

# deeble institute issues brief

Deeble Institute for Health Policy Research

no: 25

date: 14/03/2018

**title** Improving pharmacist involvement in pandemic influenza planning and response in Australia

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This paper was developed as part of a Deeble Institute for Health Policy Research Summer Scholarship. HESTA is proud to support this scholarship program.

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## Key messages

- State and territory health departments should update pandemic plans to incorporate pharmacists and define the roles they are expected to fill during pandemic influenza.
- State and territory health departments should incorporate pharmacy organisation representatives as stakeholders to ensure pandemic plans include current pharmacy practice.
- State and territory health departments should liaise with and encourage liaison between frontline pharmacists, professional pharmacy organisations, Primary Health Networks and Local Hospital Networks to ensure effective communication during pandemic response.
- State and territory pandemic planners should engage with university partners, schools of pharmacy and student organisations to prepare the student workforce for pandemic response.

## Executive summary

This Issues Brief makes recommendations about how pharmacists in Australia can be better utilised for pandemic influenza preparedness and response. These recommendations are directed at state and territory health departments but will require engagement and action from stakeholders such as frontline pharmacists, professional pharmacy organisations, Primary Health Networks (PHNs) and Local Hospital Networks (LHNs). Appropriate engagement and communication among these key stakeholders will assist with pharmacists' response to the next pandemic in Australia.

There are several steps to improving pharmacist utilisation during a pandemic. These include clarification of pharmacist roles, communication and engagement with pharmacists and ensuring workforce capacity.

This Issues Brief will firstly discuss how pharmacists are currently incorporated into Australian pandemic plans and what roles are currently within scope for pharmacists to perform during a pandemic. Pandemic plans from the United Kingdom, Canada and New Zealand will be used as examples for how current legislation could be adjusted to improve pharmacist practice during pandemic response.

Secondly, communication mechanisms between departments of health and frontline pharmacists in current Australian pandemic plans will be reviewed. The importance of early engagement with key stakeholders, pre-defined communication strategies and workforce engagement with pharmacy organisations and pharmacists will be discussed.

Finally, health workforce issues such as high levels of staff absence during a pandemic will be highlighted, with potential solutions from international pandemic plans and academic literature examined in an Australian context.

Pharmacists are an essential part of everyday healthcare in Australia and have the potential to fulfil a variety of roles which may have broad impacts on the Australian healthcare system during a pandemic influenza outbreak.

Pharmacists' skill sets are currently not well utilised or incorporated into pandemic planning. Full utilisation of pharmacists' skill sets would improve Australia's health response to a pandemic influenza outbreak, reducing associated burdens to health and the economy.

## Acknowledgements

This Issues Brief was developed as part of a Summer Scholarship, hosted by the Deeble Institute of Health Policy Research, Australian Healthcare and Hospitals Association (AHHA) Canberra and sponsored by HESTA.

I would like to express my gratitude to Alison Verhoeven (Chief Executive, AHHA), Dr Rebecca Haddock (Manager, Deeble Institute for Health Policy Research) and Dr Linc Thurecht (Senior Research Director, AHHA and Acting Director, Deeble Institute for Health Policy Research) for the opportunity to work with the Deeble Institute, their support, and invaluable feedback on drafts.

I also wish to acknowledge the support and guidance provided by all AHHA staff. I am very grateful to have had the opportunity to work with such a passionate and driven team.

My thanks also go to relevant stakeholders and policy-makers who took time to meet with me and provide advice on this Issues Brief.

Finally, I wish to acknowledge my PhD supervisors who supported me in taking this opportunity.

## 1 Background

### 1.1 *Pandemic Influenza*

Influenza or 'the flu' is an acute viral illness that affects the respiratory system (World Health Organisation, 2018). Pandemic influenza (flu) occurs when a new flu virus emerges for which humans have little or no immunity allowing the virus to spread easily from person to person (Poon et al., 2016, World Health Organisation, 2018).

Australia is not immune to pandemic influenza with four pandemics being declared in the last 100 years (Department of Health, 2011). These include the 'Spanish flu' in 1918, which is thought to have killed at least 50 million people worldwide and more recently 'Swine flu' or H1N1 in 2009 (Department of Health, 2011, Fitzgerald et al., 2012). In Australia, there were more than 37,000 reported cases of H1N1 influenza, including almost 200 deaths (Department of Health, 2011). This pandemic affected a younger age group than seasonal influenza; the median age of those who died as a result of H1N1 was 53 years old, compared with 83 years for seasonal influenza (Department of Health, 2011, Department of Health and Ageing, 2011).

### 1.2 *The Australian Health Management Plan for Pandemic Influenza (AHMPPI)*

Being prepared, planning and ensuring plans are in line with the latest health workforce activities and recommendations are essential to reduce the impacts associated with an outbreak at a local, state and territory and national level.

The Australian Health Management Plan for Pandemic Influenza (AHMPPI) outlines strategies to manage an influenza pandemic and minimise its impacts on Australian health and Australian health systems (Department of Health, 2014b). The AHMPPI also outlines agreed arrangements between the Commonwealth Government and state and territory governments for managing pandemic influenza and is used to inform operational planning in these jurisdictions. While the AHMPPI helps to inform and guide response and planning, it remains the responsibility of each state and territory government departments of health to manage a pandemic influenza outbreak. (Department of Health, 2014b). Additionally, it is the responsibility of these departments to liaise with key stakeholders, formulate plans and update them according to best evidence and practice.

### 1.3 *A role for community pharmacists in pandemic influenza outbreak*

Community pharmacists are highly accessible and provide essential health services to the general public. They are therefore uniquely placed to provide frontline healthcare to a large proportion of the population (The Pharmacy Guild of Australia, 2014). Pharmacists' potential to contribute to pandemic influenza response has been greatly improved by recent practice change enabling pharmacists to vaccinate. Their unique skill sets and position within the community make pharmacist inclusion in pandemic planning and response crucial.

In 2006, findings from *Exercise Cumpston*, (Department of Health and Ageing, 2007) Australia's largest ever health exercise and one of the first major exercises on pandemic influenza conducted in any country, recommended that community pharmacies be better integrated into pandemic plans at the national and state and territory level.

These recommendations along with experience gained from the H1N1 pandemic in Australia were incorporated into the most recent revision of the AHMPPI (2014) which reiterates that pharmacists may fill a variety of roles during pandemics to better support health system response (Department

of Health and Ageing, 2011, Department of Health, 2014b). Yet, the role of pharmacists in state and territory pandemic plans remains unclear, despite national encouragement for their inclusion in planning and management. Strategies within current state and territory pandemic plans to communicate with and activate the response of pharmacists are also vague.

While not a pandemic event, the ‘Thunderstorm Asthma’ in Victoria in November 2016 placed emergency like conditions on health services over a short period of time. Review of the emergency management response to this event included several recommendations that encouraged utilisation of pharmacists in planning, communications and response to emergencies and disasters more broadly (Inspector General for Emergency Management, 2017)

Pharmacists have significant potential as highly accessible primary healthcare providers to deliver essential health services during pandemics and reduce pressures on general practitioners and hospital systems. A lack of coordination, pre-established communication plans and mutually understood expectations between health systems and pharmacists will result in under-utilisation of this section of the healthcare workforce and negatively impact pandemic health response for Australia.

## 2 State and territory pandemic plans

After prevention, effective pandemic influenza planning is the key to reducing health impacts to individuals, communities and broader health systems (Australian Emergency Management Institute, 2011). Planning for an influenza pandemic is an integral part of being prepared and is essential to ensure an effective response and optimal recovery after the event (Australian Emergency Management Institute, 2011).

In Australia each state and territory is responsible for preparing and responding to an influenza pandemic. However, no one sector can take complete responsibility for preparedness and planning. Effective pandemic planning and response must rely on robust connectivity and alignment of goals between various levels of government, health and non-health sectors, institutions, communities and individuals (World Health Organisation, 2009). Undertaking multi-sector planning involving multiple stakeholders is complex, but essential for effective pandemic response (World Health Organisation, 2009).

### 2.1 Pharmacists in pandemic planning

With the exception of the Australian Capital Territory (ACT), state and territory pandemic health plans are publicly available on relevant health department websites (Department of Health and Human Services, 2016a, Department of Health, 2014c, Department of Health, 2009, South Australia Health, 2015a, South Australia Health, 2015c, South Australia Health, 2015b, Queensland Health, 2014, Northern Territory Department of Health and Families, 2006, New South Wales Health, 2016). There are many roles for pharmacists during a pandemic and this Issues Brief focuses on those which may have the greatest benefit on the broader health system. These include antiviral distribution, vaccination, surveillance activities, absence from work certificates and emergency medication supply.

State and territory pandemic plans contain critical gaps in terms of pharmacists’ representation and roles. Without clear planning and involvement, the pharmacy workforces’ response to Australia’s next pandemic will be *ad hoc*. Impromptu involvement of pharmacists will result in compromised

response efficacy and underutilisation of an essential health service at a time when an efficient and widespread health response is essential.

The key roles of pharmacists and pharmacy organisations in various pandemic plans is summarised in Table 1.

