Crisis Management and Communication During a Covid-19 Outbreak Among Foreign Temporary Workers

Creation Context

The case study was originally created by Elburg van Boetzelaer, Annlaug Selstø, Elina Seppälä, Kjetil Berg Veire, Anette Ester, and Pawel Stefanoff from the Norwegian Institute of Public Health based on facts of a real outbreak during the COVID-19 pandemic.

The motivation to create a case study was to foster capacity building to improve preparedness plans in small communities.

ECDC transformed the case study online to support as many local municipalities in all EU Member States to use it to build capacity in preparedness to respond to similar emergency situations in a timely and appropriate fashion.

Context of application

The case study is designed to be applied in municipalities that have large numbers of foreign temporary workers, where an outbreak response needs to involve the employers and possibly other municipal services, including public health services.

Many inter-sectorial aspects of the case study can be generalised to other outbreaks without the challenge of foreign temporary workers. (e.g. hosting a mass-gathering event)

Case study objectives

1. Determine the responsibilities of the municipality and of the employer in outbreak response.
2. Propose a plan for the recording of foreign temporary workers for public health purposes.
3. Identify communication channels and feedback loops between different key actors.
4. Determine potential barriers to compliance with control measures.
5. Integrate ‘lessons learned' from an outbreak into the municipal preparedness plan.

Intended case study outcomes

1. Define key components and actors of an effective outbreak response.
2. Identify improvement points for inter-sectorial collaboration for the municipal preparedness plan.

Learning objectives for the epidemiologist role:

1. Calculate attack rates in an outbreak setting.
2. Describe cases in terms of time, place, and person.

PART I. ALERT *(estimated time: 45 minutes)*

On 29 September 2020 the municipal doctor in municipality X was informed about three confirmed COVID-19 cases among employees of an industrial plant. The municipal doctor mapped the situation and found the following information:

One of the cases (index case 1) had tested positive at the airport when entering the country. Before he got the results, he had gone to work at the industrial plant, resulting in six close contacts who had potentially been exposed.

The second case (index case 2) lived permanently in the village and had not had any contact with the other positive cases. He had been to work at the industrial plant and was active in the local community, participating in meetings at his children's school and kindergarten, and socialising with other people. Following the positive test result of index case 2, the school and kindergarten had been closed while the municipality doctor worked on getting an overview of the situation. Contact tracing had identified 41 close contacts of index case 2 who needed to go into quarantine.

The third case (index case 3) initially tested negative for COVID-19, but a second test turned out positive. At that time, the employer retested all employees coming from abroad 3 days after crossing the border.

Q1. Should the municipal doctor be concerned about this situation? Why or why not?

Q2. Could the situation be of interest to the community and the media, and how would you prepare for this?

The municipal doctor considered the following facts.

- **Pathogen:** SARS-CoV-2 (virus which causes COVID-19) is a novel coronavirus that began to circulate among humans in late 2019. The fact that SARS-CoV-2 is a novel pathogen means that the virus has been able to spread easily in fully susceptible populations.
- **Transmission:** The virus spreads from person to person via small respiratory droplets which are spread when an infected person sneezes, coughs or interacts in close proximity with others. These droplets can be inhaled or end up in the respiratory tract through the hands if a person touches surfaces contaminated with the virus.
- **Infectiousness:** It has been estimated that one contagious person can infect an average of 2-4 other people if no control measures are in place. Some people, especially children and young adults, can be infected without any symptoms. The infectious period may begin up to 2.5 days before symptom onset, however, people are believed to be most infectious before and during the symptomatic period. The infectious period is estimated to last for 8-10 days in moderate cases requiring hospitalization, and up to an average of 2 weeks in severe cases. The time between infection and symptom onset is usually 5-6 days but can vary from 0-14 days. For some people, some symptoms may linger or recur for weeks or months following initial recovery. This can also happen in people with mild disease. People are not infectious to others during this time.
- The rather long infectious period and the fact that an infected person can transmit the disease to others before symptom onset means that the disease can spread rapidly from one single infected person if control measures are not implemented early on.
- **Severity:** Most people (70-80%) experience a mild respiratory infection, but some require hospitalization, even intensive care. A relatively small proportion of cases die.

Because of all these factors, since early July 2020, the National Directorate of Health has recommended municipalities to follow the “TISK” strategy. The strategy consists of testing (“T”) all persons suspected to be infected with SARS-CoV-2 , isolating (“I”) confirmed cases , tracing (“S”) close contacts of confirmed cases and placing them in quarantine (“K”).

Note: In an epidemiological investigation of the outbreak, the first step is to “confirm the outbreak”, i.e. find evidence that the disease risk in any given time and place, exceeds the expected (acceptable) level. This decision, which is equivalent to setting an alarm, also means that starting from now, resources will be prioritized to contain the outbreak.

The municipality were concerned about the situation and declared an outbreak based on the national definition of at least two linked cases. Until the alert on 29 September, few COVID-19 cases had been reported in the municipality. The municipality doctor was concerned that COVID-19 disease awareness was low among the foreign temporary industry workers. Therefore, the municipal director initiated mass screening of municipality inhabitants for the early detection of further transmission at this point of the outbreak. Independently, the employer started mass-screening for COVID-19 of foreign workers at the industrial plant.

The municipal leadership is aware that even few cases in a small municipality can attract media attention. Closing the school can also create anxiety, even if it is for a short time period. They observed how difficult it can be when small outbreaks were occurring previously in neighbouring municipalities.

One way to prepare for increased media attention would be to identify communication channels and involve stakeholders in collaboration and communication.

The best way to approach such situation to prepare a **communication plan**:

- To specify where and when to publish key information about the situation ('situation reports'),
- To prepare for the most frequently asked questions both from the inhabitants and the media,
- To identify one or more spokespersons to whom all questions could be directed.

Key principles to risk and crisis communication are transparent and rapid sharing of information about the situation with inhabitants in the community and the media, timeliness and collaboration.

During an outbreak, the spokesperson(s) should be kept in the loop for all information exchanges. Since this is a small municipality having a large group of foreign workers, the municipality should collaborate with the employer on all communications with the media.

Q3. What additional information would you like to receive about the work and living situation at the industrial plant and its employees to guide your outbreak response?

Approximately 30 % of the 455 plant employees are permanent residents of the village and neighbouring villages and commute to the industrial plant. The remaining 70 % employees are temporary foreign workers of which most live in industrial containers (barracks) on the premises, while some live in rented houses in neighbouring villages.

The industrial plant premises are located 4 kilometres away from inhabited areas of the municipality. Most employees live in barracks located at walking distance from the plant (see Figure 1). Each barrack has 40-60 single rooms (20 m2), most of them with a private (en-suite) bathroom. Some barracks have access to a common kitchen space. All barracks have a common space for social gatherings. All workers have access to the canteen organised by the employer.

