

Hand-washing, mask-wearing may limit transmission of pandemic flu

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Practicing non-pharmaceutical interventions (NPIs) such as hand-washing and mouth covering may help limit the transmission of the pandemic flu, but more research on these measures is critical according to a new study appearing in the May issue of *AJIC: American Journal of Infection Control*, the official publication of the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC). The study presents findings which show that although significant knowledge was gained regarding NPIs and transmission of pandemic flu in Centers for Disease Control and Prevention (CDC)-funded studies, key concerns and gaps in the research related to the acceptability and protective efficacy of these measures remain.

NPIs include measures other than vaccines and antiviral treatments that reduce the harm and spread of disease. NPIs can be implemented at the border level, the community level, or the individual level. Examples of individual actions include frequent [hand washing](#) with soap, using alcohol-based [hand sanitizer](#), covering sneezes/coughs and wearing a mask. Social distancing policies (border and community level) involve things like closing schools, working from home or restricting public gatherings. These practices are specifically geared to limit the spread of the disease from person to person.

"The recent influenza A (H1N1) pandemic may provide us with an opportunity to address many research gaps and ultimately create a broad, comprehensive strategy for pandemic mitigation," according to Allison E. Aiello, PhD, MS,. Department of Epidemiology, School of Public

Health, University of Michigan, Ann Arbor, MI. "However, the emergence of this pandemic in 2009 demonstrated that there are still more questions than answers. More research is urgently needed, especially in light of the potential for mutations in influenza A (H1N1). If mutations do occur, or if new pandemic strains emerge in the future, NPIs likely will play a crucial role in mitigating the spread of infection when vaccines are unable to provide sufficient protection."

Research project investigators and contributors to this analysis identified many gaps among CDC-funded projects falling into two main categories: (1) behavioral and social sciences and (2) biological and technological sciences. The authors conclude that "taken together, the data provide some evidence that face masks, hand hygiene, cough etiquette, reduced crowding, and school closures are effective in reducing the spread of influenza. Nonetheless, further studies with larger sample sizes, common methodologies to allow pooling of data, and study durations that cover multiple influenza seasons are needed. In addition, further laboratory studies are needed to address the relative contribution of transmission modalities (i.e., small vs. large respiratory droplets and contact transmission). Finally, research should include assessments of psychosocial and cultural factors that shape compliance with NPIs, to explore why certain groups accept NPIs while others do not, and whether barriers to compliance are lifted during a global pandemic."

Eleven CDC-funded studies from 2007 to 2009, evaluated the potential for NPIs, rather than vaccines and antiviral medications, to slow or limit the transmission of pandemic influenza, both in communities and across international air, land, and sea borders. This research used seasonal influenza outbreaks as a model for testing preventive measures for future influenza pandemics, as well as historical research of past pandemics.

The studies assessed the effectiveness of multiple NPIs used in conjunction with one another based on CDC's hypothesis that this

approach could create multiple barriers to stop the transmission of influenza. Results from several studies suggest that personal protective measures perceived as part of typical daily routine were frequently practiced. For example, hand sanitizing with alcohol-based preparations, hand washing with soap, covering sneezes/coughs, and hand awareness (ie, touching the face) showed relatively high compliance, whereas compliance with face mask use was low in most of the studies.

The following is a summary of the key studies assessed in the analysis:

- A study from the University of Michigan found that hand hygiene with alcohol-based hand sanitizers and mask use among university students was associated with a 50%-65% reduction in the rate of influenza-like illness (ILI) over a 6-week intervention period.
- A University of Hong Kong study suggests substantial reductions in the spread of influenza and ILI throughout the household when all members practice frequent hand washing and wear face masks within 36 hours of the first appearance of illness.
- The University of Pittsburgh found that after implementation of a 5-layer NPI approach, including hand hygiene and cough etiquette, elementary school students had significantly fewer laboratory-confirmed influenza A infections and a significant reduction in total absences compared with a control group.
- Research conducted by RTI International, Research Triangle Park, NC, identified that the acceptability of NPIs depends largely on early planning, consistent and targeted communication during implementation, and clear delineation of responsibilities and lines of authority. Acceptability also requires communication

from both traditional (eg, emergency response organizations, public health departments, media) and nontraditional (eg, churches, child care centers, businesses) sources.

- A Columbia University study showed that although household members had misunderstandings regarding influenza, their knowledge, attitudes, and practices improved through a community education program.

More information: AJIC 2010; 38 [4].

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