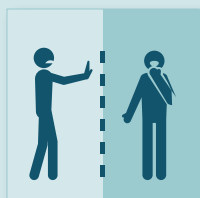


Non-pharmaceutical public health measures for mitigating the risk and impact of **epidemic** and **pandemic** influenza



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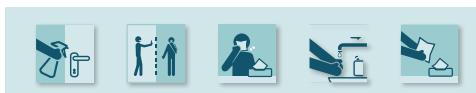
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Abbreviations and acronyms

ACH	air changes per hour
CI	confidence interval
COMBI	communication for behavioural impact
GDP	gross domestic product
GRADE	Grading of Recommendations Assessment, Development and Evaluation
IHR	International Health Regulations
NPI	non-pharmaceutical intervention
OR	odds ratio
PISA	pandemic influenza severity assessment
RCT	randomized controlled trial
RNA	ribonucleic acid
RR	rate ratio
SAR	Special Administrative Region
USA	United States of America
UV	ultraviolet
WHO	World Health Organization

Glossary

Contact tracing	Identification and follow-up of persons who may have come into contact with an infected person.
Closure	Halting the operation of an institution or business.
Entry and exit screening	Screening travellers for influenza virus infection at their arrival in and departure from border crossings, ports and airports.
Isolation	Separation or confinement of a person who has or is suspected of having influenza virus infection, to prevent further infections.
Movement restriction	Limitation on the movements of a person who has or is suspected of having influenza virus infection.
Personal protective measures	Measures to reduce personal risk of infection, such as hand washing and face masks.
Quarantine	Separation or restriction of the movement of persons who may be infected, based either on exposure to other infected people or on a history of travel to affected areas.
R₀	Basic reproductive number, a measure of transmissibility. This number represents the average number of people infected by one infectious case in a completely susceptible population.
Respiratory etiquette	Simple hygiene practices taken by people who are coughing or sneezing to prevent person-to-person transmission of respiratory infections.
Symptomatic influenza	Influenza virus infection causing an acute illness, most commonly with rapid onset of fever and other respiratory symptoms, although a proportion of illnesses are afebrile.
Travel Advice	Health advice to travellers provided by national or international health agencies to help travellers understand the risks involved during the travel and take the necessary preventive measures or precautions to protect their health while travelling.

EXECUTIVE SUMMARY

Introduction

Influenza pandemics occur at unpredictable intervals, and cause considerable morbidity and mortality. Influenza virus is readily transmissible from person to person, mainly during close contact, and is challenging to control. In the early stage of influenza epidemics and pandemics, there may be delay in the availability of specific vaccines and limited supply of antiviral drugs. Non-pharmaceutical interventions (NPIs) are the only set of pandemic countermeasures that are readily available at all times and in all countries. The potential impacts of NPIs on an influenza epidemic or pandemic are to delay the introduction of the pandemic virus into a population; delay the height and peak of the epidemic if the epidemic has started; reduce transmission by personal protective or environmental measures; and reduce the total number of infections and hence the total number of severe cases.

Scope and purpose

This document provides recommendations for the use of NPIs in future influenza epidemics and pandemics based on existing guidance documents and the latest scientific literature. The specific recommendations are based on a systematic review of the evidence on the effectiveness of NPIs, including personal protective measures, environmental measures, social distancing measures and travel-related measures. The information provided here will be useful for national authorities that are developing or updating their plans for mitigating the impact of influenza epidemics and pandemics.

Target audience

This guideline is intended to support the development and updating of national plans for mitigating influenza epidemics and pandemics in community settings. The recommendations included in this guideline will also be of interest to individuals, organizations, institutions and local health authorities.

Methods

The guideline development process included the following stages:

1. Identify a list of NPIs that have the potential to contribute to pandemic mitigation for further review and evaluation.
2. Identify and evaluate existing systematic reviews of the NPIs listed in Step 1, and perform new systematic reviews for each NPI if recently published reviews were not available.
3. Assess the body of evidence on the effectiveness of each of the NPIs.
4. Determine the direction and strength of recommendations.
5. Draft the guideline document based on evidence and planning for strategy implementation.

The guideline development process included the formation of four main groups: a World Health Organization (WHO) guideline steering group, a systematic review team from the University of Hong Kong, a guideline development group and an external review group. The primary responsibilities of these four groups are, respectively, to oversee the process of the guideline development, to review the evidence base for each NPI, to formulate recommendations based on scientific evidence and other considerations, and to review the guidelines.

Available evidence

The evidence base for this guideline included systematic reviews of 18 NPIs, covering:

- personal protective measures (e.g. hand hygiene, respiratory etiquette and face masks);
- environmental measures (e.g. surface and object cleaning, and other environmental measures);
- social distancing measures (e.g. contact tracing, isolation of sick individuals, quarantine of exposed individuals, school measures and closures, workplace measures and closures, and avoiding crowding); and
- travel-related measures (e.g. travel advice, entry and exit screening, internal travel restrictions and border closure).

The evidence base on the effectiveness of NPIs in community settings is limited, and the overall quality of evidence was very low for most interventions. There have been a number of high-quality randomized controlled trials (RCTs) demonstrating that personal protective measures such as hand hygiene and face masks have, at best, a small effect on influenza transmission, although higher compliance in a severe pandemic might improve effectiveness. However, there are few RCTs for other NPIs, and much of the evidence base is from observational studies and computer simulations. School closures can reduce influenza transmission but would need to be carefully timed in order to achieve mitigation objectives. Travel-related measures are unlikely to be successful in most locations because current screening tools such as thermal scanners cannot identify pre-symptomatic infections and afebrile infections, and travel restrictions and travel bans are likely to have prohibitive economic consequences.

Recommendations

Eighteen recommendations are provided in this guideline (Table 1). The recommendations take into account the quality of the supporting evidence, the strength of each recommendation and other considerations. In taking decisions on interventions, each WHO Member State and each local area will need to take into account the feasibility and acceptability of proposed interventions, in addition to their anticipated effectiveness and impact. This guideline provides an overview of relevant considerations.

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