

Health Security Challenges: Biological Weapons and Pandemic Influenza

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This article examines two disease-based threats to Australia's security—biological weapons and pandemic influenza—and the national and international dimensions of Australia's response. Overall, the best response is to increase public health capacity because the measures needed to protect people during a naturally-occurring infectious disease outbreak are largely the same as would be required to mitigate a biological attack. The article assesses also that the Biological Weapons Convention should be supported as an emerging instrument of global health, and that the Australian Government needs to improve its published plan for responding to pandemic influenza, especially with regard to vaccines.

This article addresses the security challenges posed by two interrelated infectious disease threats to Australia—the possibility of biological weapons use, and the inevitability of an influenza pandemic—and assesses the national and international dimensions of the Australian Government's response. The central argument is that the Australian should concentrate on public health systems and resources, both local and global, because the measures needed to protect people during a naturally-occurring infectious disease outbreak are largely the same as would be required to mitigate a biological attack. The article assesses also that the Biological Weapons Convention should be supported as an emerging instrument of global health, and that the Australian Government needs to improve its published plan for responding to pandemic influenza, especially with regard to vaccines.

Biological attacks and pandemic influenza are infectious disease threats which inspire particular human dread, and which therefore generate a level of societal disruption disproportionate to the burden they pose in terms of illness and death. Other infectious diseases causing a serious morbidity and mortality burden around the world include HIV/AIDS, tuberculosis and malaria. However, the relative familiarity of these ongoing and slow-moving diseases means they are not accompanied by the acute dread that touches the security nerve of people and politicians. As Jessica Stern has argued, fear is disproportionately evoked by certain characteristics of threats, including involuntary exposure, unfamiliarity and invisibility.¹ Individuals have a deep-seated, visceral fear of infection associated with the inherent invisibility of a microbial threat and the notion of horrific symptoms leading to

¹ Jessica Stern, 'Dreaded Risks and the Control of Biological Weapons,' *International Security*, vol. 27, no. 3 (Winter 2002/03), p. 102.

an unpleasant death. Moreover, a sudden and/or fast-moving disease outbreak of natural or deliberate origin has the potential to satisfy Richard Ullman's definition of a security threat as

an action or sequence of events that ... threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of a state.²

Elevating particular infectious disease threats to the security agenda serves to attract priority political attention, a higher level of resource allocation, and the implementation of extraordinary response measures. However, it is incumbent on any government seeking to 'securitize' an issue of human health to ensure its emergency responses are scientifically sound as well as politically acceptable. Accordingly, this article contains suggestions on how the Australian Government should approach the security challenges posed by biological weapons and pandemic influenza.

Biological Weapons

Biological weapons (BW) are pathogenic micro-organisms (bacteria, viruses, fungi and rickettsia) deliberately disseminated to cause disease and death. Historically, biological warfare has produced very few military successes, and many countries that once maintained an offensive BW capability have since renounced it. However, state interest in using disease for military purposes may persist to this day. US suspicions, for example, typically fall on Algeria, Cuba, China, Egypt, India, Iran, Israel, Libya, North Korea, Pakistan, Russia, Sudan, Syria and Taiwan.³ In addition, deliberate disease has attracted the interest of non-state actors. Examples include the 1984 use of salmonella bacteria by US-based members of the Rajneesh cult, the BW program run by the Japanese cult Aum Shinrikyo in the early 1990s, and the October 2001 attacks in the United States by an unknown perpetrator using envelopes laced with bacteria that cause anthrax. As such, it is reasonable to characterise the international threat of BW as real.

However, for at least two reasons, it is necessary to avoid approaching BW as solely a 'weapons of mass destruction' (WMD) issue. First, in contrast to nuclear weapons, the ability to cause mass casualties is a potential property of BW rather than an inherent one. The common tendency to classify BW as WMD is misleading because the extent of harm resulting from their use is highly dependent on: the type and quantity of agent released; the means by which it is delivered; the environmental conditions at the target; and whether and how soon medical intervention is available. Repeated references to BW as a mass-casualty problem serve to focus attention on the worst-case end

² Richard Ullman, 'Redefining security', *International Security*, vol. 8, no. 1 (Summer 1983), p. 133.

