Meeting: Clusters of COVID-19 cases among singing groups (10 December 2020)

To discuss:

- Objective and inclusion criteria (5 mins)
- Likely transmission route for each choir (5 mins on each)
- Conclusion (10-15 mins)
- AOB (5-10 mins)

High SARS-CoV-2 attack rates following exposure during singing events in the Netherlands, September–October 2020

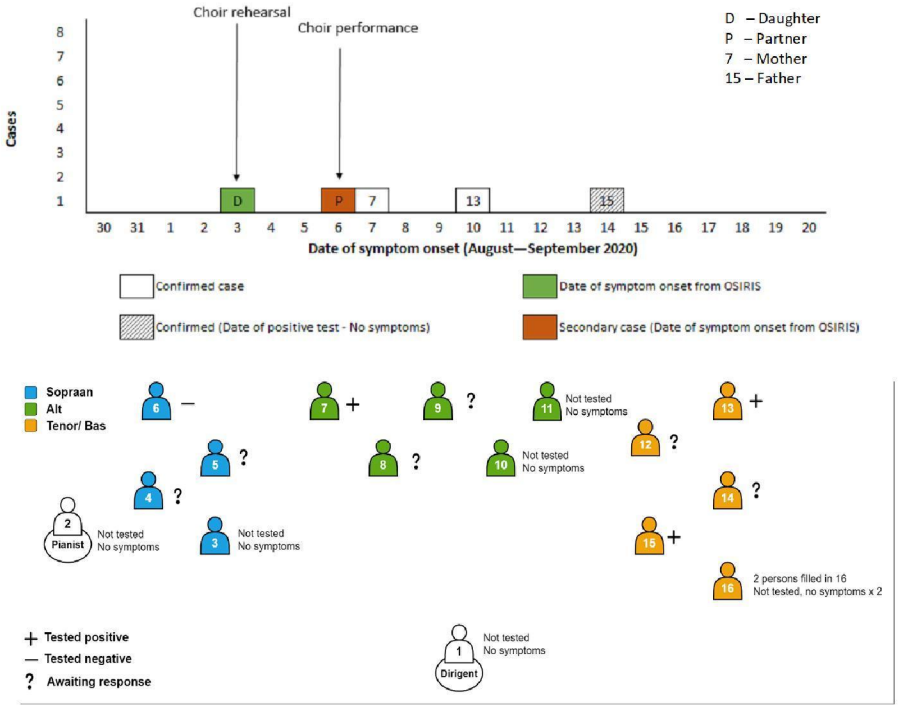
Objectives:

- To investigate whether singing increased the risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission during six singing events.
- To describe the outbreaks in terms of person, place and time and depict potential routes of SARS-CoV-2 transmission for each singing event.

Inclusion criteria:

- Singing events with high SARS-CoV-2 attack rates from September 2020 onwards.

