



**GUPTA
STRATEGISTS**

COVID mortality in 6 countries:

*a comparative, temporal study as part of
SEEKING THE CENTRE project*

Amsterdam, 27 September 2021

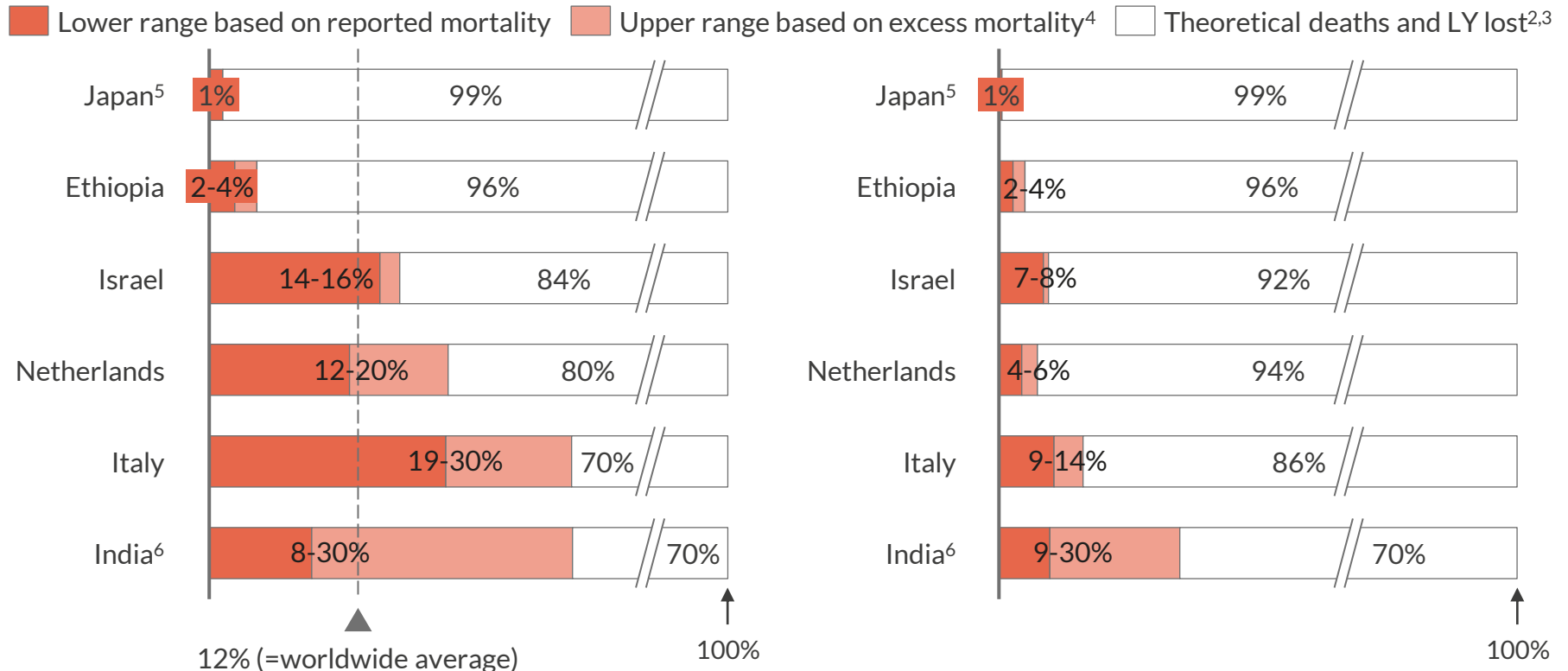
Reader's Guide

- The mortality, and life years lost of the 6 countries that form the Seeking The Centre project are analyzed
- The data on which the study is based is readily available from several public sources. The study presents three analytical steps in order to make the COVID impact more comparable across countries and across time:
 - Firstly, the demographic structure of each country is different. Ethiopia is very young, Japan the most aged, Since COVID mortality is highly skewed with age, clearly the 'raw' mortality numbers are not comparable across countries. Next to age, there are several known and unknown confounders of COVID mortality. In this study the demography corrected mortality is reported for the 6 countries. The other potential confounders are not studied
 - Secondly, the 'theoretical' or estimated best guess of world-wide mortality of COVID (0.5%) is used as a normative comparison with the actual mortality. A country demography specific, theoretical mortality is