

Pandemic influenza: preparing for an uncertain inevitability

| Kenneth A McLean

When it comes to pandemic influenza, the question is not “if”, but “when” this will occur. There has been substantial progress from the GAP over the past 10 years, and the world is more prepared than ever for an influenza pandemic. Nonetheless, there remain significant challenges to ensure there is sufficient and timely vaccine production and distribution to effectively respond when the next emerges.

Zika, Ebola, Middle-Eastern Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS) – these viruses have dominated headlines in recent decades as potential pandemic threats. We cannot know what the next outbreak will be, however the most enduring and inevitable risk remains that of a pandemic influenza outbreak. While there are possible pandemic candidates like Avian (H5N1) or Swine flu (H1N1), these remain difficult to predict. The influenza virus is highly mutable, rapidly evolving to alter the antigens displayed to present a novel challenge to the immune system. It is this feature that poses the pandemic risk, and also that ensures it is inherently difficult to produce a ‘universal’ vaccine. Each year, the World Health Organisation (WHO) must produce recommendations for influenza subtypes to include within the seasonal vaccine, based on predictions from global surveillance activities. Therefore, the capability to rapidly institute a global vaccination programme remains paramount to provide effective protection of the world population.

Centre for Global Health Research,
The Usher Institute, University of
Edinburgh, Edinburgh, Scotland, UK

Cite as: McLean KA. Pandemic influenza: preparing for an uncertain inevitability. *J Glob Health Rep* 2017; 1: e2017003.

GLOBAL ACTION PLAN ON INFLUENZA VACCINES

To address this, the Global Action Plan on Influenza Vaccines (GAP) was launched in 2006 as a WHO initiative which aimed to strengthen vaccine production capability and response to the threat of pandemic influenza (1). In November 2016, the 3rd consultation on the GAP was held in Geneva to guide the final 5 years of the plan. This meeting brought together over 100 experts from a range of governmental and non-governmental agencies, vaccine manufacturers, and academic institutions to evaluate the progress made so far, and discuss the strategy going forward.

Seasonal influenza outbreaks are public health threats in and of themselves. Each year, this affects 5–10% of the global population, resulting in 250–500 thousand deaths (2). Therefore, expanding seasonal vaccination coverage will mitigate the disease burden of influenza. Over the GAP, the number of countries with national influenza immunization policies have risen from 74 (38%) to 115 (59%), including 20 low- and middle-income countries (LMICs) (3). However, there are still significant barriers regarding vaccination access and hesitancy within these populations (4). Therefore, new strategies and approaches are required going forward to safeguard populations, particularly the ‘high risk’ groups (5).

Furthermore, increasing seasonal vaccine uptake also has a concurrent benefit in ensuring sufficient demand in place to sustain and grow the global production capacity of influenza vaccine. This is essential as seasonal and pandemic influenza vaccine production is inherently linked through the shared manufacturing facilities. In 2006, the global production capacity of influenza vaccine was estimated to be 0.5 billion seasonal and 1.5 billion pandemic doses (1). Successive estimates have demonstrated a steady growth over the GAP. The most recent estimate in 2015 (6) placed the global production capacity at 1.5 billion seasonal and 6.4 billion pandemic influenza vaccine doses. While this represents a significant expansion, this nonetheless remains insufficient to meet the overall GAP goal of immunising 70% of the global population with 2 doses of vaccine (~ 10 billion doses). Furthermore, sustainability and equitable distribution of this production capacity remain key concerns, particularly in countries with little or no production capacity.

CONCLUSION

When it comes to pandemic influenza, the question is not “if”, but “when” this will occur. There has been substantial progress from the GAP over the past 10 years, and the world is more prepared than ever for an influenza pandemic. Nonetheless, there remain significant challenges to ensure there is sufficient and timely vaccine production and distribution to effectively respond when the next emerges.

REFERENCES:

1. World Health Organization. Global Action Plan on Influenza Vaccines. Geneva: World Health Organization; 2006.
2. World Health Organization. Fact sheet No. 211: Influenza (Seasonal), 2009. Available: <http://www.who.int/mediacentre/factsheets/fs211/en/>. Accessed: 21 May 2016.
3. Ortiz JR, Perut M, Dumolard L, Wijesinghe PR, Jorgensen P, Ropero AM, et al. A global review of national influenza immunization policies: Analysis of the 2014 WHO/UNICEF Joint Reporting Form on immunization. *Vaccine*. 2016;34:5400–5. [PubMed https://doi.org/10.1016/j.vaccine.2016.07.045](https://doi.org/10.1016/j.vaccine.2016.07.045)
4. Eskola J, Duclos P, Schuster M, MacDonald N. SAGE Working Group on Vaccine Hesitancy. How to deal with vaccine hesitancy? *Vaccine*. 2015;33:4215–7. [PubMed https://doi.org/10.1016/j.vaccine.2015.04.043](https://doi.org/10.1016/j.vaccine.2015.04.043)
5. World Health Organization. Meeting of the Strategic Advisory Group of Experts on immunization, April 2012—conclusions and recommendations. *Wkly Epidemiol Rec*. 2012;87:201–6. [PubMed https://doi.org/10.1016/j.wer.2012.04.001](https://doi.org/10.1016/j.wer.2012.04.001)
6. McLean KA, Goldin S, Nannei C, Sparrow E, Torelli G. The 2015 global production capacity of seasonal and pandemic influenza vaccine. *Vaccine*. 2016;34:5410–3. [PubMed https://doi.org/10.1016/j.vaccine.2016.08.019](https://doi.org/10.1016/j.vaccine.2016.08.019)