Hoensbroek



*Information on doors and windows missing

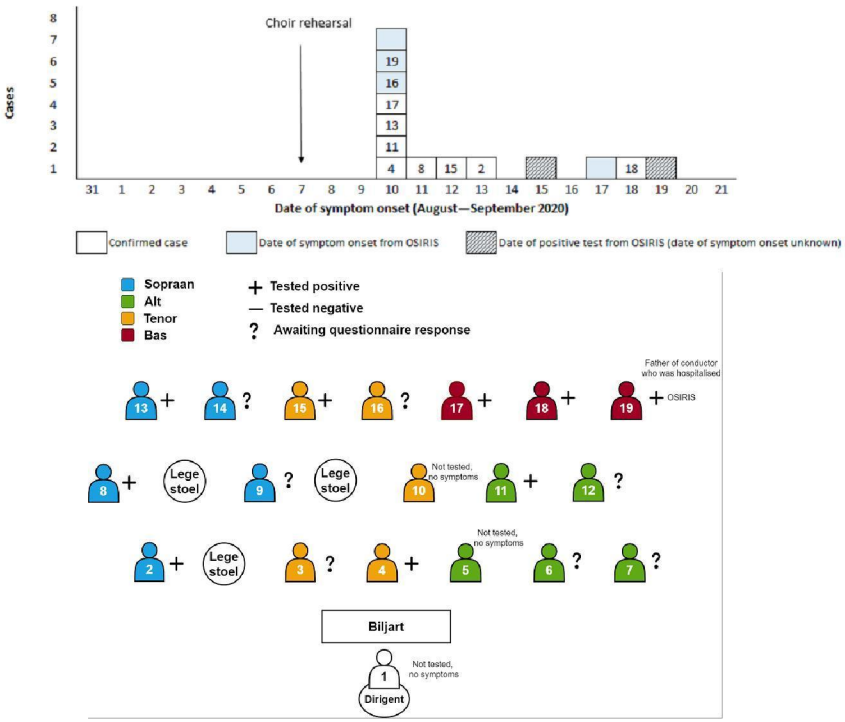
Performance date	**6 September 2020**
Size of room	Missing
Choir members attended	16
Duration of performance	60 minutes
Duration of singing	20 minutes
Duration of break	No break
Response rate	11/16 (69%)
Attack rate (confirmed cases)	4/11 (36%)
Laboratory specimens sequenced	2 (Mother [7] & partner of daughter identical)

Possible index case: Daughter [symptom onset 3 Sept)

Possible modes of transmission:

Direct transmission
- Close-contact between family members outside singing events [D, P, 7, 15].

Heerde



*2 doors open – a door to the hallway was open (in the hallway the entrance door to outside was open), and an emergency exit was open to outside – exact placement unknown

Rehearsal date	**7 September 2020**
Size of room	14x14x2.6
Choir members attended	19
Duration of rehearsal	90 minutes
Duration of singing	50 minutes
Duration of break	15 minutes
Response rate	11/19 (58%)
Attack rate (confirmed cases)	14/19 (74%)
Laboratory specimens sequenced	0

Possible index case: Unknown

Possible mode of transmission:

Direct transmission

3 x 2 choir members travelled together:
- Car 1: [6, no questionnaire] + [8, positive]
- Car 2: [19, positive] + [1, not tested] [father and son]
- Car 3: [18, positive] + [4, positive] [couple] – [18] likely became infected from [4]
- In break, one member [5, not tested, no symptoms] brought coffee to the conductor outside, kept >1.5m [1, not tested, no symptoms]

→ Less likely

Indirect transmission

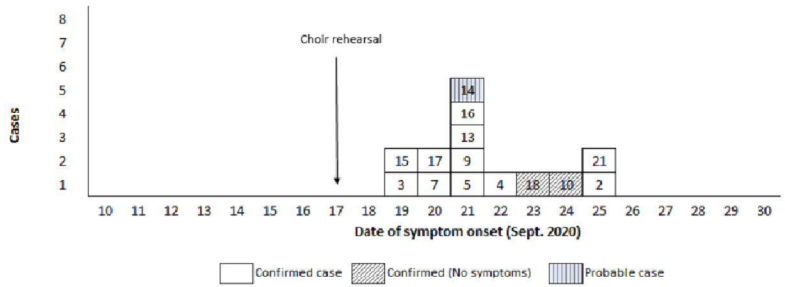
- [18, positive] prepared chairs - symptom onset quite late as rehearsal was on 7 Sept
- Everyone stayed in place during the break & staff served coffee to members

