

The global imperative to address vaccine-preventable diseases



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Background

When one speaks of global health, there are few issues that actually have a health impact globally rather than in just one or more regions of the world or in a specific population. When truly thinking globally, among the most important global health issues affecting large segments of the world's populations is the persistence of vaccine-preventable diseases.

Objective

The aim of this article is to provide a perspective on the importance of immunisation as a unique global health concern in that it is not a time-limited issue.

Discussion

Although there may be outbreaks of vaccine-preventable diseases within or across nations, effective immunisation strategies cannot be conducted in a one-off manner. No matter how effective a single immunisation campaign may be, each year there is a new global cohort of children who need protection to prevent disease, as well as new opportunities to vaccinate adults against a wide array of avoidable illnesses. The developing world should no longer experience 450,000 preventable deaths each year from rotavirus, nor 145,000 from measles. By the same token, there should no longer be 2000 preventable deaths each year from influenza in Australia. It is time to use our global health efforts to address the most pressing risks, both at home and abroad.

When one speaks of global health, there are few issues that have a health impact globally rather than in just one or more regions of the world, or in a specific population. This concept is different to the concept of needing global action to address unique humanitarian crises or specific environmental threats. Often, the term 'global health' is used as a proxy for health issues in the developing world, which in essence focuses on only specific parts of the globe. Although the authors of this article believe strongly that health issues in the developing world are important, we posit that true global health issues have an impact on a larger portion of the globe and are really global in scope. Such issues require a large proportion of the world to work together, or in tandem, to address the health and wellbeing of all.

Unfortunately, prioritisation of health issues and global concerns is too often driven by overestimations of potential risk and/or drama following media attention given to particular topics. Often, the most important factors affecting the health of a population are not those that garner the most attention or the most urgency on the part of the public. Further, because of perceptions of urgency, issues of treatment often crowd out issues of prevention to the detriment of future health status.^{1,2} This is true in both the developed and developing worlds. Because resources for public health are often scarce, prioritisation of issues is common and necessary.

When thinking globally, among the most important global health issues affecting large segments of the world's populations is the persistence of vaccine-preventable diseases.^{3,4} Such diseases exist across all continents, and can connect rich and poor nations alike through global travel and migration, which can facilitate contagion transmission.⁵

Immunisation as a global health concern is unique in that it is not a time-limited issue. Although there may be outbreaks of vaccine-preventable diseases within or across nations, effective immunisation strategies cannot be conducted in a one-off manner. No matter how effective a single immunisation campaign may be, each year there is a new global cohort of children who need protection to prevent disease, as well as new opportunities to vaccinate adults against a wide array of avoidable illnesses.

However, because immunisation must be a constant and consistent effort, it lacks the drama, exposure and perceptions of urgency generated by acute crises that may affect far fewer people.

An example of this phenomenon is measles, a well-known and vaccine-preventable disease. Measles infects almost 350,000 children and kills approximately 150,000 per year in the developing world.⁶ This tragic and preventable annual loss of life occurs relatively unnoticed and with little fanfare. The number of deaths of this highly contagious disease each year has been relatively unchanged over the past decade. There is no perception of crisis, no headlines in our newspapers or new worldwide mobilisation efforts to address the issue – the deaths simply continue to add up. There is little perception of risk to the rest of the globe outside the areas most affected. It was only the novelty of an outbreak of measles at Disneyland in 2014 that brought the issue of under-vaccination and vaccine refusal to the forefront, albeit briefly, in the US.⁷

The magnitude of vaccine-preventable diseases is staggering, both in terms of unnecessary morbidity and mortality, and the cost that is required for treatment rather than prevention. Some of the most striking annual rates of infection worldwide include 138 million cases of rotavirus, 80 million cases of varicella and 40 million cases of pertussis.⁶ The annual death rates of vaccine-preventable diseases are simply numbing: one million deaths from hepatitis B, 1.6 million deaths from pneumococcus, 450,000 deaths from rotavirus ... and the list goes on.⁶

There is, however, some good news in that current global immunisation rates are holding steady so that these numbers are not likely to climb even higher in the near future.⁸ Current vaccination efforts (eg the World Health Organization's [WHO's] Global Vaccine Action Plan) are credited with preventing an estimated three million deaths every year.⁸ However, there is still much work to be done. An estimated 21.8 million infants worldwide are still missing out on basic immunisations.⁸ The countries with some of the lowest immunisation rates are also among the poorest, including the Central African Republic, Somalia, South Sudan and Equatorial Guinea.⁹

Closer to home in Australia, we enjoy high immunisation rates overall. However, there is one vaccine-preventable disease in which we can do much better. In Australia, there are more than 250,000 cases of viral influenza each year.¹⁰ Although many may discount the seriousness of this disease and the importance of annual immunisation, the data speak otherwise. There are approximately 18,000 hospitalisations and 1500–2000 deaths from influenza each year.¹¹ The reasons for low vaccination rates in Australia and other Western countries are varied and complex, and relate largely to knowledge, attitudes and beliefs.¹² A recent meta-analysis of communications research by the US Centers for Disease Control and Prevention (CDC) highlighted the central role healthcare providers have in the acceptance of influenza vaccination.¹³

Although these numbers are relatively small in comparison to the rates of infection and death for vaccine-preventable diseases

in developing nations, they are substantial in their own right and represent the lack of urgency felt by the public with regard to this disease. Despite annual efforts to mobilise the population for influenza immunisation, rates remain low and public concern is minimal.¹⁴ The annual toll of hospitalisations and deaths is not the focus of intense media exposure, and there is no public outcry for action. The perception of risk on the part of the public remains minimal and has resulted in inertia to effect change. The authors posit that the public's familiarity with influenza occurring on an annual basis breeds complacency on many levels.

