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Influenza Vaccination is Global, But Not the Same

By Chuck Dinerstein — October 26, 2018

Influenza vaccination has global variation. Image courtesy of Pixabay [1]

Our current vaccination rate is around 38% [2], despite a flu season last year that took 80,000 lives. In the EU, the aggregate vaccination rate has been 41.8% [3] with several countries vaccination rates approaching 70% or more. But the numbers of vaccinated people in other parts of the globe, specifically southeastern Asia, the eastern Mediterranean [1] and Africa are much less. What accounts for the disparities? Hint, it is not about money.

Spurred by vaccine shortages in 2004-5, the World Health Organization (WHO) has provided a global overview of our influenza efforts. The 16 manufacturers of influenza vaccine have increased capacity from 1.5 billion doses in 2006 to 6.4 billion this year. We re-formulate and manufacture those 6 billion new influenza doses with only a six-month head start. It is an impressive feat of biologic manufacture, something for which Big Pharma, healthcare's permanent bad boy, gets little credit. While the number of doses falls short of what WHO deems necessary in the face of an influenza pandemic, estimated to be 10 billion doses, and supply is a necessary but not sufficient requirement for protection, it turns out the global demand varies quite a bit.

95% of influenza doses were used in the Americas, Europe, and western Pacific; the remaining 5% in previously mentioned, Africa, eastern Mediterranean, and southeastern Asia, which collectively make up 48.5% of our global population. In the WHO's most recent review wealth, measured as GDP, did not influence use, geography and the nature of influenza in these areas had a far more significant role.

Flu is not a monolithic disease; it has variations and a global seasonality which we may not recognize as we concern ourselves with the flu season in the U.S. Our season runs from fall to winter, a northern hemispheric pattern; Australia's flu season, a southern hemispheric pattern,

runs from May to September. As we approach the equator, those two patterns merge, and tropical areas may experience a year-round flu season. The U.S. lies within only one zone and experiences just one flu season, but for a country with a more north-south orientation, there can be multiple seasons. For example, India's influenza is closely related to the monsoon season, a southern hemisphere seasonality, except in the north where a northern hemispheric pattern is found. The timing of vaccination and the production of vaccines is tied to these patterns, so India requires a vaccination program that is virtually all year round and that features one vaccine for their south and another for their north.

There are three types of influenza - A, B, and C. Influenza A is the predominant form here and globally. But some areas have a predominance of influenza B; in Vietnam, it accounts for 72% of cases. In the Philippines there are two lineages of influenza B in play, requiring a quadrivalent rather than a trivalent vaccine. And these differences can show even smaller, within a country, regional variations.

The most susceptible at-risk groups are the very young and old, pregnant mothers and healthcare workers. Leaving aside the health care workers who have higher occupational exposure rates, influenza has global variations on which susceptible group is most affected. In Taiwan, it is the elderly; in Vietnam two-thirds of the cases involve children.

A country's infrastructure also impacts vaccination rates. Vaccines require cold storage, a "cold-chain" logistical system, providing constant refrigeration for safe distribution. Educational levels, both generally and concerning influenza also impact vaccination rates. Interestingly, only two of these Asia countries had "safety" concerns regarding the vaccines, the two most "Western," Hong Kong and Australia.

Among countries [2] with a 30% distribution of vaccines or more, there are established politically supported national strategies, with direct outreach to patients. Implementation of similar programs in southeast Asia is uneven especially concerning financing. Vietnam makes recommendations but provides no funding, Australia funds only a portion of their at-risk populace and China has a policy but does not support influenza vaccinations as part of their National Immunization Program.

Vaccination programs are more complex than the lay public appreciates, influenced by characteristics of our opponent, the influenza virus as well as our infrastructure and political will. We live in a country where many of these issues have been addressed, yet our vaccination rate is only 38%. Big Pharma has stepped up to increase production; now we need to concentrate on improving global demand.

[1] Includes Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebsanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Soumalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen

[2] US, Canada, UK, Israel, Japan, South Korea, Chile, and Australia)

Source: Influenza in the Asia-Pacific region: Findings and recommendations from the Global Influenza Initiative Vaccine DOI: 10.1016/j.vaccine.2016.12.064.
