Summary of WHO Technical Consultation: H1N1pdm Mortality Estimates, 25-26 October 2011

Background

The number of pandemic deaths reported to WHO by its member states during the influenza A(H1N1) pandemic of 2009/10 is based on laboratory confirmation and is widely considered a gross underestimate for a number of reasons. Not all the suspected pandemic influenza-associated deaths were tested and confirmed. Where access to health care was limited, deaths may have occurred without being recognized or if recognized, not tested. One can also assume that there were also deaths associated with pandemic influenza but classified as deaths due to other subsequent complications. We suspect that fatal cases in countries with limited or no laboratory testing capacity are severely under represented. An estimation of the number of cases and deaths attributable to the influenza pandemic of 2009 is needed to better understand its global impact and where this pandemic fits into the historical context. While the data for a definitive estimate of mortality will likely not exist for several years, and will never exist for some parts of the world, a preliminary estimate would be useful in the short term, and would serve to give a more realistic understanding of the true impact of the event than currently available reported mortality figures.

WHO is currently working with two teams, one from the US Centers for Disease Control and Prevention (USCDC) and a second from the Netherlands Institute for Health Services Research (NIVEL), to produce independent estimates of the influenza deaths that occurred during the global pandemic using two distinct methodologies. The process has been overseen by a committee of technical experts from around the world which has periodically reviewed the progress of the groups and provided critical advice for improvement to both teams' methodologies prior the presentation of preliminary results at the October 2011 meeting. The committee of experts was selected for their expertise in disease burden modeling and represents a broad range of institutions from Asia, Africa, Europe, and North America.

The Meeting

In the two day meeting in October 2011, preliminary work was presented to the technical oversight committee with details of the methodology used. Each group of investigators discussed their methodology and preliminary estimates in detail with the advisory committee. The committee members then made suggestions for revising the methods, validating the results against other diseases with known mortality rates, and exploring the differences between the two studies.

Methods

The CDC approach uses a pooled estimate of symptomatic attack rate and symptomatic case fatality ratios by combining data from a number of countries that have available data. This is then used to estimate a global base mortality rate. The base mortality rate is then adjusted for differences in risk of influenza death across countries by using a respiratory mortality multiplier. The multiplier is based on the ratio of lower respiratory mortality in industrialized and non-industrialized nations.

NIVEL has developed a two staged modelling approach based on available national mortality data from a number of countries. In the first stage, mortality is estimated for individual countries using standard regression modelling that have previously been used for estimating excess mortality related to seasonal influenza. Stage 2 involves a second model to extrapolate the individual country
estimates to other countries using economic development and health data between countries to match up countries without data to those that had data. Simplistically, this means that the estimates for a poor country with limited access to health care from which mortality data were available would be used as proxy estimates for other poor countries with limited access to health care from which mortality data were not available.

Discussion and the next steps

The committee made several recommendations for improving the methods, for validating the results, and for making cross comparisons to understand where the two approaches differed. The initial work was based on very limited data from a handful of industrialized countries. More countries, including some from middle- and low-income countries, are expected to provide data to the project in early 2012 enabling the investigators to produce credible estimates by late in this same year. It is hoped that the results of these efforts will allow public health policy makers to better understand the impact of the 2009 influenza pandemic and better prepare for future events.