the surgery which ... made things even more complicated because people would ... phone and say, “I’ve got symptoms of flu, and I want to have Tamiflu”. So we were under pressure to prescribe without even examining the patients... anyone could call and say I want Tamiflu, give me a letter so I can get it...” (L8)

“I don’t like prescribe antibiotics for viral infections... I am very comfortable with saying no when there is pressure from people. Likewise, I am quite comfortable in saying ‘no’ to pressure for antivirals if I think it’s just a cold... So I am quite comfortable with explaining, no they are not going to help, and this is why I am not going to prescribe them.” (M7)

In England, the antiviral treatment was liberally prescribed to everyone who described the flu symptoms consulting the NPFS over the phone. In this respect, GPs reported seeing many patients who were prescribed the drug, but were reluctant to use it without the GP approval. In addition, English GPs reported seeing patients, children in particularly, with severe side effects from the Tamiflu:

“The Tamiflu had awful side effects for children, especially hallucinations, a lot of our patients' children who ended up taking it came back and said, do you know this was a real issue for us?” (L11)
5.2.1.4 Vaccination

Organization of the Vaccination to Ensure the Wide Coverage of the Population

GPs in Australia indicated that they had autonomy to plan the vaccination program within their clinics. Many Australian GPs vaccinated patients opportunistically, but examples of clinics running immunization days were common especially in big clinics:

“...so either we did it opportunistically when they came in for a consultation, or if they rang then we said, “Look we’re having these special flu vaccination sessions where you just come in ...and have your flu vaccine...” (M13)

Usually, Australian GPs relied on patients being informed about the vaccination campaign from media, but some contacted their patients directly. The reasons for organizing vaccination clinics included lack of time during regular consultations, financial benefits, and the fact that unwell patients that came for consultations could not be vaccinated either because they were currently infected, or because other acute health problem had to be solved:

“...if you think you’re going to do it as part of a consultation, no you won’t do it. One you’ll forget, two there’s not enough time ...it’s (vaccination sessions) smart from a business point of view” (M1)

“...a lot of people who go through general practice are going through because they’ve got a problem at the time and ... the vaccination thing is not on their mind then...” (M(p)2)

Many interviewees indicated that despite the fact that, unlike the seasonal flu vaccine, the pandemic vaccine was free to all patients and was delivered in multi-dose vials, the
organization of its provision was not substantially different from the provision of the seasonal vaccine.

In Israel, the population was mainly vaccinated by nurses at Health Maintenance Organization (HMO) clinics, but some private clinics offered vaccination as well. GPs were not responsible for inviting their patients for vaccination:

“...they (the patients) could come straight to the nurse and get vaccinated. There was no need for referral (from GPs).” (I1)

In England, primary care clinics were expected to contact patients from at-risk groups who were eligible to be vaccinated and invite them for vaccination. This was usually done by administrative staff. Many GPs reported that special vaccination clinics were run at the practices while some GPs vaccinated patients opportunistically:

“...they (patients) were all sent a letter, and we had specific clinics that were set up to do the vaccinations...” (L10)

“...opportunistically who was coming in for a diabetes check and they needed an H1N1 vaccine I’d give it to them” (L19)

In Australia and Israel, the whole population was targeted. However, GPs reported that their ability to influence the vaccine uptake in healthy young was limited because this population rarely consults GPs. In addition, GPs indicated that it was difficult to bring up the vaccination issue during each consultation:

“... the group of 10-20 year olds is hardly seen here” (not frequent attendees in primary care) (I14)

“...for doctors to mention it to every single patient that came in including all
children... it just became unrealistic...” (M(p)2)

On the other hand, GPs from the three countries stated they were able to influence the decision of at-risk populations because they knew the patients that were at high risk of influenza complications and raised the vaccination issue during these patients’ visit or invited them as happened routinely in England and in selected cases in Israel and Australia:

“Well some people would come specifically in to discuss it, but often it was “I’m here for my script”, “I’m here for my blood pressure check”. And I would bring it up, or they would bring it up “Oh in addition what do you think about the swine flu thing?” or I would bring it up and say “Look by the way we’re vaccinating people against swine flu, we’re recommending it” (M10)

“...most of my patients with chronic diseases I did manage to convince... (to get vaccinated)” (I6)

**Insufficient and Conflicting Information about Vaccination**

Despite the general information about the vaccine provided by the health authorities, GPs indicated that many patients wanted advice on whether they personally should be vaccinated. Many patients expected GPs to provide clarification about vaccine safety, which was questioned in anti-vaccination press reports, and wanted to know “whether what was published is true” (I11).

Many GPs, however, indicated that they did not have sufficient information about how the vaccine differed from the seasonal flu vaccine, “how many people has it been tried on” (L1), “how many doses of the vaccine have been given already in the world” (I15), and “what the
long term consequences of having a vaccination like this would be” (L9).

GPs in the three countries indicated there was “a lot of bad press” (L5) about the vaccine. They expressed the opinion that the failure of the authorities to respond in a timely manner to the anti-vaccination messages might have had an adverse influence on seasonal vaccination campaigns and even on early childhood vaccinations as the trust in vaccination in general was eroded:

“...we have now got a higher level of resistance amongst parents about giving their kids vaccinations which we believe they should have.” (M20)

Some GPs admitted that anti-vaccination messages negatively influenced their own decision to be vaccinated:

“... all the time I got e-mails about how the vaccine is unsafe.... and at some stage my confidence in the vaccine was undermined...” (I16)

Disagreement about Vaccination Policies

Despite many GPs stating that they were impressed by the speed with which the vaccine was produced and delivered to clinics and that it was provided free of charge in the three countries, many indicated “there was disagreement within the profession” (M12) about the mass vaccination policies. While many GPs expressed support for the seasonal flu vaccinations, they demonstrated lack of support for the 2009/A/H1N1 vaccination policies. Three types of reservations were mentioned – safety, effectiveness and necessity of the vaccine.

All of the GPs who expressed concerns about the safety of the vaccine were unwilling to have the vaccine themselves (two out of 25 in Australia, 2 out of 20 in Israel and 6 out of 20
in England). They usually found it problematic to advise on vaccination to their patients despite the guidelines from the health authorities particularly when they were not prepared to be vaccinated themselves:

“GPs were pivotal in how they sold it to their patients, and one of the problems was that, as a GP, I really wasn't convinced of the safety profile of the vaccine...” (L1)

GPs who believed the vaccine was safe, but expressed a lack of confidence in its effectiveness and necessity usually based their argument on the burden of the disease in the community not being different from seasonal flu, so the benefits from vaccination would not outweigh the risks, however mild. In Australia, the additional argument was that the influenza season had passed by the time the vaccine became available:

“It was delayed (the vaccine), and so the immediacy of the concerns of the community was gone. They (patients) didn’t perceive it (the disease) as a risk anymore.” (M(p)5)

In Australia and Israel, despite the policy approach to vaccinate the entire population, GPs, who harboured doubts about the vaccine effectiveness and necessity, felt that it was reasonable to recommend vaccination only to patients whom they saw “at-risk particularly” (M(p)1). Out of 25 GPs interviewed in Australia, 10 advised vaccination to at-risk groups only, and one did not advise vaccination at all. In Israel, in the sample of 20 GPs the respective numbers were 9 and 2.

“...we certainly are very strong believers in the normal seasonal flu vaccine...But the swine flu had no proven efficacy...” (M12)
“I usually advised to give (the vaccine) to at-risk group, not to everyone.”

(II7)

Many interviewees reported that patients wanted to know if their doctor had been vaccinated and the advice reported by GPs based on personal example was diverse. While some GPs defined self-vaccination as “a social responsibility” (L17), others indicated their reservations about the vaccine were an obstacle in providing positive advice:

“I think sometimes the patients would be picking up that I wasn't 100% sure and then decided ... to hold off giving their child the vaccine.” (L1)

5.2.2 Public Health Responsibilities

In addition to the challenge of consulting patients in increased numbers, GPs had to perform public health responsibilities that are out of scope in their usual clinical routine. These responsibilities included segregation of patients and application of personal protection measures in order to reduce the disease transmission. In this respect, the theme of support from the health authorities that was made available to GPs during the pandemic response was raised. In addition, GPs indicated that they perceived some of the public health responsibilities as contradictory to the traditional role of GPs.

5.2.2.1 Role Delineation

During the pandemic, GPs were required to perform public health responsibilities that included application of infection control measures in a clinic while working according to strict guidelines from the health authorities. In this respect, GPs from the three countries felt that the public health responsibilities were imposed on them without an appropriate consultation process and that the health authorities did not acknowledge that their role as GPs
“is different to the role of the public health officer” (M17). While GPs are a “person’s advocates” (L4), “public health policy is specifically geared not to consider individual patient needs” (M17).

“We were saying, you can't have tests, you can't, you should, you shouldn’t, you know I'd love to do a test, but I'm not allowed to and we were actually instead of treating patients clinically, we were treating patients bureaucratically. And that for me was hard because I'm not a Public Health physician, I don’t deal with the big picture thing, I deal with the people who I look after.” (M3)

GPs argued that they were not part of the pre-pandemic planning and that they were not involved in the decision making during the pandemic response. Although GPs from each of the three countries raised this issue, in Israel, this theme appeared to be especially significant. The guidelines provided by the health authorities were described as lacking an understanding of the clinical practice in primary care and not developed by organizations that represent GPs:

“Nobody consulted with primary care physicians and guidelines that were imposed on us were hard to implement in the reality ...” (I4)

“When guidelines are for primary care, and the disease is treated in primary care, not in the hospital, primary care people should make decisions, they have to be involved.” (I5)

From GP responses in the three countries, it became apparent that they harboured distrust towards public health representatives and a lack of acceptance of the approach where public health representatives decide on matters that are usually in the scope of GP practice:
“They could have asked us (GPs) in the first place, they could have involved us. Those guidelines for use of multi-dose vials, they’re my guidelines. I developed them with the College (Royal Australian College of General Practitioners) we fixed them up and made them better and better, then the Government got hold of them, they didn't acknowledge the College or me, and they put them out and they're a variation of what we originally said. ... It's Public Health, you know, we know what's best.” (M4)

Another issue that was raised in this respect was the willingness of GPs to make changes to their usual approach for booking the appointments in order to accommodate for acute influenza patients. It appeared that some of the interviewed GPs did not regard the provision of care to the pandemic flu patients as their duty. While some doctors indicated that they made considerable changes to increase the accessibility of care for the flu patients, others reported that they preferred to stick to usual appointment routine giving preference to their patients:

“So we really, we cut back the booked appointments in the morning so that patients with routine problems were out of the way, and anyone who thought that they might have flu was asked to come at that time.” (M14)

“...my appointments get booked up ahead, and I have certain patients that I see on a regular basis, so I do a lot of mental health, women’s health, so I don’t have a lot of acute appointments that are open for my sessions.”

(M(p)5)

It is important to note, though, that not one of the interviewed for this study GPs described the failure to report to work during the pandemic. One GP (L2) reported that she declined all patients with flu symptoms because of her being pregnant during that time.
5.2.2.2 Support from the Health Authorities

Performing public health responsibilities in addition to their normal clinical work, many GPs felt that the support provided to them from the health authorities was inadequate. This was especially so in Australia, where no additional arrangements were made to support the work of GPs:

“There seemed to be a lot of expectations that GPs would do all the work and be happy to do all the work, without acknowledging that many clinics did not have the physical ability. If you are a solo GP, you’d have pretty finite ability to increase what you could do, without any recognition that it was going to be an enormous increase in work load because it was an enormous increase in work load, without practical support.” (M7)

Australian GPs indicated that they expected to receive practical support in the organization of the infection control in clinics:

“...what I think they (the health authorities) could have done better is to give practical advice on how to set up a practice rather than just giving advice on how to treat individual patients...” (M12)

In England, where the work load was relieved by the organization of the NPFS, GPs pointed out that the advice provided to them by the health authorities on how to treat the complicated cases that were diverted to GPs from the NPFS, was insufficient:

“So it (the NFPS) didn’t really help my working life so much to help my patient... It didn’t really help those patients who did come to see me apart from me to say, well I know they’re giving you this, and if you have any of these three things we're currently giving you this... It was actually guidance...
on the ones where we're a bit less sure that would have been more beneficial
and certainly the phone line (the NPFS) wasn’t doing that.” (L11)

In Israel, GPs often mentioned the fact that they have a very high work load throughout the
year and that they would expect to have workforce reinforcement during the pandemic flu
response:

“I have to take care of my other patients, I can’t... The HMO has to send a
doctor who would see only flu patients during this time (the pandemic)...”