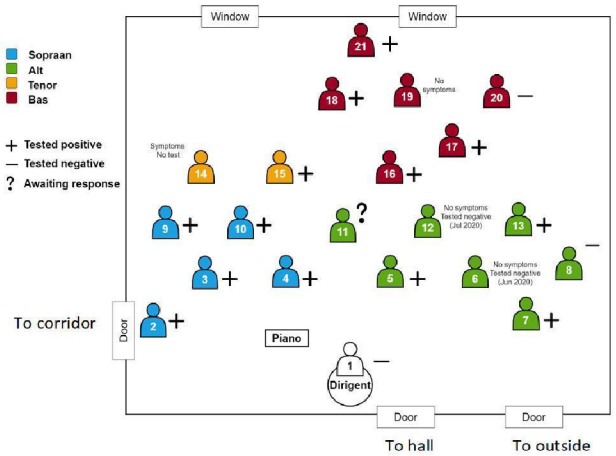
→ Less likely

Aerogenic transmission

- Cases widely dispersed
- 2 choir members [8] and [5]commented on air flow/ventilation. [5] commented there was an airflow on the side where [2],[8],[13] were.
- Supply of air from outside. Indoor air expelled to the outside through a heat exchanger.

Leiden

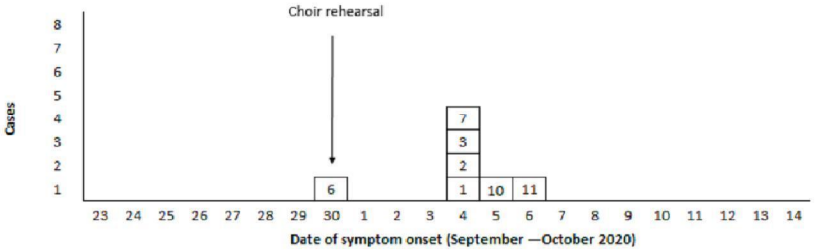


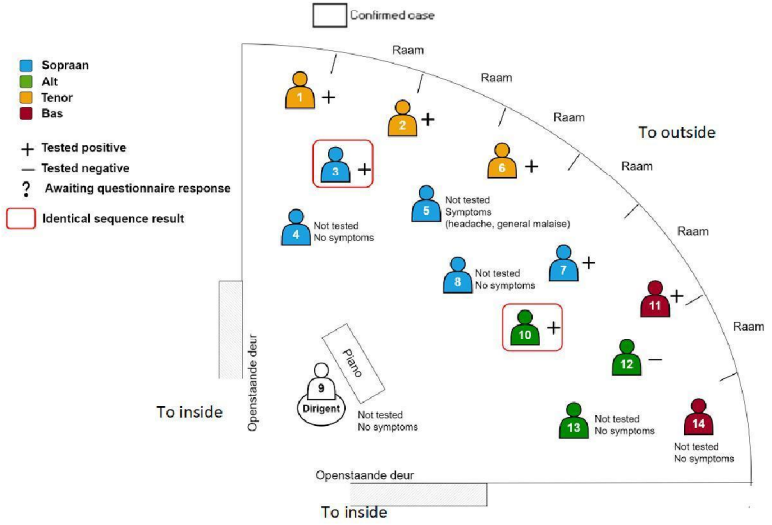


Rehearsal date	17 September 2020
Size of room	143m³
Choir members attended	21
Duration of rehearsal	120 minutes
Duration of singing	~80 minutes
Duration of break	5 minutes
Response rate	20/21 (95%)
Attack rate (confirmed and probable cases)	14/21 (67%)
Laboratory specimens sequenced	0

Possible index case	[no. 15] or [no. 3] ?
Possible mode of transmission:	
Direct transmission	• Everyone kept 1.5m distance during singing event. • 10 choir members travelled together: 6 cycled together [1,3,5,6,11,12] 2 pairs (2x2) travelled together by car [7 + 8], [18+2] → Not likely
Indirect transmission	• Everyone had their own sheet music. No items shared or passed on. • There was a short 5 minute toilet break, toilets were spacious. People were very alert and kept to the 1.5 meter rule. → Not likely
Aerogenic transmission	• Cases widely dispersed. • 1 member [1] commented on airflow. • No mechanical ventilation, only open windows. → Possible

Wageningen





Rehearsal date	30 September 2020
Size of room	80m²
Choir members attended	14
Duration of rehearsal	120 minutes
Duration of singing	~90 minutes
Duration of break	15 minutes
Response rate	14/14 (100%)
Attack rate (confirmed cases)	7/14 (50%)
Laboratory specimens sequenced	2 (No. 3 + No. 10 identical sequences)

Possible source case [No. 6]?

