All variables potentially related to death rate of COVID-19 are selected from various sources. Those variables are combined by an R code ‘IndiaAPI.R’ and the outcome is saved as ‘outcome/var\_relevant\_state.csv’ and ‘outcome/var\_relevant\_dist.csv’. Brief information about these variables can be found in’ Variable list.xlsx’, and more detailed information is summarized in this document.

**State Level**

1. **Variables from statewise\_tested\_numbers\_data**

-Variable list : total\_tested, total\_num\_icu\_beds, total\_num\_ventilators, total\_num\_of\_o2\_beds, total\_num\_beds\_normal\_isolation, total\_ppe, total\_n95\_masks, covid\_enquiry\_calls.

- These variables are from COVID19-India API (https://api.covid19india.org/)

- The original dataset is a time-series data. To obtain a single representative value by state, median is used.

- The data supplier does not provide detailed description on each variable. However, variables related to the number of beds are bed occupancy by time.

- Data location : ‘outcome/downloads/statewise\_tested\_numbers\_data.csv’

- This data is downloaded by the code ‘outcome/IndiaAPI.R’

1. **Variables from cowin\_vaccine\_data\_statewise**

- Variable list : number\_of\_containment\_zones, total\_covaxin\_administered, total\_covi\_shield\_administered, total\_doses\_administered.

- These variables are from COVID19-India API (https://api.covid19india.org/)

- The original dataset is a time-series data. To obtain a single representative value by state, median is used.

- We have a dataset at a district level as well.

- Data location : ‘outcome/downloads/cowin\_vaccine\_data\_statewise.csv’

- This data is downloaded by the code ‘outcome/IndiaAPI.R’

1. **Variables from hostpital\_capicity**

* Data location : ‘1. beds and ventilators/hospital\_capacity.csv’, which is extracted from ‘1. beds and ventilators/State-wise-estimates-of-current-beds-and-ventilators\_24Apr2020.pdf’
* Source 1: National Sample Survey (**NSS**) 75th Round Report, 2019 provides a percentage break-up of hospitalization rates across government/public, charitable/trust/NGO-run, & private sector, for India and States/UTs.
* Source 2: National Health Profile, 2019 (**NHP**) lists:

• Number of government hospitals in India and States/UTs.

• Number of government hospital beds in India and States/UTs.

* 1. **hostpital\_public**
* Number of hospitals in public sector
* No assumption.
  1. **hospital\_private**
* Number of hospitals in private sector
* Assumption: Number of private hospitals in each State/UT can be estimated based on specific percentage break-up of hospitals (as provided in NSS) and number of government hospitals (as provided in NHP) in that State/UT.
  1. **hospital\_total**
* Total number of hospitals (public + private)
* Assumption: Number of private hospitals at India level is equal to sum total of private hospitals across all States/UTs.
  1. **hospital\_beds\_public**
* Number of hospital beds in public sector
* No Assumption.
  1. **hospital\_beds\_private**
* Number of hospital beds in private sector
* Assumption: Number of private hospital beds in each State/UT can also be estimated by using the same percentage break-up as used to calculate the number of private hospitals, since the number of government hospital beds were available for each State/UT.
  1. **hospital\_beds\_total**
* Total number of hospital beds (public + private)
* Assumption: Number of private hospital beds at India level is equal to sum total of private hospital beds across all States/Uts.
  1. **icu\_beds\_public**
* Number of ICU beds in public sector
* Assumption: ICU bed strength is at 5% of hospital bed strength.
  1. **icu\_beds\_private**

- Number of ICU beds in private sector

- Assumption: ICU bed strength is at 5% of hospital bed strength.

* 1. **icu\_beds\_total**

- Total number of ICU beds (public + private)

- Assumption: ICU bed strength is at 5% of hospital bed strength.

* 1. **ventilators\_public**

- Number of ventilators in public sector

- Assumption: 50% of ICU beds across both public and private sector, are equipped with ventilators.

