



COVID-19 outbreak at a reception centre for asylum seekers in Espoo, Finland

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ARTICLE INFO

Keywords:
Migrant
Refugee
COVID-19
Reception centre
Epidemiology
Outbreak

ABSTRACT

Background shared accommodation may increase the risk of SARS-CoV-2 transmission. In April 2020, an increasing number of asylum seekers at a reception centre in Espoo, Finland presented with COVID-19 despite earlier implementation of preventive measures. We decided to screen the entire population of the centre for SARS-CoV-2.

Methods we offered nasopharyngeal swab collection and SARS-CoV-2 real-time polymerase chain reaction (RT-PCR) analysis to the centre's clients. Symptoms were recorded at the time of diagnostic sample collection using electronic forms and followed up for two weeks through phone interviews and a review of medical records.

Findings 260 clients were screened. Of them, 96 (37%) were found positive for SARS-CoV-2 and isolated. The high attack rate prompted the local public health authority to set the other clients in quarantine for 14 days to prevent further spread. Of the positive cases, 61 (64%) reported having had symptoms at the time of the screening or one week prior. Of the 35 initially asymptomatic individuals, 12 developed symptoms during follow-up, while 23 (or 18% of all screened SARS-CoV-2 positive clients) remained asymptomatic. No widespread transmission of COVID-19 was detected after the quarantine was lifted.

Interpretation in this large COVID-19 outbreak, voluntary mass screening provided valuable information about its extent and helped guide the public health response. Comprehensive quarantine and isolation measures were likely instrumental in containing the outbreak.

Funding Finnish Institution for Health and Welfare, Finnish Immigration Agency, City of Espoo

Research in context

Evidence before this study

Outbreaks of COVID-19 have been described in nursing home, hospital and homeless shelter settings, among others. Factors such as crowded living conditions and asymptomatic and presymptomatic shedding of the virus have been suggested to precipitate the risk of outbreaks.

Added value of this study

We describe what is, to our knowledge, the first documented case of a large-scale outbreak and mass screening for COVID-19 in a reception centre setting.

Implications of all the available evidence

Responding to outbreaks of COVID-19 should be prompt and not restricted by residency status. Screening by RT-PCR is useful in establishing an overall picture of an assumed outbreak. Appropriately targeted quarantine and isolation may help in containing local epidemics. Considering the ease with which SARS-CoV-2 appears to spread once introduced in a reception centre, care should be taken in accommodation of the elderly and other risk groups for severe COVID-19 during the pandemic.

Introduction

There were 7 683 asylum seekers in the reception system in Finland as of 27 April 2020. Finland's system for providing health services

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for asylum seekers is organised and funded by migration authorities and partly separate from the general public health care. However, the Finnish Communicable Diseases Act identifies the prevention and control of infectious diseases as the responsibility of municipalities, irrespective of the residency status of the people involved (Tuomisto et al., 2019; Anon 2021a).

Factors such as crowded living conditions may expose clients to increased risk of COVID-19 infection (Anon 2021b). Nihtisilta reception centre in Espoo, Finland, is an asylum seeker reception centre with capacity of 499 clients and occupancy of 409 (as of April 2020). Additionally, some clients registered with the reception centre live in private accommodation outside of the centre (350 as of April 2020). Many of the clients work outside the reception centre.

The reception centre administration undertook a number of COVID-19 preparedness and prevention measures starting in March 2020. These included moving elderly or otherwise vulnerable individuals to accommodation outside the centre, raising awareness on proper hand hygiene and physical distancing, temporarily closing recreational spaces, and rearranging meal services to take into account physical distancing principles.

Despite the implemented measures, in April, an increasing number of clients were reporting symptoms compatible with SARS-CoV-2 infection. Diagnostic PCR tests for SARS-CoV-2 were offered to symptomatic clients. Those tested positive were isolated within the reception centre premises and their contacts traced and quarantined in their rooms in accordance with the Finnish Communicable Diseases Act (Anon 2021a). Isolation sections were established within the building.