*Table 1. Identification of key roles of pharmacists and pharmacy organisations in various pandemic plans.*

	AUS	NSW	NT	QLD	SA	TAS	VIC	WA
	2014	2016	2009	2014	2015	2016	2014	2009
<b>Pharmacists</b>								
Antiviral distribution								
Vaccination	?							
Surveillance activities								
'Absence from work' certificates								
Emergency medication supply								
<b>Pharmacy organisations</b>								
Stakeholder in pandemic planning								
Information conduit								

### 3 Antiviral distribution in Australia

During pandemic influenza events there are increased demands for antivirals, vaccines, antibiotics and personal protective equipment (PPE). Antiviral medications, such as oseltamivir, are used to treat and prevent influenza and may play a role in minimising disease spread (Gauld et al., 2012, Department of Health, 2014a).

#### **The National Medical Stockpile (NMS)**

In 2002, the Australian Government established the National Medical Stockpile (NMS), a strategic reserve of these essential medications and PPE (Department of Health and Ageing, 2011). Each state and territory have their own medical stockpile and the NMS is designed to supplement these existing medical stocks. Once stock is deployed from the NMS it is the responsibility of states and territories to receive, store and employ appropriate measures for distribution to the community (Department of Health, 2014b).

At the time of the H1N1 pandemic, arrangements for the distribution of NMS varied between states and territories. Some opened 'flu clinics', while others utilised community pharmacies or relied on public health units to distribute items (Department of Health and Ageing, 2011). However, the use of community pharmacies for antiviral distribution was yet to be fully established for some states and territories, resulting in the *ad hoc* involvement of pharmacists and development of new systems to support distribution (Department of Health and Ageing, 2011).

Utilising pre-existing infrastructure and pre-trained personnel in pharmacies for antiviral distribution is an efficient use of resources and is cost-effective. Distribution of medications and an understanding of supply chains and logistics is part of a community pharmacist's core business. As an extension of this, antiviral distribution is within scope of practice for pharmacists and is supported by existing infrastructure in community pharmacies.

Antiviral distribution by community pharmacies is now a role supported by most states and the AHMPPI (see Table 1). Most pandemic plans also recommend or consider supporting pharmacists to distribute stockpile items (Department of Health, 2009, South Australia Health, 2015a, South Australia Health, 2015c, Department of Health and Human Services, 2016a, New South Wales Health, 2016, Department of Health, 2014c).

#### *3.1 Early antiviral distribution is key*

Modelling of antiviral distribution during a pandemic event shows that early and widespread dispersal of these medications to the community can yield reductions in hospitalisations, critical care requirements and reduced mortality (Singh et al., 2015, Moss et al., 2016).

In order to achieve early distribution of antivirals, it is essential that pharmacists are involved in the planning of antiviral distribution prior to a pandemic event. This would allow pandemic responses by pharmacists to be quickly and efficiently enacted, resulting in rapid and extensive availability of antiviral medications to the public.

#### *3.2 Antiviral distribution: an international context*

Internationally, several countries have improved public accessibility to antiviral stock by changing legislation which enables pharmacists to distribute antiviral medications.

### 3.2.1 New Zealand

In 2007, New Zealand was the first country to make the antiviral medication oseltamivir non-prescription, with pharmacists able to supply the medication 'over-the counter' (Gauld et al., 2012). There were concerns, from the New Zealand medical community, that pharmacist supply of antiviral medication had the potential to cause issues such as increased antiviral resistance, medication stockpiling and decreased immunisation rates (Gauld et al., 2012) and in consultation with pharmacists, strict protocols and policies around supply were developed (Gauld et al., 2012).

The use of non-prescription oseltamivir over 5 years, has resulted in no significant change in the development of resistance or rates of influenza immunization (Gauld et al., 2012).

In New Zealand during the 2009 influenza pandemic, however, most oseltamivir was still dispensed against a prescription (89%), rather than being supplied by a pharmacist (11%). (Gauld et al., 2012) This relatively low level of dispensing without prescription was thought to be due to access barriers, such as financial cost. For a pharmacist to supply oseltamivir without prescription cost consumers NZ\$75-80 for ten capsules, whereas the cost of oseltamivir on prescription was NZ\$3.

In Australia oseltamivir is not listed on the Pharmaceutical Benefits Scheme (PBS) and a treatment course on prescription costs approximately \$40-50 (Roche, 2009, Chemist Warehouse, 2017). Unless mechanisms for funding oseltamivir supply are put in place, the provision of oseltamivir by pharmacists, without a prescription, would be likely to cost this or more. However, if stockpiled oseltamivir was distributed to community pharmacies it could be provided free of charge, although pharmacies may still charge dispensing fees.

### 3.2.2 Norway

In Norway, during the 2009 H1N1 pandemic, supply of funded antivirals through pharmacists led to an increase antiviral distribution, which is thought to have caused virus transmission to slow in the weeks around the pandemic peak (Blasio et al., 2012). This outcome was underpinned by policy and legislative changes aimed at encouraging widespread public access to antivirals. The benefits of these policy changes also included easing pressure on other health care services (Reinholdt, 2010, Blasio et al., 2012).

At their peak, 80% of all oseltamivir supplies in Norway were provided by pharmacists without a prescription (Reinholdt, 2010). The sale of antivirals by Norwegian pharmacists was reported back to the Norwegian Ministry of Health and this data contributed to influenza surveillance (Reinholdt, 2010). Compared with the 11% of pharmacist supplied oseltamivir in New Zealand, Norway's distribution of antivirals demonstrates that providing oseltamivir through funded pharmacist supply would be a sensible approach to ensure early and widespread accessibility to the public (Reinholdt, 2010, Gauld et al., 2012).

### 3.2.3 United Kingdom and Canada

The provision of free antivirals and waiving of dispensing charges for patients is also present in pandemic plans for the United Kingdom and for several Canadian provinces (Ministry of Health, 2009, Alberta Health, 2014, Ministry of Health and Long-Term Care, 2013). While the provision of free or heavily subsidised antivirals available from pharmacist without prescription may be costly to the health system in Australia, this must be weighed against the potential multi-million or billion

dollar economic effects of a poorly controlled pandemic across multiple sectors (Department of Health, 2014b, Newall et al., 2007).

### *3.3 Legislation for effective antiviral distribution*

The presented international experience demonstrates that effective distribution of antivirals through pharmacists in Australia requires legislation, procedures and policies to be in place before a pandemic event.

State and territory pandemic plans should consider how they may utilise pharmacists to assist with antiviral distribution and enact this in planning. The Commonwealth Government and state and territory governments should consider putting additional legislation in place before a pandemic to improve the public's access to essential medications through pharmacists, such as allowing provision of funded antivirals through pharmacists without a prescription.

Pharmacist's presence in, and awareness of, pre-existing pandemic plans will better prepare them for supplying antiviral medication in the event of a pandemic. Lacking pre-planned legislative changes may compromise access to antivirals and result in pharmacists being unprepared to respond in roles such as supply medications without a prescription. By optimising the health systems capacity to distribute antivirals early in a pandemic, benefits such as reduced hospital admission, decreased critical care requirements and deaths may be seen (Moss et al., 2016, Singh et al., 2015).

## **4 Workforce utilisation**

Due to the unpredictable nature of disasters and emergencies, including pandemics, it can be difficult to carry out research on pandemic planning and response. Research during pandemics can also be hampered by a lack of resources and personnel during and after an event. Consequently, evidence-based activities to produce positive system-wide outcomes for pandemic influenza are deficient. Despite limited evidence in the context of pandemic response, optimising pre-existing health system capacity by ensuring the health workforce is utilised to its full potential could assist in pandemic response and potentially improve health outcomes. (Australian Emergency Management Institute, 2011).

### *4.1 Pharmacist-administered vaccinations*

Pharmacist-led vaccinations without a prescription are a recent addition to pharmacists' scope of practice in Australia. Between 2014 and 2016 each state and territory in Australia passed legislation allowing pharmacists to vaccinate provided they had undergone appropriate training.

While legislation required training and practice varies between state and territory jurisdictions, pharmacists are able to administer influenza vaccines to people over the age of 18 in all areas (Lau, 2017). However, the variability in training and practice between states and territories means that some pharmacists in certain areas may be more prepared to respond to a pandemic and able to adapt more readily to changes in practice, such as vaccinating younger patient cohorts (Pharmaceutical Society of Australia, 2017).

Pharmacist-led vaccinations have been well received by the public due to convenience and ease of accessibility, providing the opportunity for more people to be vaccinated (Hattingh et al., 2016, Nissen, 2015).

#### 4.1.1 Utilising the pharmacy workforce for rapid vaccine distribution

Reducing the potential impacts of pandemic influenza to health and the economy requires the timely and efficient distribution of the pandemic influenza vaccine as soon as it is available (Blasio et al., 2012, Schwerzmann et al., 2017, Newall et al., 2010).

As already noted, reaching population vaccination targets earlier in a pandemic has positive implications for pandemic management. This includes the reduction in virus spread and severity of illness, protection to those who cannot receive influenza vaccines (herd immunity) and reduced pressures on other areas of the health system such as emergency departments or intensive care units (Schwerzmann et al., 2017).

