

TECHNICAL REPORT

Community and institutional public health emergency preparedness synergies – enablers and barriers

Case studies on acute gastroenteritis in two EU/EEA Member States

ECDC TECHNICAL REPORT

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Authors

John Kinsman, Daniel de Vries, Lianne Cremers, Mariana Rios

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Abbreviations

CIDR	Communicable Infectious Disease Reporting System
ECDC	European Centre for Disease Prevention and Control
ECI	Early Childhood Ireland
<i>E. coli</i>	<i>Escherichia coli</i>
EPIS	Epidemic Intelligence Information System
EWRS	Early Warning and Response System
HPSC	Health Protection Surveillance Centre
HSE	Health Service Executive
HUS	Haemolytic Uraemic Syndrome
IHR	International Health Regulations
JRCC	Joint Rescue and Coordination Centre
NCCC	National Crisis Coordination Centre
NCIP	National Commissioner of the Icelandic Police
NFP	National Focal Point
NRL	National Reference Laboratory
PPE	Personal Protective Equipment
RCCC	Regional Crisis Coordination Centre
RUV	Icelandic National Public Broadcasting Service (Ríkisútvarpið)
SOP	Standard operating procedure
VTEC	Verocytotoxin-producing <i>Escherichia coli</i>

Executive summary

Introduction

Within the context of EU Decision 1082/2013/EU on serious cross-border threats to health, the European Centre for Disease Prevention and Control (ECDC) has initiated a case study project to investigate the synergies between communities affected by serious public health threats and the institutions (both health- and non-health-related) that are mandated to prepare for and respond to them. The premise for the project is that affected communities are increasingly recognised as key resources that can be utilised during public health emergencies, and that the concerns and experiences of ordinary people should be harnessed as an important part of the response.

The aim of this qualitative case study project is to identify lessons learned in relation to community preparedness for outbreaks of acute gastroenteritis. Two EU/EEA countries, Iceland and Ireland, were selected for inclusion in the case study project. Work in Iceland focused on an outbreak of norovirus that emerged during an international scouting event in August 2017. In Ireland, the case study examined verocytotoxin-producing *Escherichia coli* (VTEC) as a wider public health issue, but also with a particular focus on a single outbreak that occurred at a childcare facility in mid-2018.

Specifically, the study aims to:

- identify lessons learned in terms of cooperation patterns between affected communities and the official institutions mandated to address outbreaks of acute gastroenteritis;
- identify inter-sectoral collaboration between health and non-health-related sectors and community-institutional synergies with regard to outbreaks of acute gastroenteritis.

Methods

A comparative case study approach was taken for this project which, in both Iceland and Ireland, was based on four qualitative sources of evidence: documents; interviews and focus group discussions with community representatives and with a range of technical experts working at national and regional level; and a stakeholder mapping exercise. Field work was conducted during a visit to Iceland by the research team from 1–5 October 2018; and to Ireland during the week of 26–30 November 2018. A total of 78 people took part in the interviews and focus group discussions; 38 in Iceland and 40 in Ireland. The data were subjected to thematic analysis, with the themes being based on a theoretical preparedness cycle that includes pre-incident, incident, and post-incident phases.

Definitions

Some of the key terms used in this document are defined below.

- 'Community' refers here to the populations that have been directly affected or may have been at risk from the disease in question. The 'community' is seen as distinct from the governmental authorities who are tasked with addressing the disease outbreak response.
- 'Community engagement' describes the 'direct or indirect process of involving communities or their networks in decision making and/or in the planning, design, governance and delivery of services, using methods of consultation, collaboration and/or community control' [8].
- 'Synergy' refers to the added value that derives from the process and outcome of two or more stakeholders or sets of stakeholders working together towards a common goal. The stakeholders could be either from the community, or they could be institutional. Any synergy that arises through their collaboration can be seen as something that is greater than the sum of its parts. In other words, the benefits gained through working together are more than either could have achieved alone, and these benefits are, most probably, also mutually shared.
- 'Public health emergency preparedness' is defined as the 'capability of the public health and healthcare systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities. Preparedness involves a coordinated and continuous process of planning and implementation that relies on measuring performance and taking corrective action' [9].