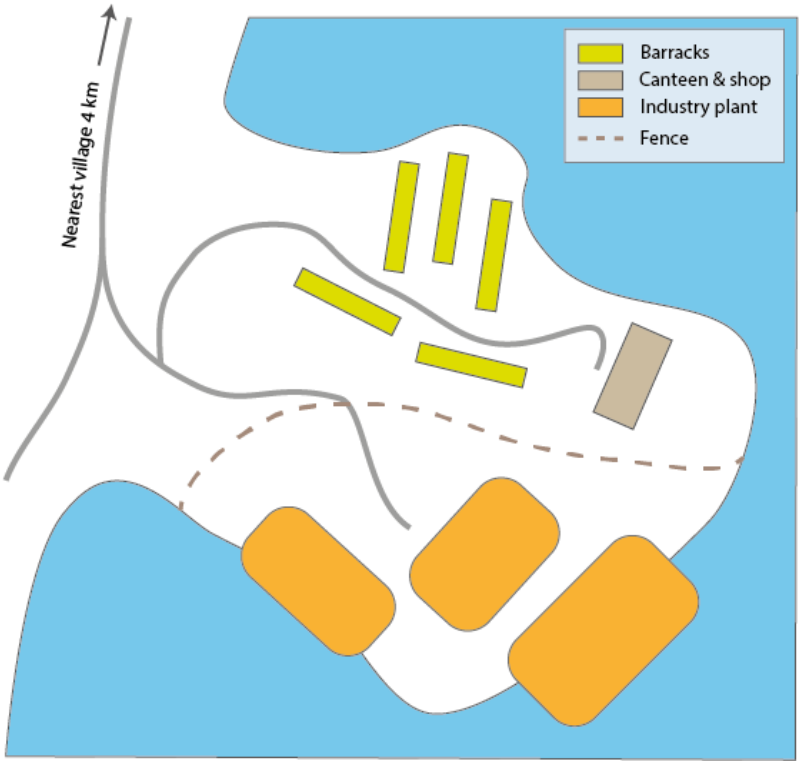


Figure 1. Map of the premises of the industrial plant

The employer is trying to facilitate that the workers are not working in close proximity of each other. The foreign temporary workers are working on 6-8 weeks rotation shifts. After each shift, the workers return to their home countries and are replaced by a new group of workers.

Q4. What challenges can you expect to contain Covid-19 outbreak in this type of workplace?

The municipal doctor contacts the Human Resources (HR) Director of the plant. Plant workers are frustrated as they do not know how long to quarantine for. At the same time, the HR director says that information on prevention measures, testing regime, quarantine time and isolation has been given to employees both directly and through subcontractors. The HR Director informs the municipal doctor that the plant is facing significant problems with the employee compliance with quarantine rules. She specifies that there are communication problems with the foreign temporary workers due to language barriers, since many do not speak either of the two languages used for disseminating messages (The local language and English). Moreover, the HR Director says she is not sure if all the advice and recommendations have reached all employees, because she can only inform staff on the plant direct payroll. Most of the employees are hired through subcontractors, and subcontractors of subcontractors. This leads to challenges in terms of communication and having a full overview of all staff. The dissemination of information to employees of the industrial plant has to go through these subcontractors.

Q5. What sort of information could aid the employees and the permanent residents to be able to follow the advice and restrictions?

Following discussion, the municipal doctor asks the National Institute of Public Health about the availability of information on COVID-19 and current quarantine and isolation rules in languages other than the local language and English. They want to reach both the community and all employees with the relevant updated information.

On 1 October, close contacts of index case 2 (work contacts and the 17-year old daughter of index case 2) test positive for COVID-19. Following the positive test results, 16 school children and a group of kindergarten pupils are placed in quarantine. By 2 October there are 13 confirmed cases, only three of them were in the local community. Two of the cases have recently arrived as foreign temporary workers, most likely infected abroad, and four are family members of the plant employees. During this period, all travellers entering the country from abroad could "test their way" out of quarantine, with two negative tests with the minimum of a three days interval. This led to massive testing at the workplace, so that people could go to work without quarantining for 10 days.

Q6. How could the municipal doctor and the employer ensure that any persons positive for COVID-19 on arrival following airport screening are not coming to the workplace?

To ensure that that persons who test positive for COVID-19 at the airport are not coming to the workplace, the employer could consider to give the employee information about paid sick leave, quarantine and isolation facilities, access to meals and social support and continued payment of salaries.

PART II. RAPID PROGRESSION OF THE OUTBREAK *(estimated time: 60 minutes)*

On 7 October the HR Director of the plant informs the municipal doctor that all 455 employees were tested from 1st to 6th October and that an additional 65 COVID-19 cases were confirmed. This triggers questions from the media and neighbouring municipalities, putting the municipal leadership under a lot of pressure. At the same time, municipality representatives receive messages from worried inhabitants, informing about foreign workers from country A doing shopping at the local grocery shop, signalling stigmatisation of the whole group.

The municipal director informs the county governor about the outbreak, and together they decide to request the assistance of the National Institute of Public Health. The institute agrees to send experts who, together with local stakeholders, form an outbreak investigation team.

Q7. Who should be part of the outbreak investigation team? What should be the task of each member?

Q8. What factors could have contributed to the rapid increase of cases?

On 8 October, the outbreak investigation team starts to operate. In a setting which involves occupational exposures, an outbreak investigation team could include an infection control specialist, contact tracing expert, epidemiologist, microbiologist, communication expert and should include the municipal doctor, local authorities and a representative of the employer.

The outbreak investigation team decides that their main task will be to review the existing information on the cases reported from the municipality and the industrial plant, and to clarify the roles of different actors in the outbreak response. This will allow development of recommendations on how to limit further spread of this outbreak and how to prepare for future outbreaks.

The outbreak investigation team discusses the possible factors contributing to the rapid increase in the number of cases. It is known that transmission can be particularly effective in crowded, confined indoor spaces, where poor ventilation can further enhance the spread of SARS-CoV-2. Furthermore, sharing transportation and facilities such as common accommodation, canteen and dressing rooms, may contribute to enhanced transmission. The team agrees that the conditions at both the plant and the barracks favour the spread of COVID-19.

In addition to the physical conditions of the working and living environment, the employer's and employees' knowledge of and adherence to guidelines regarding prevention of COVID-19 outbreaks likely played a role. The team suspects that communication regarding COVID-19, including isolation and quarantine rules and other preventive measures, may be limited. Some employees may not follow isolation and quarantine rules and other recommendations. Possible reasons for that could be lack of awareness, lack of understanding or perceiving COVID-19 as a mild disease.

The outbreak investigation team also considers the possibility of a "super spreader event", an event where one highly infectious case transmits the disease to many others, leading possibly to uncontrolled spread of the disease. Before the COVID-19 pandemic started, super spreader events were described for the severe acute respiratory syndrome (SARS) outbreak in 2003, when epidemiologists noted that a small proportion of cases were responsible for most transmissions. This has now described for COVID-19.Super-spreader events have occurred in slaughterhouses, factories and religious gatherings.