(I1)

5.2.2.3 Patient Segregation

Many GPs reported that it was impossible to separate patients in a busy clinic. Even in a
situation where a spare room for isolation was available, GPs felt that it was not good
practice to have several patients simultaneously in an isolation room, before assessing them
for the 2009/A/H1N1.

In Australia, a common practice to separate the suspected flu patients was to assess them in
their car or to ask them to wait in a car instead of in a waiting room until a GP was ready to
consult them.

”..we asked people to ring ahead, we asked if they had a fever or any
symptoms of flu, ... to stay in their cars...  And we would usually give them a
mask to walk them in, and walk them straight into the consulting room...”

(M7)

In Israel, in some HMO clinics that assessed flu patients for a limited period at the end of the
containment phase, an effort was made to separate flu patients. Regular primary clinics in
Israel started to consult pandemic flu patients when the disease was widely spread in the community, and there was overall acceptance of the fact that the separation was not feasible:

“When the disease had turned into a pandemic there was no sense in separation, it was impossible.” (I15)

In England, the approach was to keep the suspected patients out of practices and to assess them during home visits or phone consultations. It seems that many patients with the flu symptoms were turned away from the primary clinics, but the practice of putting them into an isolation room was not uncommon:

“...we tried to encourage people with flu to stay at home as per the guidelines, but when people were coming, to try and have separate rooms that we could ...put them in and segregate them.” (L14)

GPs from the three countries reported that policies introduced to low disease transmission in a clinic (separation of patients in clinics in Australia, assessment in the hospital during the containment phase in Israel, and home visits or phone consultations in England), were not always successful because of the lack of cooperation from patients. A considerable number of patients did not report flu symptoms till they got to see the doctor, thus mingling with other patients in the waiting room:

“Well naturally we had people that came in despite, you know, despite all the publicity or despite people telling them or pretending they didn’t know they had the flu, so we did have people that did come in and if they did come in I think there was a bit about patient education. The problem is they’d probably been sitting in the waiting room for half an hour before they got to your room and before you realised.” (L14)
5.2.2.4 Personal Protection

GPs described that personal protective equipment (PPE), such as masks, gloves and gowns, did not “make for good patient-doctor communication or rapport” (L18), and their use was impractical and time-consuming. The main difficulty was the necessity to change PPE between consultations. Many GPs reported that they ceased using PPE after a number of attempts due to the inconvenience of use and limited belief in PPE effectiveness.

“...it’s inconvenient in the hustle and bustle of general practice... The patient before might have nothing to do with flu, then you’re seeing an influenza patient then the next patient’s got something else. Taking the mask on and off all the time is inconvenient.” (M18)

“... I can’t change an apron 20 times... It takes time that I can’t afford to spend... ” (I14)

Disinclination to use PPE was particularly common among the Israeli GPs, and they indicated that patients if they were provided with masks, usually did not use them too:

“No, I didn’t put on the mask... Patients could take masks, but they did not put them on... ” (I8)

Another reason for low compliance with the PPE use was related to the lack of cooperation from patients who failed to identify themselves as the flu patients. GPs from the three countries described examples of consultations when patients started to talk about their symptoms only during the consultation. At this stage, GPs felt, it was late, and also inconvenient to put on PPE:

“...I felt it would be ridiculous to put on a mask after he is already in my room and he was sitting for maybe half an hour in the waiting room...” (I6)
The burden of personal safety arrangements in primary care was especially pronounced in Melbourne in the context of PPE supply. While in Israel and England PPE was supplied free of charge, in Australia GPs were expected to purchase PPE through normal suppliers. PPE was part of the National Medical Stockpile in Australia but was made available for GPs from this source only later on in the outbreak. GPs, however, were not prepared to stockpile PPE more than “a core stock for our staff” (M19) as they were reluctant to part-fund the public health response:

“And I don’t see why because that becomes not an issue of primary healthcare, why we should be bearing the cost of it (PPE). Cost for us is a major issue, yes.” (M19)

The issue of antiviral treatment as a post-exposure prophylaxis for GPs, who consulted the suspected cases of the 2009/A/H1N1 early in the pandemic, was raised by the Australian GPs. Australian GPs felt that it was the health authorities’ responsibility to provide them with the best protection available, and they expressed their disappointment with the fact that such protection was not offered to them:

“...but the thing was the Government should have been giving us protection 'cause when the Department said take the swabs, we said well how about some Tamiflu to protect him (the GP who took the swab)? And they didn't give him any Tamiflu. They said it's your problem.” (M4)

5.2.3 Communication with the Health Authorities

Communication with the health authorities appeared as a field that was frequently criticised by GPs from the three countries. Two types of communication problems were discussed by GPs: information flow from the health authorities to update GPs about the latest policies and
guidelines, and communication from GPs to report about the suspected cases or to provide feedback about the policies.

5.2.3.1 Communication of Policies and Guidelines to GPs

In the three countries, GPs reported that, on one hand, they were flooded with hard to process information from official sources and the media. On the other hand, they complained of not being provided with the latest information in a timely manner. GPs described the communication of policies to GPs as “not synchronous with the on-the-ground experience” (M2), guidelines being lengthy, not oriented to primary care, too frequently updated:

“At the beginning we were receiving the whole Circular of the Chief Officer of the Ministry of Health... It was impossible, just impossible... you see how we work here, we hardly have time to read few sentences, and all of a sudden you get to read this huge text...” (I3)

“So they would send us sometimes two or three e-mails in a day and these would be updating the new system for obtaining Tamiflu, the new system for seeing people...” (M15)

Many complained that critical updates were published in the media before they were sent to GPs by the health authorities. This situation was described by one doctor as “playing catch-up with the popular media all the time” (M16) and some GPs felt that it challenged the patients’ trust in their doctor as a source of reliable information.

“...you’d always hear it on the news before we got anything official, which is pretty pathetic.” (M1)
In Australia and England, GPs also reported communication being redundant and sometimes conflicting as the updates were available from several official sources, and it was unclear where to search to the latest update:

“...it was a variety of sources. I don’t think we had one single source that was the authoritative voice.” (L11)

The common opinion in this respect was that it would have been helpful “for doctors just having one set of guidance and for everyone to be sort of singing from the same hymn sheet rather than us getting updates from lots of different people.” (L3)

Specifically in Australia, GPs reported conflicting advice provided from the Commonwealth and the State:

“And the other problem is sometimes there is a conflict between the Commonwealth advice and the State advice so that it was ambiguous, do we do this or don’t we do this, when do we do this so.” (M2)

5.2.3.2 Bottom-up Communication from GPs

Time Consuming Reporting to the Authorities

Early involvement of GPs in the pandemic management in Australia and England implied that they were the main source of surveillance for the health authorities, and they were required to report every suspected case. The reporting was mandatory for arranging the virological test and prescription of antiviral drugs. This reporting was described by GPs as being time-consuming and extremely hard to perform in primary care. Organizational barriers, as well as the lack of proper facilities, were mentioned:
“...absolutely inaccessible barrier to getting treatment, ... you had to wait 45 minutes on the phone to get an approval number from somebody, and without that approval number you couldn’t initiate the treatment.” (M2)

“... at any one time sometimes we had two different doctors in the surgery both wanting to phone Public Health and that became very difficult, so I think our dependence on the phone was an issue.” (L1)

No Route to Provide Feedback about the On-the-Ground Experience to the Authorities

GPs in the three countries expressed opinions that the health authorities did not use GPs’ expertise to receive feedback about the situation on the coalface and that “there was not enough dialogue with primary care physicians” (I19). They believed that they could contribute to improve the case definition sensitivity early in the pandemic, to provide feedback about the severity of the disease and the applicability of the guidelines to the reality of primary care:

“...a lot of the stuff that was done made it a lot harder for us to do what we were meant to be doing. And this sort of bureaucratic blocking, drip feeding us with what we were allowed to do, when, in fact, if we had been allowed to do swabs and give Tamiflu, we probably would have contained it a lot earlier I think.” (M3)

Negative attitude to the “one way connection” (I19) with the health authorities was expressed by many Israeli GPs. Many felt resentment for not being able to influence decision making in a field that directly related to their professional activity, eroded the GP support for the proposed policy:
“The Ministry of Health does not talk to the primary care physicians, the Ministry of Health publishes guidelines and sends them to the HMOs.” (I15)

“...if primary care physicians are not convinced, the message is not passed to the public” (I14)

In this context, it is worth mentioning also a positive experience of using the professional electronic network by the Israeli primary care paediatricians. This professional network allowed free two-way communication between the decision makers and other members of the profession. It became a source of important updates, relevant specifically to the members of the network, and a mechanism for feedback provision. Two Israeli doctors, both primary care paediatricians, mentioned the usefulness of such communication:

“This interactive communication was very important. It served not only us (GPs) but, in my opinion, also them (policy makers), who do not live the reality of the primary clinics” (I17)

5.3 Summary of the Results

This chapter has presented findings on approaches for involvement of GPs in the 2009/A/H1N1 pandemic response in Australia, Israel and England; and on the views of GPs on the challenges they encountered participating in the pandemic response in these three countries.

It has been found that the approaches for involvement of GPs in the pandemic management in Australia, Israel and England differed in timing of GP involvement, in the responsibilities that GPs were allocated and in the structures of support for GPs planned by the health authorities. The Israeli approach was, during the containment phase of the pandemic, to manage all suspected cases in the hospital. Israeli GPs started to be fully involved in the
response once the disease became spread in the community. At that time, it was obvious that the disease was not as severe as previously thought. On the contrary, in both Australia and England, GPs managed the suspected patients from the very beginning of the pandemic. The work of GPs in England was supported by the introduction of the National Pandemic Flu Service during the mitigation phase while Australian GPs were not provided with additional support structures and their role was constant and intensive throughout the pandemic period.

Issues that were perceived by GPs as being a burden on their work during the 2009/A/H1N1 pandemic were identified in three fields of the pandemic response. First, the treatment of patients was found to be complicated by the high flow of flu and worried-well patients, unfamiliar drug treatment and mass vaccination campaign in the atmosphere of anti-vaccination messages in the media and doubts about the mass vaccination policies among GPs. Second, the findings revealed the difficulty of balancing the public health responsibilities imposed on GPs by the health authorities with the traditional role of GPs as providers of personalized care. The difficulty of infection control and personal protection during the pandemic response in primary care was also revealed. Third, the communication during the pandemic period between GPs and the health authorities was found to be problematic. The findings pointed to a lack of timely communication from the health authorities, redundant communication, complicated reporting procedures about the suspected cases and a lack of the mechanism to provide feedback about the pandemic policies.

The next chapter (Chapter 6) discusses the findings on the two thesis studies, document study (Study 2) and qualitative interviews (Study 3), integrating this discussion with the outcome of the systematic review of the literature (Study 1) presented in Chapter 2.
CHAPTER SIX

DISCUSSION

The previous chapter detailed the data that was collected and analysed to answer the research questions of this thesis. Section 5.1 provided the analysis of the data from the documents that were published by the health authorities during the 2009/A/H1N1 influenza pandemic in Australia, Israel and England. Section 5.2 presented the results of the interviews with GPs in the three targeted countries. This chapter lays the groundwork for understanding the challenges of the pandemic response in primary care by collating the data from the document study and interviews with GPs and putting it in the perspective of the existing evidence.