By the same notion, on the global scene, the 145,000 deaths from measles in the developing world rarely make the headlines of local papers, nor become the focus of debate and concern in parliaments around the world. The authors hypothesise that because these deaths are annual, they become, in a way, accepted as routine. As such, there is less of a public imperative to address the issue.

To highlight the impact that risk perception may play in the public's urgency to control communicable diseases, the authors believe it would be useful to contrast this complacency of common, yet deadly, vaccine-preventable diseases with a recent outbreak of a much less common communicable disease. Ebola is a disease that is much more difficult to transmit than measles or influenza. There were approximately 17,000 cases and 6500 deaths from the disease worldwide in 2014.¹⁵ Yet, the international reaction to the outbreak was dramatic. There were mobilisation efforts from the WHO, the CDC and other agencies. Resources and personnel poured into the most affected nations. Other countries, Australia included, established elaborate screening programs at their borders and ports of entry. These programs had little potential practical impact on either preventing the importation of cases and/or transmission of the disease. Most of these efforts addressed the need for the public to be reassured about their perceived risk based on fear and perception of the high mortality rate as opposed to the actual risk of the disease.

As physicians, the authors mourn the loss of life and the tragedy of any preventable death, and in no way mean to suggest that any one death is more or less important or meaningful than another. However, it is important to understand the perception of risk versus actual risk when considering the expenditure of resources in the public health domain. If our goal is to devote resources in a strategic manner, we must have the ability and the courage to educate the public accordingly, and to act in an evidence-informed manner. We must be willing to devote time and money, not on the basis of perception, but on reality and data, in order to make the most difference in the lives of populations.

With specific regard to vaccine-preventable diseases, it is time to mobilise resources in order to address our gaps in this global health issue as vigorously as we sought to address the Ebola outbreak. The developing world should no longer experience 450,000 preventable deaths each year from rotavirus, nor 145,000 from measles. By the same token, there should no longer be 2000

preventable deaths each year from influenza in Australia. We can start by ensuring all patients in our practices are fully immunised for all recommended vaccines. It is time to use our global health efforts to address the most pressing risks, both at home and abroad.

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References

1. Bishai D, Paina L, Li Q, Peters DH, Hyder AA. Advancing the application of systems thinking in health: Why cure crowds out prevention. *Health Res Policy Syst* 2014;12:28.
2. Neumann PJ. Why don't Americans use cost-effectiveness analysis? *Am J Manag Care* 2004;10:308–12.
3. Council on Foreign Relations. Vaccine-preventable outbreaks. New York: Council on Foreign Relations, 2015. Available at www.cfr.org/interactives/GH_Vaccine_Map [Accessed 4 August 2015].
4. Wallace AS, Ryman TK, Dietz V. Overview of global, regional, and national routine vaccination coverage trends and growth patterns from 1980 to 2009: Implications for vaccine-preventable disease eradication and elimination initiatives. *J Infect Dis* 2014;210:S514–22.
5. Gautret P, Botelho-Nevers E, Brouqui P, Parola P. The spread of vaccine-preventable diseases by international travellers: A public-health concern. *Clin Microbiol Infect* 2012;Suppl 5:77–84.
6. Vaccine Education Center – Children's Hospital of Philadelphia. Global immunization: Worldwide disease incidence. Philadelphia: CHOP, 2014. Available at www.chop.edu/centers-programs/vaccine-education-center/global-immunization/diseases-and-vaccines-world-view#.VcGhC0Hypz9 [Accessed 4 August 2015].
7. Centers for Disease Control and Prevention. Measles outbreak – California, December 2014 – February 2015. *Morb Mortal Wkly Rep* 2015;64:153–54.
8. World Health Organization. Immunization coverage: Fact sheet No. 378. Geneva: WHO, 2015. Available at www.who.int/mediacentre/factsheets/fs378/en [Accessed 4 August 2015].
9. World Health Organization. Immunization surveillance, assessment and monitoring. Geneva: WHO, 2015. Available at http://gamapserver.who.int/gho/interactive_charts/immunization/mcv/atlas.html [Accessed 4 August 2015].
10. Department of Health. Australian influenza surveillance report and activity updates. Canberra: DoH, 2015. Available at www.health.gov.au/flureport [Accessed 4 August 2015].
11. Influenza Specialist Group. Impact of influenza. Melbourne: ISG, 2015. Available at www.isg.org.au/index.php/about-influenza/impact-of-influenza [Accessed 4 August 2015].
12. Brien S, Kwong JC, Buckeridge DL. The determinants of 2009 pandemic A/H1N1 influenza vaccination: A systematic review. *Vaccine* 2012;30:1255–64.
13. Nowak GJ, Sheedy K, Bursey K, Smith TM, Basket M. Promoting influenza vaccination: Insights from a qualitative meta-analysis of 14 years of influenza-related communications research by US Centers for Disease Control and Prevention (CDC). *Vaccine* 2015;33:2741–56.
14. Australian Institute of Health and Welfare. 2009 adult vaccination survey. Canberra: AIHW, 2011.
15. Centers for Disease Control and Prevention. 2014 Ebola Outbreak in West Africa – Case counts. Atlanta: CDC, 2015. Available at www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html [Accessed 4 August 2015].

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