

# Fighting SARS-CoV-2

through promotion of self-initiated notification of recent contacts

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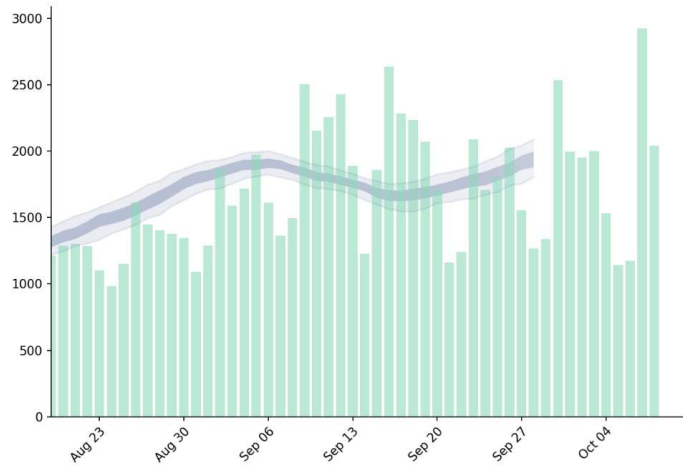
Welcome everybody from Austria. I'm Stefan Mathis-Edenhofer. My presentation is about an alternative/addition to conventional contact tracing: is about promoting self-initiated notification of recent contacts

# Problem: ongoing daily new Covid-19 cases

## Case numbers

Here we show the evolution of the number of people who tested positive for SARS-CoV-2, based on data of the *WHO*.

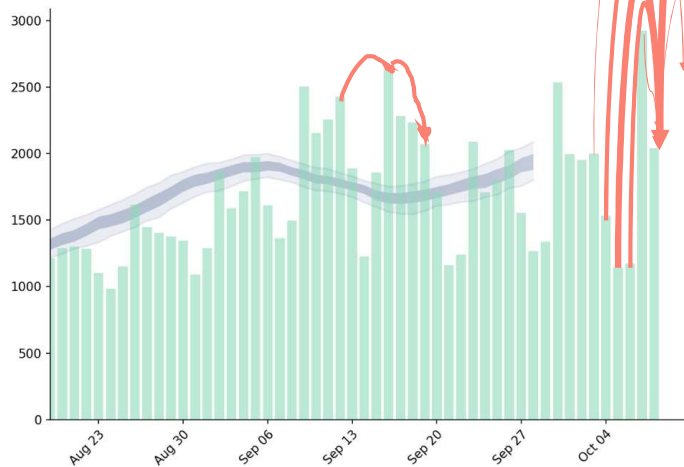
### Positively tested cases in Austria



<https://www.epimath.at/en/now/>

The problem is ongoing daily new Covid-19 cases – you see the current situation in Austria

## Background 1 (BG): Origin of these cases

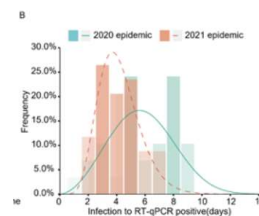


Most **today's cases** derive\* from cases ~ 4 days from the past and **will generate\* the cases ~ 4 day in the future.**

\* to a high amount (not including origins from unidentified cases) and with a certain variability

**Four days** represent a typical mean generation time interval (**person-to-person-“spreading time”**) in current generation time distributions.

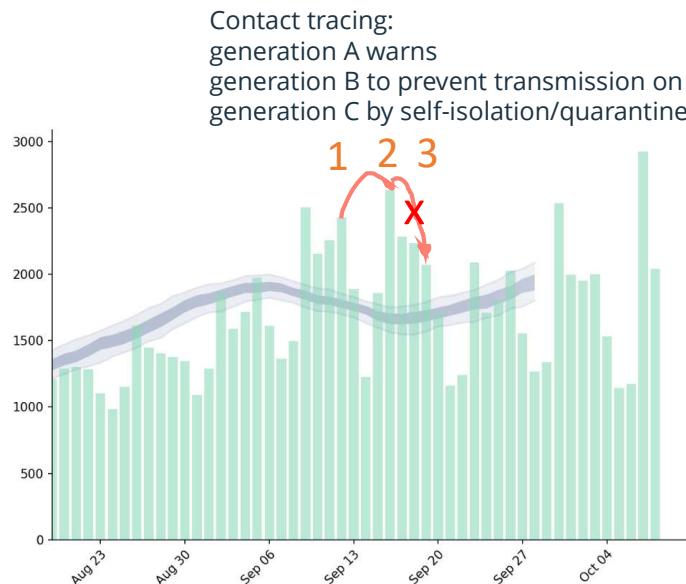
**Two days of earlier PCR-positivity** in the delta variant on average.