Possible mode of transmission:

Direct transmission

6 choirs members travelled together:

- Biked together: 2 choir members from 1 household [7, positive + 11, positive]
- Biked together: 2 choirs members [2, positive + 10, positive]
- Car: 2 choirs members [3, positive + 5, not tested, symptoms]

→ Less likely

Indirect transmission

- Shared coffee machine used by touching button
- 3-4 people stacked chairs
- During the break, 1.5m kept - Shared treats but packed, they were not crowded around.

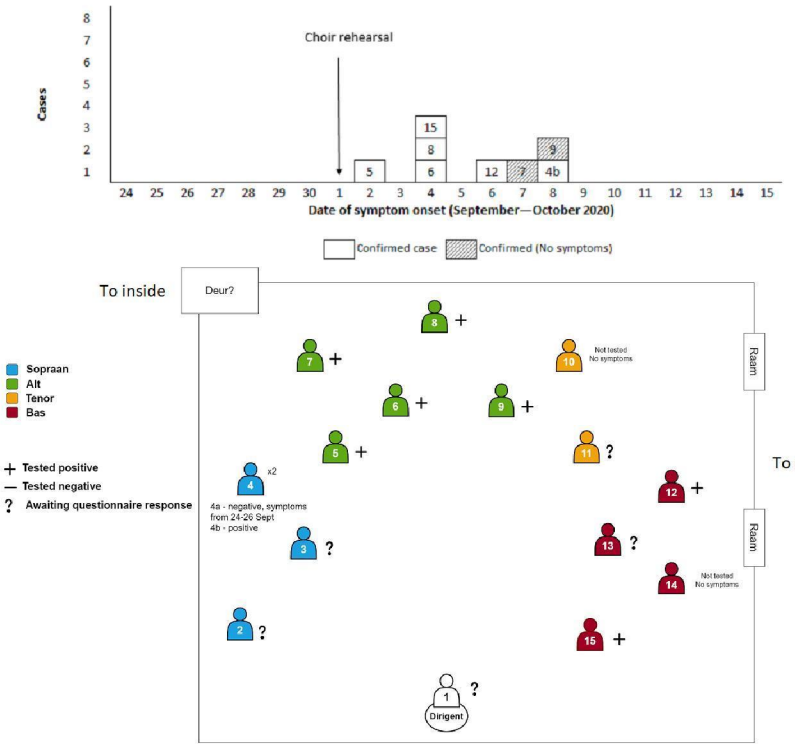
→ Possible

Aerogenic transmission

- Cases widely dispersed
- Members faced conductor throughout, except at one moment to [1] on the floor plan (it was their birthday).
- [3] and [10] have identical sequences and positioned far from each other.
- 2 members felt a (cold) air flow (1 [positive] + 5 [not tested, symptoms])
- No air conditioning, possible mechanical ventilation.

→ Possible

Alkmaar



Rehearsal date	**1 October 2020**
Size of room	11x8.5x6
Choir members attended	15
Duration of rehearsal	150 minutes
Duration of singing	120 minutes
Duration of break	15 minutes
Response rate	11/15 (73%)
Attack rate (confirmed cases)	8/15 (53%)
Laboratory specimens sequenced	0

Possible index case: [No. 5]? [No. 5]? (headache from 25 Sep, coughing from 2 Oct)

Possible mode of transmission:

Direct transmission

- In the break, focal point mentions, not sure if 1.5m was kept throughout (2 members also commented in questionnaire about this too).
- 1 member said did not keep 1.5m while entering and tidying up chairs
- 2 pairs (2x2) travelled together by car:
  - Car 1: [6, positive + 7, positive]
  - Car 2: [4, negative + 10, not tested, no symptoms specified] [same household]

→ Possible

Indirect transmission

- No common surfaces mentioned except for toilets which were spacious and separate for men & women.