There were insufficient facilities for mass-quarantine and isolation at the plant. In collaboration with the municipality, the plant management decides to close the plant and to place some of the confirmed cases and some of the employees in quarantine in designated facilities in other municipalities. These are mostly hotels adapted to isolation centres that have appropriate conditions and trained staff. While discussing containment measures, a number of questions are raised around the roles and responsibilities of the different actors regarding employees who are placed in quarantine in other municipalities. Discussion points between the municipalities include:

- Who is responsible for the supervision and wellbeing/health of these employees?
- Who is responsible for the testing of these employees?
- Who is responsible for reporting of new confirmed cases among these employees to regional and national authorities?

Q9. How could the different municipalities collaborate?

Q10. What could be the role of the county governor?

In the following days, the county governor organises a meeting with neighbouring municipalities. During this meeting the participants agree that each of the municipalities is unable to deal with such a large outbreak on their own due to limited resources. Therefore, the municipalities decide to share resources, for example health personnel speaking the languages of the plant foreign workers and assist each other in contact tracing.

During the meeting it is also agreed that the municipality where the employees of the industrial plant are temporally quarantined is responsible for the testing and assuring their safety and wellbeing. However, the municipality of residence (i.e., where the plant is located) is responsible for reporting to the regional and national authorities.

Note: Even if not part of this exercise, it is important to mention that the national government has developed specific reporting requirements during the COVID-19 pandemic:

- Each healthcare worker who identifies a confirmed case of COVID-19 shall notify the municipal doctor.
- The municipal doctor shall notify a COVID-19-associated death to the infection control doctor on duty at the national Institute of Public Health.
- Every laboratory and physician who identifies a confirmed COVID-19 case shall report the case to the national Surveillance System for Communicable Diseases.
- The municipal doctor shall notify a COVID-19 outbreak to the national Institute of Public Health through the outbreak reporting system.

Since 2017 the municipality was working to adopt the crisis preparedness plan, which was part of the national preparedness planning process. The municipal director found out, however, that:

- The municipality is not prepared for such a sudden increase of cases of an infectious disease.
- The plan includes scenarios based on influenza, a disease with different characteristics and consequences.
- There is not enough emphasis on communication challenges, especially in relation to such a large group of foreign workers.

The municipal director decides to prioritize the communication challenges first. With the help of the outbreak investigation team and other stakeholders, he starts to list all actors that needs to be kept in the feedback loops.

Q11. It is useful to think at this stage who is responsible for which aspects of crisis communication. Connect all the actors who should be involved in communication during such a crisis with arrows. Use blank boxes to include other relevant stakeholders. You can write the type of communication (a-d, see below) next to the arrows to indicate the content of the communication between actors:

a. Sharing confidential information;

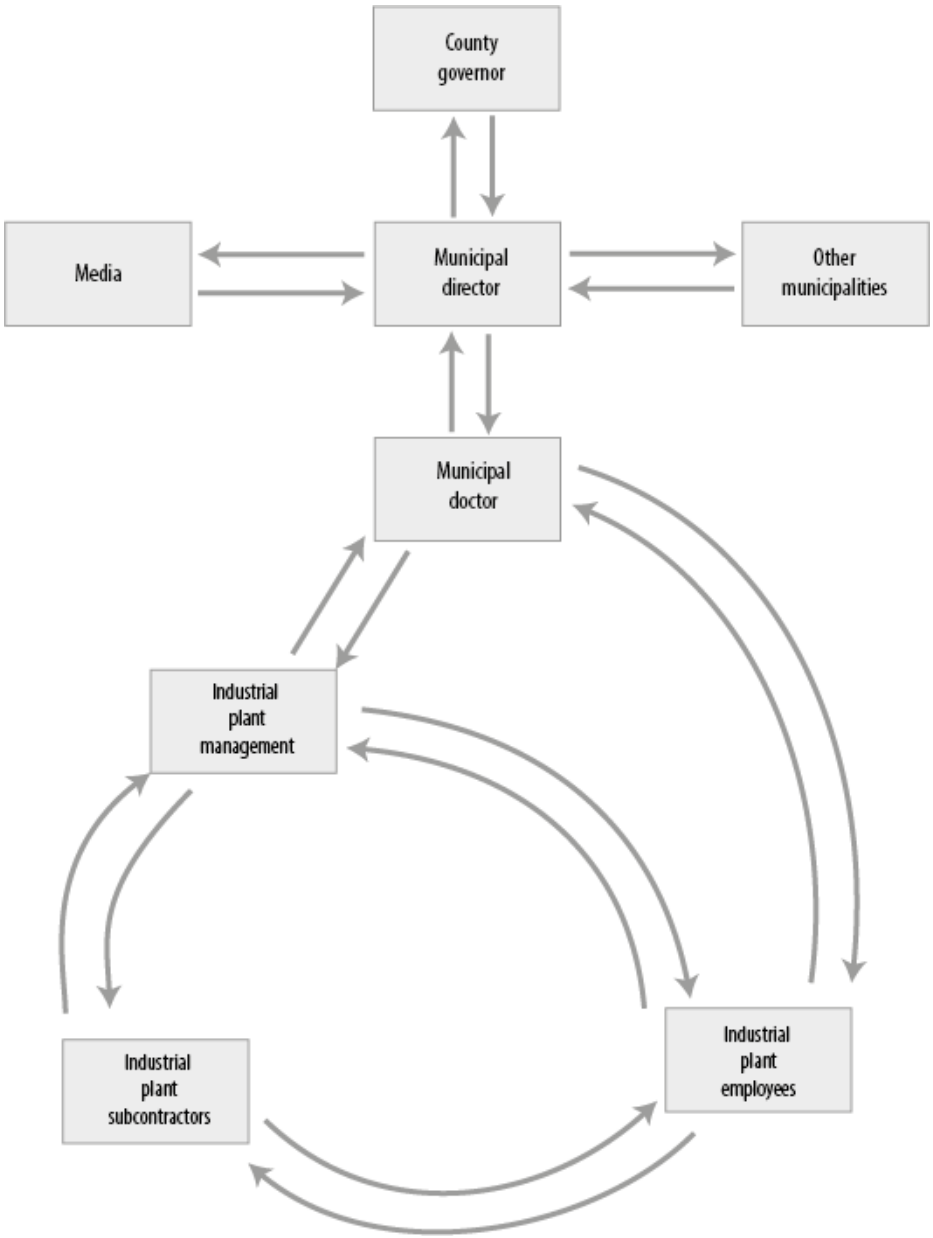
b. Reporting public information;

c. Requesting data / report;

d. Providing recommendation on control measures.

Each actor involved in the outbreak response designates one contact person responsible for communication with other actors. The industrial plant organises a secure “cloud computing” workspace (using Microsoft Teams) and grants access to representatives of the municipality, in order to share confidential information on employees.

The municipal doctor and the employer decide to have daily meetings to review the status of the outbreak, discuss control measures, and exchange other key information. The employer decides to have daily meetings with subcontractors to review the status of the outbreak and to improve sharing of information with all employees. Finally, the county governor decides to call for weekly meetings of all neighbouring municipalities to review the status of the outbreak and to improve sharing of information and resources. The outbreak investigation team sketches an information flowchart aimed to help information exchanges.



