# Sample resource model inputs with explanations

CG 19th June 2022 for Berlin meeting – UPDATED 28/06/22

**Population level inputs:**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Input | Test Data | Meaning |
| 1 | Population | 10000000 | Human population (at national or regional level) |

**Hospital resource data inputs:**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Input | Test Data | Meaning |
| 2 | ward\_beds\_per\_1K | 2 | Hospital ward beds per 1000 population, for all purposes. |
| 3 | ICU\_beds\_per\_100K | 16 | ICU beds per 100 thousand population, for all purposes. |
| 4 | ward\_nurses\_per\_1K | 0.5 | Ward nurses per 1000 population. |
| 5 | ICU\_nurses\_per\_100K | 10 | ICU nurses per 100,000 population. |
| 6 | ventilators\_per\_100K | 8 | Ventilators per 100 thousand population |

**Hospital patient parameter inputs:**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Input | Test Data | Meaning |
| 7 | hospitalisation\_fraction | 0.024 | Proportion of detected infected people who are hospitalised |
| 8 | fraction\_ICU | 0.08 | Fraction of patients admitted to hospital who require ICU on admission |
| 9 | fraction\_ward\_to\_ICU | 0.1 | Fraction of patients in wards who later require ICU |
| 10 | admission\_delay | 1 | Wait time for patients admitted to hospital to obtain a ward bed |
| 11 | ICU\_admission\_delay | 1 | Average patient wait time for ICU bed |
| 12 | LOS\_ward | 4 | Average length of stay in ward bed |
| 13 | LOS\_ICU | 11 | Average length of stay in ICU bed |
| 14 | LOS\_ward\_before\_ICU | 7 | Average length of stay of patients in ward who go on to require transfer to ICU |
| 15 | LOS\_denied\_ICU | 1 | Average length of stay of patients in ICU Overflow (time to die or survive) |
| 16 | LOS\_ward\_deaths | 7.6 | Average length of stay of patients who die in ward beds |
| 17 | LOS\_ICU\_deaths | 9.4 | Average length of stay in ICU of patients who die |
| 18 | ward\_fatality\_rate | 0.045 | Proportion of ward patients who die |
| 19 | ICU\_fatality\_rate | 0.5 | Proportion of ICU patients who die |
| 20 | Denied\_ICU\_fatality\_rate | 0.9 | Proportion of patients unable to access ICU who die |

**Hospital resource parameter inputs:**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Input | Test Data | Meaning |
| 21 | proportion\_of\_beds\_available\_for\_pandemic | 0.5 | Proportion of hospital beds made available for care of pandemic patients |
| 22 | proportion\_of\_ICU\_beds\_available\_for\_pandemic | 0.5 | Proportion of ICU beds made available for care of pandemic patients |
| 23 | proportion\_of\_nurses\_available\_for\_pandemic | 0.5 | Proportion of nurses made available for care of pandemic patients |
| 24 | proportion\_of\_ICU\_nurses\_available\_for\_pandemic | 0.5 | Proportion of ventilators made available for care of pandemic patients |
| 25 | proportion\_of\_ventilators\_available\_for\_pandemic | 0.5 | Proportion of ICU nurses made available for care of pandemic patients |
| 26 | target\_PPE\_stock | 10000 | Target PPE stock level |
| 27 | fraction\_ICU\_patients\_requiring\_ventilator | 0.56 | The fraction of ICU patients that require a ventilator |
| 28 | PPE\_per\_staff\_per\_day | 5 | PPE sets used per staff member per day (or shift) |
| 29 | reduced\_PPE\_per\_staff\_per\_day | 2 | PPE sets used per staff member per day (or shift) in times of low availability of PPE, if surge strategy is enabled |
| 30 | increased\_risk\_to\_staff\_if\_PPE\_use\_reduced | 0.25 | Increased risk to staff if surge strategy to reduce PPE usage rates is enabled |
| 31 | nurses\_per\_bed | 0.2 | Normal number of nurses required per patient in a ward bed |
| 32 | ICU\_nurses\_per\_bed | 0.5 | Normal number of ICU nurses per patient in an ICU bed |
| 33 | reduced\_nurses\_per\_bed\_ratio | 0.1 | Number of nurses required per patient/bed when availability of nurses is low, if surge strategy enabled |
| 34 | reduced\_ICU\_nurses\_per\_bed\_ratio | 0.25 | Number of ICU nurses required per patient/bed when availability of ICU nurses is low, if surge strategy enabled |
| 35 | surge\_capacity\_bed\_increase | 0.12 | Proportion of all beds to make available when surge capacity is enabled and beds are all occupied |
| ~~36~~ | ~~ventilators\_per\_ICU\_bed~~ | ~~1~~ | ~~Normal number of ventilators per ICU bed~~ |

**Surge strategy options:**

|  |  |  |  |
| --- | --- | --- | --- |
| # | Input | Test Data | Meaning |
| 36 | strategy\_1\_reduce\_ICU-nurse-to-patient\_ratio | 0 | Whether to reduce the ICU nurse-to-patient ratio (for all patients) when ICU nurses are lacking |
| 37 | strategy\_2\_reduce\_nurse-to-patient\_ratio | 0 | Whether to reduce the ward nurse-to-patient ratio (for all patients) when ward nurses are lacking |
| 38 | strategy\_3\_reduce\_PPE\_per\_shift | 0 | Whether to reduce number of PPE sets used per shift when PPE is in short supply |
| 39 | strategy\_4\_increase\_bed\_capacity | 0 | Whether to increase bed capacity when no beds are available, by diverting from non-pandemic use |
| ~~40~~ | ~~strategy\_3\_reduce\_ventilator-to-ICU-bed\_ratio~~ | ~~0~~ | ~~Whether to reduce the ventilator-to-ICU bed ratio (for newly occupied beds, not existing) when ventilators are in short supply~~ |

**Modelling options:**

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| --- | --- | --- | --- |
| # | Input | Test Data | Meaning |
| 41 | simulate\_staff\_absenteeism | 1 | Whether to include staff absenteeism in the model (i.e. factor in pandemic infections in staff leading to absence) |
| 42 | simulate\_interruption\_in\_PPE\_supply | 0 | Whether to model an interruption in the supply of PPE during the peak of the pandemic |