Findings

The main findings from Iceland and Ireland are presented below. The results of the stakeholder mapping exercise are followed by the rest of the material, which is framed within the preparedness cycle described above, including the pre-incident, incident and post-incident phases.

Stakeholder mapping

The stakeholder map for Iceland shows the extent to which the response to the norovirus outbreak was community-led. In contrast, institutional stakeholders dominate the picture in Ireland, with the community appearing to have played a significantly smaller role than that of the authorities.

Pre-incident phase

The following issues are presented as pre-existing contextual issues that could affect the way an outbreak emerges and may also frame the response.

- Cross-border issues: Both Iceland and Ireland are small island states, though Ireland shares a land border with the UK through Northern Ireland. In Iceland, the rise of mass tourism has required disaster preparedness to take on an international dimension. In Ireland, collaboration with UK colleagues is reportedly so routine that the Early Warning and Response System (EWRS) and International Health Regulations (IHR) are rarely, if ever, used in minor outbreak situations.
- Health sector and inter-sectoral collaboration: Collaboration within the health sectors of both countries (both public health and healthcare services) was reported to be strong, at least in part because they are both small countries, so people have developed long-standing professional relationships over many years of working together. Inter-sectoral connections have been made between most of the key institutions, but these are reportedly not always as effective as they could be.
- Existing knowledge and experience of gastro-enteric diseases: Knowledge of the required control measures for the two diseases among the relevant institutional stakeholders in the participating countries – such as the Ministry of Health and the regional public health authorities – appeared to be comprehensive. The Irish authorities in particular were very experienced in dealing with VTEC, while norovirus in Iceland was well known among hospital- and clinic-based health workers. However, community knowledge of the two diseases is limited in both countries.
- Availability of protocols and preparedness plans: Protocols and preparedness plans exist for a wide range of disease and natural disaster emergencies in Iceland, but, since the country is not seen to be at high risk of a major outbreak of gastroenteritis, plans specific to these diseases are not available. By contrast, VTEC-specific protocols do exist in Ireland, where the disease is a well-recognised public health problem.

Incident phase

- Use of protocols: the responses to the two outbreaks were very different, insofar as the Icelandic norovirus event was entirely unexpected and fast-moving, while VTEC in Ireland is a familiar challenge for the public health authorities, requiring rapid action. In Ireland, VTEC-specific protocols are closely followed. A generic all-hazards approach was taken in Iceland.
- Engagement of affected communities in response activities: there was considerable community support in the responses to both outbreaks. In Iceland, a surprising outbreak led community-based organisations to shoulder considerable responsibility for the response. In Ireland, people worked fast to support the deep cleaning that was required prior to re-opening the crèche.
- Communications and the media: communication strategies in both countries followed the broad principles of openness and accuracy.
- Logistical issues: essential supplies, such as personal protective equipment and sample pots, were not always available when and where needed. Challenges were also noted with the systems for finding suitable accommodation for the large numbers of patients who appeared within hours (Iceland), and perceived delays in receiving laboratory results (Ireland).
- Financial issues: financial losses were incurred by community-based stakeholders – both organisational and individual – during both outbreaks. Calls were made for appropriate compensation from the authorities.

Post-incident phase

Post-event evaluations: institutional post-event evaluations were conducted in both Iceland and Ireland.

Lessons learned

Through this study, a set of 10 lessons learned were identified by one or more of our interviewees, and as such they represent the perspectives of community members and experts involved in the two case studies. This could facilitate the promotion of collaboration and synergies between authorities and communities. Some have been tackled in one or both of the participating countries, but all of them are presented here as issues that need further attention in both countries. It is also hoped that they can be taken into consideration by other EU/EEA Member States, both for outbreaks of acute gastroenteritis and for other public health threats. The target audience for the first eight lessons learned on the list is public health authorities. The ninth and tenth lessons learned are relevant for scientific research funding bodies and those ministries with responsibility for providing social security support for people in need.