calculated. Clearly this average is not a given and will change as the virus changes or our response changes (for example vaccination). The purpose of using a normative number is to provide a reference for each country
 - Thirdly, the inaccuracies in data reporting are estimated. It is well known that often data related to COVID has serious reliability issues. Even mortality, though perhaps the most reliable measure, is under-reported (or perhaps even over-reported in some cases). The excess mortality based on both official and unofficial reports is used to provide a range of mortality for the 6 countries
- Since COVID is still very much a 'disease in progress' this analyses shall be repeated periodically during this project
- Finally, the themes explored in Seeking the Centre project shall be related to mortality as reported here

COVID deaths per country have large variation: Italy, NL, India, Israel have factor ten higher % deaths than Japan, Ethiopia

Position on 27 September 2021 per country on mortality [registered deaths¹ / theoretical deaths²]

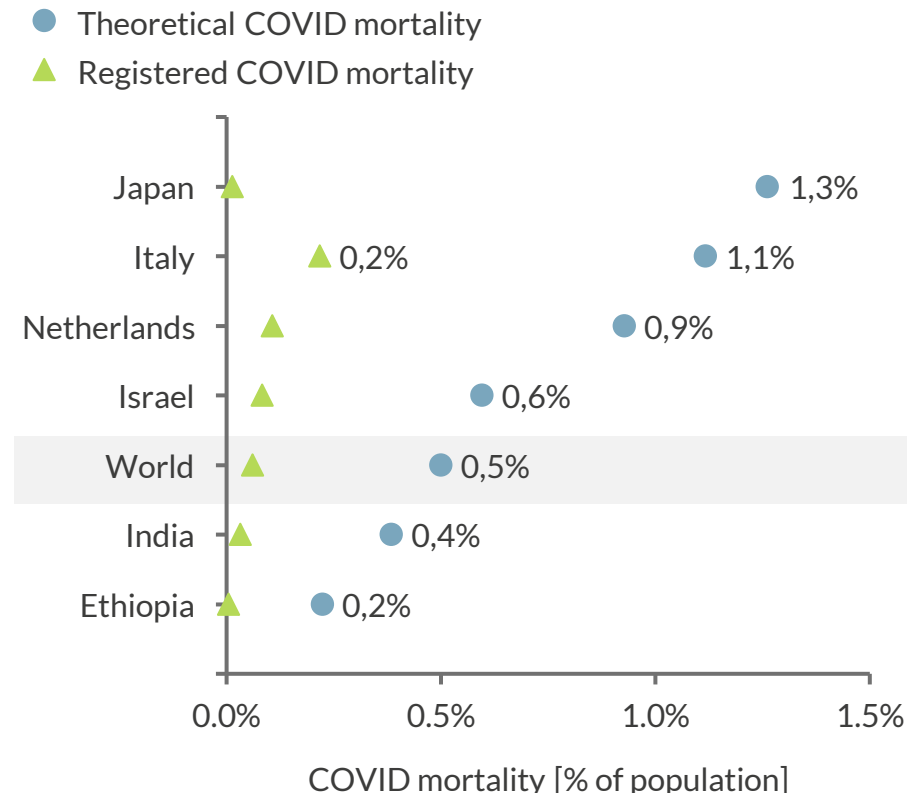
Position on 27 September 2021 per country on life years lost [registered / theoretical LY lost³]