At first, cases seemed to be limited to one section of the centre. Once cases with no obvious epidemiological linkage were detected, the local public health authorities recommended screening even asymptomatic individuals in the section in question. However, towards the end of April 2020, an increasing number of cases appeared in other sections, leading the infectious disease unit, in coordination with the Finnish Institute for Health and Welfare and the Finnish Immigration Service, to screen all clients of the reception centre for COVID-19. By the time the screening started, 29 symptomatic persons had tested positive for COVID-19.

The aim of the universal screening was to perform case finding, to determine the extent of the outbreak, and to inform future public health response in reception centres and similar environments. Furthermore, we aimed to study how symptoms developed over time in those who were asymptomatic at the time of testing. Serology following infection was assessed from a subgroup of those who tested positive for SARS-CoV-2 and will be published separately after analysis of these data.

Methods

All reception centre clients living in the premises and not previously diagnosed with COVID-19 were invited to take part in SARS-CoV-2 screening. The screening of clients took place at the reception centre; staff was advised to get tested at their occupational health care unit.

Nasopharyngeal swab collection was organized at the reception centre on three days (28th and 29th April and 6th May 2020). The real-time polymerase chain reaction (RT-PCR) testing for SARS-CoV-2 was performed in two laboratories, at the Finnish Institute for Health and Welfare and at a designated clinical laboratory (in addition, prior to screening, samples of symptomatic clients had been analysed by RT-PCR at another clinical laboratory). At the time of sample collection, reception centre nurses filled in an electronic symptom screening form for the participants.

For those who tested positive for SARS-CoV-2, a symptom follow-up was organized by reception centre staff by phone, using an electronic form, with the intention to repeat the questionnaire every other day until two weeks from diagnostic sample collection. For the ones who did not participate in the symptom screening at the time of diagnosis, or participated but did not report any symptoms, we collected complementary data from the records of the Espoo municipality in order to capture all

reported symptoms. These records were based on a minimum of two unstructured phone interviews: one at the time of diagnosis and one towards the end of isolation. If the subject had reported symptoms in any of these interviews or the symptom screening, they were considered symptomatic.

We compared the clinical and demographic characteristics between SARS-CoV-2 positive and negative screening participants using T-test and Fisher's exact test. Specific ethics approval was not needed for this study as it was performed under the mandate of the Finnish Communicable Diseases Act and the Act on the National Institute for Health and Welfare (Anon 2021a, 2021c). Informed consent for sample collection was obtained in writing.

Role of the funding source: None

Results

Out of 409 clients living at the reception centre, 260 participated in the screening by nasopharyngeal swab and 96 (37%) were found positive for SARS-CoV-2 (Table 1). Of the 260 participants, 257 were living at the centre's premises at the time of the screening; two were staying at private accommodation and for one, information on place of residence was missing.

In addition to the 29 previously diagnosed clients and the 96 cases detected through screening, 2 cases were diagnosed after the screening. The total number of positive cases during the epidemic was thus 127/409 (attack rate: 31%). All cases were relatively mild and none required hospitalization because of the infection. In this report we present the characteristics of only those 96 PCR-positive and 164 PCR-negative participants who attended the mass screening.

Of the positive cases identified in the screening, 61 (64%) reported having had symptoms at the time of the screening or one week prior and 35 (36%) reported none. Due to limited resources and difficulty in reaching clients, the number of follow-up interviews per client varied from none to three. The data were supplemented with Espoo municipality's records. Out of the 35 initially asymptomatic individuals, 12/35 (34%) went on to develop symptoms during the follow-up, meaning that during this outbreak, only 18% of the cases (23/127) appeared to have been completely asymptomatic.

