Covid-19 epidemic

Model in Switzerland

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Executive summary
Approximately 500’000 people have already been infected in Switzerland

- This represents only about 6% of the whole population
- We need to reach approximately 60% of immunization in the population for the epidemic to decline by itself

- A second, much stronger, wave is lurking (maybe already in July, probably in August and/or after)

This second wave seems hard to avoid
Executive summary: the second wave

Getting ready for the second wave

- Current «deaths/infections» ratio seems low in Switzerland (around 0.4%)
- To maintain this low ratio, we need to keep the number of patients within maximal hospital capacities

Total number of expected victims (when epidemic is over and 80% of the population has been infected)

- around 24’000 (if hospital capacities are not exceeded)
- between 200’000 and 250’000 in the worst case if hospital capacities are overwhelmed for a long period
What would happen if all restriction measures had been canceled on April 26th
Covid-19 in Switzerland State on April 30th, 2020

No measures after April 26th

No measures
Quarantine measures (like at the beginning of March) only
Only quarantine measures are applied after the end of April

Mar. 11  Apr. 30  Jun. 19  Aug. 8  Sep. 27  Nov. 16

Maximal hospital capacity

Normal hospital capacity
What is likely to happen until the end of July
Likely to happen until the end of July

No measures at all
Quarantine measures (like at the beginning of March) only

If restriction measures continue to be reduced very slowly until the end of July

Normal hospital capacity
Maximal hospital capacity

Covid-19 in Switzerland
State on April 30th, 2020
Likely to happen until the end of July

No measures at all
Quarantine measures (like at the beginning of March) only

If restriction measures continue to be reduced **slowly** until the end of July

Normal hospital capacity
Maximal hospital capacity
Likely to happen until the end of July

No measures at all
Quarantine measures (like at the beginning of March) only

If restriction measures continue to be reduced but **less slowly** until the end of July

Normal hospital capacity
Maximal hospital capacity
What might happen in August and after
Scenario 1: (unlikely) No more measures after the end of July

- No measures at all
- Quarantine measures (like at the beginning of March) only
- Relatively strong measures until the end of July
- No more measures after July

Maximal hospital capacity
Normal hospital capacity
Scenario 2: (unlikely)
Strict measures reinforced -> 31/1/2021

No measures at all
Quarantine measures (like at the beginning of March) only

Strong measures until the end of January 2021
(measures are strictly followed)
Scenario 3.1

No measures at all
Quarantine measures (like at the beginning of March) only

Restriction measures continue to be reduced very slowly until the end of July and then are maintained
Scenario 3.2

No measures at all
Quarantine measures (like at the beginning of March) only

Restriction measures continue to be reduced slowly until the end of July and then are maintained
Scenario 3.3

No measures at all
Quarantine measures (like at the beginning of March) only

Restriction measures continue to be reduced less slowly until the end of July and then are maintained.

Covid-19 in Switzerland State on April 30th, 2020
Scenario 4:
Measures are adapted

No measures at all
Quarantine measures (like at the beginning of March) only

Measures are constantly adapted from August until the end of December 2020
Only quarantine measures are applied from 2021 on

Normal hospital capacity
Maximal hospital capacity
Conclusion
Conclusion

August and after: (Several possible scenarios)

- Likely to be hit by a second wave
  - Either a much stronger one (August & September)
  - Or a much longer one (August to February 2021)

- The second wave seems hard to avoid
  - Without very long-term, (too?) strong measures

When strong measures are not respected anymore, the model shows that the second wave hits within a few weeks.
The measures

For the hospitals (May until mid-July)

- likely to be almost «normal» if the announced strategy is applied and respected
- Covid-19 teams should take holidays
- Hospitals should integrate the possibility of a second wave after mid-July in their global strategy
- New professionals should be trained to be prepared for such a second wave after mid-July
For the population

It would be theoretically possible to avoid the second wave
• by maintaining long-term strict restriction measures (probably 1 or 2 years, or until vaccination or treatment is available)

The second wave seems hard to avoid with acceptable measures
• borders will need to reopen sooner or later
• economy, SMEs, are hit too hardly by long-term, strict measures
• citizens might get bored and not respect (too) strong measures
The measures

For the population

Carefully chosen, **regularly adapted**, restriction measures taking into account both health and economic constraints could allow

- most citizens to recover a «normal» life more quickly
- to maintain the number of patients within maximal hospital capacities in order to keep our low «deaths/infections» ratio

New short confinement measures might be necessary if chosen measures are not strong enough or not strictly respected
Annex
Disclaimer

• The model uses state-of-the-art information available on April 30th
  • in the scientific literature
  • on the OFSP website
  • from the own experience of Prof Dr med D. Genné treating Covid-19 patients in the Biel hospital

• Future knowledge about the Covid-19 might significantly impact some parameters of the model and its predictions

• Long-term predictions are difficult to achieve precisely given some parameters’ sensitivity, limited knowledge of the Covid-19, and the impossibility to precisely estimate the impact of future measures

• The model will be adapted and maintained according to new information made available
Overview of some used parameters

- 15% of symptomatic patients
- $R^0$ around 4
- Incubation time between
  - 2 and 15 days
  - median 5.4 days
- Contagion time for symptomatic patients
  - about 20 days
- About 4.4% of the population had been infected until March 28th
  - 95% confidence interval between 1.3% and 7.6% (*Imperial College COVID-19 Response Team*)
- About 5.5% of the Geneva population had been infected until mid-April