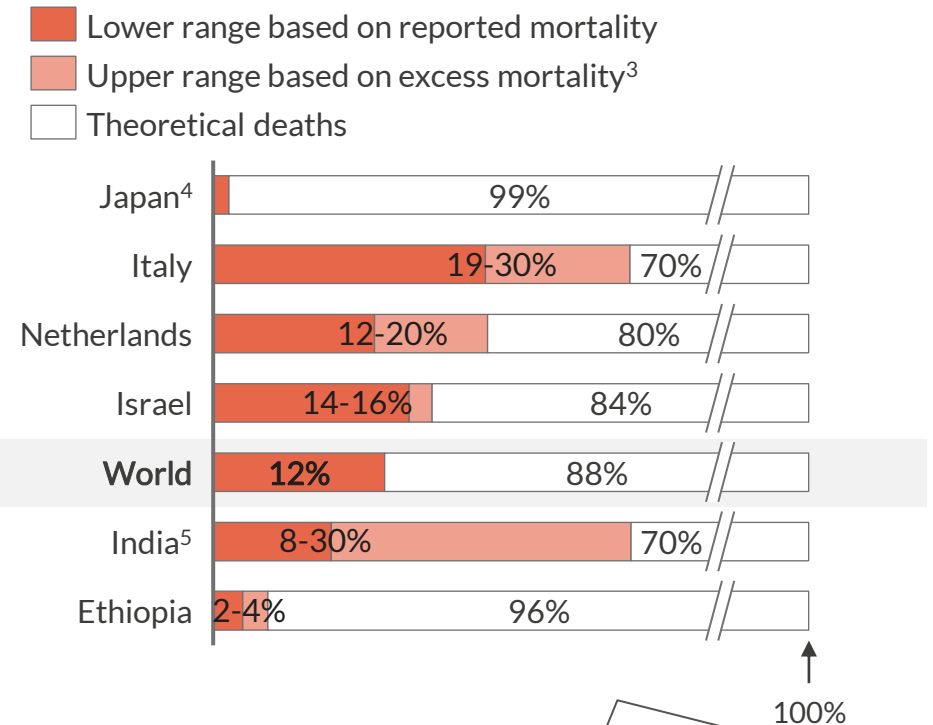
1) Registered deaths based on ourworldindata.
 2) Theoretical deaths is the mortality in a country given: 1) worldwide COVID-mortality is 0,5% (assumption based on early evidence on COVID-19), 2) age distribution of COVID-deaths based on Japan, Italy, Netherlands, Israel (date: 9 April 2021), Ethiopia (date: 30 April 2021) and two states in India (November 2020), 3) demography within a country.
 3) Life years lost is based on the life expectancy within the country. We can't calculate the worldwide average, because data on registered deaths per age group for the whole world is missing.
 4) Comparison of COVID deaths in 2020 and difference in total deaths in 2019 and 2020. Difference between excess mortality and COVID deaths is the factor we used to calculate the upper range.
 5) Total number of deaths in Japan in 2020 is lower than in 2019 (world mortality data, ourworldindata), so we don't have excess mortality to base an upper range on.
 6) In the current wave, several media reports suggest a factor 2-15 higher deaths across the country than official figures. Upper range for India is based on assuming 5 times higher deaths in the reported deaths in the current wave (based on registered deaths since April 2021).
 Source: Ourworldindata (data on COVID mortality, life expectancy and world mortality), Worldbank (data on demography), website of the government per country (data on age distribution of COVID deaths), analyses Gupta Strategists

Success in limiting COVID risk varies widely per country, Japan despite its aged population has done better than India with a young population

Registered¹ (27 September 2021) and theoretical COVID mortality²

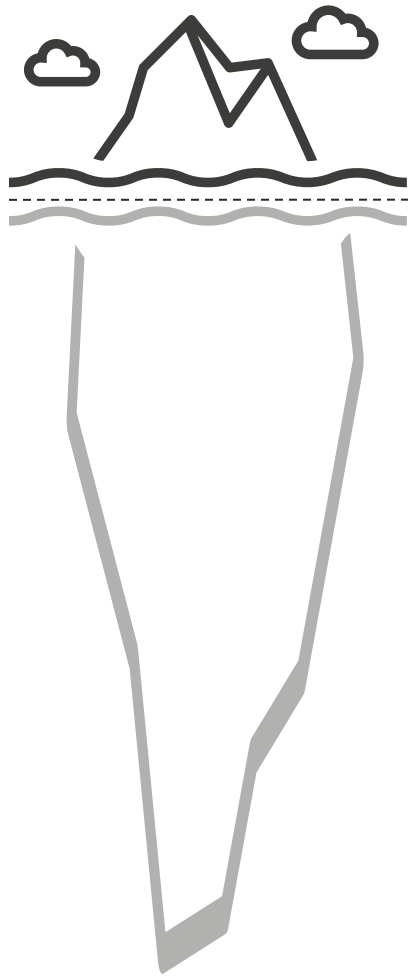


Position on 27 September 2021 per country on mortality [registered deaths¹ / theoretical deaths²]