Discussion

In total, 127 clients of the reception centre, representing one third of all persons living in the premises, tested positive for SARS-CoV-2. The extent of the outbreak demonstrates that once introduced in a reception centre setting, SARS-CoV-2 can spread easily, likely facilitated by the use of shared spaces.

As cases were detected across the entire centre and the attack rate was high, the public health authority of the municipality assumed universal risk of exposure to COVID-19 within the centre and placed each client in the reception centre in quarantine for 14 days in order to prevent further spread. The staff was advised to wear personal protective equipment at work and to avoid close contacts with others outside of home and work settings.

The evidence base and appropriateness of mass quarantines of entire facilities have been rightly questioned (Anon 2021b). However, in the case of this exceptionally large and widespread outbreak, comprehensive quarantine and isolation measures were likely instrumental in quelling transmission. It should be noted that after the quarantine period of 14 days, no more cases appeared apart from a single individual who fell ill with COVID-19 mere days after the quarantine was lifted (consistent with infection contracted during the quarantine).

In this population of mostly working-age adults, presentation of COVID-19 was largely mild and no one was hospitalized because of the infection. The transfer of at-risk individuals to accommodation outside the centre prior to the epidemic may have helped prevent cases of severe COVID-19. Several asymptomatic cases were detected in the screening,

Table 1
Characteristics of the participants in the COVID-19 screening study at a reception centre for asylum seekers in Espoo, Finland.

| | SARS-CoV-2 PCR result | | |
|--|-----------------------|----------------------|---------|
| | Positive N = 96 | Negative N = 164 | p-value |
| Age, years, mean (SD) | 28,523 (6·7) | 30,754 (8·4) | 0.027 |
| Male, N (%) | 96 (100) | 143 (87) | <0.001 |
| Reported working outside of reception centre, N (%) | 54 (56) | 88 (54) | 0.480 |
| Reported smoking cigarettes, N (%) | 27 (28) | 44 (27) | 0.288 |
| Clinical | | | |
| Reported having symptoms at the time of diagnostic test or one week prior, N (%) | 61 (64) | 24 (15) | <0.001 |
| Fever, N (%) | 24 (25) | 6 (4) | <0.001 |
| Cough, N (%) | 28 (29) | 9 (6) | <0.001 |
| Sore throat, N (%) | 25 (26) | 8 (5) | <0.001 |
| Runny nose, N (%) | 18 (19) | 8 (5) | <0.001 |
| Shortness of breath, N (%) | 10 (10) | 3 (2) | 0.005 |
| Loss of sense of smell/taste, N (%) | 16 (17) | 2 (1) | <0.001 |
| diarrhea, N (%) | 3 (3) | 1 (1) | 0.144 |
| Abdominal pain, N (%) | 10 (10) | 2 (1) | 0.001 |
| Fatigue, N (%) | 19 (20) | 9 (5) | 0.001 |
| Body temperature at the time of diagnostic test, Celcius degrees, mean (SD) | 36·3 (0·8) [N = 92] | 36·2 (0·7) [N = 156] | 0.150 |
| No symptoms reported at the time of diagnostic test or one week prior, N (%) | 35 (36) | 132 (80) | |
| Information on symptoms missing, N (%) | 0 (0) | 8 (5) | |

and some of them remained asymptomatic for the whole duration of the outbreak. The impact of asymptomatic or presymptomatic clients on the dissemination of the virus is difficult to quantify but some contribution seems plausible. Asymptomatic or presymptomatic carriage has been described earlier in the context of nursing home (Kimball et al., 2020; Escobar et al., 2020), homeless shelter (Anon 2021d) and hospital (Wang et al., 2020) outbreaks.

The study comes with other limitations. The coverage of screening was suboptimal as participation was voluntary and many clients may still have had work commitments at the time the screening commenced. Furthermore, scarcity of symptom follow-up data affects the external validity of the results; although medical records were used to complement the results of the interviews, the possibility of some missing data on symptoms cannot be ruled out.