1. Recognise the community as a partner in outbreak preparedness and response. Our respondents revealed that community-based actors want their voices to be heard in the outbreak preparedness and response process, and they want to be seen by the authorities as partners.
2. Participatory engagement with community-based actors. Pre-incident engagement of community-based actors in the development of preparedness plans can facilitate positive collaboration with the authorities during an outbreak. An essential pre-requisite for this work is a comprehensive stakeholder mapping exercise.
3. Maintenance of registers for vulnerable groups. It is important to stimulate a sense of shared responsibility for both authorities and community actors in relation to the establishment and maintenance of registers – which would include people’s contact details – of vulnerable and at-risk groups for a given health threat.
4. Training. As partners in response activities, community-based actors – identified on the basis of their specific leadership or professional capacities – need to be included in training on how to respond to a public health crisis.
5. Logistics and equipment. Ongoing provision of necessary equipment for community-based actors affected by an outbreak (e.g. sample pots and protective gear, as in the cases under discussion) and key information can be important for maintaining good relationships, especially if the outbreak continues for an extended period.
6. Recognise the difference between natural disasters and infectious disease outbreaks when using an all-hazards approach. Although the all-hazards approach is an efficient means of planning for unexpected threats, there are important differences in perception and process when addressing natural disasters as opposed to infectious disease outbreaks.
7. Conduct and act upon the findings from evaluations of the responses to previous outbreaks. The lessons learned from public health events should be documented through ‘after-action reviews’, hot debriefs, or more comprehensive evaluations, and archived so that they are accessible to any stakeholders – both institutional and community-based – who may subsequently need to use them.
8. Optimise risk communication activities with communities affected by outbreaks. Community-based actors need to be well informed about an epidemic and the official response if they are to be properly equipped to prepare for, respond to, and recover from an outbreak.
9. Funding for research. Support from funding agencies for scientific and/or operational research on aspects of infectious disease threats that relate specifically to issues relevant at community level could enhance adherence to public health measures during an outbreak.
10. Financial compensation. The development and implementation of clear, operational protocols to use social security compensation funds to cover expenses incurred by communities affected by infectious disease outbreaks could have significant and positive public health benefits.

1. Introduction

EU Decision 1082/2013 on serious cross-border health threats provides a legal basis for collaboration and information exchange between EU Member States, and between European and international institutions on preparedness planning, prevention, and mitigation in the event of a public health emergency. The Decision pays specific attention to arrangements for ensuring interoperability between the health sector and other sectors identified as critical in the event of a public health emergency [1].

As part of the process of increasing inter-sectoral preparedness for serious cross-border public health threats, the European Centre for Disease Prevention and Control (ECDC) initiated a case study project to investigate the synergies between communities affected by serious public health threats and the institutions (both health- and non-health-related) mandated to prepare for and respond to them. The premise for the project is that affected communities are increasingly recognised as key resources that can be used during public health emergencies (this was one of the major lessons learned from the West African Ebola outbreak of 2014–16). Moreover, the concerns and experiences of ordinary people should be harnessed as an important part of the response [2]. Similarly, it is important to understand how institutions in the health and relevant non-health sectors can collaborate in such community-oriented work.

Two EU/EEA countries, Iceland and Ireland, were selected for inclusion in the case study project, in agreement with ECDC and the authorities in the countries concerned. Outbreaks of acute gastroenteritis have recently been reported in both countries, two of which were the focus of the work. In Iceland, investigations focused on an outbreak of norovirus that emerged during an international scouting event in the south of the country, in August 2017. In Ireland, our case study examined verocytotoxin-producing *Escherichia coli* (VTEC) as a wider public health issue, but also with a particular focus on a single outbreak that occurred in a childcare facility in mid-2018.

These two case studies complement similar work conducted in 2017 in Spain [3,4] and in the Netherlands [4,5], on community engagement for emerging tick-borne diseases.

