

# COVID-19

## COVID-19 and comorbidities in the Americas

Hands-on tool to estimate the population at increased and high risk of severe COVID-19 due to underlying health conditions for the Americas

### 1. Background

The risk that individuals infected with SARS-CoV-2 develop severe disease is known to be higher among older people and those with underlying health conditions. Understanding the number of individuals at increased risk of severe disease can inform the design of strategies for shielding, managing chronic care conditions and allocating vaccines.

This tool enables governments to estimate the percentage of the population with underlying conditions that affect their risk of severe disease. The population can be classified as having no underlying conditions, one condition or multiple conditions, by 5-year age ranges and sex. The tool is based on the following definitions:

1) **Underlying health conditions for severe COVID-19**<sup>1,2,3</sup> are those conditions associated with “increased risk of severe COVID-19” described in guidance documents published by WHO, CDC and Public Health England (PHE):

- |   |   |
|---|---|
| (a) Cardiovascular disease  | (h) HIV/AIDS  |
| (b) Chronic kidney disease  | (i) Tuberculosis (active)                             |
| (c) Chronic respiratory disease   | (j) Chronic neurological disorders                    |
| (d) Chronic liver disease   | (k) Sickle cell disorders                             |
| (e) Diabetes  | (l) Tobacco smoking                                   |
| (f) Cancers with direct immunosuppression   | (m) Severe obesity (body mass index [BMI] $\geq 40$ ) |
| (g) Cancers without direct immunosuppression, but with possible immunosuppression caused by treatment | (n) Hypertension                                      |

2) **Severe acute respiratory illness**<sup>4</sup>: respiratory illness presenting fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness of breath) requiring hospitalization.

3) **Population at increased risk of severe COVID-19**<sup>5</sup>: those with at least one underlying health condition as defined in point one.

4) **Population at high risk of severe COVID-19**<sup>3</sup>: those that would require hospitalization if infected.

5) **Shielding strategy**<sup>6</sup>: a policy measure intended to protect extremely vulnerable people by instructing them on how to minimize interactions with others.

The primary outcomes produced by the tool are: the number and percentage of the population at increased risk and high risk of severe COVID-19; and its distribution by number of underlying conditions, 5-year age ranges, and sex.

PAHO, in collaboration with the London School of Hygiene and Tropical Medicine/Centre for the Mathematical Modelling of Infectious Diseases COVID-19 working group (LSHTM/CMMID-COVID-19), adapted the tool to better respond to countries' needs. In the Americas' version, countries can include their own data, when available, and/or use information

<sup>1</sup> World Health Organization. Information note on COVID-19 and NCDs. Geneva: WHO, 2020. Available from: <https://www.who.int/publications/m/item/covid-19-and-ncds>

<sup>2</sup> Public Health England. [Withdrawn] Guidance on social distancing for everyone in the UK [internet]. London: PHE, 2020. Available from: <https://www.gov.uk/government/publications/covid-19-guidance-on-social-distancing-and-for-vulnerable-people/guidance-on-social-distancing-for-everyone-in-the-uk-and-protecting-older-people-and-vulnerable-adults>

<sup>3</sup> Centers for Disease Prevention and Control. People at increased risk: people with certain medical conditions [internet]. Atlanta: CDC, 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>

<sup>4</sup> World Health Organization. Public health surveillance for COVID-19: interim guidance. Geneva: WHO, 2020. Available from: <https://apps.who.int/iris/handle/10665/331506>

<sup>5</sup> Clark A, Jit M, Warren-Gash C, Guthrie B, Wang HH, Mercer SW, et al. Global, regional, and national estimates of the population at increased risk of severe COVID-19 due to underlying health conditions in 2020: a modelling study. *Lancet Glob Health* 2020; 8(8): E1003–17. Available from: [https://doi.org/10.1016/S2214-109X\(20\)30264-3](https://doi.org/10.1016/S2214-109X(20)30264-3)

<sup>6</sup> Department of Social Care and Public Health England. Guidance on shielding and protecting people who are clinically extremely vulnerable from COVID-19 [internet]. London: PHE, 2020. Available from: <https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19>

from the global burden of disease online dataset published by the Institute for Health Metrics and Evaluation (IHME).<sup>7</sup> It is important to note that the estimates used are not official estimates of the IHME. The LSHTM/CMMID-COVID-19 working group has applied their own calculations/methods to publicly available datasets instead.

Some aspects should be considered when interpreting the results produced by the tool. The estimates can be generated for high, middle and low scenarios using uncertainty intervals. The results focus on underlying health conditions rather than other risk factors such as ethnicity and socioeconomic deprivation, but provide a starting point for considering the number of individuals that might need to be protected as the pandemic unfolds. However, when countries use their own data, estimates for at least one and multiple conditions can be produced by social stratifiers.

## 2. Tool features

The tool can be used to estimate the number and percentage of country populations to be targeted by different shielding policies. It also allows users to explore different scenarios. Specific health conditions can be included or excluded; different age thresholds and choices about key assumptions may be assessed. The tool can also be updated with local sources of prevalence data and specific conditions added or removed as more evidence emerges.

The key elements of the tool are presented below:

### Summary of primary outcomes

- Number at increased risk
- Number at high risk by sex
- Number with no conditions but older than minimum age

### Guidance notes

- Background and instructions
- Methods for estimating number at increased risk, at high risk and eligible for age-based shielding

### Input parameters

- Assumptions for increased risk (low, mid or high population size, disease prevalence and multimorbidity estimates; minimum for age policy)
- Assumptions for high risk (infection hospitalization ratios, adjustment for age-based frailty, relative risk of admission)
- List of underlying health conditions, inclusion of latent tuberculosis and those on antiretroviral therapy

### Results tables

- Number and percentage at increased risk by 10-year age ranges
- Number and percentage at high risk by sex and 10-year age ranges

### Plots

- Plots to visualize numbers at increased risk by age
- Plots to visualize effect of age threshold
- Plots to show effect of adjustments for high-risk estimates

### Calculations

- Population for mid-year 2020
- Prevalence of underlying conditions
- Antiretroviral therapy coverage among persons living with HIV
- Percentage with 0, 1, 1+ 2+ underlying conditions
- Multimorbidity among those with 1+ conditions
- Distribution of single and multiple underlying conditions
- Infection hospitalization ratios
- Age-standardized share of population at risk

<sup>7</sup> Institute for Health Metrics and Evaluation. Global Health Data Exchange: GBD Results Tool, default (2019) [internet]. Available from: <http://ghdx.healthdata.org/gbd-results-tool>

PAHO/IMS/PHE/COVID-19/21-0003

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**Technical assistance:**

Ana Rivière, Advisor on Data Management, Analytics and Products PHE/PAHO  
Andrew Clark, Professor Department of Health Services Research & Policy, LSHTM  
Dolores Ondarsuhu, Specialist on NCD Monitoring and Surveillance, NMH/PAHO  
Roberta Caixeta, Advisor on NCD Surveillance, Prevention and Control, NMH/PAHO

For more information, please contact:  
[each@paho.org](mailto:each@paho.org)

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