

Non-Pharmaceutical Interventions for Use During a Human Influenza Pandemic

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Centers for Disease Control and Prevention

U.S. Agency for International Development

December 2007

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I. OVERVIEW

Response to a human influenza pandemic should include a wide spectrum of medical and non-medical interventions at local, national, and international levels to reduce morbidity and mortality and to mitigate the socio-economic consequences. However, there is uncertainty about the potential effectiveness of pre-pandemic vaccines against the future specific influenza strain causing the pandemic. There is also concern about the amount of time that will be needed to develop, manufacture, and distribute a vaccine that would be specific to the pandemic strain.

To help prepare the nations of the world for a possible global influenza pandemic, the U.S. Government is promoting the consideration of non-pharmaceutical interventions for use during an influenza pandemic, both domestically and internationally. We offer this condensed and adapted version of our national “community-mitigation guidance” – developed by the U.S. Centers for Disease Control and Prevention (CDC) within the U.S. Department of Health and Human Services (HHS),¹ in accordance with recommendations of the Secretariat of the World Health Organization (WHO)² – which provides information on key non-drug, non-vaccination measures that can mitigate the effects of disease during an influenza pandemic. We believe the core principles of community mitigation highlighted in this document are adaptable for use outside the United States – particularly in developing countries, which could suffer significant morbidity and mortality in the case of a human influenza pandemic. In addition, this document intends to articulate the principles in language the WHO can use to guide national and local governments as they create their own community-mitigation policies for a human influenza pandemic.

By design, this document does not include specific suggestions for adapting the guidance to reflect different cultural and social realities across the world. Each country and its partners can do this only by developing a plan that reflects each country’s unique needs, resources, and perspectives. Key contexts for adaptation of this guidance include consideration of diverse scenarios and settings such as: urban vs. rural environments, housing structure, sources of employment and income, safety and availability of local food and water, the roles of schools, the efficacy of healthcare delivery systems, the status of sanitation and hygiene, primary forms of transportation, legal authorities, enforcement and ethical constructs, and political/governmental frameworks. Countries and communities need to factor in these variables, as well as cultural issues, when planning to implement non-pharmaceutical interventions to mitigate a pandemic, as well as the special needs of vulnerable populations such as persons with disabilities, elderly citizens or low-income individuals.

¹ “Interim Pre-Pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation in the United States – Early, Targeted, Layered Use of Nonpharmaceutical Intervention” (Feb. 2007).

² The importance of community-mitigation strategies to stave off the most catastrophic effects of a pandemic was emphasized by the WHO in its 2005 “WHO global influenza preparedness plan: The role of WHO and recommendations for national measures before and during pandemics.”

II. RATIONALE AND EVIDENCE FOR USE OF NON-PHARMACEUTICAL INTERVENTIONS

The overarching goal of using non-pharmaceutical interventions (NPIs) is to reduce the opportunities for contact with and transmission of the pandemic influenza virus (e.g., through social distancing). More specifically, NPIs are intended to accomplish the following:

- delay a rapid increase in cases and “buy time” for the implementation of possible medical interventions that address the multiple consequences of an influenza pandemic;
- decrease the number of cases occurring at any one time, to avoid overtaxing health resources; and
- reduce the total number of influenza cases occurring and so reduce morbidity and mortality in the community.

Recent retrospective analyses of the 1918 influenza pandemic have shown that NPIs can effectively accomplish these goals when used *early*, and in a *targeted* and *layered* manner.

In other words, authorities should introduce interventions *early* in an emerging pandemic, rather than after a pandemic is well established; the effectiveness of NPIs will decrease rapidly as more people become infected and ill from influenza. Authorities should *target* interventions to the locations where transmission is most likely to occur, such as in schools and childcare facilities; healthcare facilities; large public gathering spots, such as markets and places of worship; and within households in which individuals are already symptomatic. They should also focus on those at highest risk for transmission, such as children. Authorities should also use multiple NPIs concurrently (“*layered*”) to address different chains of transmission. For example, the isolation of only symptomatic individuals does not address the potential for their household contacts to infect others outside the home, but voluntary quarantine of household members, in addition to the isolation of symptomatic individuals, addresses both possible chains of transmission.

The HHS/CDC community-mitigation guidance recommends that the specific trigger for introducing NPIs should be the arrival and evidence of community transmission of a pandemic virus, defined as a laboratory-confirmed cluster of infection with a novel influenza virus along with evidence of linked cases from more than one household in the United States. However, each country will need to make its own specific determination about when to begin NPIs, based on the effectiveness of its disease-surveillance system, its state of pandemic preparedness, and other factors, such as the capacity of healthcare institutions.

To guide U.S. authorities on when to begin NPIs and which multiple interventions to deploy, the HHS/CDC community-mitigation guidance established a Pandemic Severity Index based primarily on the ratio of fatalities to cases, a measurement useful in estimating the severity of a pandemic on a population level. Taking individual situations into account, each country likely will want to devise a similar severity metric that will help to guide decisions on when (and which) interventions should be put in place.