The purpose of this thesis was to explore the challenges of managing the 2009/A/H1N1 influenza pandemic in primary care. The objectives of the thesis have been:

- To perform a systematic review of the literature examining evidence of challenges that primary care physicians encountered responding to past pandemics or epidemics that caused public health crises
- To compare the approaches for management of the 2009/A/H1N1 influenza pandemic in primary care in Australia, Israel and England using document analysis
- To explore the views of GPs on challenges they encountered managing the influenza pandemic 2009/A/H1N1 in primary care in Australia, Israel and England using qualitative interviews

The systematic review of the literature concerning GPs’ experience during past epidemic or pandemic responses revealed that GPs from different countries experienced similar challenges. This finding indicated that analysis of the experience from different countries
presents a case of transferable learning that could be used for future response planning. Some important challenges for managing pandemics or large scale epidemics in primary care were identified. These challenges related to:

- difficulties of communication with the health authorities;
- limited supply of PPE and difficulties with its use;
- challenges in performing public health responsibilities;
- limited support from the authorities;
- lack of appropriate training;

However, the mixed nature of the evidence as well as the limited amount of studies included in the review did not allow a full-scale list of possible challenges of the pandemic response in primary care. Moreover, the review yielded little systematic information concerning the nature of the identified challenges experienced by GPs in pandemic management. The reasons for these were that only 10 studies met the inclusion criteria; the included studies had different objectives and designs; the studies provided little relevant information needed to consider the differences in patterns of the disease spread and GPs’ involvement in the response in different countries.

Study 2 and Study 3 of this thesis were designed to address the identified gap in the existing literature concerning the challenges of GP involvement in the pandemic response. The thesis investigated the experience of GPs participating in the 2009/A/H1N1 influenza pandemic response in the selected examples of Australia, Israel and England.

Study 2, document analysis, provided systematic evidence concerning the different approaches for involvement of GPs in the pandemic response in these countries. This, together with the available information concerning the spread of the disease and the differences in health system organization, made the comparison concerning the challenges of
the pandemic response in primary care in these countries useful. The fact that GPs from the three countries were allocated different responsibilities during the 2009/A/H1N1 pandemic along with the fact that organization of the primary care provision in these countries differed in a number of aspects, leads to a greater relevance of the findings to the preparedness efforts in other countries.

Study 3 of the thesis, qualitative interviews with the GPs in Australia, Israel and England, elicited challenges in providing the pandemic response in primary care from the respective of GPs. The identified challenges were consistent with the findings of the systematic review of the literature. Systematic collection and analysis of the qualitative data from the three countries allowed the identification of a full-scale list of challenges in three fields of the pandemic response: treatment of patients, performance of public health responsibilities and communication with the health authorities.

The purpose of this chapter is to provide the answer to the main research question, which underpinned the purpose of this thesis, about the challenges of the 2009/A/H1N1 pandemic response in primary care. It will be done by collating the data from the document study (Study 2) and qualitative interviews with GPs (Study 3). The collated data will be discussed in relation to the broader literature and, in particular, in relation to the systematic review that provided information concerning the challenges encountered by GPs in past epidemics or pandemics.

Some challenges of the pandemic response were found to be related to the situation in a particular country, such as timing and severity of the disease spread, level of GP involvement in the response, support provided to GPs by the health authorities and organization of primary care services. These challenges will be discussed next (Section 6.1) in relation to the heavy patient workload, surveillance reporting, introduction of infection control measures, personal
protective equipment (PPE), the vaccination campaign, and the support provided to GPs by the health authorities (if appropriate). The other challenges evidenced in each of the three countries will be discussed in Section 6.2

6.1 Three Approaches to Involvement of GPs in the Pandemic Response

The investigation of the approaches for GP involvement in the pandemic response from the selected examples of Australia, Israel and England has demonstrated that each of the selected countries employed different strategies for disease containment and the involvement of GPs once a "significant increase in risk of a pandemic" was declared (45). This is despite the fact that the three countries faced the same early reports about an outbreak of a new and virulent virus in Mexico which had caused high morbidity and substantial mortality (157).

The Israeli approach during the containment phase was to maximize the protection of GPs and the public at the expense of putting pressure on hospitals where all suspected cases were tested and treated. GPs started to be fully involved in the response once the disease became spread in the community. At that time, it was obvious that the disease was not as severe as previously thought.

On the other hand, in both Australia and England, GPs were at the front line from the outset of the pandemic, expected to both test and treat all suspected patients.

In Australia, GPs were in charge of preparing a triage plan for suspected cases and introducing infection control measures in their clinics, testing, prescribing antiviral treatment and reporting the suspected cases to the health authorities. Their role was intensive and constant throughout the pandemic period.

In England, the approach was to prevent primary care clinic attendance by the suspected patients. Throughout the containment phase, most suspected patients were assessed by GPs
during home visits. Then, advice for self-treatment and prescription of antivirals through National Pandemic Flu Service (NPFS) was provided.

6.1.1 Challenges for the Australian Approach to GP Involvement in Pandemic Management

Appearance of the pandemic flu in Australia in May 2009, against the background of autumn Influenza-like Illnesses (ILI) (108), put GPs at a disadvantage compared to their counterparts in Israel and England where the disease occurred outside the regular flu season (114, 115). ILI in Australia peaked in mid-July and early August, after which they gradually decreased, reaching normal spring seasonal rate by mid-October (108). The low sensitivity of the case definition during the early stages of the pandemic paved the way for the transmission of the disease in the community (6) and resulted in a short and very intensive containment phase.

Roles and responsibilities of Australian GPs varied according to the arrangements operating in different jurisdictions (100). Primary care clinics were supposed to develop and implement pandemic management plans for their clinics according to the workplan kits provided by the authorities in each Australian State or Territory. Primary care clinics were in charge of preparing a triage plan for the suspected cases, introducing infection control measures and reporting the suspected cases to the health authorities (104).

The first crucial challenge described by Australian GPs was the workload associated with the large flow of patients. During the containment phase, the surge of the pandemic flu patients was concurrent with the surge of the worried-well, both appearing against the background of patients with other winter infections. This workload was aggravated by the patients’ demand for personalized advice, despite the fact that the authorities provided comprehensive general information to the public about the disease, infection control, treatment and vaccination.
This revealed the tension between the public health approach in provision of information to the public and guidelines to GPs, and personalized care that the patients expected to receive from GPs. The delicate balance between performing the public health role whilst simultaneously providing personalized clinical advice will be discussed in Section 6.2.2. Intense involvement of media and the way media interpreted these public health messages will be discussed in Section 6.2.1.

In addition to the significant flow of patients, Australian GPs, differing from their counterparts in Israel and England, raised the issue of the staff absenteeism as a burden on their work. However, the absenteeism concerns were raised only from three practices in the context of quarantine of the staff members who consulted the 2009/A/H1N1 cases very early in the pandemic, when the virulence of the disease was not clear. Thus, the challenge of significant flow of patients in Australia was related to the timing and intensity of the disease spread.

The next crucial issue was practice reorganization in order to introduce infection control measures. These measures necessitated introduction of additional procedures in primary care clinics, such as patient segregation. The reviewed literature has provided little information concerning the challenges of infection control in primary care. However, the fact that in the reviewed studies GPs wanted to receive more education on infection control illustrates the importance of this subject for GPs (83, 158). In Australia, GPs were expected by the health authorities to reorganize their practices in such a way that they would become responsive to the pandemic.

The main orientation of modern primary care is on chronic care delivery, given the increasing prevalence of patients with chronic diseases and multimorbidity in general practices (159, 160). Australian GPs experienced difficulties reorganizing their clinics to introduce infection
control measures. The usual barriers stated were the limited space in clinics and difficulty in room occupancy reorganization. The results of the research showed that there was no uniform approach for applying infection control measures and separation of patients. The approach depended on whether there was spare room in the clinic or existence of an adjacent car park for patients to be examined in the car. It was also found that the approach for patients’ triage was diverse, and depended on the ability to apply infection control in the clinic and ability to allocate workforce for telephone triage or a physician for “flu only” consultations. These disconnects between recommendations and practice, which highlighted need for extensive GP consultation in policy formulation, will be further discussed in Section 6.2.1

Reporting of the surveillance data for the public health authorities during the early stages of the pandemic presented an additional challenge. Australian GPs were asked to report every suspected patient to local Public Health Units in order to arrange for the viral test and antiviral drugs. The data from the interviews with Australian GPs confirmed the finding of the systematic review regarding the time consuming nature of the surveillance reporting during a pandemic response (6, 90). The current thesis adds further that GPs felt this compulsory reporting (before taking the swab test and prescribing antiviral drugs) represented a lack of trust from the health authorities in their professional decision making and intrusion into their clinical autonomy. The unsettling feeling that they were not able to provide clinical treatment for patients without the permission of a public health officer was the dominant theme for Australian GPs, and it represents the clash of responsibilities in the face of poor role delineation. This aspect will be further discussed in Section 6.2.2.

Personal safety was the next crucial issue for Australian GPs. The health authorities in Australia failed to identify barriers for stockpiling PPE and antivirals for prophylactic treatment of the staff in primary care, despite the evidence from previously conducted studies concerning pandemic preparedness in primary care (68, 71). Also, the challenge of the PPE
access during the outbreak, in terms of its cost and shortage previously identified during the SARS outbreak and reported in three studies included in the systematic review (82, 84, 89), was obviously overlooked. At the beginning of the pandemic, the health authorities expected GPs to purchase PPE “through normal suppliers” (161). PPE was part of the National Medical Stockpile in Australia but it was only made available to GPs from this source later on in the outbreak (162). The results of this thesis confirm the finding of previous reports that GPs saw the supply of PPE and prophylactic treatment as the responsibility of the health authorities (68, 71), and suggested that the GPs’ response demonstrated their reluctance to bear the costs of the public health response. The findings indicate that the requirement to part-fund the public health response might act as a disincentive to GPs to participate in future pandemic management unless the authorities provide sufficient reimbursement.

No difficulties specific to the Australian approach were identified during the provision of the pandemic vaccine. When the vaccine became available, Australian GPs had a high level of independence deciding how to organize vaccination in their clinics. In contrast to Israel and England, the organizational process of vaccine provision was not guided by the national and local health authorities. This high level of independence is consistent with the nature of the Australian primary care system. Australian GPs are mostly self-employed and experience high levels of autonomy in their practices that they run as small independent businesses (98). In addition, the distribution of the vaccine drew upon the approach that was familiar to GPs from seasonal flu vaccine distribution. Australian GPs are economically interested in providing vaccinations as vaccine administration is reimbursed through regular fee-for-service arrangement. GPs in Australia did not indicate that they experienced particular difficulties with the organisation of the A/H1N1/2009 vaccination. They emphasised that, apart from large number of patients that were coming for personalized advice about the vaccine, the arrangement was not different from usual seasonal vaccination. However,
delivery of mass vaccination in a situation of high demand with a more virulent virus may present a real operational challenge for Australian GPs. Greater coordination would be needed on state and national levels.

The role of the GPs in Australia was intensive and constant throughout the pandemic period. They were at the front line handling a new and potentially lethal contagious disease with a potentially lethal virus during the containment phase; treated the excessive numbers of flu and worried-well patients during the mitigation phase; and organized and administered pandemic vaccinations when the vaccine became available. However, they felt the support provided to them from the health authorities was inadequate in terms of the resource supply and workload relief. Their work was not supported by additional structures or arrangements organized by the health authorities to provide workload relief during the containment phase as it happened, for example, in Israel, or the mitigation phase as it was in England. The expectations of GPs to receive close, practice-specific advice on how to organize the infection control and vaccination campaign in the practice were not met, and neither were their expectations for PPE supply. The identified lack of support highlights a systemic disconnect between health departments – federal and state – and general practice. This disconnect needs to be addressed in pre-pandemic planning if the future pandemic is to be managed by GPs as frontline practitioners.

