Infection prevention and control in the context of coronavirus disease (COVID-19): A living guideline

7 March 2022

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WHO reference number: WHO/2019-nCoV/ipc/guideline/2022.1

Sections

Executive Summary

Version 2.0 Infection prevention and control in the context of coronavirus disease (COVID-19): A living guideline

What are these guidelines?
This document is a living guideline that brings together infection prevention and control technical guidance developed and published since the beginning of the COVID-19 pandemic. This consolidated "Infection prevention and control in the context of coronavirus disease (COVID-19): A living guideline" aims to provide users with the latest evidence-based recommendations for infection prevention and control in the context of COVID-19 in health care and community settings. The WHO living guidance is separated into two parts: 1) IPC in health care settings in the context of COVID-19 and 2) IPC in community settings in the context of COVID-19. This second edition of the Infection prevention and control in the context of coronavirus disease (COVID-19): A living guideline provides the most up-to-date technical guidance on mask use by children.

Each country is facing a different situation in the pandemic depending on a number of factors including the intensity of SARS-CoV-2 circulation, amount of population level immunity, capacities to respond and agility to adjust measures. As the pandemic continues and the virus evolves, changes in transmission intensity, the circulating variant of concern, the capacities for health systems to respond based on the situation will result in need for policy adjustments related to IPC and Public Health and Social Measures. National policies should be evidence based, agile and adjusted as needed taking into consideration these and other factors.

Target Audience
These guidelines are written and intended for policy and decision-makers, public health professionals, infection prevention and control professionals at both the national and facility levels, health care facility administrators, managers and health workers.

How are these guidelines developed?
Guideline development groups (GDG) consisting of experts in infection prevention and control, including health care providers, balanced according to geographical and gender representation, were convened. Different GDGs were used to address specific settings or populations. Potential conflicts of interest were identified and managed appropriately. More details are described in the Authorship, contributors and acknowledgement section. Draft guidelines were circulated to external reviewers. A methodologist with expertise in guideline development complemented the technical expertise of the GDG to support the formulation of recommendations. These guidelines were developed using the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) processes and Evidence to Decision framework (EtD). Details are described in the Methodology section.

With support from the World Health Organization (WHO) Quality Assurance of Norms and Standards department, rapid systematic reviews of published literature were identified for review. Due to the rapidly evolving nature of the pandemic, preprints were included in the evidence synthesis. Where required, additional systematic reviews were conducted by WHO staff or commissioned externally to address specific questions. Details are described in the Methodology section.

This document takes into consideration the evolving epidemiological situation and the emergence of variants of concern (VOC) including Omicron and other factors such as population immunity, availability and uptake of vaccines, the current epidemiology and the evolving context of COVID-19. Further information on Omicron can be found in the technical document Enhancing response to Omicron SARS CoV-2 variant: Technical brief and priority actions for Member States, issued by WHO on 21 January 2022 *[1]*. MAGICapp was selected to disseminate and update this guideline because of its user-friendly format, structure, and navigation, and the fact that it is well adapted to accommodate the dynamic nature of the COVID-19 public health emergency.

Key updates in this version
The previously published technical guidance documents incorporated in Version 2.0 are as follows.

1. Mask use in the context of COVID-19 - December 2020 *[2]*
   This document was integrated into version 1.0 of the COVID-19 infection prevention and control living guideline: mask use in community settings updated in December 2021*[3]*.

2. Advice on the use of masks for children in the context of COVID-19 - August 2020 *[4]*

   WHO and UNICEF jointly developed this guideline. Advice on the use of masks for children in the context of COIVD-19 was first published in August 2020 as an annex to the document Mask use in the context of COVID-19 *[2][4]*. In December 2021 it was incorporated into the online version 1.0 of the COVID-19 infection prevention and control living guideline: mask use in community settings published using the MAGICapp platform.

In version 2.0 of the living guidance, WHO and UNICEF have jointly developed updated guidelines for mask use by children, including new and updated recommendations for mask use by children of different ages, accommodations for children living with disabilities and updated implementation considerations, including for school settings. The emergence of variants of concern (e.g. Alpha, Beta, Gamma, Delta and Omicron), the continued virus evolution and potential future VOCs, evolving evidence on effectiveness of masks in community settings and transmission of SARS-C0V-2 prompted the updates to this guideline.