In America, one model of vaccination coverage compared time for vaccination targets to be reached when using traditional vaccinators only (for example general practitioners or nurses) against mixed traditional vaccinators and pharmacist vaccinators (Schwerzmann et al., 2017). Utilising pharmacists as vaccinators in addition to traditional vaccinators allowed vaccination targets for the population to be reached 7 weeks faster when compared with traditional vaccinators only (Schwerzmann et al., 2017).

With the exception of New South Wales, South Australia and Tasmania, state and territory pandemic plans have yet to adopt the use of pharmacists as vaccinators (New South Wales Health, 2016, Department of Health and Human Services, 2016a, South Australia Health, 2015b). This is not surprising considering how recently legislation has changed across the states. It should be noted that even within these states, it remains unclear whether current legislation in place to allow pharmacists to administer seasonal influenza vaccines would extend to allowing pharmacists to administer pandemic influenza vaccines (Department of Health and Ageing, 2018, Queensland Department of Health, 2016, Department of Health, 2017b, Department of Health and Human Services, 2016b, NSW Ministry of Health, 2015, Department of Health and Human Services, 2016c, Department of Health, 2017c).

The AHMPPI states that pharmacies could be used as a site for pandemic vaccinations but does not clarify if pharmacists would administer the vaccines (Department of Health, 2014b). At the time the AHMPPI was published, pharmacists were not able to administer vaccines but had started to set up nurse-led vaccination services in their pharmacies (Department of Health, 2014b, Nissen, 2015). Without AHMPPI endorsement of pharmacists' role as vaccinators at a national level, the incorporation of pharmacy lead vaccinations into state and territory pandemic plans has potential to be delayed.

Utilising the Australian pharmacy workforce during a pandemic to provide vaccines will improve community access to vaccinations and increase vaccination coverage (Schwerzmann et al., 2017, Fitzgerald et al., 2016). Ensuring pandemic influenza vaccines are widely available and highly accessible to the public is essential.

#### 4.2 Cost to consumers

With the exception of Victoria, there is no state or territory government funding available for individuals who receive pharmacist-administered influenza vaccinations (Hattingh et al., 2016, Pharmaceutical Society of Australia, 2017). In Australia, high risk groups qualify for free influenza vaccinations under the National Immunisation Program (NIP) (Nissen, 2015, Hattingh et al., 2016). These high-risk groups include those aged 65 years or over, Aboriginal and Torres Strait Islander

individuals aged between 6 months and 5 years or aged 15 years or over, pregnant women and individuals aged 6 months and over with a chronic medical condition (Hattingh et al., 2016). The Victorian Government provides free influenza vaccines to be administered by approved pharmacists in Victoria for those eligible under the NIP (Pharmaceutical Society of Australia, 2017). However, Victorian pharmacies may still charge a 'service fee' to these individuals.

The cost of receiving an influenza vaccine by pharmacists must be paid out-of-pocket by the patient but may be reimbursable by private health insurance. Even high-risk individuals who would qualify for free influenza vaccination with their general practitioner must pay the out-of-pocket cost of pharmacist-administered influenza vaccinations. Despite cost, convenience and accessibility of the pharmacist-administered vaccination is a key factor for people choosing to receive vaccinations at their pharmacy including those who are eligible for free vaccinations with their general practitioners (Lau, 2017, Nissen, 2015, Hattingh et al., 2016).

An evaluation in Western Australia found that between 12-17% of consumers vaccinated in pharmacies were eligible for free influenza vaccinations under the NIP (Hattingh et al., 2016). It is anticipated that the pandemic influenza vaccine will be provided free of charge when available, however it is important that the 'service fees' by pharmacists are pre-considered to ensure that vaccines remain highly accessible to the public.

## 5 Legislation to enable a pharmacy workforce response

Current legislation restricts pharmacists to administering vaccines within their pharmacy only. pandemic plans of Queensland, South Australia, Tasmania, Victoria and Western Australia discuss the potential for 'mass vaccination' clinics in response to a pandemic influenza outbreak (South Australia Health, 2015a, South Australia Health, 2015b, Queensland Health, 2014, Department of Health and Human Services, 2016a, Department of Health, 2014c, Department of Health, 2009). These clinics aim to deliver vaccines on a large scale to the community in locations such as school gyms or auditoriums and are traditionally staffed by public health workers, nurses and medical practitioners. Pandemic plans for states and territories do not clarify if there is a role for pharmacists as vaccinators in these clinics.

While it is within pharmacists' current scope of practice to provide influenza vaccines, current legislation restricts pharmacists from contributing and participating in mass vaccination clinics during a pandemic outbreak. A review of this legislation should be considered for pharmacists to be involved in mass vaccination clinics.

Pandemics can prompt rapid change in legislation to enable the health workforce to better respond. This is highlighted by the outbreak of H1N1 in the United States which prompted some states to implement emergency laws allowing pharmacists to vaccinate in areas where pharmacist-led vaccination had not previously been legal (Schwerzmann et al., 2017, Traynor, 2009). In this situation, rapidly changing legislation posed challenges as the pharmacy workforce required rapid training to be prepared to administer H1N1 vaccinations when they became available (Traynor, 2009).

Similarly, during a severe seasonal influenza year in New York (2012-2013), emergency legislation aimed at reducing influenza transmission changed the patient age threshold at which pharmacists were able to administer vaccines to patients from 18 years to 6 years (Rubin et al., 2014). While it was noted that these efforts were effective, due to the emergency nature of these legislative

changes pharmacists reported difficulty in rapidly implementing this new service in their pharmacies (Rubin et al., 2014). Protocols for vaccine administration to children had to be created, additional stock of vaccines and related items had to be ordered and staffing reviewed to ensure the service could be provided safely (Rubin et al., 2014).

These activities took time and delayed efficient pharmacist-administered vaccinations at a time when rapid response was critical (Rubin et al., 2014). While pandemics are unpredictable, consideration of potential legislative changes should be made before-hand so that the workforce and health infrastructure can be adequately prepared (Rubin et al., 2014).

### 5.1 A coordinated health workforce

To fully utilise pharmacist vaccinators during pandemic response in Australia, increased collaboration and planning between pharmacists, public health programs and departments of health is essential before the next pandemic. Not including pharmacists in vaccination planning or utilising them *ad hoc* in the event of a pandemic compromises how effectively this sector of the health workforce can be deployed, potentially jeopardising an efficient pandemic response.

Forward planning and collaboration would allow for expectations and issues with pharmacists as vaccinators to be discussed and addressed, allowing rapid response at the time of the pandemic. Some issues that have been raised by pharmacists with supplying seasonal influenza vaccines include factors such as staffing, pricing for services, stock availability and time constraints (Hattingh et al., 2016). Additionally, differences in practice and training of pharmacist vaccinators between states and territories may mean that some pharmacists are more prepared to respond to a pandemic.

Consideration should also be given to the legislation and support that may improve pharmacists' ability to practise as vaccinators and contribute during a pandemic (Fitzgerald et al., 2016). Factors that may improve pharmacists' ability to contribute to vaccination services include allocation of stockpile vaccines to pharmacies, legislation allowing pharmacists to administer pandemic influenza vaccines, clarification on liaison with public health sectors, legislative changes allowing pharmacists to vaccinate at mass vaccination clinics and clarification on reporting of pandemic vaccines administered by pharmacists (Fitzgerald et al., 2016).

It is essential that planning and communication networks are established before the event to ensure responses are rapid, allowing for effective and widespread vaccination of the public and ultimately helping to reduce influenza transmission, severity and impacts to the health system.

## 6 Absence from work certificates

As with seasonal influenza, during a pandemic it is currently recommended that even persons with mild influenza avoid attending work to reduce transmission of the virus (Better Health Channel, 2017, Fitzgerald et al., 2010). During a pandemic, workforce absenteeism across all sectors is estimated to be as high as 30 – 50% due to personal illness or illness of a dependent (Department of Health, 2014c).

On average the flu can last between 3-7 days and exclusion from work is recommended for this period (Better Health Channel, 2017). Registered pharmacists in Australia can supply absence from work certificates for a maximum of two days provided the condition is deemed to be within their scope of practice (Pharmaceutical Society of Australia and The Pharmacy Guild of Australia, 2010). Given that employers can request evidence such as medical or absence from work certificates for

any specified period of time, a two day absence from work certificate is inadequate to allow for an individual to recover from influenza (Fair Work Ombudsman, 2017).

### 6.1 *Emergency departments*

At present, there is no data available on the number of individuals with mild or moderate influenza who report to emergency departments or general practitioners for the sole purpose of receiving a medical certificate for work.

In the 2009 H1N1 pandemic, the presentations of patients with 'influenza-like-illness' to emergency departments was up to three times that of previous years (FitzGerald et al., 2010, Fitzgerald et al., 2012). This increase had significant impacts on emergency department workloads, despite most people who presenting to emergency not requiring hospital admission (FitzGerald et al., 2010). During this period general practitioners throughout Australia also reported high patient numbers and increased workload pressures (FitzGerald et al., 2010, Eizenberg, 2009). It is probable that a large portion of people visiting emergency departments and general practitioners during H1N1 required medical certificates to provide to their employers confirming their illness.