* 1. **ventilators\_private**

- Number of ventilators in private sector

- Assumption: 50% of ICU beds across both public and private sector, are equipped with ventilators.

* 1. **ventilators\_total**

- Total number of ventilators (public + private)

- Assumption: 50% of ICU beds across both public and private sector, are equipped with ventilators.

1. **Variables from National Health profile 2019**

* Data location : ‘2. national health profile 2019/ national\_health\_profile\_state.csv’, which is extracted from ‘2. national health profile 2019/ National Health profile 2019.pdf’
  1. **2019proj\_pop\_total, 2019proj\_pop\_male, 2019proj\_pop\_female, 2020proj\_pop\_total, 2020proj\_pop\_male, 2020proj\_pop\_female, 2021proj\_pop\_total, 2021proj\_pop\_male, 2021proj\_pop\_female**
* State/ UT wise Distribution of Projected Population of India
* Source: Report of the Technical Group on Population Projections May 2006, National Commission on Population,O/o Registrar General of India
* Projected population is based on Final Population Totals, Census of India, 2001.
* Excludes the population of Paomata,Maomaram and Purul subdivisions of Senapati District of Manipur.
* Due to rounding off in some of the States/UTs the sum of male & female may not be same as ‘pop\_total’.
  1. **2017perc\_above60\_total, 2017perc\_above60\_male, 2017perc\_above60\_female, 2017perc\_above60\_rural, 2017perc\_above60\_rural\_male, 2017perc\_above60\_rural\_female, 2017perc\_above60\_urban, 2017perc\_above60\_urban\_male, 2017perc\_above60\_urban\_female**
* Percentage distribution of Population in the age group of 60 years and above by sex and residence, India and bigger States/UTs, 2017
* Source: SRS Statistical Report 2017 , O/o Registrar General of India
  1. **2016\_2020proj\_birth\_rate**
* Projected Crude Birth Rates in India and Major States, 2016-2020
* Source : Report of the Technical Group on Population Projections May 2006, National Commission on Population, O/o Registrar General of India
  1. **2016\_2020proj\_death\_rate**
* Projected Crude Death Rates in India and Major States, 2016-2020
* Source: Report of the Technical Group on Population Projections May 2006, National Commission on Population, O/o Registrar General of India
  1. **2017death\_rate\_total, 2017death\_rate\_male, 2017death\_rate\_female, 2017death\_rate\_rural, 2017death\_rate\_rural\_male, 2017death\_rate\_rural\_female, 2017death\_rate\_urban, 2017death\_rate\_urban\_male, 2017death\_rate\_urban\_female**
* State/UT wise distribution of Death Rate by sex and residence, 2017
* Death Rate per 1000 Mid Year Population
* Source: SRS Bulletin -May, 2019, Vol. 52, No.1
  1. **2016\_2020expectation\_life\_male, 2016\_2020expectation\_life\_female**
* Projected Levels of Expectation of Life at Birth in India and Major States, 2016-2020
* Source: Report of the Technical Group on Population Projections May 2006, National Commission on Population, O/o Registrar General of India
  1. **2017infant\_mortality\_rate\_total, 2017infant\_mortality\_rate\_male, 2017infant\_mortality\_rate\_female, 2017infant\_mortality\_rate\_rural, 2017infant\_mortality\_rate\_rural\_male, 2017infant\_mortality\_rate\_rural\_female, 2017infant\_mortality\_rate\_urban, 2017infant\_mortality\_rate\_urban\_male, 2017infant\_mortality\_rate\_urban\_female**
* State/UT wise Infant mortality rate by sex and residence, 2017
* Per 1000 live births
* Infant mortality rates for smaller States and Union Territories are based on three-years period 2015-17. On account of wide year-to-year fluctuations due to inadequate sample size, the infant mortality rate by sex, separately for rural and urban areas, is not given
* Source: SRS Bulletin - May - 2019, Vol. 51 No.1 O/o Registrar General of India
  1. **2011literacy\_rate\_total, 2011literacy\_rate\_rural, 2011literacy\_rate\_urban, 2011literacy\_rate\_male, 2011literacy\_rate\_male\_rural, 2011literacy\_rate\_male\_urban, 2011literacy\_rate\_female, 2011literacy\_rate\_female\_rural, 2011literacy\_rate\_female\_urban**