1) Registered deaths based on ourworldindata.
 2) Theoretical deaths is the mortality in a country given: 1) worldwide COVID-mortality is 0,5% (assumption based on early evidence on COVID-19), 2) age distribution of COVID-deaths based on Japan, Italy, Netherlands, Israel (date: 9 April 2021), Ethiopia (date: 30 April 2021) and two states in India (November 2020), 3) demography within a country.
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'Registered deaths' are limited measure of COVID impact; several uncertainties are known



Registered deaths reflect 1) the quality of the tests that are used, 2) the testing policy, 3) the registering policy.

Actual number of deaths can therefore be much higher (iceberg underneath the water) than registered number of deaths (tip of the iceberg that we can observe)

Tests that are not tested

- **Sensitivity** of the tests that are used. E.g. sensitivity of PCR is estimated to be 67-98%, meaning that 2-33% of the persons infected with COVID-19 are tested negative (**false negatives**) and are not registered as COVID-cases (and thus also perhaps not as COVID deaths).

Case of the missing cases

- **Testing policy**; the more a country tests, the larger the proportion of actual COVID cases will be found (and cause of deaths registered). It is unclear how asymptomatic cases react to tests. Studies show that actual cases might be factor 4-40 higher

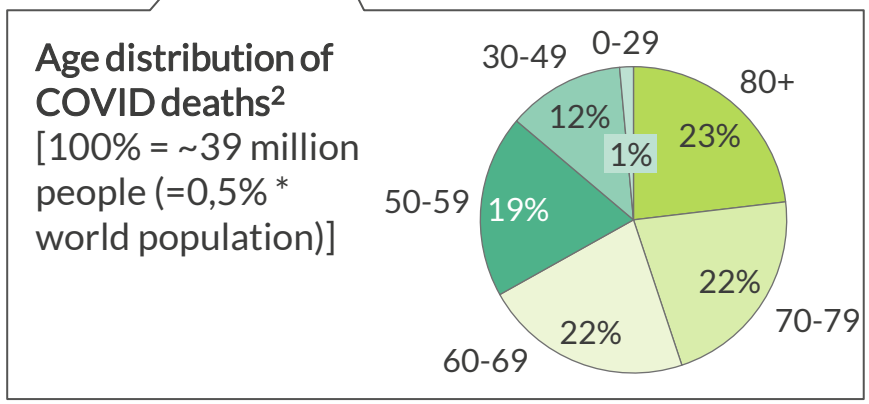
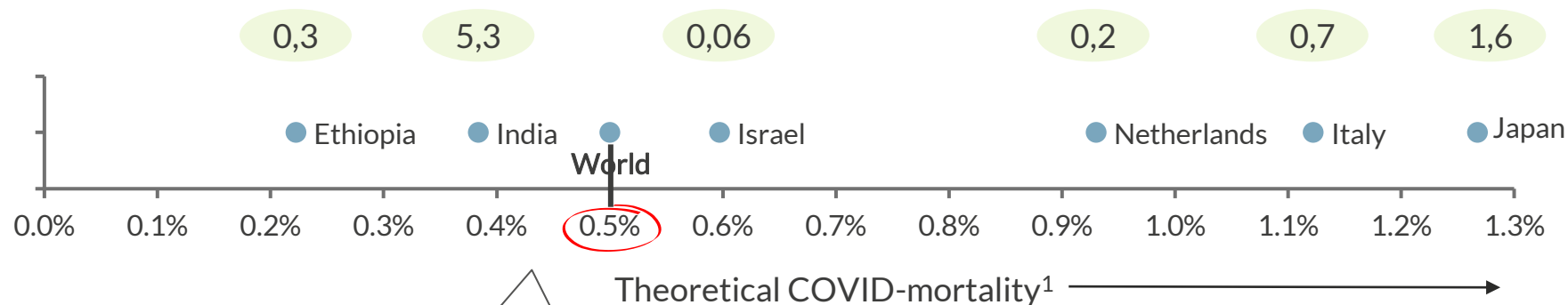
Deaths by another name

- **Registering policy**; how deaths are registered can cause an under-registration of COVID-deaths. Lack of infrastructure in developing countries mean that many deaths are not reported yet. Guidelines in assigning cause of mortality in developed countries vary per country and therefore even when deaths are reported the cause is not comparable. Where mortality is known excess mortality provides one approach to estimate COVID mortality. Lack of transparency also certainly plays a role here.