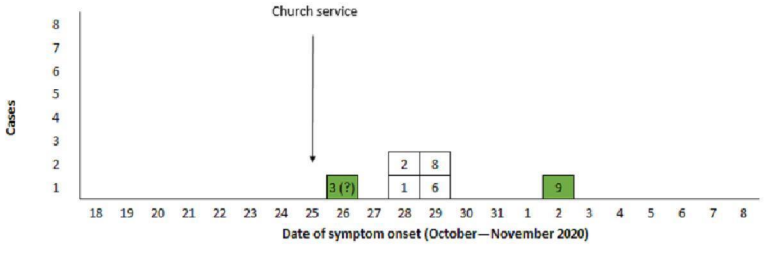
→ Less likely

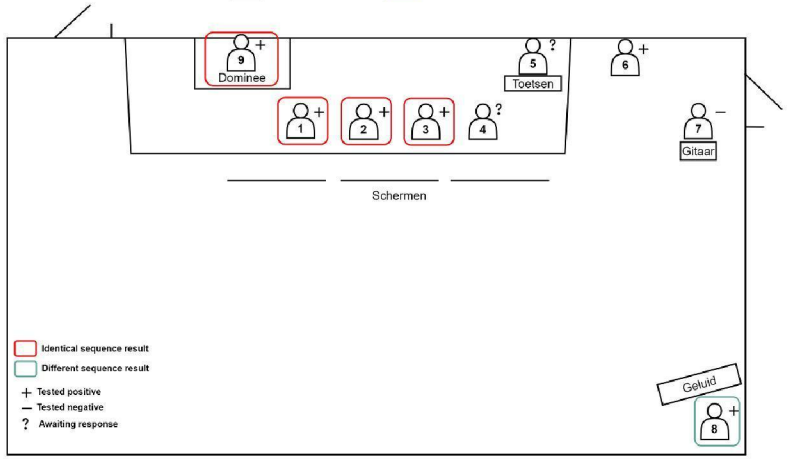
Aerogenic transmission

- Cases widely dispersed
- 6 members said they felt a (cold) air flow
- Members sang in direction of the conductor and choir members also turned around to talk/ look at each other occasionally
- Ceiling ventilation system in place

→ Possible

Mussel





Church service date	25 October 2020
Size of room	20x15x10 (pointed roof)
Church service attendees	8 musical group members + 1 "dominee" + 55 attendees
Duration of church service	>60 minutes
Duration of singing	20 minutes (spread out)
Duration of break	No break
Response rate	6/9 (67%)
Attack rate (confirmed cases)	6/9 (67%)
Laboratory specimens sequenced	5/6

Possible source case	[No. 3]
Possible mode of transmission:	
Direct transmission	• [3] had contact with persons tested positive prior to singing event due to their work at a nursing home. • 2 members (No. 1 [positive] and No.8 [positive]) stated they had contact with other members before or after the church service and wore face masks. • No members travelled together to/from the church service. → Less likely
Indirect transmission	• No common objects touched. • Microphones used, they were used by the same person. throughout. Max of 3 days since last use by different person. → Less likely
Aerogenic transmission	• 1 musical group member felt a (cold) air flow during the rehearsal [1, positive]. • No air conditioning or mechanical ventilation but air heating. → Possible

Summary

Singing event	Direct transmission	Indirect transmission	Aerogenic transmission
Hoensbroek	Likely	Less likely	Less likely
Heerde	Less likely	Less likely	Possible
Leiden	Not likely	Not likely	Possible
Wageningen	Less likely	Possible	Possible
Alkmaar	Possible	Less likely	Possible
Mussel	Less likely	Less likely	Possible

Conclusions – to discuss

- Direct and indirect transmission may have occurred and may have caused some of the cases but unlikely to cause these high attack rates.

- Air flow/ ventilation in combination with singing caused droplets to travel beyond 1.5 m so current measures are not enough.

- Aerosol transmission could have caused this high attack rate under the conditions during the singing events (duration of singing, size of room, ventilation capacity) with the presence of a superspreader.