### 6.1.2 Challenges for the Israeli Approach to GP Involvement in Pandemic Management

In Israel, the influenza pandemic occurred outside the regular flu season, which facilitated the detection of the suspected cases. The disease spread in three escalating waves – at the beginning of August, mid-September and mid-November (114), and was much longer compared to regular flu season in previous years (106). The efforts to contain the disease in
Israel were facilitated by the school closure over the summer break and autumn festive season (106, 107).

The Israeli policy of treating all suspected cases in hospitals at the beginning of the outbreak decreased the risk to GPs of exposure to the potentially virulent virus, and freed them from the workload associated with the reporting of the cases to the health authorities and patient segregation. The strict centralized approach during the initial response reflects the Israeli disaster management model that was developed to address the national security needs of Israel (99, 163). The Israeli influenza pandemic preparedness plan implies civil-defense collaboration during a severe pandemic, which means engagement of the defense sector to manage medical problems in a situation when the civil medical structures become overwhelmed (164). The use of military resources to solve public health crises is not unusual in Israel. Indeed, such cooperation was successfully used to manage the Avian Influenza outbreak in poultry in 2006 (164). During the 2009/A/H1N1, the option to involve the defense sector was considered but, after the assessment of the pandemic severity, was not pursued (164).

Until the Flu Clinics were organized in big HMO clinics in the middle of June, only 158 cases of the 2009/A/H1N1 flu were identified in Israel, so hospitals were not overwhelmed and could cope. The approach to use hospitals for testing and treating the suspected cases, even those with very mild disease, was also facilitated by the fact that most Israeli hospitals are publicly owned and work under the centralized pandemic protocol of the Israeli Ministry of Health (164). This allowed the assessment and testing of the patients to be performed according to uniform protocols and enabled the best possible surveillance of infected cases. It is believed that the data collected included most symptomatic cases that occurred in Israel and their contacts, which allowed mapping of the spread of the disease throughout the country (163).
In addition, the rigid containment measures, which included hospitalization for isolation of all suspected cases during the first two weeks of the containment, may have been promoted by the Israeli health authorities in response to an expected shortage of antiviral drugs, as outlined in the Israeli pandemic preparedness plan (101).

Thus, the limited involvement of Israeli GPs in the pandemic response during the containment phase was made possible by the nature of the pandemic spread in the country and specific characteristics of the Israeli health system. GPs started to assess flu patients when the disease became widespread in the community. By this time, the information about the overall mild nature of the virus became available from countries where the first wave of the disease has already passed, such as Australia.

The challenge of the increased workload when GPs started to consult the flu patients was described. However, Israeli GPs indicated that the surge of the anxiety in the community, characterised by increased consultations for people who were concerned they may get sick, finished before the main surge of pandemic flu patients.

Interestingly enough, Israeli GPs were less compliant, compared to their Australian counterparts, with the need to introduce infection control measures in the clinics, as they believed these measures would not be effective in a situation when the disease had spread in the community. Similarly, Israeli GPs were not enthusiastic about the PPE use. In contrast to the situation in Australia, PPE was distributed to primary care clinics through HMOs free of charge, so the issues of cost and accessibility were not raised during the interviews. GPs revealed low compliance with PPE use, emphasising the inconvenience of PPE use in primary care in terms of rapport with patients and time needed to change protective gear between consultations.
In one of the studies included in the systematic review, the compliance with PPE use during SARS in Singapore was explained using the Becker Health Belief Model which acknowledges that changes in behaviour to reduce threat depend on the perceived vulnerability, severity, effectiveness and barriers (89). In that study, GPs from Singapore changed their behaviour to accommodate the supply problems and inconvenience of PPE use, as they believed that the effectiveness of PPE in decreasing the threat on their lives outweighed the barriers. It is likely that Israeli GPs who started to consult flu patients later in the pandemic, had a lower risk perception of the disease, compared to their Australian counterparts, which reduced the perceived usefulness of PPE and the infection control measures. Thus, Israeli GPs were unwilling to overcome the barriers of making changes in their usual practice, as they did not see the need for these changes based on the prevailing epidemiology of the disease.

During the vaccination campaign, similarly to the Australian experience, health authorities asked Israeli GPs to recommend the vaccine to all patients. However, in contrast to their counterparts in Australia, where the business approach for the vaccine provision was implied by the fee-for-service reimbursement, and differing from GPs in England who were reimbursed for vaccine provision by a special agreement (116), Israeli GPs had no financial incentive in the vaccine provision. In fact, while some small primary care clinics in Israel offered vaccination for their patients, the vaccine could be administered in the big HMO clinics without GP involvement. This might have negatively influenced the uptake rate in the general public. The importance of the GPs’ role in the vaccination campaign was emphasised in recent studies that reported the weightiness of GPs’ advice on the patients’ decision to be vaccinated against the 2009/A/H1N1 (165, 166). Indeed, the vaccine uptake in the total population in Israel was reported to be as low as 9% (113), compared to 18% in Australia (109). This is despite the fact that in Israel the vaccination campaign was concurrent with the
high spread of the disease in the community, while in Australia the vaccine became available when the flu wave had passed with the beginning of the spring season in the southern hemisphere. Also, other factors might have negatively influenced the vaccine uptake. The impact of media involvement in the vaccination campaign will be addressed in Section 6.2.1.1., and limited support for a mass vaccination campaign by GPs will be discussed in Section 6.2.1.2.

Compared to the data from the interviews in two other countries, it seems that Israeli GPs were more critical of the health authorities for not involving them in the pandemic planning and decision making during the pandemic. They did not acknowledge the fact that they were protected during the containment phase of the disease because all the suspected cases were managed in the hospital, and many expressed the idea that the pandemic response of the health authorities was “over-kill”.

6.1.3 Challenges for the English Approach to GP Involvement in Pandemic Management

As in Israel, in England, the disease appeared outside the regular flu season and the pandemic flu spread was affected by school closure over the summer break (107). The disease spread in two waves – mid-July and September-December (115).

In England, the approach was to avoid primary care clinic attendance by the suspected patients during the whole pandemic period. Throughout the containment phase, this was achieved by the strategy of assessing the suspected patients during home visits. Home visits are a routine practice and an important component of the workload in primary care in England which was reported to represent about 10 percent of all consultations (167).

The data from the interviews with GPs from England showed the challenges of implementing this approach in primary care. The burden of workload associated with home visits, phone
consultations and surveillance reporting to the health authorities was evident from the
interviews with English GPs.

When it was perceived that the pressure of home visits became unbearable, the National
Pandemic Flu Service (NPFS) was organized by the health authorities a few weeks into the
mitigation phase to ease the pressure on primary care providing advice and prescriptions of
antiviral drugs over the phone or internet (151). The approach of the supported self-care and
wide distribution of the antivirals to symptomatic flu patients was part of the pre-pandemic
planning for primary care in England (105). This, indeed, resulted in a reduction in GPs’
consultations (168, 169). The data from the interviews showed that this approach was
generally welcomed by GPs, which is consistent with the findings of a cross-sectional survey
conducted in the UK (81). However, this in turn generated further concerns about the safety
of phone consultations performed by non-clinical staff, that were also reported in other
studies (81, 170). In addition, the strategy of widespread antiviral treatment of clinical cases
that was suggested for efficiency to reduce the disease transmission (171) was questioned by
the results of a recent study that showed the low adherence rate to the antiviral treatment in
practice (52). That study estimated the levels of Tamiflu in water samples taken from two
waste water treatment plants in England, concluding that the compliance rate of the patients
with the prescribed antiviral treatment was 45% to 60%. This suggests that approximately
half the collected antivirals were not used which questions the efficacy of this strategy to
reduce the disease transmission.

The results from this thesis suggest that although the NPFS reduced the load of the patients
with mild symptoms and the worried well, GPs in England indicated that additional support
was needed in the form of clear advice to manage complicated cases that were diverted from
the NPFS to primary care. The patients who were advised to consult GPs rather than the
NPFS were patients with serious underlying illnesses, pregnant women, sick children under
one year old, patients whose condition or whose child’s condition suddenly got much worse, and those whose condition was still getting worse after 7 days (5 days for a child) of treatment (151).

The finding concerning the expectations of GPs to receive more detailed advice on complicated patient treatment during the pandemic is consistent with the findings of two studies included in the systematic review. In these studies, GPs reported the lack of confidence and the need for more professional education in dealing with SARS patients in Canada; and the 2009/A/H1N1 and SARS patients in Hong Kong (83, 158). However, GPs from Australia and Israel interviewed for this thesis, while expressing the lack of confidence in infection control arrangements, did not regard the issue of patient treatment as a challenge. This might be because most flu patients who consulted GPs in England were diverted from the NPFS as complicated cases, while in Australia and Israel all cases that could be treated in primary care were treated by GPs. Another reason for this could be that in our study, GPs from England were younger and had fewer years of experience compared to the sample from Australia and Israel.

Apart from treating complicated cases diverted from the NPFS, GPs from England indicated that they consulted many patients who needed personalized clinic advice. This is despite the extensive information provided by the NPFS. The possible explanation for this phenomenon is that the provision of information from the official sources addressed the cognitive risk judgment of the population but not the "emotional" concerns. These were found to be significant predictors of behavioural responses during the initial stages of the 2009/A/H1N1 outbreak (172), and were not addressed. Also, it was reported that while about 90% of members of the public across the UK were satisfied with the amount of information about the 2009/A/H1N1, 37% still had information they wanted to know (173). Between the additional information that the public wanted to know, the most common types were details on
symptoms, and advice on prevention and treatment (173). Since these pieces of information represented concerns that are usually addressed during primary care consultations, this may provide an explanation for the high presentation rate of patients seeking personalized advice. The aspect of patient expectation to receive personalized advice concerning public health information about the disease will be addressed further in Section 6.2.2.

Differing from the vaccination policies in Australia and Israel, in England, only the population from at-risk groups was eligible to get the pandemic vaccine. Notably, in this study, English GPs seemed to be less supportive of the vaccination campaign than their counterparts in Australia and Israel. This was evident from the large numbers of English GPs who declined vaccination and were not comfortable recommending the vaccine to patients. However, GPs from England in this sample, as stated earlier, were younger than in Australia and Israel and other quantitative studies have showed that a younger age in health care workers was also associated with lower vaccination rates (174, 175).

6.2 Challenges Shared by GPs from All Three Countries

The previous section highlighted challenges of the pandemic response in primary care in Australia, Israel and England. It has been seen that the involvement of GPs in the pandemic response in these three countries differed in timing and allocated responsibilities, and GPs experienced different challenges managing the pandemic. The difficulties, which were shared by GPs from the three countries and represented the challenges of the pandemic response for primary care in general, will now be outlined.
6.2.1 *GP Difficulties in Following Pandemic Guidelines*

The findings of the thesis revealed that GPs in different countries experienced difficulties in translating the pandemic policies and guidelines into practice. The challenges of guideline implementation, particularly guidelines for chronic conditions, are known and well researched. A number of theoretical frameworks were suggested to understand the cognitive steps physicians made in adhering to clinical guidelines (176); to classify the barriers for guideline implementation (177); and to analyze the patterns of drop-off in clinical guideline utilization (178). Analysis of the current thesis findings suggests that, along with the known challenges for clinical guidelines implementation, GPs experienced challenges that were specific to the pandemic management in primary care settings.

To outline the barriers for policy implementation during the pandemic response, a framework developed by Cabana et al. (1999) was used. This framework was chosen because Cabana et al. adopted a broad approach for inclusion of different types of clinical recommendations: clinical practice guidelines, practice parameters, clinical policies, national recommendations and consensus statements (177). This broad approach is particularly useful in regards to the pandemic policies because different formats of policy communication to GPs were used during the 2009/A/H1N1 pandemic.

The framework is based on a systematic review of 76 articles that investigated barriers to clinical recommendation implementation. Cabana et al. identified 293 barriers and organized these into three categories: barriers affecting knowledge (lack of awareness or familiarity with a guideline); barriers affecting attitude (lack of agreement with a specific guideline or guidelines in general, lack of outcome expectancy, lack of self-efficacy and lack of motivation); and barriers affecting behaviour (external barriers including patient factors, guideline factors and environmental factors). The underlying conceptual framework
suggested that to conform with guidelines, physicians must be aware and be familiar with them and overcome barriers of negative attitude and external barriers.