³ Monterey Institute of International Studies Online, *Chemical and Biological Weapons: Possession and Programs Past and Present*, 9 April 2002, <<http://cns.miis.edu/research/cbw/possess.htm>> [Accessed 4 May 2007].

of the threat spectrum, and such references usually occur without the reassurance that mass casualties are also the least likely outcome of BW use.

Second and most importantly, defending against a biological attack has more in common with confronting emerging infectious disease threats of natural origin (for example, a novel sub-type of influenza) than preparation for a nuclear or chemical attack. In terms of likely consequences, a natural outbreak of a deadly, contagious disease would, like a biological attack, be unannounced and the disease would spread undetected for some time before being identified and treated. Questions would then arise about how to cope with an unfamiliar pathogenic micro-organism. Whether a disease outbreak is natural or deliberate, the public health arena is where the main struggle would take place.

RESPONDING TO THE PROBLEM OF BIOLOGICAL WEAPONS

At the level of national responses to BW threats, one high-profile capability is that of rapidly-deployed tactical response units. Fearing the prospect of chemical, biological, radiological and nuclear (CBRN) attacks, governments around the world have shown an inclination to form specialist units intended to counter the panoply of WMD threats. In Australia, this tendency to lump together threats that are scientifically dissimilar was reflected recently in an agreement by the Council of Australian Governments to a

National CBRN Security Strategy, to provide a framework to strengthen and enhance Australia's existing national counter-terrorism arrangements for Chemical, Biological, Radiological and Nuclear security.⁴

The challenge for policy-makers and multi-task military response units, however, is that attacks utilising different scientific processes produce vastly different consequences. Most significantly, the worst effects of a nuclear or chemical attack would be felt immediately. This stands in contrast to the use of biological agents which, because of the time they take to incubate inside the human body, might not be noticed for days or weeks. Typical first responders (fire, police and ambulance) are generally not sufficient for containing the effects of a biological attack, and nor are specialist CBRN military personnel. A rapid response capability simply does not apply where, as would most likely be the case, no-one even knows a biological attack is going on. The October 2001 anthrax attacks in the United States were exceptional because the envelopes containing anthrax spores also contained letters advising the reader to take antibiotics. By contrast, when Aum Shinrikyo attempted to disperse anthrax during the early 1990s, the attacks remained unannounced and their occurrence did not come to light until cult members faced trial several years later.

⁴ *Communique, Council of Australian Governments Meeting*, 13 April 2007, <<http://www.coag.gov.au/meetings/130407/index.htm>> [Accessed 3 May 2007].

In a biological attack scenario, the true first responders would most likely be doctors, nurses, pathologists and other health professionals. And the speed of their response would depend on how quickly they recognised that certain symptoms and illnesses were out of the ordinary.

Another high-profile response to the threats of BW is Australia's participation in the Proliferation Security Initiative (PSI). Devised in late 2003, the PSI aims to prevent the proliferation of "weapons of mass destruction", their delivery systems, and related materials to "terrorist groups" and "states of proliferation concern."⁵ Non-proliferation is to be achieved by stopping the flow of prohibited weapons-related items by sea, air or land. Unfortunately for Australia and other participating countries, the PSI is extremely unlikely to overcome the fundamental scientific difficulties associated with addressing BW threats.

At the level of *tangible* proliferation, efforts to stop the spread of BW face dual use dilemmas more profound than those which arise in relation to other weapons categories—many of the ingredients for a nuclear program are highly specialised, and it is generally only large quantities of chemical weapon precursors that may be deemed militarily significant. By contrast, biological agents can be grown from a tiny sample quantity. And in the unlikely event that such a thing could be intercepted in transit, it might have been intended all along for medical purposes as a reference strain for a diagnostic laboratory. In general, however, the spread of BW-relevant technology is an *intangible* phenomenon based on the knowledge and behaviour of biological scientists. That is, BW 'proliferation' is predominantly about flows of scientific information rather than shipments of materials.

