1. **Model/ parameter specification.**

Table **T1**: Settings of the model

|  |  |
| --- | --- |
| **SETTINGS** |  |
| Geographical resolution | State-level |
| Population subgroups | -Age groups: 0-4; 5-17; 18-49; 50-64; 65+  -Special categories: healthcare workers, essential workers, pre-existing medical conditions |
| Time of simulation | 1 year from January 11th |
|  |  |

Table **T2**: Parameters

|  |  |
| --- | --- |
| **PARAMETER** |  |
| - INITIAL SUSCEPTIBILITY  - ASCERTAINMENT RATE  - TRANSMISSION REDUCTION FOR NON-ASCERTAINED CASES  - CURRENT Rt (reproductive number, NPIs dependent) | Age-adjusted **POSTERIOR ESTIMATES** from county level estimates obtained with metapopulation model on Jan 10th |
| VACCINE EFFICACY | 90% between 10 days after 1st dose to 1 week after 2nd dose  95% after 1 week from 2nd dose |
| TIME BETWEEN DOSES | 3.5 weeks |
| INCOMPLETE VACCINATION (1 DOSE) | NOT CONSIDERED |
| R0 WITHOUT NPIs | 3 SCENARIOS TESTED:  Medians= [2.4; 2.8; 3.2] |
| ORDER OF VACCINATION | Phases 1a, 1b, 1c (as per CDC guidelines),  followed by other adults and children. |
| TOTAL DOSES AVAILABLE | 400 MILLION (enough to vaccinate 200 million people) |
| COVERAGE TARGET CONSIDERED\*  \*N.B. we consider PHASES completed when  Individual are vaccinated up to target coverage | 80% Healthcare workers,  70% risk groups,  60% other adults and children |

Table **T3**: NPIs/Vaccination scenarios. Vaccinations follows the calendar in file *Vaccine\_schedule* (200 million individuals are vaccinated, with 5 million vaccinated in the first 3 weeks and 5 million per week afterwards).

|  |  |  |
| --- | --- | --- |
| **SCENARIO** | **VACCINATION** | **NPIs** |
| NV | NO | NPIs fully relaxed on January 11TH |
| V1 | YES | NPIs fully relaxed on January 11TH |
| V2 | YES | NPIs maintained at currently estimated levels then **fully** relaxed 10 days **after PHASE1a** vaccination |
| V3 | YES | NPIs maintained at currently estimated levels then **fully** relaxed 10 days **after PHASE1b** vaccination |
| V4 | YES | NPIs maintained at currently estimated levels then **gradually** relaxed 10 days after **PHASE1a** vaccination |
| V5 | YES | NPIs maintained at currently estimated levels then **gradually** relaxed 10 days after **PHASE1b** vaccination |
| V6 | YES | **NPIs strengthened to achieve R0=1.5,** then **gradually** relaxed 10 days after **PHASE1a** vaccination |
| V7 | YES | **NPIs strengthened to achieve R0=1.5,** then **gradually** relaxed 10 days after **PHASE1b** vaccination |
| V8 | YES | NPIs maintained at currently estimated levels then **fully relaxed** 10 days after **vaccination of 140** million people |
| V9 | YES | NPIs maintained at currently estimated levels then **gradually relaxed** 10 days after **vaccination of 140** million people |
| V10 | YES | NPIs **strengthened to achieve R0=1.5** then **fully relaxed** 10 days after **vaccination of 140** million people |
| V11 | YES | NPIs **strengthened to achieve R0=1.5** then **gradually relaxed** 10 days after **vaccination of 140** million people |
| NV\_CURR | NO | NPIs maintained at current level for the whole year |

Notes: In the above scenarios NPIs are relaxed *10 days after* 1st dose was administered to target coverage for specific groups (see table T2).

States reached the target phases on different days; the national average was:

- PHASE1a: January 22nd

- PHASE1b: March 6th

- 140 million vaccinated: July 11th.

To these dates 10 days are added before relaxing NPIs in table T2. *Gradual relaxation* of NPIs is performed over 5 1-month steps.

1. **Output files description** (for each dataset, with the exception of historical data, we reported 3 files corresponding to 3 estimates of R0: 2.4, 2.8, 3.2).

-DailyTotalInfection

daily new infections (total, both reported and unreported) until Jan 10th

-Vaccination\_calendar\_National (First\_Doses)

million vaccinations administered daily at national level (first doses only)

-AR\_2p4, AR\_2p8, AR\_3p2:

distribution of cumulative attack rates in the 13 scenarios. Attack rate is national and include total infections (reported and unreported).

-INFECTIONS\_DAILY\_2p4, INFECTIONS \_DAILY\_2p8, INFECTIONS \_DAILY\_3p2:

daily average infections (reported and unreported) as a percent of total population

-CASES\_DAILY\_2p4, CASES\_DAILY\_2p8, CASES\_DAILY\_3p2

daily average cases (only reported infections) as a percent of total population

-VACCINATED\_CASES\_DAILY\_2p4, VACCINATED\_CASES\_DAILY\_2p8, VACCINATED\_CASES\_DAILY\_3p2

daily average cases (only reported infections) that were vaccinated as a percent of total population

-VACCINATED\_ INFECTIONS \_DAILY\_2p4, VACCINATED\_ INFECTIONS \_DAILY\_2p8, VACCINATED\_ INFECTIONS \_DAILY\_3p2

daily average infections (reported and unreported) that were vaccinated as a percent of total population

N.B. In the model individuals entered the “vaccinated” compartment 10 days after receiving the first dose, therefore, if they were infected in those first 10 days they would not be recorded as ‘’ infected among vaccinated’’.