6.2.1.1 Barriers Affecting Knowledge

The first set of barriers for clinical policy implementation, knowledge, consists of the barriers of lack of awareness and familiarity with the guidelines. In this research, the major barrier during this step was related to the volume of information from the health authorities and the manner in which the information was released.

In this research, all participants were aware of the pandemic guidelines very early in the pandemic. The alert documents were sent by the health authorities of the three countries to all GPs directly and through the mid-level organizations that duplicated or customized these alerts to local circumstances. No reports of limited guideline accessibility were found. However, some GPs revealed that their familiarity with the guidelines was limited. Some barriers to becoming familiar with the guidelines were similar to those already known for regular clinical practice, which included the high volume of information and the lack of time. However, additional barriers were identified. These included multiple sources of information, frequent updates, and guidelines not being oriented to primary care.

High Volume of Information and Lack of Time

Lack of time and the length of documents were reported by the research participants as barriers to stay updated with the frequent policy changes. This is consistent with the findings of the studies concerning the barriers for guideline adherence in general (177, 179). However, during the pandemic response, when the changes in policy were much more frequent and were happening against the background of increased pressure of significant flow of patients
and the necessity to perform additional public health responsibilities, the negative influence of these barriers on the ability of GPs to implement the policies increased.

Multiple Sources of Information for GPs

The thesis results have shown that multiple sources of information challenged the effectiveness of the emergency communication with GPs. This is consistent with the findings of recent studies that redundant messages during emergency situations increase communication challenges (180, 181). GPs in the three countries received information from different organizations (national, state, mid-level authorities and professional organizations) and they reported that these communications were uncoordinated and sometimes confusing. Specifically, Australian GPs reported conflicting information provided from the national and state level authorities about virological testing and prescription of antivirals during the initial stage of the pandemic. Difficulties managing duplicated information from multiple sources were also outlined in the results of the systematic review in this thesis (81, 82).

Frequent Updates of Information Provided to GPs

The volume of the documents reviewed for this thesis in the three countries and their content suggested that multiple changes were introduced during the containment phase of the pandemic management in case definition, infection control and personal protection measures, and in terms of treatment protocols. The flexibility in policy management during the 2009/A/H1N1 pandemic undoubtedly had many positive aspects; however, it presented one of the most challenging issues for GPs.

The evidence from the reviewed literature indicated that frequent updates of guidelines presented operational challenges for GPs. Coping with rapid changes in policy was
challenging for GPs both during SARS outbreak as well as during the response to the 2009/A/H1N1. This thesis confirms the identified difficulty and provides an explanation of the adverse effects of frequent changes in policy for primary care.

GPs in this research found it difficult to keep with the pace of updates due to the lack of time and the lack of confidence they felt concerning whether they provided treatment according to the latest update. Also, GPs experienced difficulties accommodating daily updates in their work routine, due to the unusual process of guideline dissemination which lacked an educative process and the time for them to absorb the guidelines for their clinical practice. In addition, the rapid response during pandemic management, which must take place in a matter of days rather than months, is extraordinary for primary care where responses to guidelines with longer timeframes, such as vaccination programs or chronic disease management policies, are the more usual way in which changes to medical practice are communicated (182).

Pandemic Guidelines not Oriented to Primary Care

In all three countries, GPs stressed that the guidelines provided by the health authorities suffered from a lack of understanding of the primary clinics. This finding is consistent with the finding of the systematic review where screening tools and guidelines not tailored for primary care were reported in Hong Kong during the SARS outbreak (83) and in Australia during the 2009/A/H1N1 flu pandemic (90).

GPs from the current research especially highlighted the problematic applicability of the guidelines for infection control and personal safety measures. The fact that during the 2009A/H1N1 pandemic GPs were more vulnerable to infection, as evidenced by higher infection rates compared to hospital staff (183), emphasises the challenges of controlling
infection transmission in primary care settings (184, 185). The findings suggest that the guidelines to control infection transmission in primary care should take into consideration the infrastructure and resource constraints as well as the importance of personalized communication between GPs and their patients.

The difficulty in implementing pandemic guidelines during the 2009A/H1N1 pandemic may well indicate that GPs’ involvement in pre-pandemic planning was insufficient. GPs in this thesis, similar to previous research (68), saw their involvement in pre-pandemic planning as critically important, but it appeared that they had little influence on the final published guidelines which remained difficult to implement in practice.

6.2.1.2 GP Attitudes to Pandemic Guidelines

The evidence of barriers that affected the attitudes of GPs to the pandemic policies and guidelines were presented in the findings of this thesis as a lack of authority of the pandemic guidelines; a lack of agreement with some pandemic policies; and a lack of established route to provide feedback about pandemic policies.

Lack of Authority of the Pandemic Guidelines

In the three countries studied for this research, regular clinical guidelines are developed by representatives of the profession: relevant professional bodies, such as The Royal Australian College of General Practitioners (RACGP), professional societies of the Israeli Medical Association (IMA), or National Institute for Health and Clinical Excellence in the UK (NICE).

The pandemic guidelines during the 2009/A/H1N1 response were introduced by the Departments of Health that are legislative bodies not usually involved in guideline
development. Previous research, however, found that physicians, including GPs, have more confidence in guidelines developed by their own professional association (178).

The pandemic guidelines were developed rapidly and were based on the predictions of a much more virulent A/H5N1 virus. Although the guidelines were based on the pre-pandemic plans developed in the three countries a few years beforehand, the relevance of these plans to the 2009/A/H1N1 pandemic was questioned by the GPs. In contrast, clinical guidelines are usually systematically developed over a substantial period and are linked to evidence that is supported by the professional research literature. Thus, the pandemic guidelines did not have the necessary authority in the eyes of GPs.

**Lack of Agreement with Some Pandemic Policies**

Evidence of limited agreement of GPs with some of the pandemic policies was identified. Specifically, limited agreement was reported concerning the policies of antiviral drug prescription and mass vaccination.

In all three countries GPs were challenged by the necessity to work under strict guidelines to prescribe an unfamiliar drug, the safety and efficacy of which were questioned. The low level of confidence in antiviral medication was not exclusive to GPs and was also found among hospital health care workers (186). Prioritizing public health guidelines for antiviral prescriptions meant challenging the trusted patient-doctor relationship by devaluing the expectations of patients for the best-possible personalized care (187).

In the three countries, GPs were involved in the vaccination campaign. They were involved in the provision of advice and information about the vaccine; however, many GPs disagreed with the health authorities on the mass vaccination. Even though GPs in this research did not express belief in conspiracy theories about the vaccine as, for example, did health care
workers in Turkey (188), many revealed their lack of support of the mass vaccination strategy through questioning the necessity and effectiveness of mass vaccination and, to lesser extent, its safety.

Having to deliver what was perceived to be an unconvincing public health policy created difficulties for GPs as they had to balance between the necessity to vaccinate, the safety of their patients and the benefits of patient immunity at the community level. Similar concerns were faced by GPs in Japan where advice on vaccination was associated with GPs’ experience in treating A/H1N1/2009 patients (166). GPs in our research usually resolved this dilemma by executing their clinical autonomy while advising patients who, in their opinion, would personally benefit from vaccination, even if the official guidelines explicitly advocated wider distribution of the vaccine. Considerations at the public health level, that took into account the importance of lowering the disease transmission, were usually not raised. Difficulties in treatment with an unfamiliar antiviral drug and a rapidly launched vaccination program highlighted GPs’ concerns about implementing public health policy in which they were not convinced, or which contradicted their clinical judgment.

*Lack of Established Feedback Mechanism for Pandemic Policies*

The data from the interviews suggest there was no established method of providing feedback to the health authorities about the appropriateness of the guidelines to the situation at the coalface. The only positive (and, unfortunately, limited) experience in this respect was reported by the Israeli primary care paediatricians who used the electronic professional network for two-way communication with the health authorities.

Interviewed GPs felt that they could contribute to the applicability of guidelines in certain regions based on their knowledge of disease epidemiology in that region, as distinct from the
state epidemiology. They also felt they could improve the relevance of the guidelines to primary care by adjusting them to the nature and the severity of the cases that they consult in primary care, as opposed to the cases that were admitted to the hospital. They felt frustrated that the health authorities did not use their expertise to make policy decisions during the pandemic.

GPs’ role in the pandemic response was challenged by the fact that they harboured doubts about some of the pandemic policies and, without a feedback loop to the public health authorities, GPs reverted to their professional autonomy, unwilling to follow official guidelines. For example, the GPs from the three countries were less willing to prescribe antivirals compared to the more liberal approach advised by the authorities. Indeed, some GPs in Israel and Australia advised vaccine only to the patients at clinical risk, despite the recommendation of the authorities to vaccinate the entire population.

6.2.1.3 Barriers Affecting GP Behaviour

The evidence of barriers that affected the behaviour of GPs was related to the environmental factor of massive involvement of mass media in the process of policy dissemination.

Media Involvement

As distinct from the regular clinical guideline communication, policy updates during the pandemic were happening in an atmosphere of constant media attention. Mass media plays a key role in informing the public about risks during public health crises related to large-scale epidemics or pandemics (189). However, there are a number of communication challenges in delivering public health messages.
First, the news coverage of the crisis diminished as a pandemic novelty waned (190). Second, the coverage of a crisis was found to be influenced by a small set of news values: catastrophic potential, cultural and geographical proximity, unfamiliarity and uncertainty (190). The coverage during the initial stage of the pandemic usually focused on the spread of the virus, rather than on any systemic or individual level response (191) while, as the pandemic progressed, journalists tended to prioritise their role as critics of the government pandemic policies (190). Moreover, protecting their professional independence, journalists were found to express reluctance to publish the government agenda on account of concerns of being exploited by either government or commercial interests (190). These challenges framed public response to the public health messages from the health authorities during the 2009/A/H1N1 pandemic.

In that way, the public’s concerns about the relevance of the communicated information to their own health was not satisfied, despite the extensive public health advice that was communicated by the health authorities through the mass media during the containment phase of the pandemic. Constant changes in the public message contributed further confusion to the mass media reports that were oriented to highlight the spread of the disease. As the public see GPs as a trusted source of information about their health (192), the patients went to the GPs asking them to translate the public health information to the individual patient level. This quest of the public for personalized information increased primary care consultation rates during the containment phase, which formed operational difficulties at the primary care level. Apart from the pressure of workload associated with increased consultation rates, GPs in this research reported finding themselves in an awkward position when they were not provided with the timely information from the health authorities to respond to the concerns of their patients.
Similarly, the intensive involvement of media was one of the main challenges for the GPs during the vaccination campaign when they had to provide advice in response to the anti-vaccination messages. GPs felt this questioned their professional authority. Traditionally, patients saw their doctor as an ultimate source of reliable information regarding their health. However, broad and speedy access to internet based medical information during the last decade presented patients with the challenge of encountering conflicting clinical advice (193). During the pandemic vaccination in 2009, patients tried to resolve this conflict by seeking GPs’ advice; however, many GPs in this thesis indicated that they had no better sources of information than their patients did. Moreover, many GPs indicated that they were influenced by the mass media and found it difficult to reconcile conflicting information. Difficulty in dealing with conflicting or insufficient information about the vaccine was also reported by health care workers in general (194).

In addition, the 2009/A/H1N1 was the first pandemic that was managed engaging the public through media, including social net-based messaging tools (so called “blogosphere”) (49). These web-based networks are a relatively new phenomena, and their potential was not taken into account during the planning. The experience during the 2009/A/H1N1 influenza pandemic showed that these social web-based networks can have both positive and negative impact on the pandemic policy implementation. On the one hand, these networks can be efficiently used for policy discussions between health authorities and GPs as it happened in some cases in Israel. On the other hand, the intensive involvement of the new-age mass media created practical difficulties for efficient communication of the policies and guidelines for GPs. In many instances, the mass media and social networks were reporting about the policy changes before health authorities had sent the official updates to GPs. In addition, anti-vaccination groups broadly used these social networks to promote their agenda during the mass vaccination campaign, which caused considerable damage resulted in low uptake of the
vaccine. Therefore, the use of social web-based networks to support the policy implementation should be discussed as well as ways to limit their harmful effect.