Source: [Viral infection and transmission in a large well-traced outbreak caused by the Delta SARS-CoV-2 variant - SARS-CoV-2 coronavirus / nCoV-2019 Genomic Epidemiology - Virological](#)

To understand contact tracing we need to know where the daily cases come from: today's cases come from cases in about 4 days ago – and they will generate a lot of the cases in about 4 days. 4 days are a realistic mean person-2-person spread time, this can be concluded from current statistics on generation intervals and from statistics on PCR-Test-positivity.

## BG2: Idea of contact tracing is to filter spread



(Forward) contact tracing:

Generation 1 is asked for recent contacts, so

generation 2 is identified as a close contact, notified and invited to quarantine. Thus,

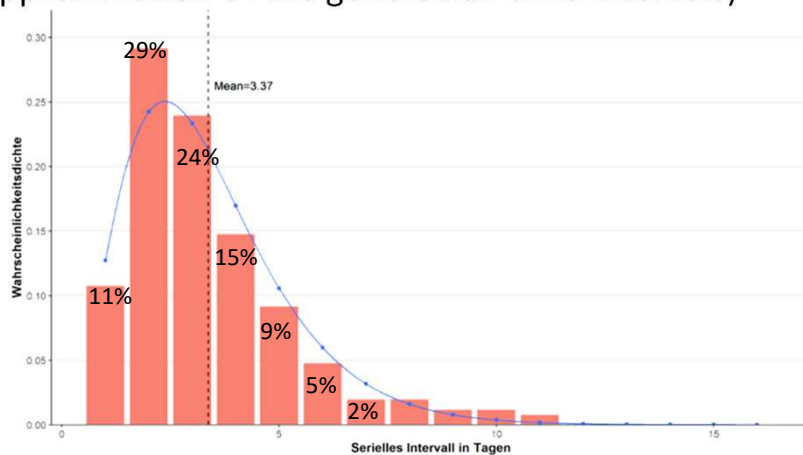
generation 3 can be prevented from the infection.

Contact tracing acts immediately – a better contact tracing comes into force in a few days!

Contact tracing starts with evident positive cases representing the first generation. With their help close contacts from the past 2 days are identified – these are representing the possibly 2nd generation. Close contacts are warned and recommended to self-isolate. This prevents the spread to the 3rd generation. Key is to identify close contacts (which have a high risk of being infected) referenced by the first generation. Ideally, this information inform those with a high risk faster than any test could do and of course faster than symptoms evolve. And – it also needs to be said, that better contact tracing measures comes into force in few days.

## BG3: Speed is critical for success of contact tracing

“Spreading time” distribution in Austria (serial intervals as an approximation of the generation time intervals)