2. Aims and objectives

The main aim of the case studies is to identify enablers and barriers for community and institutional synergies, including those in the health and relevant non-health sectors, related to preparedness and control of infectious diseases. The work also aims to support the implementation of EU Decision 1082/2013/EU on serious cross-border health threats [1].

Specifically, the studies aim to:

- identify which practices and patterns of cooperation between affected communities and the official institutions mandated to address health threats have worked well, and which have not;
- identify and analyse inter-sectoral collaboration as well as community-institutional synergies, and to provide examples of collaborative efforts between health and non-health-related sectors.

It is hoped that the case studies will directly benefit the participating countries, by raising awareness among important stakeholders of the need for inter-sectoral collaboration and the development of community-institutional synergies, and by providing a situational analysis of community resources for infectious disease outbreak preparedness, and indicating areas that may need additional attention. They will also help identify lessons learned, which in turn will support the strengthening of inter-sectoral and community-institutional collaboration. Moreover, the lessons learned will be shared among other EU Member States, who may also benefit from this process.

3. Methods

3.1 Study design and participants

A case study approach was taken for this project, based on a variety of qualitative evidence sources. In both Iceland and the Ireland, these included documents; semi-structured qualitative interviews and focus group discussions (with a range of experts working at national and regional level, from both the health and non-health sectors and with representatives of affected communities) and a stakeholder mapping exercise.

Field work was conducted when the research team visited Iceland during the period 1–5 October 2018, and when they visited Ireland during the period 26–30 November 2018. In each country, a research team visited the study areas, including two anthropologists and two or three ECDC experts. In addition, the National Focal Point for Preparedness or their delegate joined most of the interviews and focus groups.

Potential interview and focus group discussion participant categories were discussed and agreed in close collaboration with ECDC, the Icelandic counterparts (based at the Directorate of Health's Division of Health Security and Communicable Disease Control) and the Irish counterparts (based at the Health Protection Surveillance Centre, HPSC). Recruitment of respondents and organisation of the schedule was facilitated through the national counterparts. Respondents were selected from each respondent category using convenience sampling, and discussed with ECDC before finalisation. Table 1 presents the list of the respondent categories for those met.

Table 1. Respondent categories for the two case studies

	Iceland	Ireland
National level	<ul style="list-style-type: none"> • Directorate of Health Division of Health Security and Communicable Disease Control • National Red Cross of Iceland • National civil protection • Environmental and public health authorities of South Iceland 	<ul style="list-style-type: none"> • Health Services Executive • National Public Health Veterinary Laboratory • National Public Health Laboratory • Early Childhood Ireland (civil society organisation supporting crèches) • Health Protection Surveillance Centre <ul style="list-style-type: none"> ○ Gastro-zoonotic and vector-borne disease team ○ Communications ○ Infection Prevention and Control
Regional level	<ul style="list-style-type: none"> • Civil Protection Municipality • Red Cross South Iceland • Police/Civil Protection South Iceland • Healthcare Institution of Iceland (service provider) • Fire Department South Iceland 	<ul style="list-style-type: none"> • Regional Department of Public Health, VTEC-affected region
Community level	<ul style="list-style-type: none"> • University Hospital • Hotel at Hveragerdi • Hveragerdi Primary School parents • Hveragerdi Primary School • Municipality Hveragerdi • ICE-Search and Rescue • University of Iceland • Red Cross Selfoss • Úlfjótuvatn Outdoor and Scout Centre • Icelandic Boy and Girl Scout Association 	<ul style="list-style-type: none"> • Staff and owner of affected childcare facility • Parents

3.2 Data collection

Documents

A documentary review and analysis were conducted. The documents were provided by the Irish and Icelandic NFPs and supplemented by material online, where available, and in peer-reviewed literature. The documentary review sought to identify:

- policies concerning the prevention of acute gastroenteritis, including those relating to community engagement;
- reports concerning challenges faced in preventing, diagnosing (clinically and in the laboratory), and treating acute gastroenteritis;
- lessons learned from any simulation or training exercises on acute gastroenteritis that may have been held in the last five years (both national and international), as well as from actual cases and events in the two countries.