THE BIOLOGICAL WEAPONS CONVENTION

Given that BW proliferation is largely a normative challenge centred on the conduct of biological scientists, it is important that the strong international norm against deliberate disease be carefully maintained. The embodiment of that norm is the 1972 Biological Weapons Convention (BWC), and most legal responses to the BW problem operate in accordance with the letter and/or spirit of this treaty. Although the norm against BW use creates a powerful stigma for potential proliferators, it nevertheless requires constant reinforcement in the face of new security challenges. In particular, there is a danger that, as a result of technological advances and/or changed international security circumstances, some political decision-makers might convince themselves and others that BW are no longer an illegitimate means of protecting national interests.

Prior to 2001, the issue attracting most political attention as a means of strengthening the BWC was a legal instrument for monitoring compliance by

⁵ Australian Department of Foreign Affairs and Trade Online, *Proliferation Security Initiative (PSI): Interdiction Principles*, <<http://www.dfat.gov.au/globalissues/psi/>> [Accessed 4 May 2007].

member states. An Ad Hoc Group (AHG) of member states had a mandate, granted at a Special Review Conference in 1994, to negotiate a verification protocol. Broadly speaking, greater confidence in treaty compliance was to be generated by: (1) declarations by member states of existing BW stockpiles and potentially BW-capable facilities; (2) routine and unannounced visits to declared or suspected BW-relevant sites; and (3) investigations of suspicious disease outbreaks. However, the AHG negotiations were brought to an abrupt end after 2001 when the United States announced it would not support a draft protocol presented to the Fifth BWC Review Conference.

Since then, a new process for reviewing the BWC has arguably shifted the BW problem away from the traditional arms control paradigm and towards broader notions of disease-based threats to security. Ongoing international negotiations regarding the Convention could generate greater understanding of how best to address a larger array of overlapping security challenges in an era of emerging natural diseases and rapid advances in microbiology. A particular advantage of the new negotiation process is that discussions among member states may now be less about making the BWC emulate verifiable regimes governing other weapons.

In preparation for the Seventh BWC Review Conference in 2011, the member states have agreed to hold four annual meetings (2007–2010) to discuss, and promote common understanding and effective action on six interrelated topics:⁶

1. Ways and means to enhance national implementation, including enforcement of national legislation, strengthening of national institutions and coordination among national law enforcement institutions.
2. Regional and sub-regional cooperation on implementation of the Convention.
3. National, regional and international measures to improve biosafety and biosecurity, including laboratory safety and security of pathogens and toxins.
4. Oversight, education, awareness-raising, and adoption and/or development of codes of conduct with the aim of preventing misuse in the context of advances in bio-science and bio-technology research with the potential of use for purposes prohibited by the Convention.

⁶ Sixth Review Conference of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, *Final Document*, Geneva, 2006, pp. 20-21.

5. With a view to enhancing international cooperation, assistance and exchange in biological sciences and technology for peaceful purposes, promoting capacity building in the fields of disease surveillance, detection, diagnosis, and containment of infectious diseases: (1) for States Parties in need of assistance, identifying requirements and requests for capacity enhancement; and (2) from States Parties in a position to do so, and international organization, opportunities for providing assistance related to these fields.
6. Provision of assistance and coordination with relevant organizations upon request by any State Party in the case of alleged use of biological or toxin weapons, including improving national capacities for disease surveillance, detection and diagnosis and public health systems.

Topics 5 and 6 above are recognition of the importance to international security of improved national capacities for the surveillance, detection, diagnosis, containment and treatment of disease. As such, the BWC may reasonably be regarded as an emerging instrument of global public health as well as an arms control treaty. This is a welcome development because, from a public health perspective, the response to an outbreak of natural origin would be largely identical to that required for one caused deliberately. Historically, it has sometimes been difficult to distinguish between the two, but disease control and patient-care imperatives have had to be addressed regardless.