As a result of overcrowding in emergency departments and the scarcity of appointments with general practitioners, during the H1N1 outbreak in 2009, pharmacists supplied absence from work certificates (Fitzgerald et al., 2012, Branley, 2009).

While this may have contributed to keeping some individuals away from overcrowded medical centres and emergency departments, pharmacists were limited in their contribution. This was due in part due to the maximum two-day limit for an absence from work certificate supplied by a pharmacist and compounded by the fact that the Pharmaceutical Society of Australia and The Pharmacy Guild of Australia discourage promotion of pharmacy supplied 'absence from work' certificates due to concerns over misuse of the service (Pharmaceutical Society of Australia and The Pharmacy Guild of Australia, 2010). Therefore, a large portion of the Australian population may not have been aware of this service during the H1N1 pandemic and indeed may still be unaware of its availability at local pharmacies.

### 6.2 *Absence from work certificates and pandemic plans*

Tasmania is the only jurisdiction which includes the provision of absence from work certificates by pharmacists as a role in its pandemic plan (Department of Health and Human Services, 2016a). States and territories should consider the benefit of this service provision by pharmacists and how it may be adjusted in times of pandemic influenza to be more robust and ease the burden on other health services.

Adjustments such as approval to supply absence of work certificates for increased time periods and promotion of this service by pharmacies during a pandemic outbreak should also be considered. This may help to reduce burden on general practitioners and emergency departments, allowing more time and resources to be dedicated to handling more moderately to severely ill patients rather than those with mild influenza or even simple colds.

## 7 Surveillance

Pharmacists are not currently utilised to contribute to influenza surveillance data, despite their daily documentation and services which produce large volumes of data in their everyday practice. Information such as immunisation records, number of absence from work certificates provided for

‘influenza-like-illness’, antivirals dispensed or even number of influenza related items sold (such as cold and flu tablets or analgesics) could be provided by pharmacies to contribute to influenza surveillance (Rosenfeld et al., 2011).

Influenza surveillance is complex and relies on various data sources to provide accurate and relevant information on spread, virology and prevalence of influenza activity, as well as data on hospitalisations and mortality (Department of Health, 2017a). This information is then used to guide decision making and response activities by government agencies (Department of Health and Ageing, 2011).

The Department of Health and Ageing reports on a number of lessons learnt from Australia’s response to the 2009 H1N1 pandemic, including the use of pharmacist dispensing records of antivirals for surveillance in future pandemics (Department of Health and Ageing, 2011). Yet to date, only Tasmania mentions the use of pharmacists, under the remit of ‘primary health providers’, for surveillance activities. The Tasmanian pandemic plan does not expand on how this may relate specifically to pharmacists.

### 7.1 *Project Stop™*

During the H1N1 pandemic in 2009 an existing program available in Queensland pharmacies, Project Stop™, normally used for real time tracking of pseudoephedrine sales, was utilised to enable real time monitoring of oseltamivir distribution and identification of related disease hot spots by Queensland Health (I. Todd, former SA Pharmacy Guild President and National Councillor, 2018, pers. comm. 7 Feb).

During the outbreak Queensland Health stockpile distribution of oseltamivir through community pharmacies was organised by the Queensland Branch of the Pharmacy Guild (I. Todd 2018, pers. comm. 7 Feb). The novel use of this existing technology, processes and systems highlights the potential of using pharmacists and pharmacy software in pandemic response to assist with tracking of antiviral dispensing and subsequent influenza outbreak hot spots.

Implementation of surveillance activities utilising a program similar to Project Stop™ would allow departments of health and other relevant bodies to better target outbreaks and assist in minimising disease spread and severity.

For example, in Canada provision of antiviral dispensing records allowed for prescription tracking and identified large volumes of inappropriate prescribing (Lynas, 2009). This enabled targeted education for physicians and pharmacists around appropriate antiviral prescribing and subsequently reduced the number of inappropriate antivirals being given to the public (Lynas, 2009).

Pharmacists accumulate a wealth of health-related data which could be utilised during a pandemic to guide decision making and identify issues, however they require guidance and support. State and territory governments need to provide clear direction as to what data would be useful and how it should be collected, stored and transmitted to relevant health departments to guide decision making around pandemic response. Guidance on how the My Health Record could be utilised and contribute to pandemic planning and response should also be formulated (Australian Digital Health Agency, 2017).

## 8 Emergency medication supply

Predicting the duration of pandemic influenza is difficult. Typically pandemic influenza infection occurs in two or more waves, with each wave being several months apart and lasting between 6 – 8 weeks (Mummert et al., 2013). Due to the prolonged nature of a pandemic influenza outbreak, in addition to considering acute influenza, chronic conditions must be considered in pandemic planning (Collignon, 2008).

### 8.1 Chronic disease and pandemic influenza

In the wake of disasters and emergencies, a lack of access to routine healthcare such as medications has been identified as one of the leading cause of mortality (Mokdad et al., 2005). While preventing mortality from influenza is essential, people with chronic conditions such as diabetes, asthma, cardiovascular disease and renal disease require ongoing high-level care to ensure their health does not suffer during pandemic response.

Without medications people with chronic diseases may experience complications or worsening of their conditions resulting in visits to general practitioners or hospital admissions that could have been prevented. Supply of chronic disease medications and ensuring appropriate use of medications is an integral part of pharmacists' everyday role in the community.

Due to the prolonged nature of a pandemic, it is likely that a significant number of people with chronic diseases may run out of prescriptions for their regular medications. Without prescriptions, patients will need to visit their general practitioner or a hospital for a new prescription at a time when health services are overcrowded with acutely ill patients where they may risk exposure to the pandemic influenza virus.

Alternatively, if patients are unable to access a new prescription they may miss doses of essential medications putting them at risk of disease complications and hospitalisation. This places unnecessary and preventable strain on the health care system at a time when resources and personnel are already strained.

### 8.2 Legislation for provision of emergency medication

Current legislation allows pharmacists to supply 3 days 'emergency supply' of regular medications without a prescription, with the exception of the Northern Territory which permits 7 days (Hope et al., 2017). In Australia 'emergency supply' legislation allows pharmacists to assist patients with continuing their chronic disease medications and give them time to obtain another prescription from their regular general practitioner.

Emergency supply of medication from a pharmacist is not funded and the cost to the patient is determined by the individual pharmacy. No state or territory pandemic plans include pharmacists' role in ensuring ongoing supply of chronic disease medications through emergency supply. Emergency supply of medications may be absent from pandemic plans due to the 3 day nature of the supply, reducing the likelihood of this role as it currently stands being sufficient during a pandemic which may last several months.

Legislation allowing pharmacists to provide 'emergency supply' of regular medications for as long as 30 days has been seen in the aftermath of several disasters and emergencies internationally (Hogue et al., 2009).

This legislation aims to do two things:

- ensure access to regular medications for patients with chronic diseases; and
- reduce the number of people visiting medical centres and hospitals which are already overcrowded in the aftermath of a disaster or emergency.

Within the United Kingdom's pandemic plan, it is noted that there is legislation in place to allow pharmacists to dispense without prescription 30 days of a person's regular prescription medications and 5 days of controlled drugs such as strong pain killers (Department of Health, 2012). During a pandemic, preventing otherwise healthy people with chronic diseases from visiting general practitioners and hospitals has the added benefit of preventing exposure and spread of the influenza virus. Current Australian legislation around pharmacist provision of emergency medication supplies is unlikely to allow pharmacists to contribute to continuity of regular medications for significant periods of time.

Both the length of time for which pharmacist can provide an emergency supply of chronic disease medications and the cost to the patient are barriers to this service being better utilised and accepted. Changes to legislation around length of time and cost of medications during a declared pandemic would allow people with chronic diseases to continue with their current medications without having to wait in crowded waiting rooms or emergency departments where they risk exposure to influenza. Exposure to influenza would place people with chronic diseases at significant risk of catching the virus due to their increased susceptibility and their increased likelihood of developing complications from an infection (Hattingh et al., 2016, Nissen, 2015).

## 9 Communication and workforce engagement

A lack of pre-established communication plans and mutually-understood expectations between health systems and pharmacists would negatively impact pandemic response for Australia. During the 2009 H1N1 outbreak, the Australian Government facilitated communications with general practitioners and primary care providers with forums, roundtables and a webpage dedicated to information for health professionals (Department of Health and Ageing, 2011).

Despite the numerous forms of communication, information flow was still described as 'chaotic' by frontline health professionals (Overton, 2016, Sweet, 2009, FitzGerald et al., 2010). This indicates existing gaps in information dissemination between departments of health and frontline health professionals and the need for improved communication strategies with these groups (FitzGerald et al., 2010, Overton, 2016, Sweet, 2009).

Clear and rapid communications and effective response to pandemic influenza requires engagement between multiple stakeholders and pre-established relationships (McVernon et al., 2017).

Relationships between relevant stakeholders, such as Departments of Health, Primary Health Networks, professional pharmacy organisations and Local Hospital Districts, must be well established before a pandemic to ensure information flow and workforce engagement are maximised during this time.

### 9.1 The Department of Health

There is currently no research on efficacy of communication between Australian pharmacists and Departments of Health during the H1N1 pandemic, however deficiencies in outreach and

effectiveness of information dissemination have been demonstrated in Canada and the United States.