Demography has huge impact on COVID risk: theoretical COVID mortality in Japan is estimated to be a factor ten higher than Ethiopia

Theoretical COVID mortality¹

[% of the population, 0,3 = number of theoretical deaths x 1 mln]

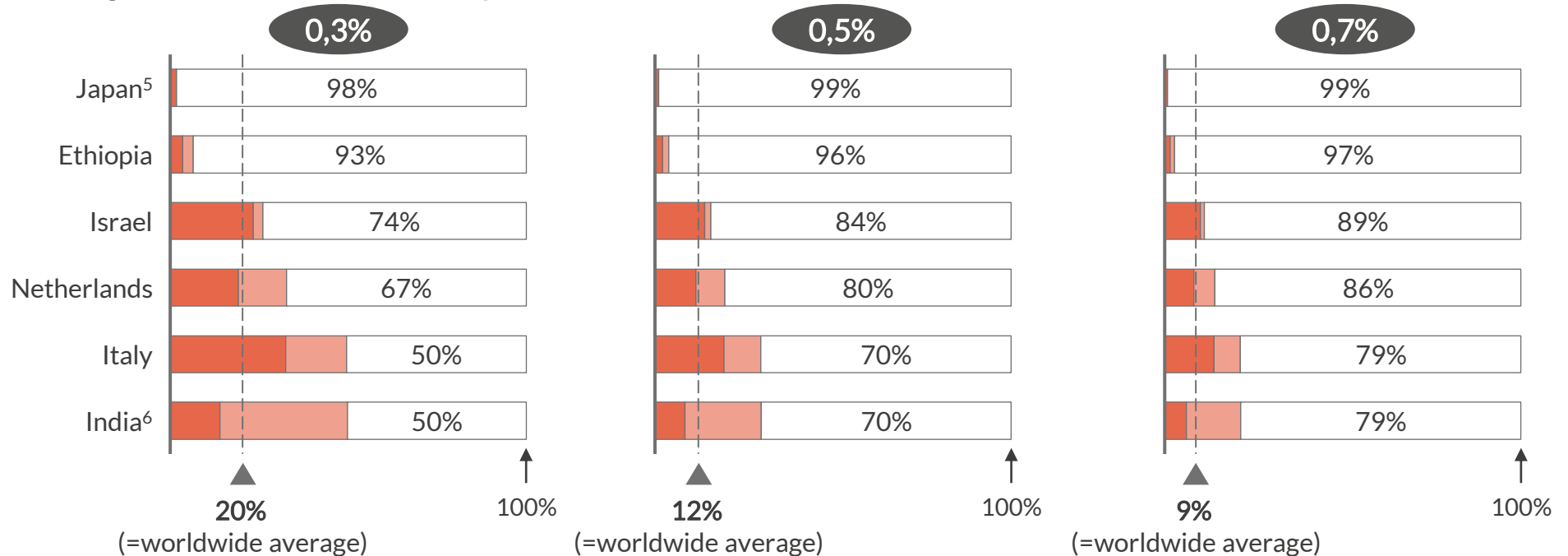


1) Theoretical mortality is the mortality in a country given: 1) worldwide COVID-mortality is 0,5% (assumption based on early evidence on COVID-19), 2) age distribution of COVID-deaths based on Japan, Italy, Netherlands, Israel (date: 9 April 2021), Ethiopia (date: 30 April 2021) and two states in India (November 2020), 3) demography within a country.
 2) Based on registered deaths in the 6 countries (see countries and dates in footnote 1).
 Source: Ourworldindata (data on COVID mortality and life expectancy), Worldbank (data on demography), website of the government per country (data on age distribution of COVID deaths), analyses Gupta Strategists

Uncertainties in COVID mortality impact the disease progress in a country, but the relative position is the same in different scenarios

Position on 27 September 2021 per country on mortality
 [registered deaths¹ / theoretical deaths²]

Assuming worldwide COVID mortality:



1) Registered deaths based on ourworldindata.