Q12. Based on the previous discussions, add the contents of the communication for each arrow to the flowchart above.

PART III. OUTBREAK RESPONSE *(estimated time: 60 minutes)*

The outbreak investigation team discusses whether this COVID-19 outbreak involves the whole community or whether it is limited to the industrial plant. They review the information they received from key actors and they find out that:

- Of the 1,350 municipality inhabitants, 4 persons were registered as cases
- Of the 455 plant employees, 85 persons were registered as cases

Q13. What factors can explain the different case numbers between the municipality inhabitants and the foreign temporary workers?

Around the world, foreign workers, especially if they travel to a country for temporary or seasonal work, tend to stick together and are often a vulnerable group in terms of access to health care and information. This could be due to factors including language differences, shared cultural background which differs from the host population, housing far from town provided by employer, or other barriers or preferences.

In this case, the foreign temporary workers spend most of their time at the plant and the barracks that are set up on the premises. They spend evenings cooking together, playing cards and chatting. Interaction between plant employees and municipality inhabitants is limited. You could almost imagine that they are living in a social bubble isolated from the surrounding community. This limited mobility may have minimized the transmission of COVID-19 from the plant employees to the permanent residents (see figure 2).

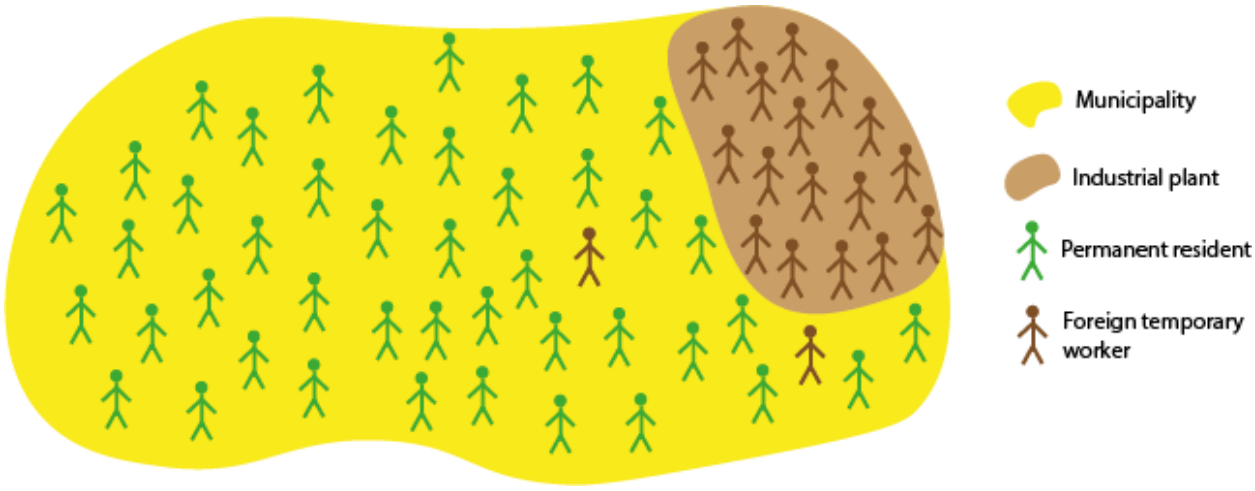


Figure 2. Illustration of the isolated social bubble of foreign temporary workers

Q14. Where would you implement control measures?

The outbreak investigation team decides that the investigation and control measures should be focused on the industry plant employees. At the same time, the municipal doctor should carefully monitor the situation in the community.

In order to get a better overview of the current outbreak, and to be able to monitor how the outbreak progresses, the outbreak investigation team decides to describe the reported COVID-19 cases by person, place and time. They use the information on cases collected by the municipal contact tracing team.

The municipality doctor had over a longer time requested the municipal director for a contact tracing team. This was not organised before the start of this outbreak and it was set up in hurry when the first cases were diagnosed. A team from a neighbouring municipality organised a short training for the new contact tracing team. The municipal doctor decides to use a contract tracing system, which is a simple and easy to use online software designed for this disease tracing. Based on the positive test results received from the laboratory, the contract tracing team calls persons with a positive test and records a list of their close contacts. The following challenges are identified regarding capturing of information on cases and their contacts:

- Lack of experience and work routines in disease outbreaks (persons tasked with contact tracing were delegated from other tasks in the municipality and they are not health professionals).
- Key information for cases (for example symptoms, date of symptom onset, date of testing, etc) is not captured systematically.
- Ineffective communication between the contact tracing team, municipal doctor and cases, due to language barriers (many of the cases and contacts did not speak English or the local language).
- Discontinuation of contact tracing because of the assumption that everyone in the industry plant is a close contact of one of the cases.

As agreed during the first meeting organised by the county governor, neighbouring municipalities helped the municipal doctor to recruit health workers speaking the most common foreign languages of the affected population. The health workers started calling all plant employees who are currently in isolation or quarantine, to check their health status and inform them about the recommended precautions.

The current contact tracing system does not support data manipulations, data export nor data analysis. The national public health institute team therefore advises the municipal doctor to prepare a line list of cases using MS Excel, in order to monitor the outbreak. However, it is challenging for the municipal doctor to get the full overview of the outbreak as the full list of employees at the plant is not up to date. Reasons for this include high number of subcontractors who are using different documenting systems and high turnover of staff at the plant and the 6-8 week rotation shifts. The information that she receives is often incomplete or not up-to-date. Finally, the limited human resources in the small municipality (only two doctors) makes the data gathering even more difficult. Therefore, the outbreak investigation team decides to help with setting up and completing a line list of all cases that test positive for COVID-19 among industry plant employees.

Note: before preparing the line list, the epidemiologists should always elaborate a “case definition”. The case definition includes information on person, place and time and allows separating the cases belonging to a given outbreak (in this case: employees of the industrial plant present at work from mid-September until mid-October) from unrelated cases.

Q15. What information would you want to collect from each positive case?

Based on the information obtained from employees of the industry plant that tested positive for COVID-19 and from the information captured in the current contract tracing system, the outbreak investigation team prepared a line list.

