



Institute  
and Faculty  
of Actuaries

# COVID-19 Report

International Context of COVID-19 Scenario  
Modelling :

Factors Impacting COVID-19 Outcomes by Country &  
Relevant Data references for Actuaries to Use in  
Scenario Modelling

By Aparna Batra & Maryam Abdullah FIA

March 2021

---

**Disclaimer:** The views expressed in this publication are those of invited contributors and not necessarily those of the Institute and Faculty of Actuaries. The Institute and Faculty of Actuaries do not endorse any of the views stated, not any claims or representations made in this publication and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this publication. The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, not to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this publication be reproduced without the written permission of the Institute and Faculty of Actuaries.

---

# International Context of COVID-19 Scenario Modelling

## 1. Factors Impacting COVID-19 Outcomes by Country

### **Socio-ecological factors:**

1. Immunity: This varies between different regions and dependent upon quality of food intake, environment (pollution etc)
2. Urban / rural areas - can use household data but we need Mobility indicators (how much a population moves around)
3. Population data – 2 links provided
4. Population density: we need sq Km data for countries
5. Household data: these come from Census data
6. Economic classification of country
7. Behaviour of humans: how it varies across regions, proper precautions used by people or not? Wearing masks, sanitization and gloves.
8. Maintaining Social Distancing: Possibility to work remotely differs between and within countries.

### **Medical Factors**

9. Preparedness of a country – JEE score, link shared below
10. Medical capacity – link shared below
11. Universal health, insurance schemes, expenditure on health per GDP
12. Co-morbidities in the population – link shared below
13. Case fatality by age data – link shared below, these interact with economic factors by country

### **Governmental Interventions and Policies:**

14. International intervention database – Link shared, needs updating as COVID is still ongoing and stringency database
15. Population adherence data – need those but have not looked into where we can find some

### **Economic Factors**

16. GDP and per capital income
17. Unemployment created by COVID – can maybe use informal economy size in each country
18. Tourism data
19. Fiscal impact data:
  - decentralisation of the country, in particular the assignment of spending responsibilities.
  - characteristics of sub national government revenues, in particular their degree of sensitivity to economic fluctuations.

- “fiscal flexibility” i.e. the ability of sub national governments to absorb exceptional stress, their capacity to adjust their expenditure and revenues to urgent needs;
- fiscal health or financial conditions i.e. the current budget balance and debt situation of a given local government, the level of cash treasury and set-aside reserves.
- the impact on finance also depends heavily on the scope and efficiency of support policies from higher levels of government.

20. Supply chain impact

21. Tradable sectors in a country and how they are affected.

22. Technological advancements: Some developed countries having access to advance technologies were able to use technology to trace the COVID-19 patients and able to reduce the potential spreads.

## **2. Relevant Data references for Actuaries to Use in Scenario Modelling**

Population Data by country: Age, sex, underlying health conditions, country medical Capacity (doctors, nurses, etc) and population health information

<https://data.humdata.org/dataset/world-bank-indicators-of-interest-to-the-covid-19-outbreak>

COVID-19 case /death/recovery data by region and country

<https://data.humdata.org/event/covid-19>

Testing data by country

<https://www.finddx.org/covid-19/test-tracker/>

COVID-19 vaccinations by country

<https://data.humdata.org/dataset/covid-19-vaccinations>

Case fatality rates by country

<http://www.cebm.net/covid-19/global-covid-19-case-fatality-rates/>

Stringency of governmental intervention database

<https://data.humdata.org/dataset/oxford-covid-19-government-response-tracker>

Global Travel restrictions

<https://data.humdata.org/dataset/covid-19-global-travel-restrictions-and-airline-information>

World Health Organisation's Joint External Evaluation (JEE) country data : This is a country health system assessment, defined by WHO as a multisectoral process to assess country capacity to prevent, detect and rapidly respond to public health risks

<https://www.who.int/ihr/procedures/mission-reports/en/>