Additional documentary materials were collected from the interviewees and focus group discussion participants during both country visits. Note that all VTEC outbreak reports from Ireland are confidential internal documents (i.e. for the Regional Department of Health that produced them, or for other relevant stakeholders within the Health Services Executive), and we cannot therefore name or refer to them directly in this report.

Interviews and focus groups

An initial set of questions for the qualitative, semi-structured interviews and for the focus group discussions was derived from a literature review that had been conducted for ECDC during an earlier phase of this community engagement project [2]. The questions were arranged according to the preparedness cycle phases – pre-incident, incident and post-incident [6,7] – and then adapted according to comments received from the Icelandic and Irish counterparts. Within this framework [6,7], the pre-incident phase involves preparation; the incident phase involves management, monitoring, investigation and intervention; and the post-incident phase involves recovery and identifying lessons learned. In order to facilitate the interview and the focus group discussion process, the questions, which had been developed in English, were translated into Icelandic (for the Iceland interviewees), and sent to the participants in advance to enable them to prepare. The final version of the questionnaires is presented in Annex 2 and the number of participants from the different levels (i.e. national, regional, and community) are set out in Table 2.

The questions were designed to be broadly relevant to all interviewee categories, but the focus of the questioning varied according to the position and particular expertise and experience of each individual interviewee or focus group. All interviews and focus group discussions were conducted in English language, face-to-face, except for four interviews in Ireland which were conducted by phone for logistical reasons. Extensive notes were taken during interviews and focus groups, which were cleaned and checked on the day of data collection. These notes provide the basis for the material presented below.

Table 2. Number of focus groups and interviews (including number of participants)*

	Focus groups (number of participants)	Interviews (number of participants)	Total number of participants
ICELAND			
National level	1 (8)	4 (6)	14
Regional level	1 (7)	3 (3)	10
Community level	2 (8)	5 (6)	14
Total number of participants	23	15	38
IRELAND			
National level (institutional)	0	7(11)	11
Regional level	1 (10)	0	10
Community	2 (15)	4 (4)	19
Total number of participants	25	15	40
Total for both countries	7 (48)	23 (30)	78

* Six people in Iceland participated in both focus group discussions and interviews.

Stakeholder mapping

All interview and focus group participants (with the exception of those whose interviews were conducted by phone) were invited to contribute to our stakeholder mapping exercise. At the start of each interview and focus group, we asked the participants to draw on a blank piece of paper all the different stakeholders and/or interest groups – both community-based and institutional – that they were aware of who had previously been engaged in the norovirus or VTEC outbreak events, respectively. In addition to identifying stakeholders who we may not previously have been aware of, this exercise also provided respondents with the opportunity to add points to the discussion that *they* felt were important, thereby providing an invaluable supplement to the pre-defined questions that we wanted to ask. Collectively, the exercise also offered us the opportunity to develop a snapshot overview of the social network of stakeholders engaged in the responses to norovirus in Iceland and VTEC in Ireland [2].

3.3 Ethical considerations

An informant consent process was developed in collaboration with ECDC and reviewed by the local ECDC focal points for preparedness and response. Written informed consent was obtained from all interviewees and focus group participants, except for those interviewed by phone, who gave verbal informed consent.

3.4 Data analysis

Notes from the interviews and focus group discussions were subjected to thematic analysis, using NVivo qualitative data software. A set of pre-defined codes was used as a starting point, based on the questions from the interviews and the preparedness cycle framework (e.g. health sector and inter-sectoral collaborations during the pre-incident phase; communications during the incident phase; and after-action reviews during the post-incident phase), with additional codes included as they emerged inductively. Stakeholder maps were collected and their data compiled into UCINET software, with symmetry forced into the matrix. Two individual country reports were produced as a result of this process.