Table 1. Line list of COVID-19 cases

ID	Sex	Age	Nationality	Residence	Symptoms	Date of onset	Date of sample
1	Male	44	Country A	Barrack 1	Unk		28 Sep
2	Male	49	Country A	Barrack 1	Yes	18 Sep	17 Sep
3	Male	28	Country A	Unk	Unk		9 Oct
4	Male	65	Country A	Barrack 2	Unk		1 Oct
5	Male	55	Country D	Permanent	No		22 Sep
6	Male	36	Country A	Barrack 2	Unk		9 Oct
7	Male	31	Country A	Barrack 1	Yes		9 Oct
8	Male	20	Country A	Unk	No		1 Oct
9	Male	44	Country A	Barrack 2	Yes		5 Oct
10	Male	58	Country A	Rented house 1	No		5 Oct
11	Male	44	Country A	Barrack 2	Unk		1 Oct
12	Male	31	Country A	Unk	No		1 Oct
13	Male	61	Country A	Barrack 1	No		1 Oct
14	Male	42	Country A	Barrack 3	Unk		1 Oct
15	Male	54	Country A	Barrack 2	Unk		26 Sep
16	Male	58	Country A	Barrack 1	Yes		1 Oct
17	Male	45	Country A	Barrack 2	Unk		30 Sep
18	Male	42	EU member state	Rented house 1	Yes		30 Sep
19	Male	47	Country A	Barrack 2	Unk		30 Sep
20	Male	56	EU member state	Rented house 3	Yes	2 Oct	2 Oct
21	Male	65	Country B	Barrack 1	Unk		2 Oct
22	Male	42	Country A	Barrack 1	Unk		2 Oct
23	Male	42	Country A	Barrack 2	Unk		2 Oct
24	Male	43	Country B	Barrack 3	Yes		2 Oct
25	Male	47	Country A	Barrack 2	Unk		9 Oct
26	Male	53	Country A	Unk	Yes		2 Oct
27	Male	25	Country A	Barrack 4	Unk		2 Oct
28	Male	38	Country A	Rented house 1	Unk		9 Oct
29	Male	45	Country A	Barrack 4	Unk		2 Oct
30	Male	47	Country B	Barrack 2	No		2 Oct
31	Male	37	Country A	Barrack 1	No		2 Oct
32	Male	41	Country A	Unk	No		2 Oct
33	Male	48	Country A	Barrack 2	Yes		2 Oct
34	Male	49	Country A	Barrack 5	Yes		2 Oct
35	Male	37	Country B	Barrack 2	No		2 Oct
36	Male	57	Country A	Barrack 2	Yes		3 Oct
37	Male	23	Country A	Barrack 2	No		3 Oct
38	Male	54	Country A	Barrack 2	No		3 Oct
39	Male	45	Country A	Barrack 3	Unk		3 Oct
40	Male	44	Country A	Rented house 1	Unk		3 Oct

ID	Sex	Age	Nationality	Residence	Symptoms	Date of onset	Date of sample
41	Male	55	Country A	Barrack 2	Yes		3 Oct
42	Male	48	Country A	Barrack 2	Unk		3 Oct
43	Male	63	Country A	Barrack 3	No		3 Oct
44	Male	37	Country A	Barrack 2	Yes	3 Oct	3 Oct
45	Male	40	Country A	Unk	Yes	5 Oct	3 Oct
46	Male	46	Country A	Barrack 2	Yes		3 Oct
47	Male	54	Country A	Barrack 3	Yes		5 Oct
48	Male	34	Country B	Barrack 1	Unk		3 Oct
49	Male	45	Country A	Rented house 1	No		3 Oct
50	Male	46	Country A	Barrack 3	Yes		3 Oct
51	Male	51	Country A	Barrack 2	Unk		3 Oct
52	Male	44	Country A	Unk	No		3 Oct
53	Male	33	Country A	Barrack 3	Unk		3 Oct
54	Male	35	Country B	Barrack 2	No		3 Oct
55	Male	61	Country A	Rented house 1	Unk		9 Oct
56	Male	23	Country A	Rented house 1	Unk		9 Oct
57	Male	38	Country A	Barrack 1	Unk		9 Oct
58	Male	52	Country A	Barrack 2	Unk		9 Oct
59	Male	36	Country A	Unk	Unk		9 Oct
60	Male	51	Country A	Rented house 1	Yes	8 Oct	5 Oct
61	Male	47	Country B	Barrack 3	No		5 Oct
62	Male	53	Country B	Barrack 2	No		5 Oct
63	Male	41	Country B	Barrack 2	No		5 Oct
64	Male	44	Country B	Barrack 2	No		5 Oct
65	Male	45	Country B	Rented house 3	No		5 Oct
66	Male	42	Country A	Barrack 2	No		5 Oct
67	Male	63	Country A	Rented house 1	Unk		5 Oct
68	Male	34	Country B	Barrack 2	Unk		5 Oct
69	Male	62	Country C	Barrack 4	No		5 Oct
70	Male	41	Country A	Unk	No		5 Oct
71	Male	48	Country A	Barrack 2	No		4Oct
72	Male	45	Country A	Barrack 1	No		3 Oct
73	Male	60	Country A	Barrack 2	No		3 Oct
74	Male	52	Country A	Unk	No		3 Oct
75	Male	59	Country A	Barrack 4	No		3 Oct
76	Male	32	Country A	Barrack 2	Unk		3 Oct
77	Male	47	Country A	Barrack 1	No		3 Oct
78	Male	40	Country A	Barrack 3	Yes	7 Oct	3 Oct
79	Male	48	Country A	Barrack 4	No		3 Oct
80	Male	45	Country A	Barrack 4	Yes		6Oct
81	Male	47	Country B	Barrack 3	No		2 Oct
82	Male	51	Country D	Rented house 2	Yes	28 Sep	28 Sep
83	Male	24	EU member state	Rented house 3	Yes	29 Sep	30 Sep
84	Male	38	Country A	Barrack 4	Yes	9 Oct	8 Oct
85	Male	43	Country A	Rented house 1	No		5 Oct

Q16. How can you summarise the information from the above line list of cases?

Q17. Complete and interpret the following tables, using data from the line list:

Age (years)	Number of cases	% by category
18-29		
30-39		
40-49		
50-59		
>60		
TOTAL		

Nationality	Number of cases	% by category
EU member state		
Country A		
Country B		
Other country		
TOTAL		

Residence	Number of cases	% by category
Barrack 1		
Barrack 2		
Barrack 3		
Barrack 4		
Barrack 5		
Rented house 1		
Rented house 2		
Rented house 3		
Permanent resident		
Missing information		
TOTAL		

The outbreak investigation team summarized the available data and prepared the following illustrations. The municipal spokesperson suggested that this kind of information could be included in the daily situation report.