- State / UT wise Literacy Rate in India as per Census, 2011

- Source: Census of India, 2011

* 1. **2011\_2012poverty\_perc\_rural, 2011\_2012poverty\_no\_rural, 2011\_2012poverty\_perc\_urban, 2011\_2012poverty\_no\_urban, 2011\_2012poverty\_perc\_total, 2011\_2012poverty\_no\_total**
* State/UT wise Number and Percentage of Population below poverty line by States 2011-12
* Source: National Instiution for Transforming India Aayog
* Poverty as on 1st March 2010 has been used for estimating number of persons below poverty line. (Interpolated between 2001 and 2011 population census)
* poverty ratio of Tamil Nadu is used for Puducherry & Andaman Nicobar Islands.
* Urban poverty ratio of Punjab is used for both rural and urban poverty of Chandigarh
* Poverty line of Maharashtra is used for Dadra & Nagar Haveli
* Poverty ratio of Goa is used for Daman & Diu
* Poverty ratio of Kerala is used for Lakshadweep
  1. **2015\_2016domestic\_product**
* State/UT wise Per Capita Net State Domestic Product at Current Prices Base year 2011-12
* In Rupees
* Source: Directorate of Economics & Statistics of respective State Governments. Central Statistics Office - All India figure
* The estimates for the State West Bengal have not been finalized for new series with base year
* 2011-12. Estimates of these States, as on July 31,2015, with base year 2004-05 are available separately on Ministry’s website.
  1. **2018\_Malaria\_case, 2018\_Malaria\_death**
* State/UT wise Provisional Cases and Deaths due to Malaria, 2018
* Source: Directorate of National Vector Borne Disease Control Programme, Dte.GHS, Ministry of Health & Family Welfare
  1. **2018\_Dengue\_case, 2018\_Dengue\_death**
* State/UT wise Provisional Cases and Deaths Due to Dengue in India, 2018
* Source: Directorate of National Vector Borne Disease Control Programme, Dte.GHS, Ministry of Health & Family Welfare
  1. **2018Typoid\_male\_case, 2018Typoid\_male\_death, 2018Typoid\_female\_case, 2018Typoid\_female\_death, 2018Typoid\_total\_case, 2018Typoid\_total\_death**
* State/UT wise Provisional Cases and Deaths due to Enteric Fever(Typhoid) in India, 2018
* Source: Monthly Health Condition Reports from Directorate of Health Services of State/UT.
* August data was excluded in Lakshadweep
  1. **2018acute\_resp\_infect\_male\_case, 2018acute\_resp\_infect\_male\_death, 2018acute\_resp\_infect\_female\_case, 2018acute\_resp\_infect\_female\_death, 2018acute\_resp\_infect\_total\_case, 2018acute\_resp\_infect\_total\_death**
* State/UT wise Provisional Cases and Deaths due to Acute Respiratory Infection in India, 2018Pneumonia\_male\_case
* Source: Monthly Health Condition Reports from Directorate of Health Services of State/UT.
* August data was excluded in Lakshadweep
  1. **2018Pneumonia\_male\_death, 2018Pneumonia\_female\_case, 2018Pneumonia\_female\_death, 2018Pneumonia\_total\_case, 2018Pneumonia\_total\_death**
* State/UT wise Provisional Cases and Deaths due to Pneumonia (All Causes) in India, 2018.
* Source: Monthly Health Condition Reports from Directorate of Health Services of State/UT.
* August data was excluded in Lakshadweep
  1. **2018NCD\_attended, 2018Diabetes, 2018Hypertension, 2018HTNandDM, 2018CVDs, 2018Stroke, 2018CommonCancers**
* Number of persons attended NCD Clinics
* Out of those screened at NCD Clinics, the number oof persons diagnosed with Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) from 01.01.2018 to 31.12.2018
* Common Cancers includes Oral, Cervical and Breast Cancer.
* Source: National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), Dte. GHS, Ministry of Health & Family Welfare.
  1. **2015-2016Mothers\_antenatal\_checkup\_first\_trimester, 2015-2016Mothers\_4antenatal\_care\_visits, 2015-2016Mothers\_whose\_last\_birth\_protected\_neonatal\_tetanus7, 2015-2016Mothers\_consumed\_iron\_folic\_acid, 2016-2016Mothers\_full\_antenatal\_care8, 2015-2016Mothers\_postnatal\_care**