Following the 2009 H1N1 pandemic in the United States, approximately 80% of local health departments indicated they distributed information to general practitioners and pharmacies during the outbreak (Dearing et al., 2011). However only 50% of general practitioners and 16% of pharmacies reported receiving this information (Dearing et al., 2011).

Similarly following the 2003 SARS outbreak in Canada, it was found that poor and disorganised communication between LHDs and community pharmacies led to confusion about what action to take and a lack of understanding about the illness (Austin et al., 2007).

The failure of clinically relevant information from the Australian Government Department of Health to reach frontline pharmacists has the potential to negatively impact clinical practice and pandemic response, as has been previously demonstrated in the United States (Dearing et al., 2011).

## *9.2 State and territory pandemic plans*

A failure to include frontline pharmacists in communication plans during pandemic planning in Australia may lead to inconsistent messages and responses across the health sector and negatively impact clinical practice and patient care (Dearing et al., 2011, Rubin et al., 2014).

Tasmania, South Australia, Victoria and New South Wales note that communication pathways linking the state and territory departments of health with frontline pharmacists will be facilitated by relevant state branches of pharmacy organisation such as the Pharmaceutical Society of Australia or the Pharmacy Guild of Australia (Department of Health and Human Services, 2016a, South Australia Health, 2015a, Department of Health, 2014c, New South Wales Health, 2016). Of these only Tasmania and New South Wales pandemic plans contain specific information include how communication with pharmacists will occur and who pharmacists can expect to receive communications from such as Departments of Health, Primary Health Networks, and professional organisations (New South Wales Health, 2016, Department of Health and Human Services, 2016a).

Formal communication pathways between state and territory Departments of Health and frontline pharmacists remain unclear in three state and territory pandemic plans (Northern Territory Department of Health and Families, 2006, Queensland Health, 2014, Department of Health, 2009).

## *9.3 Role of professional organisations*

Despite four state plans encouraging the use of professional organisations in pandemic response, only two pandemic plans mark the role of professional pharmacy organisations as key stakeholders during development and consultation of their pandemic plan (Department of Health and Human Services, 2016a). Whether the remaining states and territories formally engage professional pharmacy organisations in these processes remains unclear.

Lacking pre-established stakeholder relationships between Departments of Health and professional pharmacy organisations could result in disjointed information reaching frontline pharmacists, confusion over roles and potential unwillingness to work (Dearing et al., 2011, Tippett et al., 2009). If professional pharmacy organisations are to be involved and relied upon in pandemic response, it is important that they are involved in reviewing and contributing to pandemic planning in states and territories. Pre-established relationships and awareness of pandemic plans and expectations by

pharmacist organisations would assist effective response and communications with frontline pharmacists during a pandemic (Dearinger et al., 2011).

While it is essential that pharmacist organisations are used in communications during a pandemic, if pharmacists are unaware of who to expect information from, they may not seek information from these sources. Professional pharmacy organisations have the ability to provide leadership in communication, representation to Departments of Health and assist with developing information specific to pharmacists under pandemic conditions.

At present, membership to professional pharmacy organisations is not compulsory and information can be restricted to 'members only'. During a pandemic professional organisation should actively engage with and supply information to all pharmacists regardless of their membership with their organisation. While online information would improve accessibility, more targeted communications may prove difficult as professional organisations may not have contact details for all pharmacists.

To ensure expectations and roles are well understood it is essential that collaboration and engagement between stakeholders is considered and enacted before a pandemic. Once information has been formulated by Departments of Health with assistance from professional pharmacy organisations, other avenues for communication of this information could be utilised. These could include, the Pharmacy Board of Australia, to which all pharmacists' must be registered, Primary Health Networks and/or Local Hospital Networks. Frontline pharmacists should be informed of planned communications in state and territory pandemic plans and of who they should contact to receive professionally relevant information and advice during a pandemic.

## 10 Workforce capacity in the pharmacy sector

During a pandemic the health workforce may become depleted with health professionals being unable to work due to illness and family responsibilities, or unwilling to work due to safety concerns (Fitzgerald et al., 2012, Overton, 2016, Tippett et al., 2009). As demands for services increase with larger numbers of patients presenting to health services for treatment, the number of health professionals and essential resources available may decrease (Levin et al., 2007). This demand has potential to overwhelm health systems, compromising healthcare delivery and patient safety (Edwards, 2008, Levin et al., 2007). In areas with already reduced staffing, such a regional and rural communities, health services are at greater risk of being overwhelmed in the event of a pandemic (Edwards, 2008). Alternative workforce capacity and means to provide care must be included in pandemic plans to ensure acute and chronic health conditions are not compromised in the event of a pandemic influenza outbreak (Levin et al., 2007).

### 10.1 After hours services

Parallels between the 'Asthma Thunderstorm' and an influenza pandemic can be drawn as they are both examples of emergencies with outcomes that put sudden strain on the healthcare system. In the final report from the Asthma Thunderstorm inquiry, (Inspector General for Emergency Management, 2017) the importance of after-hours services that are accessible to the public was highlighted. The 'Asthma Thunderstorm' took place 'after hours' between 6pm and 6am, during this time the efforts of several community pharmacies that remained open after hours and 24-hour 'super care' pharmacies was praised by the Inspector General of Emergency Management (Inspector General for Emergency Management, 2017).

These pharmacies assisted with distributing emergency asthma medication to hundreds of people and prevented them from having to attend overcrowded emergency departments (Insepector General for Emergency Management, 2017). While changes in opening hours are an appropriate response to an acute incident, staffing may not be sustainable for a longterm response such as a pandemic.

### *10.2 Ensuring workforce capacity*

Given the prolonged nature of a pandemic, reduction in staffing may reduce the ability of pharmacists to provide outside hours care or to fulfil additional roles required.

Pandemic plans from New Zealand discuss the use of part-time health workers, locums, or retired health professionals to bolster staffing during a pandemic (Hawke's Bay District Health Board, 2016, MidCentral District Health Board, 2006). New Zealand pandemic plans also suggest that private pharmacy businesses consider other strategies for ensuring pharmacy workforce capacity including closing down several pharmacies in the same area in order to consolidate workforce and stock into one practice and redistributing staff to rural or regional areas (Hawke's Bay District Health Board, 2016, MidCentral District Health Board, 2006).

While these strategies are suggested by pandemic plans, it is the responsibility of pharmacy business owners and managers to consider and enact these recommendations as appropriate. The appropriate way to engage with, recruit and assign roles to part time pharmacists, locums, or retired pharmacists should be considered by key stakeholders such as pharmacy business owners, professional pharmacy organisations and pandemic planners to ensure local workforce capacity at times of pandemic outbreak.

### *10.3 University engagement: A role for pharmacy students*

In Australia, pre-existing relationships between universities and sites where students undertake their university placements could be leveraged to distribute students to various areas and organisations and bolster workforce capacity.

Engaging with Australian universities, schools of pharmacy and other relevant stakeholders such as student organisations would be essential to utilise the pharmacy student workforce during pandemic response. Across Australia, there are over 3500 pharmacy students (National Australian Pharmacy Students' Association, 2017).

In the United States, healthcare students have been identified as a potential source of workforce capacity during disasters and emergencies (Woodard et al., 2010, Gershgol et al., 2008). Pharmacy students across the United States have assisted in response to several disasters and emergencies including the H1N1 pandemic in 2009 (Gershgol et al., 2008, Woodard et al., 2010). While students are not able to work in a full clinical role, there are tasks with which they could assist.

For example, pharmacy students in the United States have been engaged with pandemic responses to assist government with determining stock levels of antivirals and personal protective equipment by phone inquiries to pharmacies (Woodard et al., 2010). Student have also been used to provide education to the public, assist people with filling out forms and help with work flow in mass vaccination or antiviral distribution clinics (Woodard et al., 2010, Miller et al., 2012).

Factors such as reduced number of workplace commitments compared to full time workers, their strong sense of social responsibility and their enthusiasm for new experiences make students

potentially appropriate to assist during a pandemic (Woodard et al., 2010). Healthcare students may also have reduced study commitments during a pandemic due to university closures designed to stop the spread of the pandemic, increasing their available time to contribute to pandemic response.

With appropriate liaison between relevant university partners and departments of health, this large number of health professionals in training could be effectively utilised to assist with tasks and relieve pressure on other health professionals in pandemic response.

## 11 Recommendations

Examination of pharmacists' roles in current pandemic plans in Australian states and territories shows critical gaps in utilisation of this sector of the healthcare workforce. Pharmacists may fill multiple roles during pandemics, but this Issues Brief focused on five which may have the broadest impacts to the healthcare system including:

- antiviral distribution,
- vaccination,
- emergency medication supply
- absence from work certificates; and
- surveillance.

Antiviral distribution was the role most assigned to pharmacists in pandemic plans (included in 5 out of 7 plans), followed by vaccination (included in 3 out of 7 plans), then surveillance activities and provision of absence from work certificates (included in one plan each). Ensuring an emergency medication supply was not included in any state and territory pandemic plan.

The following recommendations are directed at pandemic health planners in states and territories.