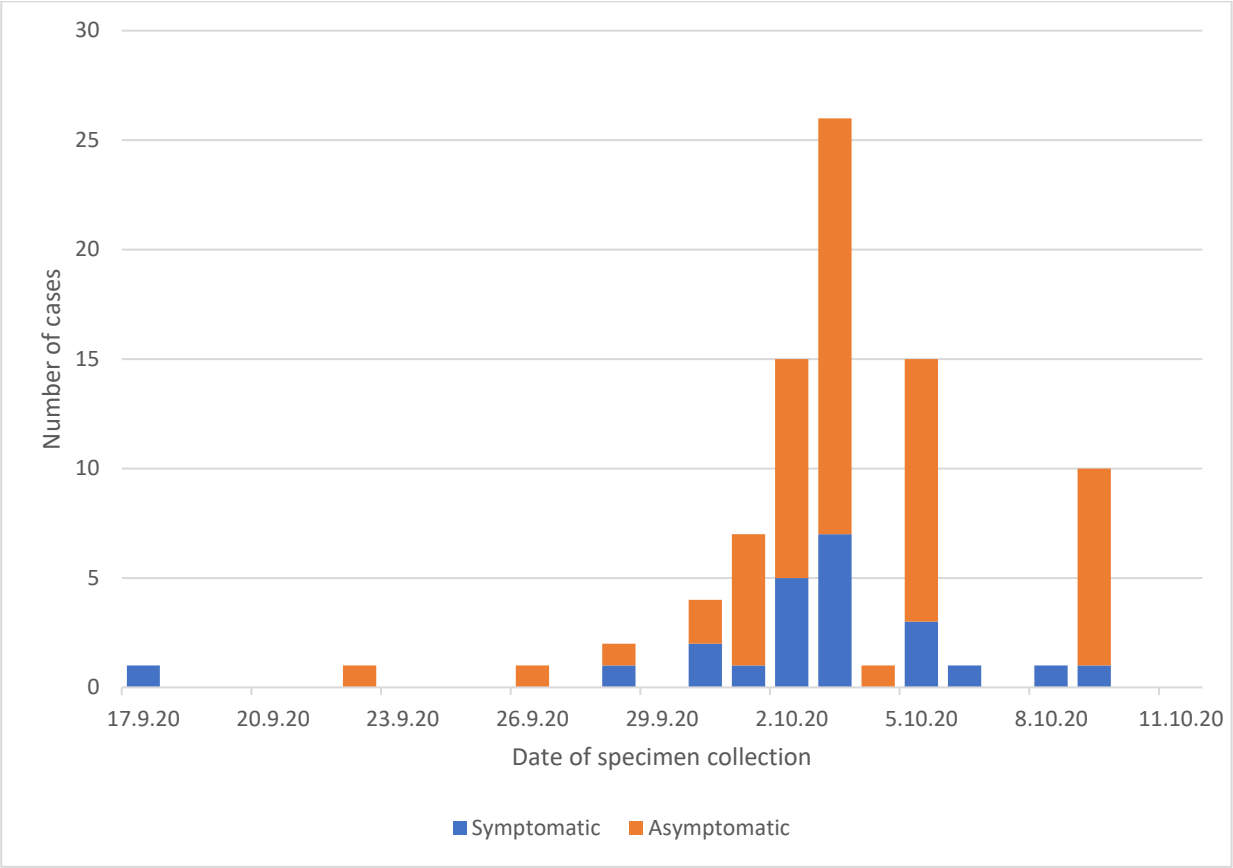


Figure 3. Number of cases among plant employees by date of specimen collection (description by time)

Note that using date of symptom onset would give a more accurate picture of the development of the outbreak. The date of specimen collection reflects testing practices. For asymptomatic cases, however, the date of specimen collection is the only available date that can be used as a "proxy date" to follow outbreak development in time.

Table 2. Number of cases among plant employees by age group.

Age (years)	Number of cases	% by category
18-29	6	7 %
30-39	15	18 %
40-49	39	46 %
50-59	17	20 %
>60	8	9 %
TOTAL	85	100 %

Table 3. Number of cases among plant employees by nationality.

Nationality	Number of cases	% by category
EU member state	3	4 %
Country A	66	78 %
Country B	13	15 %
Other country	3	4 %
TOTAL	85	100 %

Table 4. Number of cases among plant employees by place of residence before the outbreak.

Residence	Number of cases	% by category
Barrack 1	12	14 %
Barrack 2	30	35 %
Barrack 3	10	12 %
Barrack 4	7	8 %
Barrack 5	1	1 %
Rented house 1	10	12 %
Rented house 2	1	1 %
Rented house 3	3	4 %
Permanent resident	1	1 %
Missing information	10	12 %
TOTAL	85	100 %

The outbreak investigation team discusses the characteristics of reported cases so far:

- All reported cases are male.
- The most affected age group is 40-49 years.
- Most cases are reported among foreign nationals born in country A, and fewer cases are reported among foreign workers from country B.
- Most cases live in three of the five barracks, but there are also cases among employees living in rented houses in the neighbouring villages.

The outbreak team agrees that the information available does not allow for an interpretation of the disease risk (risk of getting infected with COVID-19). In order to measure the disease risk, information is required on people who became ill and on those who did not. So far, we have only looked at the individuals who have become ill and have excluded those who did not. The probability of being infected can then be calculated. In outbreak settings such a measure of probability is called the “attack rate”. This attack rate can be used to compare whether the risk of falling ill differs between groups. For example, you could calculate and compare attack rates between employees of different nationalities, or between employees of different age.

Q18. In addition to the line list, what information does the municipal doctor need to calculate the attack rates? Propose a layout of a table looking at the age groups and draw it on the side of one of the above tables.

The municipal doctor wants to know if the COVID-19 risk differs by age group. If she can identify which age groups are most at risk for COVID-19 infection, the control measures can be focused on the most affected age groups. She adds three new columns to her distribution of cases by age:

Table 5. Layout needed to calculate attack rate per age group

Age (years)	All employees	Not ill	Ill (cases)	Risk (attack rate)
18-29			6	
30-39			15	
40-49			39	
50-59			17	
>60			8	
TOTAL			85	

To get an idea of the number of employees who are not ill, and to allow for the calculation of the attack rates per group, the municipal doctor asks the industrial plant management to prepare a table with the number of employees grouped by sex, age, residence and nationality, and to identify to which groups the reported COVID-19 cases belong. Unfortunately, it is difficult for the employer to prioritize getting such an overview table as they have to focus on crisis communication and the management of testing a large group of employees.

Considering that it is difficult to calculate attack rates for specific groups, the outbreak investigation team starts to review the control and containment measures, to subsequently see how these could be strengthened. Some of these control measures were already in place prior to the arrival of the national public health institute delegation. When reviewing the applied control measures, the outbreak team finds that in the early stages of the outbreak the employer did not consult on the implementation of some of the control measures with the municipal doctor. As a result, control measures implemented by the employer were not aligned with the national guidance. For example, the employer required confirmed cases to remain in isolation until they had a negative test result. However, the national guidelines stated that isolation ends 10 days after the date of positive test for asymptomatic cases, and 10 days after symptom onset for symptomatic cases if the patient is not febrile. As a consequence, many employees who were kept in isolation longer than required and were unable to return to their home countries. The employees became worried and stressed because they did not understand what was happening and could not obtain any information on their status and when they could return home.

Q19. Thinking about the unique context of foreign temporary workers working at an industry plant in a small municipality. What barriers might you encounter when implementing control measures? How could you mitigate against them? For this discussion you can use the table below. The first row was filled in using the example from the actual outbreak.