Key points for this updated version for mask use by children in the context of COVID -19 include:

- The utilization of masks in community settings is likely associated with a decreased risk of SARS-CoV-2 infections compared with no mask-wearing, although there is very limited evidence in children five years and under.
- Masks are not required for children aged 5 years and under.
- In areas where there is known or suspected community transmission of SARS-CoV- 2, masks are recommended for use in children ages 6-11 years in the following settings:
  - in indoor settings where ventilation is known to be poor or cannot be assessed, or the ventilation system is not properly maintained, regardless of whether physical distancing of at least 1metre can be maintained,
  - in indoor settings that have adequate ventilation if physical distancing of at least 1 metre cannot be maintained.
- Adolescents 12 years or older should follow the same WHO recommendations for mask use as adults.
- Children with cognitive or respiratory impairments, developmental disorders, disabilities or other specific health conditions who experience difficulties wearing a mask or have health conditions that interfere with mask-wearing should not be required to wear a mask.
- The use of a medical mask is recommended for children with a higher risk of severe complication from COVID-19 but should be assessed in consultation with the child's medical provider.

Definitions

A child is defined as any person under the age of 18 years *[5]*.

Health workers are all people primarily engaged in actions with the primary intent of enhancing health. This includes health service providers, such as doctors, nursing and midwifery professionals, public health professionals, technicians (laboratory, health, medical, and non-medical), personal care workers, healers, and practitioners of traditional medicine. It also includes health management and support workers, such as cleaners, drivers, hospital administrators, district health managers, social workers and other occupational groups in health-related activities. This group includes those who work in acute care facilities and long-term care, public health, community-based care and other occupations in the health and social care sectors *[6]*.

Medical masks are a type of medical device covering the mouth and nose of the wearer used to prevent the spread of respiratory infections. To be designated as a 'medical' or 'surgical' mask, the mask must be tested at independent, accredited laboratories and must meet performance standards defined by various internationally recognized standards' organizations (e.g. European Standards, ASTM, Guobiao, or equivalent). *[7]*.

Non-medical masks are a type of facial covering of the mouth and nose of the wearer used to mitigate the spread of respiratory infections which does not meet the performance standards of 'medical' or 'surgical' masks. Their primary purpose is for source control and to provide a degree of particulate filtration to reduce the amount of inhaled particulate matter. Essential parameters for the performance and safety of non-medical masks have been advocated during the COVID-19 Public Health Emergency of International Concern through several existing international guidelines (e.g. Association Française de Normalisation, World Health Organization, European Committee for Standardization, Bangladesh Directorate General of Drug Administration) and one international standard for non-medical masks (ASTM F3502-21) *[7][8][9][10][11]*. Non-medical masks which are self-made or commercially produced and do not meet guideline supported essential parameters are permitted in areas which have not mandated minimum performance requirements for non-medical masks prior to sale and use by the general public.

Abbreviations

AGP	Aerosol generating procedure
aOR	Adjusted odds ratio

COVID-19	Coronavirus disease 2019
CI	Confidence interval
CT	Community transmission
DOI	Deceleration of interest
EtD	Evidence to decision
FFP	Filtering facepiece respirator
GDG	Guideline Development Group
GPS	Good practice statement
GRADE	Grading of Recommendations, Assessment, Development and Evaluations
ILI	Influenza-like illness
IPA	International Paediatric Association
IPC	Infection prevention and control
NIOSH	National Institute for Occupational Safety and Health
MAGIC	Magic Evidence Ecosystem Foundation
OR	Odds ratio
PICO	Population, intervention, comparator, outcome
PPE	Personal protective equipment
RCT	Randomized control trial
PHSM	Public health and social measures
SARS-CoV	Severe acute respiratory syndrome coronavirus
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
UNICEF	United Nations Children's Fund
WHO	World Health Organization
VE	Vaccine effectiveness
VOC	Variant of concern

Methodology

Guideline development groups and external review groups

GDGs were convened to review the available evidence and determine the recommendations and good practice statements (GPS) found in this document. GDGs consisted of individuals with broad expertise spanning multiple specialties, across all WHO regions, and were gender-balanced (See Authorship, contributors and acknowledgements). Consensus was sought for recommendations and good practice statements. When consensus was not achieved, approval of a recommendation or good practice statement required a majority (>70%) of the GDG. The technical officer who leads the development of the guidelines collects the required declaration of interests (DOI) from GDG members and assesses them for any potential conflicts. If a conflict of interest is identified, appropriate actions are taken in accordance with the *WHO Handbook for guideline development* and *WHO Guidelines for DOI for WHO Experts* [12][13]. These include removal from the GDG or recusal from voting or discussion for a particular recommendation or a decision to take no action. Members of the GDGs and any DOIs declared are detailed in the Authorship, contributors and acknowledgement section. External review group members were also identified for specific technical areas and engaged for additional review of the guidelines. External review groups do not change the recommendations made by the GDG, but major concerns were brought back to the GDG for additional discussion.