PUBLIC HEALTH PREPAREDNESS

Because the magnitude of the BW problem is so difficult to calculate, and the intention of potential attackers so hard to gauge, it makes sense to focus on broadly-applicable remedies aimed at limiting vulnerability to outbreak events. The result of such a focus would be to improve public health in general, regardless of whether biological attacks ever occur. A strong and effective public health response would be based on two main pillars. First, highly sensitive and well-connected systems for disease surveillance and response would be a vital means of containing an outbreak in its early stages and facilitating the timely treatment of victims. And second, national health systems with surge capacity in areas such as diagnostics and patient care would be better able to cope with sudden outbreak contingencies. In addition to addressing ongoing human health imperatives, these pillars serve three important security functions: (1) they may lead potential BW perpetrators to suppose that the effects of an attack would be thwarted or at least reduced; (2) they directly address human vulnerability to the effects of a successful BW attack; and (3) most importantly, they serve also to bolster defences against disease outbreaks of natural origin.

Unfortunately, Australia's hospital staff, facilities, supplies and equipment are usually stretched to the limit on day-to-day matters and generally cannot

cope well with small, sudden surges in patient numbers.⁷ A key response to BW is therefore to build a surge capacity into the health system to allow for outbreak contingencies. Emergency plans would be needed in areas such as staff protection, patient triage on a mass scale, distributing and administering drugs and other therapy, and coordination between relevant state, national and international agencies. Of particular importance is the surge capacity of diagnostic laboratories. Rapidly establishing a diagnosis is critical for public health response purposes because this then guides the use of vaccines, drugs and other medical interventions. Beyond the issue of possible BW attacks, these health system issues are relevant also to the prospect of pandemic influenza.

Pandemic Influenza

The security significance of the H5N1 avian influenza virus lies in the possibility that it will mutate into a form capable of sustained human-to-human transmission. H5N1 has repeatedly managed to jump species and successfully infect humans, and every instance of this is a potential mutation opportunity. According to the World Health Organization (WHO), as of 14 August 2007 there have been 320 confirmed cases of human H5N1 infection since late 2003, including 193 deaths.⁸ Historical experience indicates that the world is overdue for the emergence of a pandemic strain of influenza, and there is consensus that an event of this kind is virtually inevitable. As such, in this first identifiable 'pre-pandemic' phase of human history, it makes sense to be thinking seriously about how governments should prepare and respond.

Past influenza pandemics have always caused high rates of illness and death, with consequent social and economic disruption. The worst pandemic of the twentieth century was the 'Spanish flu' of 1918-1919 which killed around 50 million people worldwide. Subsequent pandemics in 1957 (the 'Asian flu') and 1968 (the 'Hong Kong flu') were much less deadly, causing two million and one million deaths respectively. The conservative estimate of the WHO, using epidemiological modelling based on the comparatively mild 1957 pandemic, is that a future influenza pandemic would cause between 2 million and 7.4 million deaths worldwide.⁹ However, another estimate based on data from the 1918-19 pandemic has predicted

⁷ See Anthony Bergin and Rupal Khosa, 'Are we ready? Healthcare preparedness for catastrophic terrorism,' *ASPI Special Report*, Canberra, Australian Strategic Policy Institute, 2007.

⁸ WHO Web Site, *Confirmed Human Cases of Avian Influenza A (H5N1)*, 14 August 2007, <http://www.who.int/csr/disease/avian_influenza/country/en/> [Accessed 16 August 2007].

⁹ WHO Web Site, *Ten Things You Need to Know about Pandemic Influenza*, 14 October 2005, <<http://www.who.int/csr/disease/influenza/pandemic10things/en/index.html>> [Accessed 4 May 2007].

