Evidence on the effectiveness of backward contact tracing at KU Leuven, Belgium

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Outline

- Forward versus backward contact tracing
- What is backward contact tracing?
- Hypothesis
- KU Leuven contact tracing study
- Results
- Conclusion/discussion
Forward contact tracing

New case identified
Identify high risk contacts from 2 days prior to diagnosis/onset of symptoms
Refer for testing and quarantine

\[ HRC = 15\text{min}, <1,5\text{m}, \text{no masks} \]
Forward contact tracing

New case indentified
Identify high risk contacts from 2 days prior to diagnosis/onset of symptoms
Refer for testing and quarantine

\[ \text{HRC} = 15\text{min}, <1,5\text{m}, \text{no masks} \]
Forward versus backward contact tracing

(A) Forward contact tracing only

(B) Forward + backward contact tracing

- Primary case
- Index case #1
- Index case #2

- Undetected case
- Detected case
- Quarantined case

- Un traced transmission
- Traced transmission
- Transmission prevented

Endo et al. [https://www.medrxiv.org/content/10.1101/2020.08.01.20166595v1](https://www.medrxiv.org/content/10.1101/2020.08.01.20166595v1)
Backward contact tracing?

Can mean in practice:

1. Testing & quarantine of *all HRC* from 7 days prior to symptoms/diagnosis

2. Testing & quarantine of all attendants (HRC and LRC) of *single* source event

3. Testing & quarantine of all attendants (HRC and LRC) of *all* high risk events
1. Testing & quarantine of *all HRC* from 7 days prior to symptoms/diagnosis

*All HRC* from 7 days prior to symptoms/diagnosis of index case are referred for:

- Testing ASAP and 7 days after exposure
- Quarantine 7 days after exposure
2. Testing & quarantine of all attendants (HRC and LRC) of *single* source event

*All* attendants (HRC and LRC) of *single* source event are referred for quarantine and testing

26/05/2021
Do you think you know where you got infected?

Most don’t know where they got infected!
3. Testing & quarantine of all attendants (HRC and LRC) of all high risk events

All attendants of all the index case’s recent high risk events are referred for quarantine and testing

- All the attendants = HRC & LRC
- High risk event = Closed space, Crowding, Close contact
- Recent = D-7 (onset of symptom or diagnosis of index case) -> diagnosis

Average number of contacts identified: 7,0

Flemish region contact tracing: 2,6
Outline

• What is forward contact tracing?
• What is backward contact tracing?
• Hypothesis
• KU Leuven contact tracing study
• Results
• Conclusion/discussion
In SARS-CoV-2, it is worthwhile to refer all attendants (HRC & LRC) of all high risk events up until 7 days prior to onset of symptoms/diagnosis of index case for testing & quarantine
### Methods

<table>
<thead>
<tr>
<th>Date</th>
<th>Mum</th>
<th>Dad</th>
<th>Partner</th>
<th>HRC</th>
<th>LRC at CCC event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday 18/1</td>
<td>Start of symptoms</td>
<td></td>
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</tr>
<tr>
<td>Sunday 17/1</td>
<td>-1</td>
<td>?</td>
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<tr>
<td>Saturday 16/1</td>
<td>-2</td>
<td>?</td>
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<tr>
<td>Friday 15/1</td>
<td>-3</td>
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<td>Thursday 14/1</td>
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<td>Wednesday 13/1</td>
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<td>Tuesday 12/1</td>
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<td>?</td>
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<tr>
<td>Monday 11/1</td>
<td>-7</td>
<td></td>
<td>?</td>
<td>?</td>
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</tr>
</tbody>
</table>

**Positivity rate forward contact tracing**

**Positivity rate backward contact tracing**

all attendants all high risk events

Klaas Nelissen, Joren Raymenants

26/05/2021
KU Leuven testing & tracing

• Community based approach
• Low barrier free PCR testing
• Maximum integration of testing & tracing with regards to human and IT processes
• Same day testing, tracing & variant identification
• Focus on backward contact tracing
• Structured data gathering
KU Leuven testing & tracing

• > 50,000 students in a city with 100,000 permanent residents
• Over 22,000 tests conducted in over 12000 students since October 2020
• >1000 positives and all their recent contacts (both HRC and LRC at high risk events) followed up
KU Leuven testing & tracing

N cases = 197 (not shown)
N contacts (grey) = 1365
AVG N contacts/case = 7,0
Already positive (orange)
= passive case finding
Referred & positive (blue)
= active case finding

Note the skewed distribution of positive contacts found through active case finding
Results KU Leuven contact tracing study

N cases = 197 (not shown)
N contacts (stacked bar) = 1311 (D-8, D-9 excluded)
AVG N contacts/case = 6.7
Already positive (orange) = passive case finding
Referred & positive (blue) = active case finding
Others (grey) = Negative, not reached, refuses testing, not referred since too low risk, immune

Note the high positivity rate of contacts D-3 -> D-7 after referral
Results KU Leuven contact tracing study

- Stratified ≈ date of last contact
- D0 = date of diagnosis (asymptomatics) = date of symptom onset (symptomatics)
- Stacked bar = all contacts identified (HRC, LRC at high risk events)
- Blue bar = active case finding
- Orange bar = passive case finding
- Red line: positivity rate of actively referred contacts / all identified contacts

N cases = 197 (not shown)
N contacts = 1311
Conclusions

Preliminary data show that for SARS-CoV-2, it is worthwhile to refer all attendants (HRC & LRC) of all high risk events up until 7 days prior to onset of symptoms/diagnosis of index case for quarantine and testing.

Contextual factors for success of backward contact tracing:
• Low barrier testing
• Rapid laboratory TAT
• Rapid tracing TAT
• Testing ASAP and after incubation period
Q&A

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