### *11.1 Recommendation 1. Defining roles of pharmacists' in pandemic influenza*

Pharmacists are highly trained and highly accessible to the public and have the potential to provide frontline healthcare to a large proportion of the population in the event of a pandemic.

Infrastructure exists in pharmacists' everyday practice to assist them with these five roles. However, without pre-planning of how pharmacists may be involved and utilised, pharmacists' response will be *ad hoc* compromising the efficiency of their response. Not optimising the contribution of this section of the healthcare workforce would negatively impact the response to pandemic influenza and have implications for the broader health system and economy.

**It is therefore recommended that state and territory departments of health review their pandemic plans to incorporate pharmacists and clearly define the roles that they expect pharmacists to fill during a pandemic influenza outbreak.**

By clarifying roles and expectations at a state and territory department level, individual pharmacists and professional pharmacy organisations can thoroughly plan for a pandemic, ensuring rapid, coordinated and cohesive response of the pharmacy workforce when a pandemic strikes.

### *11.2 Recommendation 2. Consider legislation and policy that supports pharmacy practice during pandemic influenza*

Legislation exists internationally to support pharmacists' roles in pandemic response and ensure that the public has access to affordable and flexible healthcare during a pandemic.

Some legislative changes made by countries other than Australia during the 2009 H1N1 pandemic include:

- the abolition of patient co-payments for antiviral medications and vaccinations,
- making antiviral medications available without a prescription from community pharmacies,
- changes to the type of patient pharmacists were able to vaccinate; and
- allowing pharmacists to supply up to 30 days of a patients regular medications without a prescription.

This Issues Brief also notes that an adjustment in the number of days for which pharmacists can supply absence from work certificates would allow for this role to have a greater impact on the health system.

While pandemics are unpredictable, it is important that factors which may hinder medication and healthcare access during a pandemic be considered in an Australian context before a pandemic event and appropriate legislation and policy put in place to minimise barriers. Leaving legislative and policy changes until a pandemic has already begun will delay tasks being started, cause issues with workforce upscaling and potentially undo careful pandemic preplanning, impacting the health system response.

**It is recommended that state and territory departments of health, in conjunction with the Australian Government Department of Health, consider how legislation and policy could be modified to engage pharmacy practice during pandemic influenza and to more fully utilise this section of the healthcare workforce.**

### *11.3 Recommendation 3. Communication between departments of health and professional pharmacy organisations*

Communication with frontline health professionals is highlighted in state and territory pandemic plans as essential for pandemic planning and response.

Four state pandemic plans note the use of professional pharmacy organisations in supplying information to frontline pharmacists in the event of a pandemic in Australia. Clear communication strategies between departments of health, professional pharmacy organisations and frontline pharmacists are essential to ensure rapid communications and actions in a pandemic event.

Pandemic planning should also include mechanisms by which frontline pharmacists can provide feedback about pandemic response allowing for adjustment of response techniques and identification of potential issues and solutions.

**It is recommended that state and territory pandemic plans include clarification on communication pathways that will be used between broad health services and frontline pharmacists during a pandemic. These communication pathways should allow for feedback from frontline pharmacists so that responses may be appropriately adjusted.**

#### *11.4 Recommendation 4. Professional pharmacy organisations as stakeholders*

Only two state pandemic plans acknowledge professional pharmacy organisations as stakeholders in feedback and development of their pandemic plan. This is despite four state pandemic plans noting the use of pharmacy organisations as information conduits in a pandemic.

It is important that professional pharmacy organisations contribute to the development and review of pandemic plans to ensure that pharmacists are incorporated into pandemic plans in realistic and viable roles. Engagement with professional pharmacy organisations in the planning stage of a pandemic will make engagement in their response more effective and well understood.

Additionally, by utilising professional pharmacy organisations as stakeholders, they may promote to frontline pharmacists their expected roles in relevant state and territory pandemic plans and give advice on preplanning.

**It is recommended that state and territory departments of health incorporate professional pharmacy organisation representatives as stakeholders in pandemic planning to ensure they contain current pharmacy practice and to better prepare the pharmacy workforce for an outbreak.**

#### *11.5 Recommendation 5. Liaison between broader health networks*

While liaison and communication between the various departments of health, pharmacy organisations and frontline pharmacists is essential, collaboration and engagement with a variety of stakeholders should be considered and enacted before a pandemic. Additional areas that may assist with identifying health needs and assisting with coordinating pharmacists' health response to a pandemic include Public Health Units, Primary Health Networks and Local Hospital Networks.

**It is recommended that state and territory departments of health liaise with and encourage liaison between frontline pharmacists, professional pharmacy organisations, Public Health Units, Primary Health Networks and Local Hospital Networks to ensure effective communication and response during a pandemic.**

#### *11.6 Recommendation 6. Engagement with student workforce*

During a pandemic the healthcare workforce will be reduced due to illness causing difficulty in mounting an appropriate health workforce response to control pandemic influenza.

In order to bolster the health workforce international pandemic plans note the potential use of locum, part-time and retired pharmacists. Another strategy highlighted in experiences from several disasters and emergencies in the United States is the use of pharmacy students in pandemic response. While students are unable to fill full clinical roles they may assist with roles such as calling pharmacies to determine stock levels, calling patients for follow up, assisting patients with forms and supporting workflow in mass vaccination or dispensing clinics. Pre-existing relationships between universities and clinical placement sites could be utilised to distribute students across various areas and organisations.

**It is therefore recommended that state and territory pandemic planners engage with university partners, schools of pharmacy and student organisations to prepare the student workforce for pandemic response.**

## **12 Conclusion**

Pharmacists are underutilised in current pandemic planning and response as outlined in state and territory pandemic plans.

While there is no certainty of where or when the next pandemic influenza outbreak will occur, it is considered inevitable that Australia will face another influenza pandemic (Department of Health, 2014b). Therefore it is essential that pandemic planning efficiently utilises resources and personnel to their full potential in order to improve pandemic response and outcomes (Department of Health, 2014b).

Pharmacists are highly accessible to the public, highly trained and supported by existing infrastructure to perform key roles in pandemic response. Utilisation of this sector of the health workforce with its pre-existing infrastructure and training is cost-effective and efficient (Dalton and Byrne, 2017). By omitting pharmacists from the pandemic response, health systems may be compromised in the event of a pandemic.

Pharmacists play an essential role in the everyday healthcare team and have the potential to fill roles including antiviral distribution, vaccine administration, surveillance, provision of absence from work certificates and emergency medication supply within current Australian, State and Territory legislation. With some adjustment to legislation and policy, pharmacists would have a more profound impact on the health system during pandemic influenza and improving patient and community outcomes.

Communication with pharmacists is essential to ensure they receive up to date information and clinical advice to inform practice and ensure they provide members of the public with accurate and timely advice. Engagement with professional pharmacy organisations, Primary Health Networks and Local Hospital Networks is encouraged to ensure pharmacists are well connected in times of pandemic influenza response.

Ensuring workforce capacity is an essential consideration during a pandemic when a large proportion of healthcare professionals may be unable or unwilling to work. Utilisation of retired pharmacists, part time pharmacists, locum pharmacists and pharmacy students should be considered to assist with bolstering the workforce for a pandemic. Engagement with relevant stakeholders and key organisations is essential well before a pandemic to ensure that communications, recruiting strategies and expectations are in place so that pandemic response runs smoothly.

Ultimately, by including pharmacists in pandemic response, exploring how they could be better utilised and ensuring communication pathways are predefined, the pharmacy sector could be better prepared to contribute to the response to pandemics and other public health emergencies that may affect Australia. Engagement and ongoing cooperation of various stakeholders at multiple levels is needed well before a pandemic to ensure that pharmacists are included and their practice supported during pandemic response. The inclusion of pharmacists in pandemic planning and response would assist with taking pressure off other areas of the health system including emergency departments and general practitioners.

## References

- Alberta Health 2014. Alberta's pandemic influenza plan. Updated 2017. [Online] Available: <https://open.alberta.ca/dataset/c89245b6-a7fc-4c24-be87-c2686341ffb5/resource/a652811e-42f2-4c0d-90af-54e0e759e05e/download/2014-albertas-pandemic-influenza-plan-apip-march-2014.pdf> [Accessed Feb 2018]
- Austin, Z., Martin, J. C. & Gregory, P. A. 2007. Pharmacy practice in times of civil crisis: The experience of SARS and the blackout in Ontario, Canada. *Research in Social and Administrative Pharmacy*, 3, 320-35.
- Australian Digital Health Agency. 2017. Using the My Health Record system: For Pharmacists [Online]. Canberra: Australian Government. [Online] Available: <https://www.digitalhealth.gov.au/using-the-my-health-record-system-for-pharmacists> [Accessed Feb 2018].
- Australian Emergency Management Institute 2011. Disaster Health Handbook 1. In: ATTORNEY-GENERAL'S, C. (ed.) 1 ed. Canberra: Australian Emergency Management Institute.
- Better Health Channel. 2017. Flu (influenza) [Online]. Department of Health and Human Services. [Online] Available: <https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/flu-influenza?viewAsPdf=true> [Accessed Feb 2018].
- Blasio, B. F., Iversen, B. G. & Tomba, G. S. 2012. Effect of vaccines and antivirals during the major 2009 A(H1N1) pandemic wave in Norway--and the influence of vaccination timing. *PLoS One*, 7, e30018.
- Branley, A. 2009. Pharmacists writing medical certificates. Newcastle Herald. [Online] Available: <https://www.theherald.com.au/story/444289/pharmacists-writing-medical-certificates/> [Accessed Feb 2018].
- Chemist Warehouse. 2017. Tamiflu 75mg Capsules 10 private prescription price [Online]. Available: <http://www.chemistwarehouse.com.au/buy/42505/Tamiflu-75mg-Capsules-10> [Accessed Feb 2018].
- Collignon, U. 2008. Be prepared for a major incident by careful planning. *Pharmacy in Practice*, 233-238.
- Dalton, K. & Byrne, S. 2017. Role of the pharmacist in reducing healthcare costs: current insights. *Integrated Pharmacy Research and Practice*, 6, 37-46.
- Dearinger, A., Howard, A., Ingram, R., Wilding, S., Scuthfield, D., Pearce, K. & Hall, B. 2011. Communication efforts among local health departments and health care professionals during the 2009 H1N1 Outbreak. *Journal of Public Health: Management and Practice*, 17, 45-51.
- Department of Health 2009. Western Australian health management plan for pandemic influenza 2009. Perth.