In January 2019, the research team then held a workshop in Amsterdam, at which the lessons learned set out in the two individual country reports were discussed in depth. A synthesis of this material was conducted in an effort to produce a generic set of lessons learned that could apply to gastro-enteric diseases within the EU more broadly. Ten topics emerged through this process, and these are presented in Section 5 below, along with supporting details for each.

4. Findings

The main collective findings from Iceland and Ireland are presented below. The findings from the stakeholder mapping exercise are followed by the rest of the material which is framed within the preparedness cycle described above, with pre-incident, incident and post-incident phases. Full details of all the findings are given in the individual country reports.

4.1 Stakeholder mapping

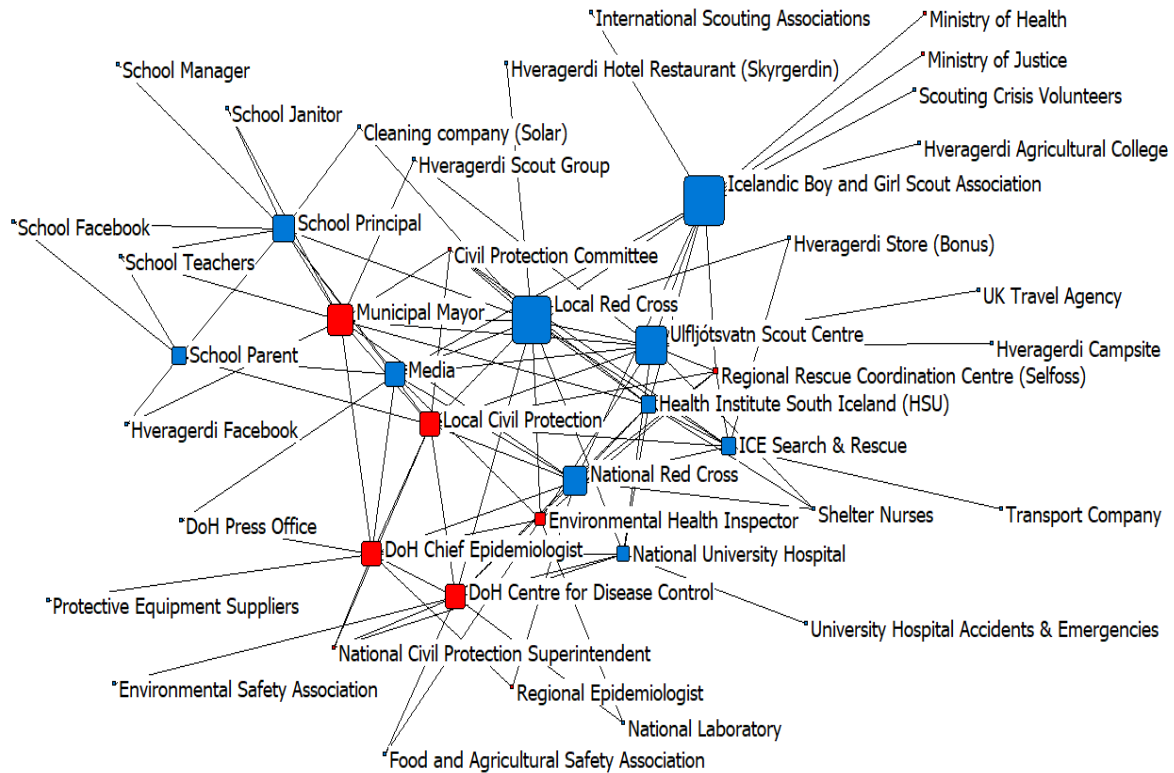
Figures 1 and 2 present the products of the stakeholder mapping exercise for the two countries. The red squares represent authorities, and the blue squares represent community-based stakeholders. Those with larger squares have a greater role as 'brokers' of information and thereby as agents of outbreak control than those with smaller squares. Brokerage ('betweenness') measures how much an actor (node) connects other actors who otherwise would not be connected. If brokers are removed, parts of the network would become disconnected [10]. Note that the stakeholder maps relate mainly to the response phase as opposed to the pre- and post-incident phases.

