

COVID-19 Scenarios

Printable report

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Important information

COVID-19 Scenarios is a tool that allows to explore the dynamics of a COVID-19 outbreak in a given community and to assess the associated burden on the healthcare system. COVID-19 Scenarios, as every other model, it has parameters whose values are not known with certainty, which might differ between places and change with time. The values of some of these of these parameters have a major effect on the results.

The results are particularly sensitive to parameters that determine how rapidly the disease spreads or how effective counter-measures are: some values will result in a small limited outbreak, others in a massive outbreak with many fatalities. Furthermore, when extrapolating the outbreak into the future, the results will critically depend on assumptions of **future** policy and the degree to which infection control measures are adhered to. It is therefore important to interpret the model output with care and to assess the plausibility of the parameter values and model assumptions.

COVID-19 Scenarios uses an age-structured generalized SEIR model. For details, please consult the documentation on covid19-scenarios.org/about. Default parameter choices are informed by the available evidence at the time, but might need adjustment for a particular community or as more information on the outbreak is available.

This tool is not a medical predictor, and should be used for informational and research purposes only. Please carefully consider the parameters you choose. Interpret and use the simulated results responsibly. Authors are not liable for any direct or indirect consequences of this usage.



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Scenario: United States of America (edited)

Parameters

Population

Parameter	Value
ageDistributionName	United States of America
caseCountsName	United States of America
Number of hospital beds	798288
icuBeds	100000
Cases imported into community per day	0.1
Number of cases at the start of the simulation	1
Population size	327167434

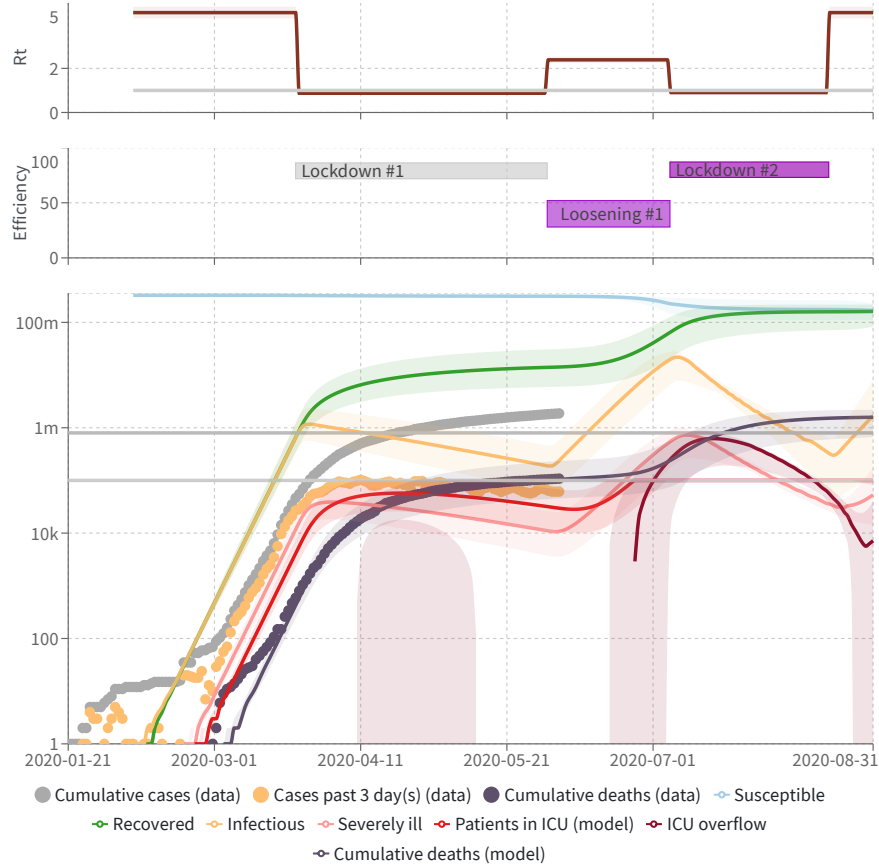
Epidemiology

Parameter	Value
hospitalStayDays	3
icuStayDays	14
infectiousPeriodDays	3
latencyDays	3
Increase in death rate when ICUs are overcrowded	2
Seasonal peak in transmissibility	January
R0 at the beginning of the outbreak	4.1 - 5
Seasonal variation in transmissibility	0