- Department of Health. 2011. History of pandemics Australian Government. [Online]. Available: <http://www.health.gov.au/internet/main/publishing.nsf/Content/about-pandemic-history#1918> [Accessed Feb 2018].
- Department of Health 2012. Health and social care influenza pandemic preparedness and response. London. [Online] Available: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/213696/dh\\_133656.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213696/dh_133656.pdf) [Accessed: Feb 2018]
- Department of Health 2014a. Antivirals: Evidence Summary. Depart of Health. Canberra. [Online]
- Department of Health 2014b. Australian Health Management Plan for Pandemic Influenza. [Online] Available: <http://www.health.gov.au/internet/main/publishing.nsf/content/ohp-ahmpipi.htm> [Accessed Feb 2018].
- Department of Health 2014c. Victorian health management plan for pandemic influenza. [Online] Available: <https://www2.health.vic.gov.au/about/publications/policiesandguidelines/Victorian-health-management-plan-for-pandemic-influenza--October-2014>. [Accessed Feb 2018].
- Department of Health 2017a. Australian Influenza Surveillance Report. Canberra: Australian Government. [Online] Available: <http://www.health.gov.au/flureport> [Accessed Feb 2018].
- Department of Health 2017b. Northern Territory Pharmacist-Led Immunisation Guidelines. Darwin: Northern Territory Government. [Online] Available: <http://hdl.handle.net/10137/1303> [Accessed Feb 2018].
- Department of Health 2017c. Structured Administration and Supply Arrangement: Administration of Influenza Vaccines by Pharmacists. Perth: Government of Western Australia. [Online] Available: [https://www2.health.wa.gov.au/Articles/S\\_T/Structured-Administration-and-Supply-Arrangements](https://www2.health.wa.gov.au/Articles/S_T/Structured-Administration-and-Supply-Arrangements) [Accessed Feb 2018].
- Department of Health and Ageing 2007. Australia. Department of Health and Ageing. Office of Health Protection. (2007). *Exercise Cumpston 06 report*. Canberra, A.C.T: [Online] Available, <http://nla.gov.au/nla.arc-75847> [Accessed Feb 2018].
- Department of Health and Ageing 2011. Review of Australia's health sector response to pandemic (H1N1) 2009: Lessons identified. Canberra.
- Department of Health and Ageing 2018. Vaccine Administration Code February 2018. Government of South Australia.

- Department of Health and Human Services 2016a. Tasmanian health action plan for pandemic influenza 2016. Tasmanian Government. [Online] Available: [http://www.dhhs.tas.gov.au/publichealth/public\\_health\\_archive/flu\\_and\\_you2/tasmanian\\_health\\_action\\_plan\\_for\\_pandemic\\_influenza](http://www.dhhs.tas.gov.au/publichealth/public_health_archive/flu_and_you2/tasmanian_health_action_plan_for_pandemic_influenza) [Accessed Feb 2018].
- Department of Health and Human Services 2016b. Tasmanian Vaccination Program Guidelines. Hobart: Tasmanian Government. [Online] Available: <http://www.dhhs.tas.gov.au/peh/immunisation> [Accessed Feb 2018].
- Department of Health and Human Services 2016c. Victorian Pharmacist-Administered Vaccination Program Guidelines. Melbourne: Victoria State Government. [Online] <https://www2.health.vic.gov.au/public-health/immunisation/immunisers-in-victoria/pharmacist-immunisers/guidelines> [Accessed Feb 2018].
- Edwards, J. K., J. Silenas, R. 2008. Promoting regional disaster preparedness among rural hospitals. *The Journal of Rural Health*, 24, 321-325.
- Eizenberg, P. 2009. The general practice experience of the swine flu epidemic in Victoria - lessons from the front line. *Medical Journal of Australia*, 191, 151-153.
- Fair Work Ombudsman. 2017. Notice and medical certificates. Commonwealth of Australia. [Online] Available: <https://www.fairwork.gov.au/leave/sick-and-carers-leave/paid-sick-and-carers-leave/notice-and-medical-certificates#> [Accessed Feb 2018].
- Fitzgerald, G., Aitken, P., Shaban, R. Z., Patrick, J., Arbon, P., Mccarthy, S., Clark, M., Considine, J., Finucane, J., Holzhauser, K. & Fielding, E. 2012. Pandemic (H1N1) influenza 2009 and Australian emergency departments: implications for policy, practice and pandemic preparedness. *Emergency Medicine Australiasia*, 24, 159-65.
- Fitzgerald, G., Patrick, J., Fielding, E., Shaban, R., Arbon, P., Aitken, P., Considine, J., Clark, M., Finucane, J., Mccarthy, S., Cloughessy, L. & Holzhauser, K. 2010. Pandemic (H1N1) 2009 influenza outbreak in Australia: Impact on Emergency Departments. Brisbane: Queensland University of Technology.
- Fitzgerald, T. J., Kang, Y., Bridges, C. B., Talbert, T., Vagi, S. J., Lamont, B. & Graitcer, S. B. 2016. Integrating pharmacies into public health program planning for pandemic influenza vaccine response. *Vaccine*, 34, 5643-5648.
- Gauld, N. J., Jennings, L. C., Frampton, C. & Huang, Q. S. 2012. Five years of non-prescription oseltamivir: effects on resistance, immunization and stockpiling. *Journal of Antimicrobial Chemotherapy*, 67, 2949-56.
- Gershgol, S., Cantrell, L. & Mutrux, B. 2008. Disaster relief efforts of pharmacy students during California wildfires. *American Journal of Health System Pharmacy*, 65, 2006-2007.

- Hattingh, H., Sim, T., Parsons, R., Czarniak, P., Vickery, A. & Ayadurai, S. 2016. Evaluation of the first pharmacist-administered vaccinations in Western Australia: a mixed-methods study. *BMJ Open*, 6.
- Hawke's Bay District Health Board 2016. Pandemic Influenza Plan. [Online] Available: <http://www.hawkesbay.health.nz/about-us/emergency-response/pandemic-resources/> [Accessed Feb 2018].
- Hogue, M., Hogue, H., Lander, R., Avent, K. & Fleenor, M. 2009. The nontraditional role of pharmacists after Hurricane Katrina: Process description and lessons learned. *Public Health Reports*, 124.
- Hope, D., Dickfos, S. & King, M. 2017. Legal gems: Emergency supply of prescription medicines [online]. *Australian Pharmacist*, 36, 61.
- Inspector General for Emergency Management 2017. Review of response to the thunderstorm asthma event of 21-22 November 2016: Final Report. [Online] Available: <https://www2.health.vic.gov.au/about/publications/researchandreports/thunderstorm-asthma-igem-review-final-report-april-2017> [Accessed Feb 2018].
- Lau, E. N., L. 2017. The role of pharmacists as immunisers. *Australian Pharmacist*, April.
- Levin, P. J., Gebbie, E. N. & Qureshi, K. 2007. Can the Health-Care System Meet the Challenge of Pandemic Flu? Planning, Ethical, and Workforce Considerations. *Public Health Reports*, 122, 573-578.
- Lynas, K. 2009. Nova Scotia H1N1 experience underscores need to clarify and support community pharmacy in a pandemic. *Canadian Pharmacists Journal*, 142, 162-163.
- Mcvernon, J., Sorrell, T. C., Firman, J., Murphy, B. & Lewin, S. R. 2017. Is Australia prepared for the next pandemic? *Medical Journal of Australia*, 206, 284-286.
- Midcentral District Health Board 2006. MidCentral District Health Board Pandemic Plan. Palmerston.
- Miller, S., Patel, N., Vadala, T., Abrons, J. & Cerulli, J. 2012. Defining the pharmacist role in the pandemic outbreak of novel H1N1 influenza. *Journal of the American Pharmaceutical Society*, 52, 763-774.
- Ministry of Health 2009. Saskatchewan pandemic influenza plan for the health care system. [Online] Available: <http://www.homelesshub.ca/sites/default/files/vmd0jm0k.pdf> [Accessed Feb 2018].
- Ministry of Health and Long-Term Care 2013. Ontario health plan for and influenza pandemic. Toronto. [Online] Available: [http://www.health.gov.on.ca/en/pro/programs/emb/pan\\_flu/pan\\_flu\\_plan.aspx](http://www.health.gov.on.ca/en/pro/programs/emb/pan_flu/pan_flu_plan.aspx) [Accessed Feb 2018].