Overall, the stakeholder map for Iceland shows the extent to which the response to the norovirus outbreak was community-led. The local Red Cross, Úlfjótsvatn Outdoor & Scout Centre, and the Icelandic Boy and Girl Scout Association played the most important roles in linking up stakeholders: these community-based actors provided important linkages to other actors who otherwise might not have been connected to the flow of information. In particular, the Icelandic Boy and Girl Scout Association had many interactions with groups from outside the response, which resulted largely from their inquiries into how to receive compensation for their costs incurred during the response. On the authorities' side, the municipal mayor appears to be the largest broker, but the relative disconnectedness of the regional epidemiologist (who was on leave at the time) was also observed. Although this can be partially explained by their absence as a respondent in the study, the social network also reflects the extent to which other stakeholders mentioned – or did not mention – an actor as being relevant in their response communications.

In contrast to the Icelandic network, institutional stakeholders dominate the picture in Ireland, with the community appearing to have a significantly smaller role than the authorities. The major institutional stakeholders are the Health Surveillance Protection Centre in Dublin (more specifically its Gastro-Zoonotic Vector-Borne Disease Unit) and, to a lesser extent, the Infection Prevention and Control team and the Outbreak Control Team at regional level. The major community-based stakeholders are the affected crèche (i.e. the owner and staff) and the parents of children attending the crèche.

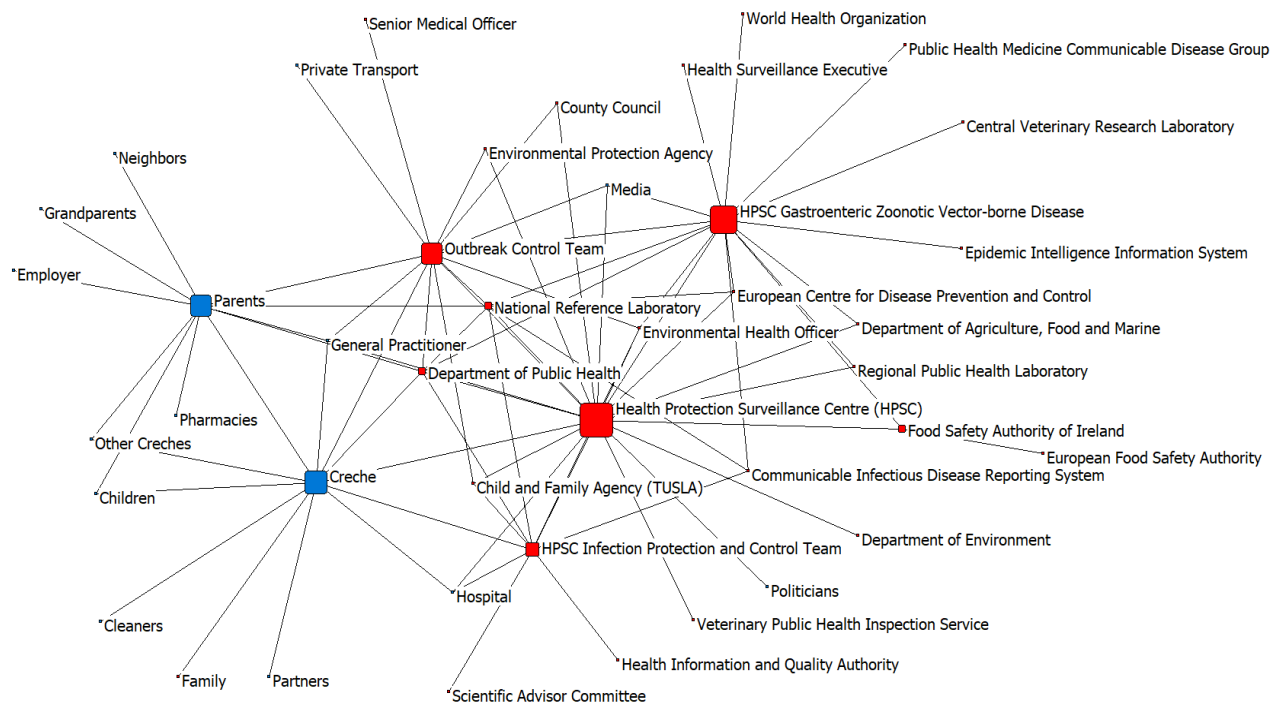
One reason for the differences between the two countries in this regard could be that the norovirus outbreak in Iceland was essentially a one-off crisis, and it was completely unexpected. As such, the authorities were not fully prepared in advance, and therefore the community played a very significant role, as in emergency situations where survivors or bystanders at a disaster help the victims before the first responders arrive. In contrast, VTEC outbreaks are a recognised public health issue in Ireland, and the authorities therefore have a standardised, well-practised, and more prominent role to play in response activities.