* Mothers who had antenatal check-up in the first trimester (%)
* Mothers who had at least 4 antenatal care visits (%)
* Mothers whose last birth was protected against neonatal tetanus7 (%)
* Mothers who consumed iron folic acid for 100 days or more when they were pregnant (%)
* Mothers who had full antenatal care8 (%)
* Mothers who received postnatal care from a doctor/ nurse/LHV/ANM/midwife/other health personnel within 2 days of delivery (%)
* Source: National Family Health Survey 2015-16 (NFHS-4)
  1. **2015-2016Children\_12-23m\_fully\_immunized, 2015-2016Children\_12-23m\_BCGvaccine, 2015-2016Children\_12-23m\_poliovaccine, 2015-2016Children\_12-23m\_DPTvaccine, 2015-2016Children\_12-23m\_measlesvaccine, 2015-2016Children\_12-23m\_HepatitisBvaccine, 2015-2016Children\_9-59m\_vitaminA**
* Children age 12-23 months fully immunized (BCG, measles, and 3 doses each of polio and DPT) (%)
* Children age 12-23 months who have received BCG (%), 3 doses of polio vaccine (%), 3 doses of DPT vaccine (%), measles vaccine (%), and 3 doses of Hepatitis B vaccine (%)
* Children age 9-59 months who received a vitamin A dose in last 6 months (%)
  1. **2015-2016public\_expenditure\_medical\_PH\_UHS, 2015-2016public\_expenditure\_medical\_PH\_RHS, 2015-2016public\_expenditure\_medical\_PH\_MERT, 2015-2016public\_expenditure\_medical\_PH\_PH, 2015-2016public\_expenditure\_medical\_PH\_Misc, 2015-2016public\_expenditure\_medical\_PH\_Total, 2015-2016public\_expenditure\_FamilyWelfare\_UFWS, 2015-2016public\_expenditure\_FamilyWelfare\_RFWS, 2015-2016public\_expenditure\_FamilyWelfare\_MCH, 2015-2016public\_expenditure\_FamilyWelfare\_Misc, 2015-2016public\_expenditure\_FamilyWelfare\_Total, 2015-2016public\_expenditure\_other, 2015-2016public\_expenditure\_total**
* Public expenditure on health by components across States, 2015-16 (Actuals in Rs. Crores)
* Misc (Miscellaneous) includes expenditure under Medical & Public Health as well as Family Welfare that have very insignificant individual values and are inclusive of deducted recoveries.
* 2015-2016public\_expenditure\_other include medical reimbursement/medical Treatment expenditure, other departments’ expenditure within the health demand.
* $ Only aggregate figures are available for Manipur.
* Source: “Health Sector Financing by Centre and States/UTs in India 2015-16 to 2017-18”, National Health Accounts Cell, Ministry of Health & Family Welfare.
  1. **2015-2016expenditure\_health, 2015-2016expenditure, 2015-2016health\_over\_total, 2015-2016pop, 2015-2016GSDPcurrentprices, 2015-2016expenditure\_health\_percap, 2015-2016expenditure\_health\_perGSDP**
* Expenditure on Health: Per Capita, as share of Total Expenditure and as share of GSDP for all State & Union Territories, 2015-16
* 2015-2016health\_over\_total = 2015-2016expenditure\_health / 2015-2016expenditure
* 2015-2016expenditure\_health\_percap = 2015-2016expenditure\_health / 2015-2016pop
* 2015-2016expenditure\_health\_perGSDP = 2015-2016expenditure\_health / 2015-2016GSDPcurrentprices
* Population for Andhra Pradesh and Telangana are taken from Socio Economic Survey published by Andhra Pradesh and Statistical Year Book 2015 of Telangana respectively.
* Source 1. “Health Sector Financing by Centre and States/UTs in India 2015-16 to 2017-18”, National Health Accounts Cell, Ministry of Health & Family Welfare.
* Source 2. State Finances : A Study of Budgets, Reserve Bank of India
* Source 3. “Report of the Technical Group on Population Projections may 2006”, National Commission on Population, Registrar General of India
* Source 4. Gross State Domestic Product (GSDP) at Current Prices with base year 2011-12 (as on 28-02-2018) from Central Statistics Office, Ministry of Statistics & Programme Implementation.