6.2.2 Role Delineation in Pandemic Management

Section 6.2.1 has discussed the difficulties in following the pandemic guidelines in the real world of primary care. These difficulties were in evidence in each of the three countries. This section will present the challenge of participating in the pandemic public health response whilst providing personalized primary care. The potentially conflicting roles of GPs during the pandemic response will also be discussed in regards to the role theory, which presumes that when there is inconsistency in expected behaviour, individuals will experience stress and perform less effectively (195). Two role constructs will be discussed – role ambiguity and role conflict.

The literature in the systematic review concerning the challenges GPs encountered participating in pandemic or epidemic responses pointed to a number of conflicting roles GPs had to perform. The necessity to prioritise scarce resources (vaccine provision) (85) or provide care in a situation of a high flow of patients and inability to employ efficient infection control (90) were examples of such potential role conflicts. The reviewed literature also pointed out that participation in the pandemic response had a negative emotional effect on GPs (83, 84). However, the emotional distress was not linked in the reviewed studies to the performance of conflicting roles, and analysis of such a conflict was not provided.

In this research, GPs in the three countries reported that they experienced pressure of expectations to perform public health responsibilities. The roles of GPs during pandemics were not clearly defined before the 2009/A/H1N1 crisis and GPs indicated that their role
suffered from ambiguity and the conflict of public health versus personalized treatment responsibilities.

*Role Ambiguity in Pandemic Management*

GPs were frequently confronted with situations where there was a lack of information while the guidelines provided were conflicting or unclear. This lack of information created role ambiguity – the uncertainty regarding expectations associated with the role (196).

Specifically, the uncertainty was reported about duties (uncertainty whether to provide care to all patients, to treat only the flu patients, or to prioritize their own patients); authority (using strict guidelines for prescription of antivirals and testing versus relying on their own clinical knowledge and experience); relationship with other authorities involved in the response (PPE supply, provision of feedback about the policies); existence of clear guidelines (difficulty to keep up with frequent updates and conflicting guidelines).

*Role Conflict*

Role conflict is defined as incompatibility or incongruence in the requirements of the role (195). This incompatibility or incongruence may result in various kinds of conflicts. In this thesis, the following conflicts were identified: dual hierarchy for provision of pandemic guidelines; and provision of care in the interest of a patient versus collective good.

The role conflict for working in medical settings such as hospitals was previously investigated and was found to be related to the dual hierarchy – loyalty to the employing bureaucratic organization (for example the hospital) and to the professional collegial authority (197). This conflict, however, was not described in relation to the pandemic or epidemic response. In this study, this type of role conflict was evident, as mentioned earlier,
when GPs questioned the authority of the guidelines that were provided by the government health departments rather than by representatives of the profession.

Another type of conflict – the interests of a particular patient versus the collective good – was also identified. GPs had to provide personalized care while working under strict guidelines that stressed the collective good of containing the disease. This situation was seen by GPs as limiting their professional autonomy and challenging the patient-doctor relationship. Incompatible and concurrent responsibilities for individual and collective created role conflict (198) that sometimes was resolved by GPs prioritizing the good of the individual patient (reluctance to prescribe an unfamiliar drug, the safety and efficacy of which were questioned), and sometimes prioritizing of the public health goal of containing the disease (introduction of infection control measures).

6.3 Summary

The systematic review of the literature yielded the list of challenges that GPs faced participating in past responses to pandemics or large-scale epidemics. The challenges identified were not exclusive to specific countries and encompassed different outbreak responses. However, there was little systematic information identified concerning the nature of the challenges experienced by GPs; specifically, how these challenges related to the certain conditions, such as the spread of the disease or the level of GP involvement in the response.

The analysis of the documents published by the health authorities in Australia, Israel and England indicated that the involvement of GPs in the pandemic response differed in timing and allocated responsibilities. In Australia, the role of GPs was intensive throughout the pandemic period and they were the first responders from the beginning of the disease spread and until the last pandemic patient. In contrast, in Israel, GPs started to be involved in the
response once the disease spread in the community. Before this, all suspected cases were assessed in the hospital. In England, the strategy was to prevent primary care clinic attendance. GPs were assessing the suspected cases during home visits. During the mitigation phase, advice for self-treatment and prescription of the antiviral drugs were provided through NPFS.

Data from the qualitative interviews with GPs from the three countries, together with the results of the document analysis, enabled to identify two types of difficulties for pandemic response in primary care:

(1) difficulties that were related to the situation in a particular country, such as timing and severity of the disease spread, level of GP involvement in the response, support provided to GPs by the health authorities, and organization of primary care services in a country;

(2) difficulties that were evidenced in each of the three countries and thus presented generic challenges for the pandemic management in primary care.

Challenges specific to the situation in each of the three countries are presented in Table 6-1.
Table 6-1 Challenges Specific to the Pandemic Situation in Australia, Israel and England

<table>
<thead>
<tr>
<th>Australia</th>
<th>Israel</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>• high flow of flu patients and worried-well, staff absenteeism</td>
<td>• low compliance with infection control measures</td>
<td>• the burden of home visits, phone consultations and reporting</td>
</tr>
<tr>
<td>• practice reorganization</td>
<td>• low compliance with PPE use</td>
<td>• no support in managing complicated cases</td>
</tr>
<tr>
<td>• reporting of the surveillance data</td>
<td>• no financial incentive in the vaccine provision</td>
<td>• patients needed personalized advice after consulting NPFS</td>
</tr>
<tr>
<td>• personal safety</td>
<td>• critical of the health authorities for not involving them in decision making</td>
<td>• limited support of the vaccination campaign</td>
</tr>
<tr>
<td>• work not supported by additional structures</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Challenges evidenced in all three countries are summarized in Table 6-2.
Table 6-2 Challenges Evidenced during the Pandemic Management in all Three Countries

<table>
<thead>
<tr>
<th>Difficulties in Following Guidelines</th>
<th>Role Delineation Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Barriers Affecting Knowledge</td>
<td>• Role ambiguity — uncertainty regarding expectations about:</td>
</tr>
<tr>
<td>➢ <em>High volume of information and lack of time</em></td>
<td>➢ duties (prioritization)</td>
</tr>
<tr>
<td>➢ <em>Multiple sources of information</em></td>
<td>➢ authority (guidelines/clinical experience)</td>
</tr>
<tr>
<td>➢ <em>Frequent updates</em></td>
<td>➢ relationship with other authorities involved in the response (PPE, feedback)</td>
</tr>
<tr>
<td>➢ <em>Guidelines not oriented to primary care</em></td>
<td>➢ unclear guidelines</td>
</tr>
<tr>
<td>• GP Attitudes to Pandemic Guidelines</td>
<td>• Role conflict — interests of a particular patient versus the collective good</td>
</tr>
<tr>
<td>➢ <em>Lack of authority of the pandemic guidelines</em></td>
<td></td>
</tr>
<tr>
<td>➢ <em>Lack of agreement with some pandemic policies</em></td>
<td></td>
</tr>
<tr>
<td>➢ <em>Lack of established feedback mechanism for pandemic policies</em></td>
<td></td>
</tr>
<tr>
<td>• Barriers Affecting GP Behaviour</td>
<td></td>
</tr>
<tr>
<td>➢ <em>Media involvement</em></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER SEVEN

CONCLUSION AND RECOMMENDATIONS

This final chapter of the thesis has three sections. The first section provides a brief overview of the thesis and puts the findings in the perspective of the thesis purpose and objectives. Significance of the research findings is also discussed. Further, in Section 7.1.2, the conclusion about the lessons learned from the three investigated approaches for involvement of GPs in the pandemic response, as well as general lessons, is presented. In the Section 7.2, practical recommendations for the future pre-pandemic planning, inferred from the analysis of the thesis results, are presented. Section 7.3, final remarks, concludes the thesis.

7.1 Conclusion

7.1.1 Overview of the Thesis and Its Contribution to Knowledge

The purpose of the research performed for this thesis was to investigate the challenges that GPs faced during the 2009/A/H1N1 pandemic response. The research studies in the thesis investigated the response to the 2009/A/H1N1 pandemic in Australia, Israel and England. The fact that these three countries represent three different approaches for primary care delivery organization contributes to the greater relevance of the study findings for the future pre-pandemic planning.

A significant gap concerning the nature of challenges that GPs encountered responding to the past pandemics and large-scale epidemics was identified in the systematic literature review presented in this thesis. This gap was addressed in this research by means of a combined thesis design. First, analysis of the three different approaches for involvement of GPs in the
pandemic response was employed through systematic review of the documents that were published by the health authorities in Australian, Israel and England during the pandemic response. Second, qualitative data concerning the experience of GPs in the three countries during the response to the 2009/A/H1N1 influenza pandemic was collected through in-depth interviewing and was analysed.

Analyses of the data collated from the two thesis components, Study 2 and Study3, generated new knowledge concerning the challenges that GPs experience participating in a pandemic response. In particular, it identified the challenges of the pandemic response from the perspective of GPs, differentiating between difficulties of a situational nature (those relating to the disease spread and the roles allocated to GPs by health authorities), and difficulties that are intrinsic to the pandemic response in primary care in general (unrelated to any specific infectious disease with a pandemic potential or the way primary care services are organised in a country).

This thesis is unique in the way that it is based on the sample of GPs recruited in three different health systems shortly after the 2009/A/H1N1 pandemic. Rich qualitative data were collected by means of the in-depth interviews with the GPs. These data permitted the exploration of the pandemic response in primary care, from the perspective of GPs who actually participated in the pandemic management. The thesis compares three different approaches for involvement of GPs in the pandemic response; however, the findings can be expanded beyond the three countries where the research was done.

7.1.2 Lessons Learned from the 2009/A/H1N1 Pandemic Response in Primary Care

The experience of the 2009/A/H1N1 influenza pandemic management highlighted the centrality of primary care in the pandemic response. The findings of this thesis showed that
GPs were intensively involved in the pandemic response in the three investigated countries, despite the differences in the responsibilities that were allocated to them. The connection of GPs to the populations they routinely serve and trust that these populations have in GPs, positioned them as the pivotal figures when people were concerned about their health or the possibility of getting sick. This situation is not likely to change in the future.

However, the outcome of this thesis highlights a significant problem. Despite intensive preparations for the influenza pandemic that were undertaken during the last decade, the response in primary care leaves much to be desired. Investigation of three different approaches for involvement of GPs in the pandemic management showed that none of these approaches worked smoothly. If the virus was more virulent, it is unclear whether the general practice would be able to bear the burden of the pandemic response. Each of the investigated approaches presented a unique experience that is important to take on board in the evaluation of the pandemic response and planning for its improvement. Lessons learned from the experience of each of the three countries, as well as apprehension of the primary care response in general, will now be outlined.

*Lessons Learned from the Australian Experience*

Readiness of GPs to develop pandemic response plans for their practices, as was expected by the Australian health authorities, should not be taken for granted. Such planning, especially if it includes funds investment in stockpiling of PPE or preparedness for rapid reorganization of the practice, has proved to be difficult for GPs. In the health systems, where primary care is decentralised, and general practices are run as private businesses, health authorities must plan extensive support for GPs who will inevitably perform public health responsibilities.
Lessons Learned from the Israeli Experience

The health authorities should take into consideration that a lack of incentives for vaccine administration may result in limited outcomes of the vaccination campaign. Similarly, low compliance with the introduction of infection control measures and the PPE use may be evident in a situation where there is little perception of danger related to the disease. Such disconnect between the pandemic management policies and practice in primary care may lead to practical barriers for pandemic policies implementation.

