“Swine flu”: when thinking globally and acting locally is more than just a slogan

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The recent emergence of a new strain of “swine” flu and the ensuing international epidemic are presenting researchers, public health services and decision makers with some predictable and many uncertain challenges.

The World Health Organization (www.who.int/csr/don/), as of June 15 2009, has announced the virus has spread to 76 countries, with 35,928 reported cases and 163 deaths and has been assessed as being a pandemic. The new virus is a hybrid virus derived from swine, avian and human flu sources. Genomic analysis suggests that it is closely related to common reassortant influenza A viruses, that have spread around the globe in swine herds sometimes infecting humans (1). However, this virus is highly transmissible human-to-human. The growing epidemic is involving primarily otherwise healthy young adults and adolescents, i.e. the population segment that is more mobile, more exposed to crowded settings (schools, work sites, traveling) and less immunized with the seasonal flu vaccines. Fortunately, at least so far, this outbreak appears to be associated with an overall low case fatality rate and it seems unlikely it could lead in the near future to increased severity and high mortality. Moreover, the current strain is susceptible to the neuraminidase inhibitors oseltamivir and zanamivir.

How long will these features persist unchanged? Stricter epidemiological monitoring will be necessary. Indeed, since the emergence of the so-called “swine flu”, good news along with some bad news are emerging. The best news is that the global preparedness to face a pandemic is now much better than was the case for the previous ones: timely dissemination of updates and guidelines about control and treatment is enormously facilitated by internet; rapid and reliable diagnostic tests, respiratory support devices, antiviral agents and antibiotics are likely to radically change the profile of the 2009 pandemic flu as opposed to previous pandemics of the twentieth century. Moreover, pandemic flu plans are activated and international agreements for sharing essential resources are in place.

The bad news is that how severe the H1N1 new strain will turn out to be in the future is at this time unpredictable in terms of natural history, spread, illness and death. As Lipsitch et al. (2) have lucidly highlighted, it is premature to throw away concerns about severity and not only because of the uncertainty about severity estimates. Much remains to be done to ascertain incubation and infection periods and to estimate reliable generation time. Moreover, understanding variation of incidence and severity from country to country in relation to health care resources and public health measures being implemented is in progress. Existence of any cross-immunity from past exposure to prior influenza A virus is suspected by the marked age dependence of attack rates, but this would imply in turn that the $R_0$ could be higher in a fully susceptible population than the reassuring 1.4 - 1.6 firstly estimated in La Gloria, Mexico (3) and could reach 2.2 – 3.1 in more recent estimates by Boëlle PY et al. (4). It cannot be predicted whether the new virus will displace existing influenza A subtypes circulating in humans as has occurred in the previous pandemics.

More importantly, the present epidemiological picture could reflect the first wave of spread of the new influenza virus and, for many reasons, the severity of the possible subsequent waves is largely unpredictable. Indeed, the emergence of a more virulent mutant or reassortant during the pandemic cannot be ruled out. Furthermore, different patterns of spread could also strongly influence the severity of the possible second wave if more vulnerable people like the elderly or individuals with comorbidities

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are affected. The poor quality of health services in some countries where hospitals are low-equipped and understaffed and supplies of drugs, including antibiotics and antiviral, are limited, could also amplify the impact of the pandemic. Eventually, what could take place as the new virus will encounter circulating seasonal flu viruses and, in some parts of the world, the H5N1 virus is a further reason for concern.

To reduce all these uncertainties, it is critical that public health agencies continue to collect and analyze worldwide epidemiological data. Indeed, to balance any differences in temporal-spatial setting affecting the socio-economic cost of interventions, such as social distancing measures, against the numbers of lives saved or the extent to which antiviral use is justified against the potential risk of developing resistances, needs robust data that at this time are insufficient. Nevertheless, according to Lipsitch et al. (2), many important decisions will have to be made without definitive estimates of severity. Among these decisions are for example those concerning the production of vaccine and the potential shift from the seasonal influenza viruses to that of pandemic influenza. Accurate measures of incidence of mild to severe disease and estimation of the true size of spread of infection by serological surveys are prerequisites to predict effectiveness of non-medical interventions (primarily social distancing) and target use of limited resources such as antivirals and vaccine when available.

Only a close international collaboration and the lessons drawn from previous pandemics will contribute to reduce the global impact of the possible H1N1 pandemic.

REFERENCES