Mitigation

Intervention name	From	To	Reduction of transmission
Lockdown #1	Mar 23 2020	Jun 01 2020	73.8% - 84.2%
Loosening #1	Jun 01 2020	Jul 05 2020	30% - 50%
Lockdown #2	Jul 05 2020	Aug 18 2020	75% - 85%

Results



Results summary

Date	Severe	Critical	ICU Overflow	Deaths	Recovered
Feb 07 2020	0	0	0	0	0
Feb 14 2020	0	0	0	0	3
Feb 21 2020	0 - 1	0	0	0	26 - 35
Feb 28 2020	4 - 7	1 - 2	0	0	227 - 374
Mar 06 2020	34 - 72	12 - 24	0	1 - 2	2k - 4k
Mar 13 2020	285 - 763	104 - 257	0	11 - 26	16k - 42k
Mar 20 2020	2k - 8k	881 - 3k	0	96 - 269	139k - 440k
Mar 27 2020	15k - 61k	7k - 26k	0	802 - 3k	988k - 4m
Apr 03 2020	18k - 79k	18k - 73k	0	4k - 14k	2m - 9m
Apr 10 2020	16k - 76k	24k - 100k	0 - 4k	9k - 35k	3m - 13m
Apr 17 2020	14k - 70k	26k - 100k	0 - 16k	15k - 64k	4m - 17m
Apr 24 2020	11k - 62k	25k - 100k	0 - 17k	21k - 96k	4m - 20m
May 01 2020	9k - 54k	23k - 100k	0 - 13k	26k - 127k	5m - 23m

Date	Severe	Critical	ICU Overflow	Deaths	Recovered
May 08 2020	8k - 46k	21k - 100k	0 - 5k	31k - 155k	5m - 25m
May 15 2020	6k - 40k	18k - 96k	0	36k - 178k	5m - 27m
May 22 2020	5k - 34k	15k - 86k	0	40k - 200k	6m - 29m
May 29 2020	4k - 28k	13k - 76k	0	43k - 219k	6m - 30m
Jun 05 2020	4k - 27k	11k - 66k	0	46k - 236k	6m - 31m
Jun 12 2020	7k - 56k	10k - 70k	0	48k - 251k	6m - 34m
Jun 19 2020	18k - 149k	15k - 100k	0 - 17k	51k - 272k	7m - 42m
Jun 26 2020	49k - 382k	34k - 100k	0 - 153k	56k - 332k	10m - 64m
Jul 03 2020	133k - 788k	87k - 100k	0 - 447k	70k - 491k	18m - 111m
Jul 10 2020	261k - 929k	100k	105k - 826k	114k - 818k	34m - 172m
Jul 17 2020	229k - 542k	100k	184k - 833k	210k - 1m	48m - 201m
Jul 24 2020	172k - 289k	100k	186k - 607k	324k - 2m	57m - 212m
Jul 31 2020	104k - 163k	100k	150k - 385k	429k - 2m	63m - 216m
Aug 07 2020	57k - 97k	100k	105k - 220k	513k - 2m	67m - 217m
Aug 14 2020	34k - 61k	100k	62k - 114k	575k - 2m	70m - 217m
Aug 21 2020	21k - 43k	100k	16k - 47k	619k - 2m	72m - 218m
Aug 28 2020	15k - 116k	87k - 100k	0 - 27k	653k - 2m	78m - 218m

Proportions

Outcome Population average

Mild [%]: 93.83

Severe [%]: 3.48

Critical [%]: 1.72

Fatal [%]: 0.97

Totals/Peak

Quantity Peak/total valueTotal death: (664.6k, **1.58m**, 2.2m)Total severe: (2.9m, **5.67m**, 7.65m)Peak severe: (262.25k, **726.63k**, 980.83k)Peak critical: (291.47k, **721.89k**, 981.98k)