Lessons Learned from the English Experience

The approach for assessment of the infected patients during home visits is not sustainable and could be applied for a very limited period only. The National Pandemic Flu Service (NPFS) that was introduced during the mitigation phase has proved itself as an efficient approach able to reduce the pressure on primary care. The NPFS, however, had a number of serious deficiencies related to the safety of phone consultations provided by the staff that was not clinically trained and efficiency of liberal prescription of the anti-viral drugs. Plans to overcome these deficiencies should be made in order to ensure that this system can be efficiently used in the future.

General Lessons

The findings of the research showed that numerous barriers exist for implementation of the pandemic policies in general practice during the pandemic response. These barriers were found to be consistent with the barriers for clinical guidelines implementation in the health sector in general. However, some barriers identified were specific for the response during pandemics, for example, frequent policy updates, intensive involvement of the mass media,
guidelines not oriented to primary care. In order to overcome these barriers in the future, health authorities should be cognisant of them during pre-pandemic planning.

The experience during the last influenza pandemic showed that, in spite of the intensive planning, the role that GPs were meant to perform during the pandemic was yet clearly defined. The responsibilities imposed on GPs and expectations from them were unclear. Moreover, some of the public health responsibilities imposed of GPs were seen by them as conflicting with the role of GPs as providers of personalised care. Role delineations between public health and primary care should be discussed and defined.

Another important conclusion from this thesis is that the work of GPs during the pandemic response should be supported and that it is imperative that the health authorities should plan for this support. This support should include additional structures to ease the pressure on general practices during the intensive pandemic period, the timely provision to general practices of PPE or other prophylactic gear (for example, antiviral drugs for post-exposure if these will be recommended by professional bodies as an effective prophylactic), and effective two-way communication between the health authorities and GPs.

7.2 Recommendations

It is important to note that the real significance of the current research is not in the investigation of the past pandemic response, but rather the implications of the findings on how the next pandemic will be handled. In this respect, the results of this thesis may be useful for policy makers responsible for pandemic preparedness planning. An understanding of challenges that GPs encountered during the 2009/A/H1N1 pandemic response will enable the health authorities to be cognisant of the needs of GPs while they plan for future pandemic. Models of responding to pandemic threat are not inherently transferable form one country to another or applicable from past to future pandemics. However, different options of pandemic
response should be considered during the pre-pandemic planning. A number of recommendations related to integration of GPs in pre-pandemic planning, communication of the pandemic policies, and support from the health authorities provided to GPs, arise from the analysis of the thesis results. These can be applied to improve planning for primary care response and will be outlined next.

Integration of GPs in Pre-pandemic Planning

In the light of poor role delineation between public health authorities and GPs that was identified in the current thesis, which resulted in the role conflict and role ambiguity reported by GPs, broader inclusion of GPs in the process of planning should be aimed.

This includes:

1. Engagement of GPs and public health representatives in the pre-pandemic planning activities that include collaborative meetings, knowledge transfer and drills. These collaborative activities will generate broader understanding of differences in public health versus primary care perspectives, enabling greater cooperation during the pandemic response that is based on mutual trust. From the GPs’ perspective, understanding the logic of public health approach will enable them to accept and to expect rapid changes in pandemic response policies.

2. Health authorities need to engage with representatives of GPs in order to evaluate policies for pandemic planning aiming to provide adequate support and protection to GPs during different stages of pandemic management.

3. Inclusion of GP representatives in decision making and planning committees should be mandatory. This will contribute to greater acceptability of pandemic policies by GPs and to better applicability of the pandemic guidelines relevant to primary care.
Communication of the Pandemic Policies

Considering problems that were identified in the communication of the influenza pandemic policies and guidelines to GPs, the following improvement in communication clarity and strategy should be implemented:

1. Ensure that there is one body that is responsible for communicating pandemic policy updates to GPs as multiple sources of information were found to challenge the effectiveness of the emergency communication with GPs.

2. Ensure that policy updates are oriented to primary care by engaging GPs in pre-pandemic policy planning committees. Particularly, guidelines for infection control and personal safety measures should by targeted for improvement as these were identified by GPs as being the most problematic.

3. Ensure that the authority regulating the development of the pandemic guidelines, liaison with GP professional bodies that develop and distribute guidelines for primary care.

4. Ensure mechanisms for GP feedback provision during the pandemic response and incorporation of this feedback into policy in order to improve the appropriateness of the policies and guidelines during rapidly changing circumstances. The use of professional web-based networks can be considered for rapid two-way communication between GPs and the health authorities.

Support from the Health Authorities

Taking into account the fact that during pandemics GPs play a central role in the response, planning the support to be provided to them to implement the pandemic policies is imperative.
This planning should include:

1. Planning for rapid distribution of PPE and antiviral drugs for post-exposure prophylaxis by the health authorities. Alternatively, the reimbursement for PPE stockpiling should be offered for GPs. This planning is essential as GPs indicated that they are reluctant to fund public health response and to stockpile equipment that they may not use. In addition, there is limited access to the protective equipment during the actual outbreak of a disease.

2. In health systems where the financial incentive for GPs to administer the pandemic vaccine is not build-in, in spite the plan to administer the vaccine in GP clinics, plans for GP reimbursement should be made. GP advice was found valuable in patients’ decision to get vaccinated; thus their involvement in the mass vaccination is important.

3. In health systems where the provision of the primary care is decentralized, greater coordination during the mass vaccination campaign should be planned on state and national levels.

4. In health systems where GPs are required to treat complicated pandemic cases, education of GPs to treat such cases during a pre-pandemic period should be implemented. Detailed guidelines to treat complicated pandemic cases should be provided during the pandemic.

7.3 Final Remarks

Planning for a pandemic response is a relatively new phenomenon. Pandemic preparedness is an emerging field that started to be addressed only in the 21st century. The national pandemic preparedness plans were developed only a few years before the 2009/A/H1N1 struck. This influenza pandemic was the first real test of the developed plans, and the deficiencies that
were revealed have to be addressed. One major such deficiency was the problematic involvement of GPs in the pandemic response that was identified in the current thesis.

A saying goes that “generals always prepare for the last war”. Preparedness for an influenza pandemic is by no mean an easier task. This thesis provided recommendations for the improvement of pandemic planning in primary care based on research findings derived from the A/H1N1/2009 pandemic response. Thus, these recommendations are based on the lessons drawn from the last pandemic response. However, these recommendations may be generic enough to facilitate the development of future plans involving GP preparedness to respond to pandemics in years ahead.
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APPENDIX 1. INVITATION LETTER FOR DIVISIONS OF GENERAL PRACTICE

The A/H1N1 2009 pandemic: the implementation of policies and practices by primary care physicians

Learning from the current A/H1N1 2009 pandemic has to lead to a greater understanding of the issues that are needed to be addressed in pandemic preparedness. The proposed study will be focused on studying the implementation of the containment, antiviral treatment and vaccination policies in the 3 participant countries - Australia, Israel and England.

The purpose of this study is to learn from the experience achieved during the current pandemic in order to improve the pandemic management in future. Specifically, this project aims to provide an analysis of pandemic management policies and their implementation via the primary care system. It will try to answer the question: What could be learned from the different approaches in the A/H1N1 2009 pandemic management by the health authorities and the difficulties of policy implementation by the primary care system?

The following general questions will be raised:

- What was done well and what were the problems and difficulties of the primary physician during the A/H1N1 2009 pandemic?
- What could be done differently?
- What were the major obstacles in policy implementation?

**Importance:** Appropriate pandemic management assessment, from the decisions that have been taken by the health authorities to the implementation by the primary care physicians, is necessary. This assessment will provide the health authorities and the primary care physicians with the insights that will lead to the improvement of the policy implementation during future pandemics. Better plans for future influenza pandemics and more effective policy implementation are expected to reduce morbidity and mortality of patients and to prevent unnecessary hospitalization and expenses.
APPENDIX 2. PARTICIPANT INFORMATION

1. PILOT

Explanatory Statement Pilot

The implementation of the Pandemic (A/H1N1) 2009 influenza management policies by the primary care physicians

This information sheet is for you to keep.

My name is Marina Kunin and I am conducting a research project towards a PhD degree at Monash University under the supervision of Prof. Shane Thomas and Prof. Leon Piterman in the School of Primary Health Care. This means that I will be writing a thesis which is the equivalent of a 300 page book.

The aim of this project is to analyse the official state health policies during the outbreak of A/H1N1 2009 influenza pandemic and to evaluate to what extent these policies were implemented in the primary care system. This is the reason why the opinion of the primary health physicians, who found themselves at the frontline during the pandemic outbreak, regarding the mentioned policies, is extremely important for my research. During the in-depth interview I will be interested to find out what were the deficiencies and the strengths of the pandemic policy implementation in your clinic and how, in your opinion, these policies can be planned better in the future.

For the research it is important to interview physicians from both the large practices and the small ones. The advice concerning the e-mail address of your practice I’ve received from the Head of the Division.

The interview will probably take 30 or 45 min. and will be done at your clinic at a suitable time for you. With your permission, audio taping will be used to record the interview. The tapes will be transcribed and a copy of the interview transcription will be sent to you for your approval before being analysed.

To ensure anonymity, all the audiotapes will be identified by a number linked to a sheet with identifying features stored at a secure location. I will be the only person to be able to match the audio-tape with the name of the interviewed. Storage of the tape-recording and the transcriptions will adhere to the University regulations and kept on University premises in a locked cupboard/filing cabinet for 5 years. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Being in this study pilot is voluntary and you are under no obligation to consent to participation. However, if you do consent to participate, you may only withdraw prior to having approved the interview transcript.

If you have any queries or would like to be informed of the aggregate research finding, please contact
Marina Kunin on [redacted]. The findings are accessible for the end of 2013.

If you have a complaint concerning the manner in which this research 201000308 is being conducted, please contact:

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
Building 3e Room 111
Research Office
Monash University VIC 3800

Tel: +61 3 9905 2052 Fax: +61 3 9905 3831 Email: muhrec@adm.monash.edu.au

Thank you.
Marina Kunin
2. **AUSTRALIA**

   **Explanatory Statement**

   **Implementation of the A/H1N1 influenza management in primary care**

   This information sheet is for you to keep.

   My name is Marina Kunin and I am conducting a research project towards a PhD degree at Monash University under the supervision of Prof. Shane Thomas and Prof. Leon Piterman in the School of Primary Health Care. This means that I will be writing a thesis which is the equivalent of a 300 page book.

   The aim of this project is to analyse the official state health policies during the outbreak of A/H1N1 2009 influenza pandemic and to evaluate to what extent these policies were implemented in the primary care system. This is the reason why the opinion of the primary health physicians, who found themselves at the frontline during the pandemic outbreak, regarding the mentioned policies, is extremely important for my research. During the in-depth interview I will be interested to find out what were the deficiencies and the strengths of the pandemic policy implementation in your clinic and how, in your opinion, these policies can be planned better in the future.

   For the research it is important to interview physicians from both the large practices and the small ones. The advice concerning the e-mail address of your practice I’ve received from the Head of the Division.

   The interview will probably take 30 or 45 min. and will be done at your clinic at a suitable time for you. With your permission, audio taping will be used to record the interview. The tapes will be transcribed and a copy of the interview transcription will be sent to you for your approval before being analysed.

   To ensure anonymity, all the audiotapes will be identified by a number linked to a sheet with identifying features stored at a secure location. I will be the only person to be able to match the audio-tape with the name of the interviewed. Storage of the tape-recording and the transcriptions will adhere to the University regulations and kept on University premises in a locked cupboard/filing cabinet for 5 years. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

   Being in this study is voluntary and you are under no obligation to consent to participation. However, if you do consent to participate, you may only withdraw prior to having approved the interview transcript.

   As a gesture of appreciation, the physicians who contributed their time to the interview will be reimbursed with a gift voucher in amount of AUD$75.

   If you have any queries or would like to be informed of the aggregate research finding, please contact
Marina Kunin on [redacted]. The findings are accessible for the end of 2013.