62 million deaths.¹⁰ In 2006 an Australian study considered four scenarios for an influenza pandemic. The authors estimated that a mild pandemic would result in 1.4 million deaths and a cost to the global economy of \$US330 billion in lost economic output. The worst case scenario was 142 million dead and a loss to the global economy of \$US4.4 trillion.¹¹

AUSTRALIA'S HEALTH AND SECURITY

Just as nations fear military conflict because so many national achievements could be quickly undone, so too an influenza pandemic would set back hard-won economic gains and potentially undermine trust in government. And like the all-consuming effort of prosecuting a war, defeating 'the flu' would become a first order issue for governments; one which would alter the premise for all other activity. Australia's response to this threat includes offshore efforts to prevent or delay a pandemic and domestic efforts to prepare for damage control when a pandemic virus arrives. To date, the Australian Government has been wisely generous in providing international assistance and its national plan for pandemic influenza is, by world standards, a good one. However, Australia's published pandemic preparedness plan requires further development, especially with regard to the distribution of vaccines.

Regarding Australia's international efforts, the policy of providing overseas aid is consistent with the December 2004 acknowledgment by the UN Secretary General's High-Level Panel on Threats, Challenges and Change that "the security of the most affluent State can be held hostage to the ability of the poorest State to contain an emerging disease."¹² International security against outbreak threats requires sustained efforts to enhance the national health systems of developing countries. To a great extent, well-resourced countries like Australia can protect themselves against disease threats of international proportions by helping developing countries to create a strong public health infrastructure, educating and training local health professionals, and sponsoring appropriate measures to enable timely identification and control of infectious diseases.

Australia has stated that it is in its own best interests to be a major player in regional disease surveillance and to ensure that the mechanisms used for this purpose are the best available. This is essentially because detecting and responding to overseas outbreaks relieves the Australian health system of infectious disease casualties that might otherwise arrive undetected in Australia. To this end, Australia deploys epidemiologists and microbiologists

¹⁰ Christopher J. L. Murray et al., 'Estimation of potential global pandemic influenza mortality on the basis of vital registry data from the 1918-20 pandemic: a quantitative analysis,' *The Lancet*, vol. 368 (2006), pp. 2211-18.

¹¹ Warwick McKibbin and Alexandra Sidorenko, *Global Macroeconomic Consequences of Pandemic Influenza*, Sydney, Lowy Institute for International Policy, 2006.

¹² *A More Secure World: Our Shared Responsibility. Report of the High-Level Panel on Threats, Challenges and Change*, New York, United Nations, 2004, p. 14.

throughout Asia and the Pacific to engage in surveillance, laboratory diagnosis, and outbreak investigation.¹³ In 2005-06 Australia's international aid program provided around \$280 million in direct support to the health sector, and health has accounted for around 11-12 per cent of Australia's total aid expenditure over the past five years.¹⁴ Australia has also committed an additional \$100 million over four years (from July 2006) to combat the threat of pandemics and emerging diseases in the Asia-Pacific region.

Of course, Australia's response to a pandemic cannot rest on offshore preventive measures; resources must be reserved for domestic damage control in the likely event that an overseas influenza outbreak cannot be contained. Thus, in the event of human-to-human transmission commencing elsewhere, the Australian Government has stated that it will

consider requests from the WHO or other governments for assistance, and respond commensurately with the nature of the threat, *without weakening Australia's own capacity* for action should the pandemic spread here.¹⁵

Under circumstances in which a fast-spreading and unfamiliar disease is inspiring dread and potentially stimulating panic among national populations, the social contract under which citizens rely on governments to protect them during times of crisis would be subjected to severe pressure. Today, for the first time in history, governments have an opportunity to warn their citizens in advance of a pandemic, whether caused by H5N1 or another influenza virus subtype. Combined with preparations for damage control in the area of human health, this advance warning should be based upon the best available scientific information being communicated candidly to the public. By thus fostering trust in government, this would do much to minimise the panic that historically accompanies a pandemic.

The Australian Government's plan for responding to an influenza pandemic, as communicated to the Australian public, is to delay and contain the spread of disease until a vaccine is developed. Containment measures in the updated Australian Health Management Plan for Pandemic Influenza (published in May 2006) include: border control and quarantine measures to reduce the risk of overseas travelers bringing a pandemic influenza virus into Australia; adoption of basic infection control measures such as cough and sneeze etiquette, frequent hand washing, and the wearing of masks on public transport; social distancing practices, such as avoiding public gatherings and short-term home quarantine for people exposed to an

¹³ Australia, *The Role of the World Health Organisation in Infectious Disease Surveillance: Australian Perspective*, Geneva, Meeting of Experts, Meeting of the States Parties to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, 2004, p. 4.