Control measure	Potential challenge	Potential mitigation strategy
Quarantine or isolation of employees	Lack of adherence	Employer to facilitate isolation, ensuring access to food and bathroom facilities and continued payment of salary

PART IV. HOW CAN THE MUNICIPALITY PREPARE BETTER FOR THE NEXT OUTBREAK? *(estimated time: 45 minutes)*

While containment measures are being implemented and the municipal doctor continues to monitor the COVID-19 outbreak, the municipal leadership and the plant management reflect on how they can better prepare for the next outbreak. They expect new outbreaks to occur in the future. Since closing workplaces which employ temporary foreign workers would affect the local economy and many small businesses in the area, the plant will continue to function by employing temporary foreign workers who come to the country for short-term rotations. The actors evaluate the outbreak investigation, aiming to identify 'lessons learned' that can help control future outbreaks in the plant and municipality. These can also be applied to other municipalities with a substantial foreign temporary workforce, where interactions between foreign workers and permanent inhabitants are limited and groups of foreign temporary workers are closely knit.

Q20. What do you think are the 'lessons learned' in terms of preparedness and communication (internal and external)?

Q21. How could key actors of outbreak response in this municipality, prepare themselves for future outbreaks?

The outbreak investigation team believes that if the municipality prepares in advance and develops a working cooperation with the employer, it can react more rapidly and effectively to limit disease spread in future outbreaks. Employees of the plant are vulnerable. Each time a new group of temporary foreign workers comes to the country, it can potentially bring new infections. And the virus can quickly spread when so many people live and work so close together.

Therefore, the outbreak investigation team recommends that the municipality updates the existing crisis preparedness plan. One of the main aims of a preparedness plan is to establish and practise collaborative working routines and communication channels with all key actors, to create 'muscle memory'. Whenever there is an outbreak, this muscle memory will then enable all key actors to quickly activate the outbreak response, take up their assigned roles, responsibilities and engage in the appropriate communication channels, saving precious time and potentially limiting casualties. Planning, establishment of collaborative work routines and communication channels should be set up between the plant management, the municipal doctor, public health services, neighbouring municipalities and the county governor. Established, tested communication channels can help with:

- Transparent and rapid sharing of information on testing strategy and results
- Transparent and rapid sharing of information about the situation with inhabitants in the community and the media
- Good overview of current status of persons in isolation and quarantine
- Rapid dissemination of eventual changes in TISK rules among partners
- Rapid dissemination of relevant materials in foreign languages, as soon as they become available
- Effective sharing of resources between municipalities, in terms of competent personnel speaking a specific language
- Preparation in advance for new temporary foreign worker groups coming from abroad.

Q22. How can different key actors better coordinate control measures in case of a future outbreak?

To prepare better for future outbreaks, the outbreak investigation team proposes to strengthen coordination of stakeholders' activities by developing Standard Operating Procedures for daily and weekly meetings, template situation reports, template line lists, etc. These can be included in the municipal preparedness plan and operationalised rapidly when the outbreak is declared. In addition, the outbreak investigation team recognises the importance of epidemiological data that should guide the implementation of control measures. For example, if cases first occur only in one barrack among employees working in the same team, rapid intervention can limit the spread to other groups of workers. Therefore, it is important that employers keep up-to-date and complete recordings of all employees. They need to provide the required information at short notice.

It is also important for key actors to be familiar with public health guidance prior to the occurrence of the outbreak and to ensure these are followed, especially in times of crisis. Members of the outbreak investigation team conclude that it is too late to develop communication channels and set up employee registers when the outbreak occurs, because everyone is focused on "extinguishing fires", and that therefore these preparations should be in place before the onset of an outbreak.

Q23. How can the municipality prepare to communicate to the municipality inhabitants and other key actors during a crisis, to decrease the social distress and countermeasure foreign workers' potential stigmatisation?

During a crisis, communication between authorities and the community faces different challenges than during “peace time”. If communication is not handled appropriately, residents can feel concern, discomfort, fear, and even outrage. In such situation, it is easy to blame others like foreign temporary workers. In this outbreak, the municipal director was facing accusations from permanent residents, media and other municipalities, blaming the foreign temporary workers for spreading infections and endangering the permanent residents.

The outbreak investigation team suggested to develop a communication plan to be implemented in case of a crisis, including:

- Planning for early, frequent and open communication from municipal authorities about what is known and what is not known about the situation.
- Planning for communication directed both to the permanent residents and to foreign temporary workers, adjusting the messages and language, if necessary.
- Identify a spokesperson among foreign workers (and/or other vulnerable groups) and work together on effective communication between the community and foreign workers group.

Proactive communication can help in assuring people’s trust and make sure they will comply with recommended control measures, if needed.

One way to prevent stigmatisation of foreign temporary workers might be to “give them a voice”, by collaborating and seek to establish a spokesperson who could talk on their behalf. This person could inform the actors involved in the future outbreak response about the situation and communicate to the community through the media or through the municipal authorities’ website/social media. If the community is well informed, it will possibly be less concerned and less likely to stigmatize the foreigners.

As we have seen in this case study, it is difficult to set up communication lines and define roles and responsibilities when an outbreak has already started. Most likely the pressure of the media and neighbouring municipalities will be high, and the urgency of the outbreak can lead to disorganized and confusing lines of communication. Therefore, agreeing on communication channels and frequency of communication as a part of preparedness planning is crucial as described above. One way of doing this can be to draw a communication flow as you have practised in question 12. An example of a communication flow that was made by the key actors in this case study can be found below.