<table>
<thead>
<tr>
<th>If you have a complaint concerning the manner in which this research &lt;project number here&gt; is being conducted, please contact:</th>
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<tbody>
<tr>
<td><strong>Executive Officer</strong></td>
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<tr>
<td>Monash University Human Research Ethics Committee (MUHREC)</td>
</tr>
<tr>
<td>Building 3e  Room 111</td>
</tr>
<tr>
<td>Research Office</td>
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<tr>
<td>Monash University VIC 3800</td>
</tr>
<tr>
<td>Tel: +61 3 9905 2052  Fax: +61 3 9905 3831  Email: <a href="mailto:muhrec@adm.monash.edu.au">muhrec@adm.monash.edu.au</a></td>
</tr>
</tbody>
</table>

Thank you.
Marina Kunin
3. ISRAEL

The research project is to be conducted in Israel, Australia and England. The research is led by Dr. Marina Konin and is conducted under the supervision of Dr. Angela Harn.

The research aims to examine the experience of the first responders during the 2009 H1N1 pandemic in order to improve the way healthcare systems handle such events in the future.

The research will be conducted through interviews with healthcare professionals who were on the front lines during the pandemic. Before the interview, a short letter will be sent to the interviewee with a list of topics to be discussed. Upon the interviewee’s consent, the interview will be recorded on audio. The recording will be stored and a transcript will be sent to the interviewee before it is reviewed for research purposes.

Only data that is necessary will be recorded and stored, and all data will be kept confidential and accessible only to the researchers. The storage and handling of the recording and transcript will follow the university’s policies, and will be kept in a secure location.

The research has been approved by the ethical review board of Monash University.

Participants will be compensated for their time and effort. If you have any questions or wish to know the final results, please contact:

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
Building 3e Room 111
Research Office
Monash University VIC 3800
Tel: +61 3 9905 2052 Fax: +61 3 9905 3831 Email: muhrec@adm.monash.edu.au

Thank you for your time.

Dr. Marina Konin

2013

The research is conducted in ten countries, including Israel, Australia, and England. The research aims to examine the experience of the first responders during the 2009 H1N1 pandemic in order to improve the way healthcare systems handle such events in the future.
4. ENGLAND

Participant Information Sheet

Implementation of the A/H1N1 influenza management in primary care

This information sheet is for you to keep.

My name is Marina Kunin and I would like to invite you to take part in our research study. Before you decide I would like you to understand why the research is being done and what it would involve for you. I will go through the information sheet with you and answer any questions you have. I’d suggest this should take about 5 minutes. Talk to others about the study if you wish.

This study is conducted as a research project towards my PhD degree at the University. This means that I will be writing a thesis which is the equivalent of a 300 page book.

The aim of this project is to analyse the official state health policies during the outbreak of A/H1N1 2009 influenza pandemic and to evaluate to what extent these policies were implemented in the primary care system in Australia, UK and Israel. This is the reason why the opinion of the primary health physicians, who found themselves at the frontline during the pandemic outbreak, regarding the mentioned policies, is extremely important for my research.

During the in-depth interview I will be interested to find out what were the deficiencies and the strengths of the pandemic policy implementation in your clinic and how, in your opinion, these policies can be planned better in the future.

The interview will probably take 30 or 45 min. and will be done at your clinic at a suitable time for you. With your permission, audio taping will be used to record the interview. The tapes will be transcribed and a copy of the interview transcription will be sent to you for your approval before being analysed.
To ensure anonymity, all the audiotapes will be identified by a number linked to a sheet with identifying features stored at a secure location. I will be the only person to be able to match the audio-tape with the name of the interviewed. Storage of the tape-recording and the transcriptions will adhere to the University regulations and kept on University premises in a locked cupboard/filing cabinet for 5 years. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Your contact details were obtained via official NHS public database. Twenty physicians who have been working in the primary care during the years 2009-2010, were selected.

Being in this study is voluntary and you are under no obligation to consent to participation. However, if you do consent to participate, you may only withdraw prior to having approved the interview transcript, without giving a reason.

Reimbursement in the amount of AUD $75.00 will be offered to the participants.

The findings are accessible for the end of 2013.

This study is sponsored by the Monash University, Melbourne. King’s College is a legal representative of the research in London.
This study has been reviewed and given favourable opinion by Proportionate Review Service, London.

If you would like to be informed of the research details or of aggregate research finding, please contact Marina Kunin on ________________________

If you have a concern about any aspect of this study, please contact

Marina Kunin on ________________________

If you remain unhappy and wish to complain formally, you can complain to the sponsor of this research using the following contact details:

**Executive Officer**

Monash University Human Research Ethics Committee (MUHREC)

Building 3e  Room 111

Research Office

Monash University VIC 3800

Tel: +61 3 9905 2052       Fax: +61 3 9905 3831  Email:   muhrec@adm.monash.edu.au

Thank you.

Marina Kunin
APPENDIX 3. PARTICIPANT CONSENT

1. AUSTRALIA

Consent Form

The implementation of the Pandemic (A/H1N1) 2009 influenza management policies by the primary care physicians

NOTE: This consent form will remain with the Monash University researcher for their records

I agree to take part in the Monash University research project specified above. I have had the project explained to me, and I have read the Explanatory Statement, which I keep for my records. I understand that agreeing to take part means that:

I agree to be interviewed by the researcher ☐ Yes ☐ No
I agree to allow the interview to be audio-taped ☐ Yes ☐ No

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw before I have approved the interview transcript without being penalised or disadvantaged in any way.

I understand that any data that the researcher extracts from the interview for use in reports or published findings will not, under any circumstances, contain names or identifying characteristics.

I understand that I will be given a transcript of my interview for my approval before it is included in the write up of the research.

I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party.

I understand that data from the audio-tape and its transcript will be kept in a secure storage and accessible to the research team. I also understand that the data will be destroyed after a 5 year period unless I consent to it being used in future research.

Participant’s name
Signature

Date
2. ISRAEL

Consent Form

Form: Consent 2009: Information for Medical Doctors in the Community in Israel, Australia and England

Purpose: The purpose of this form is to inform the researcher that the form is kept for the documentation of the participation of the volunteer.

The form must be kept by the researcher for documentation of the participation of the volunteer.

I agree to participate in the project of the University of Monash as mentioned above. I was informed about the project and read the information page kept for documentation of the participation of the volunteer.

I understand that my participation means:

☐ Yes ☐ No

I understand that my participation means that the interview will be recorded by audio recording.

☐ Yes ☐ No

I understand that I can cancel my participation before the approval is given without it affecting me in any way.

I understand that all information that the researcher will collect for reporting or publication will not include my name or personal information.

I understand that I will receive the report before it is included in the writing of the research.

I understand that any information I provide will be confidential and that no information that could lead to the identification of any person will be disclosed.

I understand that the audio recording and transcription will be kept in a secure and accessible place only to the researchers of the project. I understand that this information will be destroyed after 5 years unless I agree to use it for future research.

Name of the participant:

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Signature:

-------------------------------------

Date:

-------------------------------------
CONSENT FORM

Title of Project: Implementation of A/H1N1 influenza management in primary care
Name of Researcher: Marina Kunin

1. I confirm that I have read and understand the information sheet dated 04.06.2010 (version.3) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw prior to having approved the interview transcript without giving any reason, without my legal rights being affected.

3. I agree to allow the interview to be audio-taped. I understand the audio tapes and transcription documents will be destroyed after a 5 year period.

4. I understand that I will be given a transcript of my interview for my approval before it is included in the write up of the research.
5. I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party.

6. I agree to take part in the above study

Name of Participant  _____________  Date  _______  Signature  ___________

Name of Person taking consent  ___________  Date  _______  Signature  ___________

When completed: 1 for participant; 1 for researcher site file
APPENDIX 4. QUESTIONNAIRE DISTRIBUTED BEFORE THE INTERVIEW

1. AUSTRALIA

Interview with Primary Care Physicians

Questionnaire (to be distributed before the interview)

1. Please indicate your age
   - Less than 30 years
   - 30-39 years
   - 40-49 years
   - 50-59 years
   - 60-69 years
   - 70+ years

2. How many years have you practised in primary health care as a general practitioner or family doctor?
   - Less than 5 years
   - More than 5 but less than 10 years
   - More than 10 but less than 20 years
   - More than 20 but less than 30 years
   - 30+ years

3. How many work sessions do you have per week?

4. Approximate number of consultations you have per session

5. Have you personally been vaccinated for H1N1?
   - Yes
   - No

   If YES:
   Was it part of seasonal vaccination?
   - Yes
   - No
   - Both

6. Where have you obtained information about the H1N1 outbreak? Please indicate as many sources as relevant
   - Updates from the Victorian Department of Health
   - Updates from the Australian Department of Health
   - Updates from the Division
   - From mass media
   - Medical Journal articles
   - Other

7. Can you estimate how many of your patients have been hospitalized during 2009 as a result of H1N1 infection and associated complications?

8. Have you advised any of your patients to be vaccinated specifically for H1N1?
   - Yes
   - No

   If YES: (You can choose more than one answer)
   - to all patients
   - to all children
   - to elderly patients
   - to patients with chronic illness
   - to pregnant women
   - to health workers

9. Can you estimate what percent of your patients has been vaccinated?

   Patients at risk:
   - Less than 10%
   - 10-25%
   - 25-40%
   - 40-55%
   - 55-70%
   - More than 70%

   Regularly healthy patients:
   - Less than 10%
   - 10-25%
   - 25-40%
   - 40-55%
   - 55-70%
   - More than 70%
1. Can you give an example of a study conducted in Israel?  

2. IRONSHIELD (IMMUNITY LEVELS)  

3. What is the impact of H1N1?  

4. Are the following sources relevant: Ministry of Health, Health Fund, District Health Authority, Media, Medical News?  

5. In the period of 2009-2010, how many patients were hospitalized?  

6. Do you administer H1N1 to patients?  

7. Who do you administer H1N1 to?  

8. Is H1N1 sufficient?  

9. Do you consult with primary care physicians beforehand?  

10. Did you consult with professionals and officials regarding the epidemic?  

11. Is the family doctor appointed?  

12. How many patients did you consult with in each age group?  

13. What are the ages of the employees?  

14. What are the numbers of patients in each age group?  

15. Can you give an example of a study conducted in Israel?
Interview with General Practitioners

Questionnaire (to be distributed before the interview)

1. Please indicate your age
   - □ Less than 30 years
   - □ 30-39 years
   - □ 40-49 years
   - □ 50-59 years
   - □ 60-69 years
   - □ 70+ years

2. How many years have you practiced in primary health care as a general practitioner?
   - □ Less than 5 years
   - □ More than 5 but less than 10 years
   - □ More than 10 but less than 20 years
   - □ More than 20 but less than 30 years
   - □ 30+ years

3. How many clinical sessions do you work per week?

4. Approximate number of consultations you have per clinical session

5. Have you personally been vaccinated for H1N1?
   - □ Yes  □ No

6. Where did you obtain information about the H1N1 outbreak? Please indicate as many sources as relevant
   - □ Updates from the Department of Health
   - □ Updates from the RCGP
   - □ Updates from the Health Protection Agency
   - □ From mass media
   - □ Medical Journal articles
   - □ Other

7. Can you estimate how many patients in your practice were hospitalized during 2009-2010 as a result of H1N1 infection and associated complications?
   - □ ________ patients (please give an estimate if you are unsure of exact numbers)

8. Have you advised any of your patients to be vaccinated specifically for H1N1?
   - □ Yes  □ No
   - If YES: (You can choose more than one answer)
     - □ to all patients
     - □ to all children
     - □ to elderly patients
     - □ to patients with chronic illness
     - □ to pregnant women
     - □ to health workers

9. Can you estimate what percent of your patients has been vaccinated?

   Patients at risk:
   - □ Less than 10%
   - □ 10-25%
   - □ 25-40%
   - □ 40-55%
   - □ 55-70%
   - □ More than 70%

   Regularly healthy patients
   - □ Less than 10%
   - □ 10-25%
   - □ 25-40%
   - □ 40-55%
   - □ 55-70%
   - □ More than 70%