Evidence synthesis and assessment

Given the dynamic situation of the COVID-19 pandemic, this living guideline integrates existing guidance that was developed using streamlined processes. As noted in the Summary, with support from the WHO Quality Assurance of Norms and Standards department, rapid systematic reviews of published literature were identified for review. Because of the time lag for peer-reviewed publication of relevant studies in the context of a dynamic pandemic, preprints were included in the evidence synthesis. In addition, for some topics, systematic reviews were commissioned to external groups (clinical effectiveness of mask use in health care and community settings) or conducted by WHO staff (ecological studies on the effectiveness of masks). These reviews have been published and are regularly updated to identify any emerging evidence that may inform deliberations by the GDG [14][15][16].

Evidence from randomized control trials (RCT) has been limited. Therefore, the reviews also included non-randomized studies. The review on clinical effectiveness focused on cohort and case-control studies. The review of ecological studies also included before-after studies. The systematic reviews presented in GDG meetings were supplemented by other (non-systematically reviewed) data presented by WHO staff, Member States, or partner organizations. Such presentations informed considerations regarding contextual factors on mask recommendations, such as data on the changing epidemiology of COVID-19, mask filtration properties and technical specifications, ventilation, values/preferences, acceptability and feasibility. The literature for each identified topic is assessed using Grading of Recommendations, Assessment, Development and Evaluations (GRADE) to determine the certainty of the evidence (see Table 1), based on the presence of risk of bias/study limitations, inconsistency, imprecision, indirectness and publication/reporting bias.

Table 1. Determining the Quality of Evidence in GRADE

Quality level	Definition
High	The Group is very confident in the estimate of effect and considers that further research is very unlikely to change this confidence.
Moderate	The Group has moderate confidence in the estimate of effect and considers that further research is likely to have an important impact on that confidence and may change the estimate.
Low	The Group has low confidence in the estimate of effect and considers that further research is very likely to have an important impact on that confidence and is likely to change the estimate.
Very low	The Group is very uncertain about the estimate of the effect.

Process for developing recommendations

Once the certainty of the evidence is determined, the GDG, with the guidance of the Methodologist, determines if a recommendation (strong or conditional) or a good practice statement (GPS) is warranted. GRADE evidence profiles contain an assessment of the certainty of the evidence and a summary of findings for each critical outcome and each key question. The GDG uses these summaries as the basis for discussions and formulation of recommendations.

The Evidence to Decision (EtD) framework is used by the GDG to support the formulation of the recommendation or GPS. Core domains in the EtD framework are the balance of benefits and harms and quality of the evidence, although other factors also influence the

recommendations (see table 2). For some domains, there is insufficient published data to provide the GDG with informative systematic reviews or studies of health workers, patients or community members' perceptions or experience with implementation of IPC recommendations during the pandemic. In such cases, additional evidence/data is presented when available, supplemented by GDG members' (including community members) experiences and judgements. Strong recommendations are supported when benefits highly outweigh harms with high certainty, the recommendations are not sensitive to variability in preferences/values regarding outcomes, and the recommendations are widely feasible and acceptable, cost-savings or cost-effective, and would improve equity. When certainty is low or very low strong recommendations can be made but they require a strong rationale for potential net benefits and the other EtD domains. In these situations, good practice statements are considered (see the section on GPS). In some situations, after determining that benefits of an intervention do not outweigh harms, and considering EtD domains (certainty of evidence, costs, feasibility, acceptance, preferences), the GDG may make a recommendation against an intervention.

The GRADE tables can be found in the Annex section of this living guidance.

The recommendations on mask use by children were additionally informed by five consultation sessions conducted by the United Nations Children's Fund (UNICEF) with members of the International Paediatric Association (IPA) members from different geographical regions, in multiple languages, to synthesize paediatric health professionals' field experiences with the implementation of the previous guidance.

Table 2. EtD framework

Domain	Favours strong recommendations	Favours conditional recommendations
Balance of benefits and harms	Benefits highly outweigh harms	Benefits and harms more closely balanced
Quality of evidence	Higher certainty	Lower certainty
Values/preferences regarding outcomes	Benefits to harms assessment not impacted by variability in values/ preferences	Variability in values/preferences would impact benefits to harms assessment
Acceptability	Highly acceptable	Low or variable acceptability
Costs/Resources	Cost-saving/cost-effective	Costly/cost-ineffective
Feasibility	Feasible in intended settings	Unfeasible or feasibility varies in intended settings
Equity	Increased equity	Decreased equity or effect on equity variable