- Mokdad, A., Mensah, G., Posner, S., Reed, E., Simoes, E. & Engelgau, M. 2005. When chronic conditions become acute: prevention and control of chronic diseases and adverse health outcomes during natural disasters. *Preventing Chronic Disease*. 2.
- Moss, R., Mccaw, J. M., Cheng, A. C., Hurt, A. C. & Mcvernon, J. 2016. Reducing disease burden in an influenza pandemic by targeted delivery of neuraminidase inhibitors: mathematical models in the Australian context. *BMC Infectious Disease*, 16, 552.
- Mummert, A., Weiss, H., Long, L.-P., Amigó, J. M. & Wan, X.-F. 2013. A Perspective on Multiple Waves of Influenza Pandemics. *PLOS ONE*, 8, e60343.
- National Australian Pharmacy Students' Association. 2017. NAPSA - FAQs [Online]. Available: <https://home.napsa.org.au/getting-involved/faqs> [Accessed Feb 2018].
- New South Wales Health 2016. NSW Health Influenza Pandemic Plan.[Online] Available: [https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2016\\_016.pdf](https://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2016_016.pdf) [Accessed Feb 2018].
- Newall, A., Scuffham, P. & Hodgkinson, B. 2007. Economic report into the cost of influenza to the Australian health system. [Online] Online: <http://www.isg.org.au/assets/assets/isg-cost-influenza-report-30-2007.pdf> [Accessed Feb 2018].
- Newall, A. T., Wood, J. G., Oudin, N. & Macintyre, C. R. 2010. Cost-effectiveness of pharmaceutical-based pandemic influenza mitigation strategies. *Infectious Disease Emergencies*, 16, 224-30.
- Nissen, L. G., B.; Lau, E.; Rosenthal, M. 2015. Queensland pharmacist immunisation pilot phase 1 pharmacist vaccination -influenza final report. Queensland University of Technology.
- Northern Territory Department of Health and Families 2006. Special counter disaster plan - Human pandemic influenza. [Online] Available: <http://www.territorystories.nt.gov.au/jspui/handle/10070/214913> [Accessed Feb 2018].
- NSW Ministry of Health 2015. NSW Pharmacist Vaccination Standards. Sydney: NSW Government. [Online] Available: <http://www.health.nsw.gov.au/pharmaceutical/Documents/pharmacist-vacc-standards.pdf> [Accessed Feb 2018].
- Overton, K. 2016. The Australian public health response to the H1N1 pandemic. *Australian Journal of Emergency Management*, 31, 21-25.
- Pharmaceutical Society of Australia 2017. Managing the delivery and administration of injections and immunisations. Learner guide - implementing an immunisation service. 8ed. Canberra.

- Pharmaceutical Society of Australia and the Pharmacy Guild of Australia 2010. Guidelines for pharmacists issuing certificates for absence from work. [Online] Available: <http://www.psa.org.au/guidelines/issuing-certificates-for-absence-from-work> [Accessed Feb 2018].
- Poon, L. L., Song, T., Rosenfeld, R., Lin, X., Rogers, M. B., Zhou, B., Sebra, R., Halpin, R. A., Guan, Y., Twaddle, A., Depasse, J. V., Stockwell, T. B., Wentworth, D. E., Holmes, E. C., Greenbaum, B., Peiris, J. S., Cowling, B. J. & Ghedin, E. 2016. Quantifying influenza virus diversity and transmission in humans. *Nature Genetics*, 48, 195-200.
- Queensland Department of Health 2016. Drug Therapy Protocol: Pharmacist Vaccination Program. V1.0ed. [Online] Available: [https://www.health.qld.gov.au/data/assets/pdf\\_file/0031/443983/dtp-pharmacist-vaccination.pdf](https://www.health.qld.gov.au/data/assets/pdf_file/0031/443983/dtp-pharmacist-vaccination.pdf) [Accessed Feb 2018].
- Queensland Health 2014. Queensland Health pandemic influenza plan. Brisbane.
- Reinholdt, T. G., A. 2010. Pharmacists prescribing of antivirals for the treatment of pandemic influenza in Norway [Online]. Available: <http://www.fip.org/?page=abstracts&action=generatePdf&item=3254> [Accessed Feb 2018].
- Roche 2009. Fact Sheet - Tamiflu. [Online] Available: <http://www.roche-australia.com/home/products/pharmaceuticals/tamiflu.html>
- Rosenfeld, L. A., Etkind, P., Grasso, A., Adams, A. J. & Rothholz, M. C. 2011. Extending the reach: local health department collaboration with community pharmacies in Palm Beach County, Florida for H1N1 influenza pandemic response. *Journal of Public Health Management and Practice*, 17, 439-48.
- Rubin, S. E., Schulman, R. M., Roszak, A. R., Herrmann, J., Patel, A. & Koonin, L. M. 2014. Leveraging partnerships among community pharmacists, pharmacies, and health departments to improve pandemic influenza response. *Biosecurity and Bioterrorism*, 12, 76-84.
- Schwerzmann, J., Graitcer, S. B., Jester, B., Krahl, D., Jernigan, D., Bridges, C. B. & Miller, J. 2017. Evaluating the Impact of Pharmacies on Pandemic Influenza Vaccine Administration. *Disaster Medicine and Public Health Preparedness*, 11, 587-593.
- Singh, B., Huang, H., Morton, D., Johnson, G., Gutfraind, A., Galvani, A., Clements, B. & Meyers, L. 2015. Optimizing distribution of pandemic influenza antiviral drugs. *Emerging Infectious Diseases*, 21, 251-258.
- South Australia Health 2015a. Pandemic Influenza Plan. [Online] Available: <http://www.sahealth.sa.gov.au/wps/wcm/connect/92b0e0804338c7cf8502ed8bf287c74e/15060.1+Pandemic+Influenza+Plan+A4+Report-v3.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-92b0e0804338c7cf8502ed8bf287c74e-lmsEreu> [Accessed Feb 2018]

- South Australia Health 2015b. South Australia Vaccination pandemic influenza sub plan. Adelaide: Government of South Australia. [Online] Available: <http://www.sahealth.sa.gov.au/wps/wcm/connect/4507048048c624b89959fd7577aa6b46/Pandemic+vaccination+plan+2015+FINAL.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-4507048048c624b89959fd7577aa6b46-m08svV4> [Accessed Feb 2018]
- South Australia Health 2015c. South Australian pandemic influenza antiviral drug distribution sub plan. Adelaide: Government of South Australia. [Online] Available: <http://www.sahealth.sa.gov.au/wps/wcm/connect/0804940048c633399d33fd7577aa6b46/Antiviral+Drug+Distribution+sub+plan+2015+-+FINAL.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-0804940048c633399d33fd7577aa6b46-lpjmsZ0> [Accessed Feb 2018]
- Sweet, M. 2009. Pandemic lessons from Australia. *British Medical Journal*, 339, b3317.
- The Pharmacy Guild of Australia 2014. Community Pharmacy: Delivering accessibility, quality and choice for all Australians. [Online] Available: [https://www.guild.org.au/\\_data/assets/pdf\\_file/0019/6157/pgoa-submission-to-competition-policy-review-draft-report-november-2014-fv.pdf](https://www.guild.org.au/_data/assets/pdf_file/0019/6157/pgoa-submission-to-competition-policy-review-draft-report-november-2014-fv.pdf) [Accessed Feb 2018]
- Tippett, V., Watt, K., Raven, S., Kelly, H., Corry, M., Archer, F. & Jamrozik, K. 2009. Anticipated behaviours of emergency prehospital medical care providers during an influenza pandemic. *Prehospital and Disaster Medicine*, 25, 20-25.
- Traynor, K. 2009. With Maine on board, pharmacists in all 50 states can vaccinate: H1N1 prompts emergency vaccination rules for pharmacists. *American Journal of Health-System Pharmacy* 66, 1892, 1894.
- Woodard, L. J., Bray, B. S., Williams, D. & Terriff, C. M. 2010. Call to action: Integrating student pharmacists, faculty, and pharmacy practitioners into emergency preparedness and response. *Journal of the American Pharmacists Association* 50, 158-64.
- World Health Organisation 2009. Pandemic influenza preparedness and response: A WHO guidance document. [Online] Available: [http://www.who.int/influenza/resources/documents/pandemic\\_guidance\\_04\\_2009/en/](http://www.who.int/influenza/resources/documents/pandemic_guidance_04_2009/en/) [Accessed Feb 2018]
- World Health Organisation. 2018. Influenza (seasonal) Fact Sheet [Online]. World Health Organisation. Available: <http://www.who.int/mediacentre/factsheets/fs211/en/> [Accessed Feb 2018]



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