Community Mitigation Strategies

Current HHS Guidance

In addition to vaccines and antiviral agents, a number of nonpharmaceutical interventions can be considered, although data assessing the effectiveness of these interventions are limited. Examples of such measures include isolation and quarantine, social distancing (such as school closures), use of masks by the general public (outside of healthcare settings), handwashing, and respiratory hygiene/cough etiquette.

In February 2007, the CDC and HHS released a document on nonpharmaceutical interventions (see References: CDC/HHS 2007). In this guidance, community mitigation strategies are tied to the PSI, as shown in the following table, which is included in the document. Additional details about community mitigation can be found in the guidance.

Summary of Community Mitigation Strategies by Pandemic Severity Index Level

Interventions* by Setting	Category 1	Categories 2 and 3	Categories 4 and 5
Home			
Voluntary isolation of ill at home (adults and children); combine with use of antiviral treatment as available and indicated	Recommended†‡	Recommended†‡	Recommended†‡
Voluntary quarantine of household members in homes with ill persons§ (adults and children); combine with antiviral prophylaxis if effective, feasible and quantities sufficient	Generally not recommended	Consider**	Recommended**
School: Child social distancing			
Dismissal of students from schools and school-based activities, and closure of child care programs	Generally not recommended	Consider (<4 wk)††	Recommended (<12 wk)‡‡
Reduce out-of-school social contacts and community mixing	Generally not recommended	Consider (<4 wk)††	Recommended (<12 wk)‡‡
Workplace/Community: Adult social distancing			
Decrease number of social contact (eg, encourage teleconferences, alternatives to face-to-face meetings)	Generally not recommended	Consider	Recommended
Increase distances between persons (eg, reduce density of public transit, workplace)	Generally not recommended	Consider	Recommended
Modify postpone, or cancel selected public gatherings to promote social distance (eg, postpone indoor stadium events, theater performances)	Generally not recommended	Consider	Recommended
Modify workplace schedules and practices (eg, telework, staggered shifts)	Generally not recommended	Consider	Recommended
Definitions: *Generally not recommended:* Unless there is a compelling rational for specific populations or jurisdictions, measures are			

generally not recommended for entire populations as the consequences my outweigh the benefits.
Consider: Important to consider these alternatives as part of a prudent planning strategy, considering characteristics of the pandemic, such as age-specific illness rate, geographic distribution, and the magnitude of adverse consequences. These factors may vary globally, nationally, and locally.
Recommended: Generally recommended as an important component of the planning strategy.

*All of the interventions should be used in combination with other infection control measures, including hand hygiene, cough etiquette, and personal protective equipment, such as face masks.
†This intervention may be combined with the treatment of sick individuals using antiviral medications and with vaccine campaigns, if supplies are available.
‡Many sick individuals who are not critically ill may be managed safely at home.
§The contribution make by contact with asymptomatically infected individuals to disease transmission is unclear. Household members in homes with ill persons may be at increased risk of contracting pandemic disease from an ill household member. These household members may have asymptomatic illness transmission. Therefore, household members of homes with sick individuals would be advised to stay home.
**To facilitate compliance and decrease risk of household transmission, this intervention may be combined with provision of antiviral medications to household contacts, depending on drug availability, feasibility of distribution, and effectiveness.
††Consider short-term implementation of this measure (<4 wk).
‡‡Plan for prolonged implementation of this measure (1 to 3 mo).

In June 2008, HHS released interim guidance on the use and purchase of face masks and respirators by individuals and families for pandemic influenza preparedness (see References: HHS 2008: Interim guidance on the use and purchase of facemasks and respirators by individuals and families for pandemic influenza preparedness). Settings for respirator or face masks use will depend on the potential for exposure to infectious persons; the following recommendations are outlined in the guidance:

- A face mask (ie, a disposable mask that covers the nose and mouth, such as a surgical mask) is recommended when exposure in a crowded setting (such as a bus or subway) occurs with persons not known to be ill.
- A face mask also is recommended for use by ill persons when they must be in close contact with others.
- An N-95 respirator is recommended for close contact (less than about 6 feet) with someone who has known or suspected influenza illness. In nonoccupational settings, the most common use for a respirator would be in the household of someone ill with influenza.

WHO Recommendations for Nonpharmaceutical Interventions

In 2006, the WHO published two reports on community interventions, one geared toward prevention of transmission internationally and one geared toward the national and local levels. These are briefly addressed below.

International level (see References: WHO Writing Group 2006: Nonpharmaceutical interventions for pandemic influenza, international measures):

- Screening and quarantine of entering travelers have not been shown in previous pandemics to substantially delay virus introduction into countries where such measures were employed.
- Rather than instituting entry screening, the WHO recommends providing information to international travelers and possibly conducting exit screening (through health declarations and temperature measurement) for travelers departing from affected areas. It is important to note that exit screening is costly and disruptive and may not detect persons who are asymptomatic or in the preclinical stages of infection; however, exit screening may decrease transmission on conveyances (such as airplanes) and is a better use of resources than entry screening.