In conclusion, we describe a large outbreak of COVID-19 in an asylum seekers' reception centre where approximately a third of the clients contracted the virus. Mass screening is valuable in establishing an overall picture in the case of an assumed outbreak and in detecting asymptomatic and presymptomatic carriers of the virus. Quarantine and isolation, when appropriately targeted and enacted in accordance with local law, can be useful in containing an outbreak. Outbreaks among asylum seekers and refugees should be responded to as promptly as with any other population and taking into account the elderly and other risk groups for severe illness. Prevention of infectious diseases should not be restricted by residency status.

Declaration of Competing Interest

The authors declare no competing interests.

CRediT authorship contribution statement

T. Turunen: Investigation, Writing - original draft. **K. Kontunen:** Investigation, Formal analysis, Writing - original draft. **K. Sugulle:** Investigation, Data curation. **P. Hieta:** Investigation. **O. Snellman:** Supervision, Writing - review & editing. **I. Hussein:** Investigation. **T. Dub:**

Investigation, Writing - original draft. **M. Melin:** Supervision, Formal analysis, Writing - original draft. **A. Haveri:** Investigation, Formal analysis. **N. Ekström:** Formal analysis. **N. Ikonen:** Writing - original draft. **O. Helve:** Conceptualization, Investigation. **J. Sane:** Conceptualization, Supervision, Writing - review & editing.

Acknowledgments

We would like to thank the clients of the reception centre for their participation and cooperation, Mari Saari, Essi Virtanen and Elina Siren from the Luona company managing the reception centre, as well as reception centre staff for their collaboration and valuable inputs to the study, Medical Centre Aava for their contribution to the sample collection and analysis, and laboratory personnel at THL for their valuable work.

References

- Tuomisto, K., Tiittala, P., Keskimäki, I., Helve, O., 2019. Refugee crisis in Finland: challenges to safeguarding the right to health for asylum seekers. *Health Policy* 123 (9), 825–832. doi:10.1016/j.healthpol.2019.07.014, Epub 2019 Jul 20. PMID: 31399260.
- Anon, 2021a. Communicable Diseases Act 1227/2016. Anon <https://www.finlex.fi/fi/laki/ajantasa/2016/20161227>.
- Anon, 2021b. Guidance on Infection Prevention and Control of Coronavirus Disease (COVID-19) in Migrant and Refugee Reception and Detention Centres in the EU/EEA and the United Kingdom 15 June 2020. Anon <https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-guidance-refugee-asylum-seekers-migrants-EU.pdf>.
- Anon, 2021c. Act on the National Institute for Health and Welfare 668/2008. Anon <https://www.finlex.fi/fi/laki/ajantasa/2008/20080668>.
- Kimball, A., Hatfield, K.M., Arons, M., et al., 2020. Asymptomatic and presymptomatic SARS-CoV-2 infections in residents of a long-term care skilled nursing facility - King Country, Washington, March 2020. *MMWR Morb. Mortal. Wkly. Rep.* 69 (13), 377–381. doi:10.15585/mmwr.mm6913e1, Published 2020 Apr 3.
- Escobar, D.J., Lanza, M., Saberi, P., et al., 2020. Mitigation of a COVID-19 outbreak in a nursing home through serial testing of residents and staff. [published online ahead of print, 2020 Jul 20]. *Clin. Infect. Dis.* doi:10.1093/cid/ciaa1021, ciaa1021.
- Anon, 2021d. COVID-19 Outbreak at a Large Homeless Shelter in Boston: Implications for Universal Testing medRxiv preprint doi:10.1101/2020.04.12.20059618.
- Wang, X., Zhou, Q., He, Y., et al., 2020. Nosocomial outbreak of COVID-19 pneumonia in Wuhan, China. *Eur. Respir. J.* 55 (6), 2000544. doi:10.1183/13993003.00544-2020, Published 2020 Jun 4.