¹⁴ AusAID, *Helping Health Systems Deliver*, Canberra, Australian Agency for International Development, 2006, p. 9.

¹⁵ *Australian Health Management Plan for Pandemic Influenza*, Canberra, Commonwealth of Australia, 2006, p. 33. Emphasis added.

infected person; and targeted distribution of antiviral medication to people exposed or at continuous risk of exposure to the influenza virus. To support its pandemic plan, Australia has a National Medical Stockpile (NMS) which includes: 3.8 million courses of the antiviral drug Tamiflu; 50,000 bottles of Tamiflu suspension for children; 275,000 courses of Relenza (an inhaled antiviral drug); dedicated personal protective equipment for government workers at international airports; 40 million surgical masks for the health care system; and equipment to deliver 50 million vaccinations.¹⁶

PHARMACEUTICAL DEFENSES

On the basis of epidemiological modeling, the Australian Government believes its strategy could delay the development of a pandemic within Australia by up to 12 months, thus hopefully allowing enough time to develop and produce a vaccine to protect the entire Australian population. By international standards the Australian plan is a good one. In particular, the recommended measures on taking personal responsibility for infection control are highly specific and sensible. However, it is important to acknowledge that the targeted deployment of antivirals is not certain to be effective. Once tens of millions of people worldwide started taking such medication, for example, the development of drug resistance would be a real possibility. In early 2005, H5N1 virus with high-level resistance to oseltamivir (Tamiflu) was isolated from two Vietnamese patients, both of whom died despite being treated with the antiviral drug.¹⁷

To the extent that a national campaign against pandemic influenza would depend upon pharmaceutical defences for individuals, another important area that warrants further consideration by the Australian Government is the distribution of vaccines. The advantage of vaccinating populations against pandemic influenza would be that it is much less expensive than administering antiviral medication and more effective at preventing the spread of disease. The downside, however, is that the vaccine development process could begin only once the influenza virus had started to spread, and the disease would probably have circulated the world before large-scale manufacturing could be initiated. The Department of Health and Ageing website states:

The Australian Government has signed contracts with two vaccine manufacturers to ensure that enough pandemic vaccine for all Australians will be produced in the event of a pandemic. However, the vaccine may take 3-6 months to produce, and *initially will be in short supply*. Once

¹⁶ Ibid., p. 48.

¹⁷ Menno D. de Jong et al., 'Oseltamivir Resistance during Treatment of Influenza A (H5N1) Infection,' *New England Journal of Medicine*, vol. 353, no. 25 (2005), pp. 2667-72.

sufficient pandemic vaccine has been produced, all Australians will be able to receive the vaccine.¹⁸

A thorny but vital question to which the Australian Government has yet to provide a satisfactory answer is: who should receive the influenza vaccine first if it is not immediately available to everybody? This policy gap is acknowledged in the government's own pandemic plan, which states: "If it [the pandemic] arrives before a vaccine is developed, priorities will need to be set for the distribution of the vaccine as it is produced."¹⁹

In the United States, the Department of Health and Human Services has made recommendations (subject to change depending on the epidemiology of the pandemic virus) about which age and occupational groups should have priority for vaccination. Frontline medical personnel, as well as vaccine production and distribution workers, are to receive top priority along with pregnant women, household contacts of severely immuno-compromised people, household contacts of children under six months old, emergency response workers, and key government leaders. Lower down the priority list are healthy people over 65 years old, healthy children aged 6-23 months, utility workers, transportation workers, telecommunications and IT workers. Below these groups are health decision-makers in government and funeral directors, and last of all are healthy people aged between 2 and 64.²⁰

The US plan, based on the 'save the most lives' principle, is comparable to the Australian plan which envisages that the resources of the NMS "will need to be triaged to provide the best outcome for the largest number of Australians."²¹ If a vaccine is not available to protect the entire population against the pandemic before it spreads to Australia, the government's plan is to make the vaccine available "first to people at high risk of exposure to the virus and providing essential services, then to people most vulnerable to severe illness from infection."²² However, vaccine distribution founded on a utilitarian ethic of achieving the greatest good for the greatest number is by no means the only option, and the Australian public should have the opportunity to consider alternatives.