III. NON-PHARMACEUTICAL INTERVENTIONS

The HHS/CDC guidance identifies four basic NPIs designed to be implemented in an early, targeted, and layered manner:

1. Isolation and supportive treatment of all people suspected to have influenza. Isolation should usually occur in the home, but could be in a healthcare setting, depending on the severity of an individual's illness and/or the current capacity of local healthcare infrastructure.
2. Voluntary home quarantine of members of households with confirmed or probable influenza case(s).
3. Social distancing of children, for example school closure³ and/or suspension of all school-based activities and childcare programs (including public and private schools, as well as colleges and universities), combined with social distancing in the community to achieve reductions in out-of-school social contacts and community mixing.
4. Use of social distancing measures to reduce contact among adults in the community and workplace, including, for example, canceling large public gatherings and altering workplace environments and schedules to decrease social density and preserve a healthy workplace to the greatest extent possible, without disrupting essential services.⁴

The common element in these interventions is that all reduce the probability of contact between infected and uninfected individuals. Both developed and developing countries will identify other specific interventions that reduce contact. Regardless, all community-based strategies should be used early in the course of a pandemic and in combination with individual infection-control measures, such as hand-washing and cough etiquette.

IV. ACTIVATION AND DURATION OF IMPLEMENTATION OF NON-PHARMACEUTICAL INTERVENTIONS

The decision to launch and the plan for implementation of interventions, including NPIs, in the event of human influenza pandemic should be phased:

- *Alert* – notification of critical systems and personnel of the impending activation of interventions; usually occurs during WHO Pandemic Phase 5;

³ School attendance has different meaning and importance depending on the social norms and culture of the local area and country. It will be very important for parents to know the risks to children and teenagers during a severe pandemic so they may encourage their children to remain home. Closing schools may not provide additional protection to older children or teens who may not be enrolled in school.

⁴ Social distancing in the community may be particularly difficult in some cultures. Cancelling mass worship services will be quite difficult in some areas. For some communities, the central market serves as an important source of social contact and as the primary place for procuring food on a daily basis. Stockpiling of food and water will be particularly difficult for some communities, therefore alternate strategies to promote social distancing should be developed.

- *Standby* – initiation of decision-making processes for the imminent activation of interventions, including mobilizing resources and personnel; usually occurs during WHO Pandemic Phase 6; and
- *Activate* – implementation of the specified pandemic-mitigation measures.

The HHS/CDC guidance indicates that communities should be prepared to maintain interventions for up to 12 weeks. A shorter period could be adequate for less severe outbreaks of the pandemic virus. However, retrospective data suggest the duration of implementation is significantly associated with overall mortality rates.

Stopping or limiting the intensity of interventions while pandemic virus is circulating within the community could be associated with increases in mortality because of complications with pneumonia and renewed transmission of influenza in many communities.

V. PLANNING TO MINIMIZE THE ADVERSE CONSEQUENCES OF NON-PHARMACEUTICAL INTERVENTIONS

Planning and preparedness for implementing mitigation strategies during a pandemic are complex tasks that require broad participation. Planning should include educating all levels of government and all segments of society about their role in implementing these interventions, in particular, sharing the responsibility for helping mitigate the adverse consequences of isolation, quarantine, school closures, and canceling public events. Keeping communities functioning will call for specific actions by specific groups, including the following:

- individuals and families
- employers/workplaces;
- healthcare providers, hospitals and clinics;
- schools;
- faith-based organizations; and
- community organizations.

VI. OTHER CRITICAL ISSUES FOR THE USE OF NON-PHARMACEUTICAL INTERVENTIONS

Authorities should address a number of outstanding issues to optimize the planning for the use of these measures. Ideally, these issues include the following:

- defining the roles of sectors in government and civil society;
- establishing sensitive and timely disease surveillance and tracking;
- reviewing legal authorizations needed for implementing NPIs as applicable;
- actively engaging mass media in planning for and implementing NPIs;
- planning and conducting multi-level exercises to evaluate the feasibility of implementation;
- identifying and establishing appropriate monitoring-and-evaluation systems;
- publishing policy guidance regarding the community and workplace-specific use of personal protective equipment, such as gowns, gloves, surgical masks, respirators,

and eye protection (particularly for healthcare workers and emergency responders – if practical and available for the given area), and safe home management of ill persons;

- employer commitment to optimize the ability of ill workers or those who have been exposed to an influenza pandemic and their families to be allowed to stay home and out of the workplace, without losing their jobs;
- private- and public-sector employer planning for continuity of operations with significant increased absenteeism;
- generating appropriate risk-communication content/materials aimed at the public, and devising an effective means for delivering those messages and information;
- soliciting active community support and involvement in strategic planning decisions;
- assisting individuals and families in addressing their own preparedness needs; and
- weighing the possible benefit from the implementation of these measures against the possible negative consequences that could arise from their use (e.g., quarantining the family members of sick people could have a major impact on household income).

Because few communities have experienced disasters of the scale or scope of a severe pandemic, realistic drills and exercises that anticipate and consider the effects of these proposed interventions and the possible negative consequences will help to identify potential obstacles related to feasible resources and planning. Public health officials; country/district and local government officials; healthcare professionals; emergency responders; hospitals and clinics; representatives from schools, community and faith-based groups and the private sector should actively participate in such drills and exercises and subsequently take actions to strengthen their pandemic preparedness.

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