1. **Variables from census 2011.**

* Data location : ‘3. census 2011/data\_state.csv’ and ‘3. census 2011/data\_dist.csv’ for state level and district level, respectively.
* They are generated by the code, ‘3. census 2011/census2011.R’. For more detail on how the data sets are generated, please see ‘3. census 2011/note.txt.’
  1. **c11\_Total, c11\_TotalMales, c11\_TotalFemales, c11\_RuralPersons, c11\_RuralMales, c11\_RuralFemales, c11\_UrbanPersons, c11\_UrbanMales, c11\_UrbanFemales, c11\_% Male, c11\_% Rural**
* Demographic variables from census 2011.
  1. **c11\_Area(km2), c11\_pop/km2**
* The size of area and the population density.
  1. **c11\_Total\_SC, c11\_% SC, c11\_Total\_ST, c11\_% ST**
* Total population and the proportion of scheduled castes and scheduled tribes of the area.
  1. **c11\_Hindu, c11\_Muslim, c11\_Christian, c11\_Sikh, c11\_Buddhist, c11\_Jain, c11\_religion\_Others, c11\_religion\_Notstated**
* Population by religion
  1. **c11\_age\_0-4, c11\_age\_5-9, c11\_age\_10-14, c11\_age\_15-19, c11\_age\_20-24, c11\_age\_25-29, c11\_age\_30-34, c11\_age\_35-39, c11\_age\_40-44, c11\_age\_45-49, c11\_age\_50-54, c11\_age\_55-59, c11\_age\_60-64, c11\_age\_65-69, c11\_age\_70-74, c11\_age\_75-79, c11\_age\_80-84, c11\_age\_85+, c11\_age\_Notstated**
* Population by age.
  1. **c11\_age\_0-60, c11\_age\_>60, c11\_age\_>60\_RuralFemales, c11\_age\_>60\_RuralMales, c11\_age\_>60\_RuralPersons, c11\_age\_>60\_TotalFemales, c11\_age\_>60\_TotalMales, c11\_age\_>60\_UrbanFemales, c11\_age\_>60\_UrbanMales, c11\_age\_>60\_UrbanPersons, c11\_age\_0-60\_RuralFemales, c11\_age\_0-60\_RuralMales, c11\_age\_0-60\_RuralPersons, c11\_age\_0-60\_TotalFemales, c11\_age\_0-60\_TotalMales, c11\_age\_0-60\_UrbanFemales, c11\_age\_0-60\_UrbanMales, c11\_age\_0-60\_UrbanPersons**
* Population by age group (less than or equal to 60 vs over 60).

**District Level**

1. **Variables from census 2011.**

* Same as the variables at a state level.

**Others**

1. **List of states and districts of India.**

* File location : ‘outcome/Indian-States-and-Districts-List.csv’
* Source : <https://www.askbankifsccode.com/blog/list-of-all-states-union-territories-and-districts-in-india/>
* To find which districts are omitted in the API data sets, this file is referenced. (‘outcome/datacheck2.Rmd’ and ‘outcome/ datacheck2.html’)