There are in fact many ethical principles for rationing health care. For example, 'first come, first served' operates in intensive care units when admitted patients retain beds despite the presentation of another patient who is sicker. 'Save the worst-off' is an ethic that plays a role in allocating organs for transplantation. And 'save those most likely to fully recover' guided

¹⁸ Department of Health and Ageing, *Pandemic Influenza - frequently asked questions*, 30 May 2006, <<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/phd-pandemic-faq.htm>> [Accessed 4 May 2007], emphasis added.

¹⁹ *Australian Health Management Plan for Pandemic Influenza*, p. 37.

²⁰ U.S. Department of Health and Human Services Online, *HHS Pandemic Influenza Plan*, 2005, <<http://www.hhs.gov/pandemicflu/plan/appendixd.html>> [Accessed 16 June 2006].

²¹ *Australian Health Management Plan for Pandemic Influenza*, p. 53.

²² *Ibid.*, p. 37.

principles for giving penicillin to soldiers with syphilis in World War Two.²³ Bioethicists at the US National Institutes of Health, Ezekiel Emanuel and Alan Wertheimer, disagree with pandemic vaccine prioritization based on the 'save the most lives' principle. They instead advocate a 'life-cycle allocation' principle based on the notion that each person should have an opportunity to live through all the stages of life. This would see influenza vaccine being distributed to the very young before, for example, elderly people or people with life-limiting illnesses or disabilities.²⁴

From a security perspective, vaccine distribution according to a 'social functioning' principle would be particularly important, and the Australian Government plans to prioritize vaccine for those providing "essential" services. There is no question that this includes medical and public health professionals who participate directly at the life-saving end of pandemic response. Beyond that, however, it is vital to decide how vaccine should be prioritized as *between* first-responders (ambulance and fire), security personnel (military and police), sanitation workers, telecommunications operators, undertakers, and so on. On close consideration, the list of "essential" workers requiring limited vaccines becomes alarmingly long.

Conclusion: A Message to the Next Government

Biological weapons and pandemic influenza are two areas in which Australia's health and security interests intersect. The extent of damage from a biological attack or a naturally-occurring outbreak event is highly dependent on the capacity of the country's public health system to identify, diagnose and treat victims, and to contain contagion. Thus the strengthening of public health capabilities, both in the Asia-Pacific region and at home, is the most worthwhile measure towards which the Australian Government should direct financial resources and political attention. It is essential that the problem of BW be treated as distinct from that of chemical and nuclear weapons, and that the practical limitations of catch-all approaches such as the PSI and 'CBRN counterterrorism' are recognised. A better approach is for the government to continue its support for a strong BWC as a normative obstacle to deliberate disease as well as an instrument of global public health.

With regard to the prospect of pandemic influenza, the Australian Government is wisely operating on the premise that protecting populations against disease outbreaks is necessarily a transnational endeavour. Domestically, Australia's national plan for responding to pandemic influenza contains sensible measures, but more detailed planning is required. Vaccination is by far the most important preventive measure, yet the reality

²³ Ezekiel Emanuel and Alan Wertheimer, 'Who Should Get Influenza Vaccine When Not All Can?', *Science*, vol. 312, no. 5775 (2006), p. 854.

²⁴ *Ibid.*, p. 855.

of Australia's limited production capacity is that vaccines will initially be in short supply. Under these circumstances, and as a way of enhancing public cooperation and trust, the government needs to engage its citizens in ethical discussions about vaccine distribution priorities. In the event of a pandemic, when it transpires that some Australians are receiving vaccinations while others do not, people will reasonably want to know why.

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