- Although generally not recommended, entry screening could be considered in the following situations: (1) where exit screening at the traveler's point of embarkation is suboptimal; (2) in geographically isolated areas, such as islands; and (3) when the host country's internal surveillance capacity is limited.

National and community levels (see References: WHO Writing Group 2006: Nonpharmaceutical interventions for pandemic influenza, national and community measures):

- In general, isolation of patients in the community and quarantine of contacts are measures that have not been shown in past pandemics to be effective in preventing transmission outside of closed settings (such as dormitories or military barracks) and are not recommended once a pandemic is well established. However, the WHO recommends aggressive measures to detect and isolate cases and quarantine their contacts in situations where human-to-human transmission of a potential pandemic influenza strain is highly localized and limited (ie, during the pandemic alert period [WHO phases 4 and 5]).
- Social distancing measures, such as closing schools and other public gathering places and canceling sports events, have met with limited success during past pandemics, and the impact of such measures remains unclear. Social distancing measures and wearing masks in public apparently decreased influenza and other respiratory infections in Hong Kong during the 2003 SARS epidemic. About 76% of Hong Kong residents wore masks during that period.
- No controlled studies to date have specifically assessed mask use in preventing influenza transmission in community settings.
- Although data on these measures are limited, the WHO has made the following recommendations to decrease influenza transmission in community settings during a pandemic (phase 6).
    - Ill persons should be advised to remain at home as soon as influenza-like symptoms develop.
    - Measures to increase social distance should be considered, depending on the epidemiology of transmission, severity of disease, and risk groups affected.
    - Mask use by the public should be based on risk, including frequency of exposure, and closeness of contact with potentially infectious persons. Routine mask use should be permitted but not required.
    - Handwashing and respiratory hygiene/cough etiquette should be routine for all and strongly encouraged in public messages (although this recommendation is supported on the basis of plausible effectiveness rather than controlled studies or other supporting data).
- Despite the above guidance from the WHO, the potential efficacy of such measures in stemming the tide of a pandemic remains unclear. The value of implementing various community-based measures continues to be debated by experts in public health and epidemiology (see References: Inglesby 2006).

Examples of Available Studies on Nonpharmaceutical Interventions

A review of six US communities that reported relatively few, if any, cases of influenza during the 1918 pandemic found that these communities enacted "protective sequestration" to prevent healthy people from being exposed to the virus (see References: Markel 2006). It is important to note that all six communities were relatively small and isolated. Also, the society of 1918 was much different than it is now. Protective sequestration involves the following features:

- Prohibitions on members of the community from leaving the site

- Prohibitions against visitors from entering a circumscribed perimeter
- Typically placing those visitors who are allowed to enter the community in quarantine for a period of time before they are admitted
- Taking advantage of geographic barriers, if available (eg, being on an island)

A historical review of nonpharmaceutical interventions implemented by US cities during the 1918 pandemic concluded that early, sustained, and layered application of nonpharmaceutical interventions was associated with mitigating the consequences of the pandemic (see References: Markel 2007). However, a letter to the editor by historian John Barry called into question the validity of the data used in the review (see References: Barry 2007). Another analysis of nonpharmaceutical interventions in 17 US cities during the 1918 pandemic also found that rapid implementation of multiple interventions resulted in lowered overall death rates (see References: Hatchett 2007).

Several studies have used modeling methodology to assess influenza transmission and/or the impact of various nonpharmaceutical interventions; examples of published reports are outlined below. In addition, the IOM summarized available information from various modeling projects (see References: IOM 2006: Modeling community containment for pandemic influenza). The IOM Committee on Modeling Community Containment for Pandemic Influenza concluded that community restrictions may play a role in reducing pandemic influenza virus transmission.

- A pandemic influenza simulation model using high-resolution population density data and data on travel patterns suggested that in the United States one third of transmission will occur in households, one third in workplaces and schools, and one third in the general community (see References: Ferguson 2006). School closures could reduce peak attack rates but may have little impact on overall attack rates without other interventions. The authors advocate a combined strategy of targeted antiviral prophylaxis (to exposed persons, particularly household members) and school/business closures.
- Findings from another study involving mathematical modeling of influenza transmission within and between households showed that the combination of household-based quarantine, isolation of ill family members in a facility outside the household, and targeted use of antiviral prophylaxis of exposed household members could substantially reduce the impact of an influenza pandemic (see References: Wu 2006).
- A third modeling study suggests that targeted social distancing (such as school closures and keeping children at home), to be implemented soon after cases begin occurring, could have a substantial impact in mitigating a pandemic at the local level (see References: Glass 2006). However, for highly transmissible strains, social distancing would need to be widely practiced (for both adults and children) to be effective and may be impractical to implement.