2) Theoretical deaths is the mortality in a country given: 1) worldwide COVID-mortality is 0,5% (assumption based on early evidence on COVID-19) or 0,3% or 0,7%, 2) age distribution of COVID-deaths based on Japan, Italy, Netherlands, Israel (date: 9 April 2021), Ethiopia (date: 30 April 2021) and two states in India (November 2020), 3) demography within a country.

3) Life years lost is based on the life expectancy within the county. We can't calculate the worldwide average, because data on registered deaths per age group for the whole world is missing.

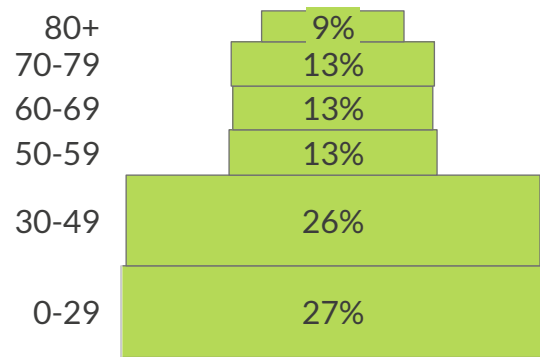
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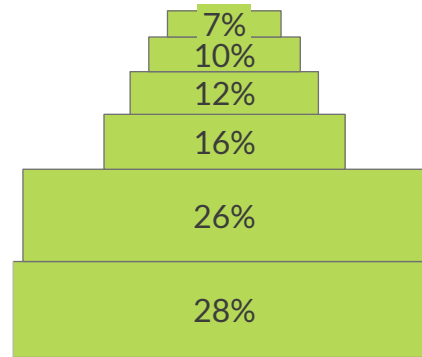
6) In the current wave, several media reports suggest a factor 2-15 higher deaths across the country than official figures. Upper range for India is based on assuming 5 times higher deaths in the reported deaths in the current wave (based on registered deaths since April 2021).

Demography determines the differences in theoretical COVID mortality: Japan is most aged, Ethiopia has the youngest population

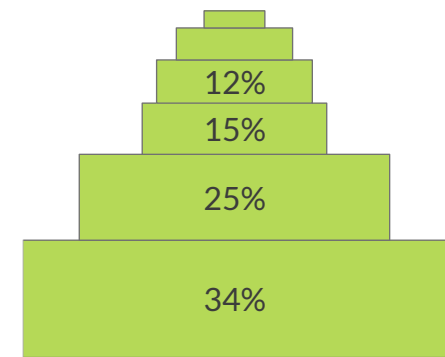
 **Japan**
[total # of citizens = 126 mln]



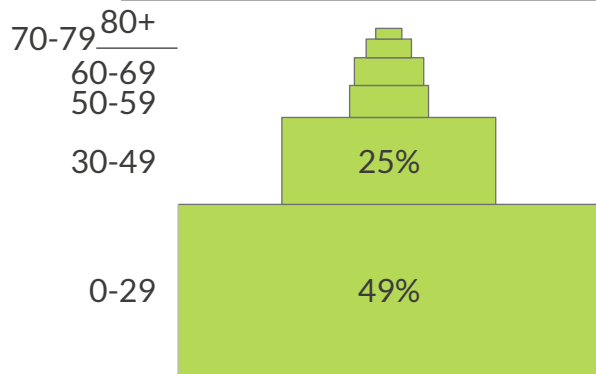
 **Italy**
[total # of citizens = 60 mln]



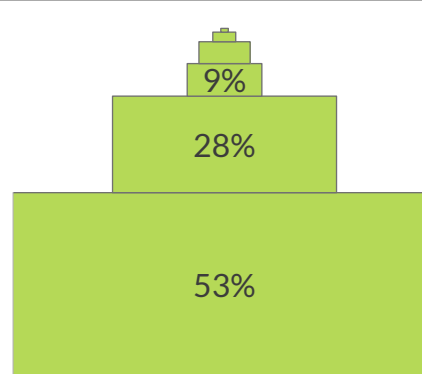
 **Netherlands**
[total # of citizens = 17 mln]