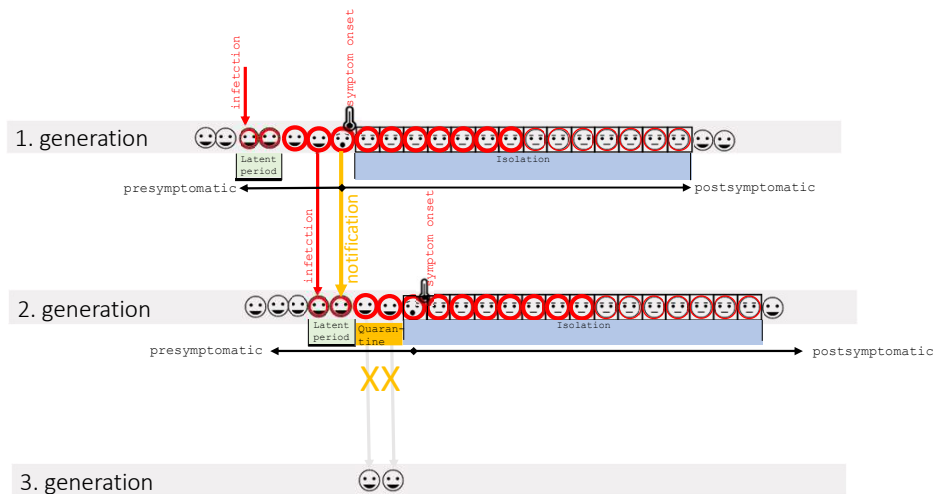
Mean = 3.37  
Day 1-3: 65%

Nearly 2/3 of all spreading happens within 3 days -> high speed transmission chains!

Source: AGES

You see the statistics from Austria on the „spread time“ – the time intervals that Covid need to jump from one to the next person. You see that two third of transmissions happen within 3 days. So, we really can speak of high speed transmissions chains, due to the delta variant!

## BG4: Window of opportunity: between latent period and isolation



Notification must reach the 2. generation **within the latent period**, otherwise it's too late to **prevent pre-symptomatic spread** to the 3. generation by **quarantine**.

Instant warning is essential in particular with the delta variant

From this figure you can see that notification of the 2nd generation must take place early – to be clear - in the latent period. This helps to close the „leak“ *before* isolation would have taken place anyway and this is usually in the pre-symptomatic interval where people are not aware to be contagious.

## Problems of existing contact tracing measures

Digital and conventional contact tracing struggle with **problems** like

- **significant delays** in the flow of information
- **problems to scale** up (tracing staff) when the case load is high
- **low acceptance and compliance.**
  
- Failure of contact tracing is particularly critical in the case of SARS-Covid-19, where **asymptomatic or pre-symptomatic transmissions** (spreaders are **not aware** of their infectiousness) account for a large proportion of infections.

Here some problems of existing CT are presented – delay, scaling problems and low compliance.

This is critical with covid 19 because of a high amount of pre-symptomatic spread

Research question: is self-initiated notification of recent contacts superior to other contact tracing?

Existing example of self-initiated notification from Denmark

## 2. Tracing close contacts

When you have tested positive for novel coronavirus, it is important to inform everyone you have been in close contact with as they are at high risk of having been infected. These people are called your 'close contacts', and tracing them is called 'contact tracing'. Contact tracing is an important tool in preventing the spread of infection by making your close contacts self-isolate as soon as possible and get tested.

[Source: Til dig, der har symptomer på COVID-19 \(sst.dk\)](#)

To address the problems of current digital and conventional contact tracing: we question, if the measure to promote self-initiated notification of recent contacts could be superior or an advancement to other forms of contact tracing.

I'd like to remark that this measure is already in practice in many countries: Denmark / Wisconsin



## Example 2: Wisconsin



Notifying your own close contacts of their exposure to COVID-19 can help limit the spread in your community.

### Who should I notify?

First, you need to determine the time period during which you could have exposed others.

- If you have symptoms, you were able to spread COVID-19 starting **two days before your first symptoms started**.
- If you have not had any symptoms, you were able to spread COVID-19 starting **two days before your positive COVID-19 test was taken**.
- You should notify anyone with whom you had **close contact while able to spread COVID-19**.

Close contact is defined as any of the following interactions:



Having direct physical contact with someone.  
(e.g. hug, kiss, handshake)



Being within 6 feet of someone for 15 minutes total in a day.



Having contact with your respiratory secretions.  
(e.g. coughed/sneezed on, contact with dirty tissue, sharing a drinking glass, food, towels, or other personal items)



Living with or spent the night with someone.