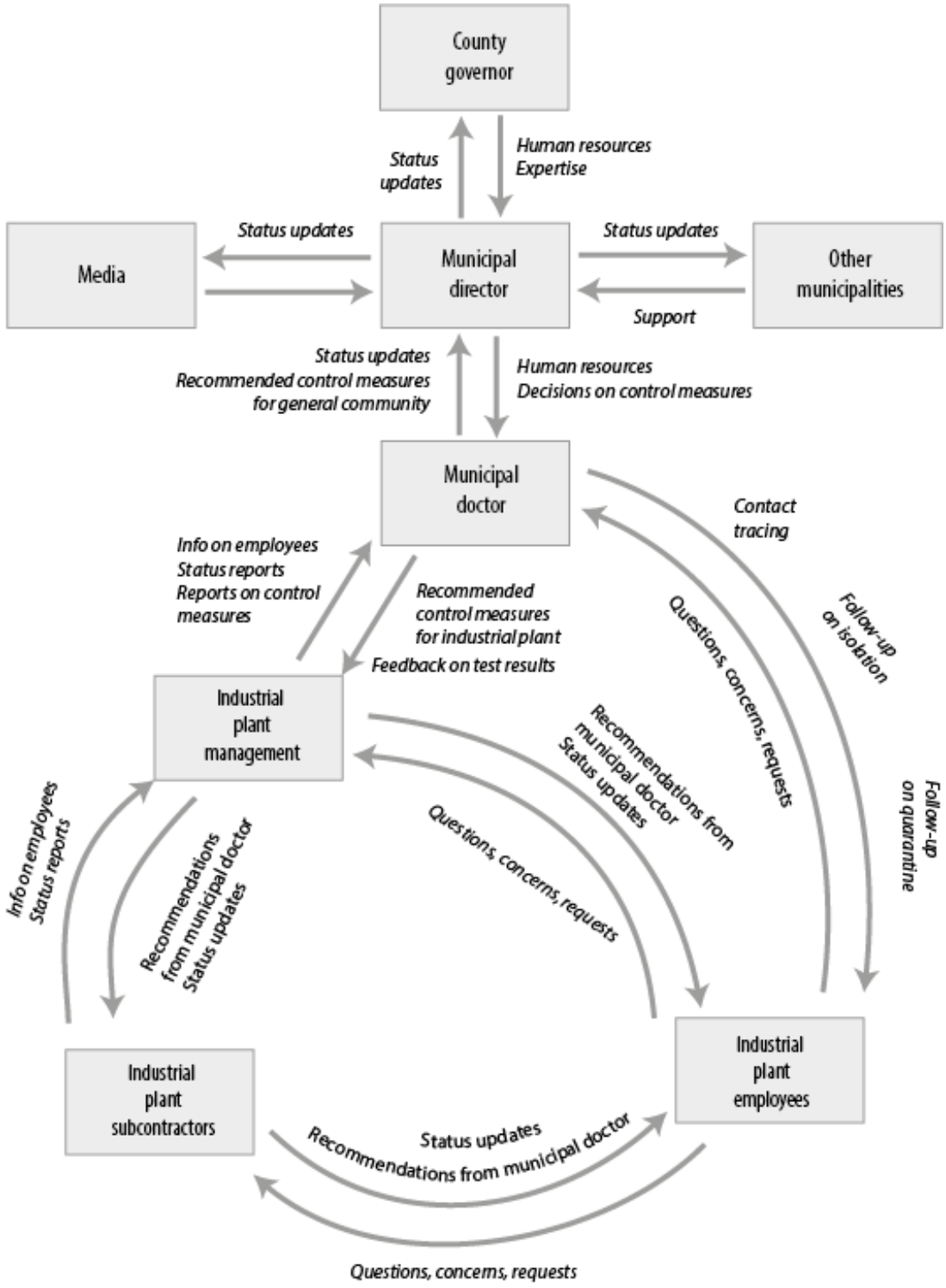


Figure 4. Information flowchart

Two weeks after the outbreak, the outbreak investigation team receives an email from the municipal doctor who has collaborated with the industrial plant management to track down the number of employees. She also sends the information on the employees' distribution by category as requested. This information allows you to fill out the below tables and calculate the attack rates. Remember that attack rates are expressed as a percentage *(number of cases/employees*100)*.

Q24. Complete the below tables.

a. How should these tables be interpreted?

b. Why is it important to have these tables?

Age (years)	Employees	Number of cases	Attack rate (%)
18-30	46		
30-39	88		
40-49	149		
50-59	98		
>60	33		
Missing	41		
TOTAL	455		

Nationality	Employees	Number of cases	Attack rate (%)
EU member state	109		
Country A	269		
Country B	37		
Other country	40		
TOTAL	455		

Residence	Employees	Number of cases	Attack rate (%)
Barrack 1	45		
Barrack 2	54		
Barrack 3	52		
Barrack 4	48		
Barrack 5	62		
Rented house 1	10		
Rented house 2	12		
Rented house 3	10		
Rented house 4	12		
Rented house 5	8		
Rented house 6	16		
Permenent	142		

TOTAL	455		

Table 6. Number of cases among plant employees by age.

Age (years)	Employees	Number of cases	% by category
18-29	46	6	**13 %**
30-39	88	15	**17 %**
40-49	149	39	**26 %**
50-59	98	17	**17 %**
>60	33	8	**24 %**
Missing	41	0	**0 %**
TOTAL	455	85	**19 %**

Table 7. Number of cases among plant employees by nationality.

Nationality	Employees	Number of cases	% by category
EU member state	109	3	**3 %**
Country A	269	66	**25 %**
Country B	37	13	**35 %**
Other country	40	3	**8 %**
TOTAL	455	85	**19 %**

Table 8. Number of cases among plant employees by place of residence before the outbreak.

Residence	Employees	Number of cases	% by category
Barrack 1	45	12	**27 %**
Barrack 2	54	30	**56 %**
Barrack 3	52	10	**19 %**
Barrack 4	48	7	**15 %**
Barrack 5	62	1	**2 %**
Rented house 1	10	10	**100 %**
Rented house 2	12	1	**8 %**
Rented house 3	10	3	**30 %**
Rented house 4	12	0	**0 %**
Rented house 5	8	0	**0 %**
Rented house 6	16	0	**0 %**
Permanent resident	142	1	**1 %**
Missing information	-	10	**N/A**
TOTAL	455	85	**19 %**

By having information on the number of employees and the number of cases for each age group, nationality and (temporary) place of residence, the municipal doctor and outbreak investigation team were able to pinpoint in which age group, nationality and (temporary) place of residence the attack rate of COVID-19 was highest during the outbreak. If they had been able to calculate this during the outbreak, they could have taken tailored and targeted control measures that would potentially have contained the outbreak earlier on.

For example, during the outbreak all the attention was directed to the largest group of foreign workers from Country A, having most of reported cases. This belief that infection spreads only in one group, lead to focusing control measures on this group, which also suffered most stigmatization. However, when the number of cases was placed in the context of how numerous particular groups were (Table 7), the municipal doctor saw that the higher risk was observed in temporary workers from country B. A possible explanation for this would be that there were more interactions within this group and lower compliance with recommended control measures. Knowing this at the beginning of the outbreak could help in better directing response and communication. Similarly, knowing more about the age and residence of the affected population, could help in faster and more targeted response.

On the last evening of their stay in this small municipality, the outbreak investigation team debriefed and recorded the main lessons learned from the COVID-19 outbreak in this small municipality:

P : Prepared municipality can react faster and more efficiently

R : Response can start faster if key actors are identified in advance

E : Each actor must have a defined contact person, role and responsibilities

P : Preparedness plan includes mapping vulnerable populations

A : Analysis of risk is possible if data on vulnerable population is ready in advance

R : Response is effective if communication is effective

E : Epidemiological data warrants an evidence-based response

Q25. What were the main learning points from the case study and key take-away messages about effectively managing a disease outbreak?

PART V. EPILOGUE

Six weeks after the first outbreak, and four weeks after closing the outbreak investigation, a new COVID-19 outbreak occurred in the same industry plant. The plant has opened again, and new groups of foreign workers came from their home countries to work at the plant. This time all the stakeholders were better prepared and managed to respond faster. This resulted in a smaller outbreak involving approximately 20 cases among quarantined group travelling from abroad. The outbreak did not affect other groups of workers and permanent residents. This shows that the municipality and the employer has developed better routines in terms of isolating and quarantining workers coming from abroad. However, the employer could improve compliance of foreign workers with the quarantine rules. This example shows that preparing for the crisis is a continuous process. Municipalities should learn from each new crisis how to further improve their preparedness planning. One could say that the more outbreaks a municipality will experience, the better it will be prepared.