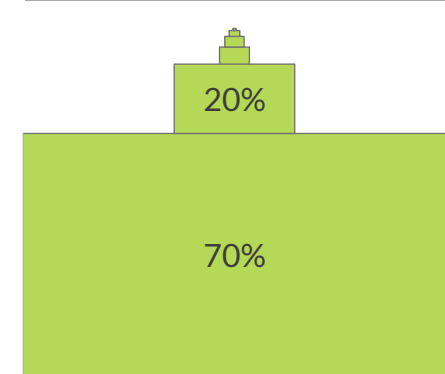
 **Israel**
[total # of citizens = 9 mln]



 **India**
[total # of citizens = 1380 mln]

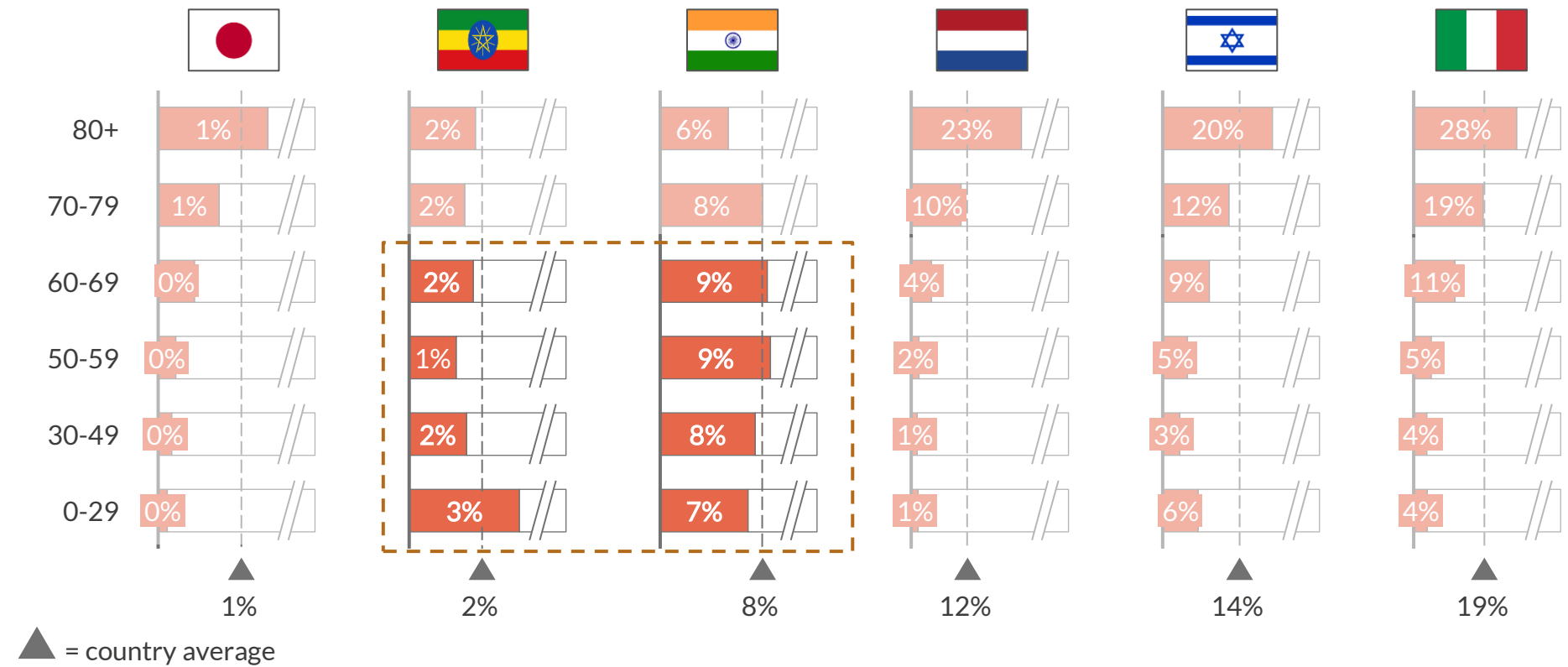


 **Ethiopia**
[total # of citizens = 115 mln]



In young demographic countries like Ethiopia and India the young appear to have relatively higher COVID mortality risk than the aged

Position on 27 September 2021 in COVID journey per country on mortality
 [registered deaths¹ / theoretical deaths²]



1) Registered deaths based on ourworldindata.

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