### What do I tell my close contacts?

- A 14-day quarantine remains the safest option for close contacts. Quarantine may be shortened to 10 days, provided people still monitor for symptoms for the full 14 days. Quarantine may be shortened further to 7 days if a person receives a negative test result (PCR or antigen) that was collected on day 6 or 7.
- If your close contacts are fully vaccinated against COVID-19, they do not have to quarantine if they meet ALL of the following criteria:
  - The exposure to COVID-19 happened at least two weeks after receiving the last dose of their vaccine series; and
  - They have not had any symptoms of COVID-19 since the last close contact.
- They should continue to monitor for symptoms for 14 days after the last close contact. If they develop any symptoms of COVID-19, they should isolate from others, contact their health care provider, and get tested.
- Your contact may receive a call from Public Health who will ask your contact some questions and provide additional information. **Please ask your contact to answer the phone call.**
- The DHS fact sheet called "[Next steps: close contacts of someone with COVID-19](#)" will provide more details for what to do to protect others.
- If your contact has additional questions, they can contact their primary care provider, local health agency, or visit the Wisconsin DHS [COVID-19 Website](#).



Source: [Next Steps: Notifying Close Contacts of Positive Exposure \(wisconsin.gov\)](#)

## Hypothesis: self-initiated notification of recent contacts is a superior alternative to conventional and digital contact tracing measures

- Arguments speaking for the hypothesis
  - self-initiated notification is done instantly – **small delay**
  - better **compliance** from the next ones – those who are close (family, friends)
  - it is self-scaling
  - Previous models on digital contact tracing show the potential: *“Optimising testing and tracing coverage and minimising tracing delays, for instance with app-based technology, further enhanced contact tracing effectiveness, with the **potential to prevent up to 80% of all transmissions.**”* [https://doi.org/10.1016/S2468-2667\(20\)30157-2](https://doi.org/10.1016/S2468-2667(20)30157-2)
- Next steps: Modelling the impact on given grow rates by impacting a **reduced effective reproduction** number and **less “fast-interval”-spread**.

Work is in progress!

Speaking for self initiated contact tracing is that:

- \* it is fast
- \* high compliance in household settings can be expected
- \* self-scaling
- \* and promising existing evidence from models on digital contact tracing

we have started modelling with promising results but our work is still in progress

## Implications for care professionals, if the hypothesis gets confirmed

- Hospital and health service staff has a key **role in promoting public health measures** and
- could act as **key disseminators** to establish self-initiated notification
  - by informing on the existence of presymptomatic spread
  - by informing on the importance to warn close contacts instantly
  - by informing those who are identified as close contacts to self-isolate
- Additionally, health care institutions could benefit from the strategy itself because the models show that notification of recent contacts is powerful to **prevent the expansion** of clusters in health care settings.

The introduced promotion to notify is already applied in many countries and communities. Preliminary results from modelling are promising.

Therefore, implications for care professionals can already be pronounced:

- health service staff has a key **role in promoting and could**
- establish self-initiated notification
  - by informing on the existence of pre-symptomatic spread
  - by informing on the importance to warn close contacts instantly
  - by informing those who are identified as close contacts to self-isolate

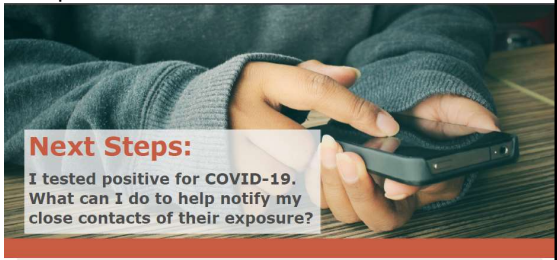
# Questions?

## Contact

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Example: Wisconsin



**Next Steps:**  
I tested positive for COVID-19. What can I do to help notify my close contacts of their exposure?





Notifying your own close contacts of their exposure to COVID-19 can help limit the spread in your community.

**Who should I notify?**

First, you need to determine the time period during which you could have exposed others.

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Thank you – please contact me for any questions or if you have been working with a model that could be parameterised for self initiated notification.