Figure 1. Social network of stakeholders mapped in the Icelandic norovirus outbreak



red = authorities, blue = community-based stakeholders, size = brokerage

Figure 2. Stakeholder mapping of VTEC outbreaks in crèches, Ireland



red = authorities, blue = community-based stakeholders, size = brokerage

4.2 Pre-incident phase

Cross-border issues

As with all EU/EEA Member States, Iceland and Ireland are connected to ECDC's Early Warning and Response System (EWRS), and also to the Epidemic Intelligence Information System (EPIS), which is a platform used for the voluntary exchange of expert opinions. They are, of course, also signatory to the WHO International Health Regulations [11], and to EU Decision 1082 on cross-border health threats [1]. Another significant factor with regard to infectious diseases is that both are island states, though Ireland shares a land border with the UK through Northern Ireland. With respect to the norovirus outbreak in Iceland, international youth were involved and they needed appropriate shelter and evacuation which had to be organised through their Icelandic host. This placed substantial pressure on the Icelandic Boy and Girl Scouting Association, who had to manage communications with predominantly US and UK international partners. In Ireland, since VTEC outbreaks may emerge near the Northern Irish border, UK authorities are sometimes involved in the response – and vice versa, when an outbreak emerges near the border on the northern side.

Health sector collaboration

Collaboration within the health sectors (both public health and healthcare services) in both Iceland and Ireland was reported to be strong, partly because they are both small countries, and so people have developed longstanding professional relationships over many years of working together. Within the Icelandic Directorate of Health, the Chief Epidemiologist keeps in regular contact with regional epidemiologists through face-to-face meetings, e-mail exchange and regular teleconferences to discuss lessons on outbreaks, and to provide training on outbreak investigation. In Ireland, all the main health sector stakeholders reported strong collaboration before, during, and after a VTEC outbreak. These stakeholders included the Health Protection Surveillance Centre (HPSC), the regional public health departments, the VTEC National Reference Laboratory at Cherry Orchard, and potentially affected general hospitals.

Inter-sectoral collaboration

Inter-sectoral connections have been made between most of the key institutions, but these are not always as effective as they could be. In Iceland, response activities are embedded within an all-hazards framework, which integrates civil protection and health services at both national and community levels. As a result, very strong ties exist between the Directorate of Health and the civil protection authorities, and there is a clear legal basis outlining how and what to do in response to a health threat. However, according to our study participants, there are different organisational hierarchies within which different ministries operate, which is not always conducive to ensuring a coordinated response. In Ireland, two major non-health sectors were discussed by our respondents in relation to VTEC: agriculture, and child protection & safety. Personal relationships between high-level stakeholders in agriculture and public health have historically been good, but the respondents considered that the power differentials between the two sectors are not in favour of public health. Several respondents indicated that other healthcare sectors responsible for improving well-being and outcomes for children – may not prioritise infectious diseases such as VTEC, as there are other competing priorities and thus, according to our respondents, there is a gap in policy and practice in this important area.

Existing knowledge and experience of gastro-enteric diseases

Knowledge of the required control measures for the two diseases among the relevant institutional stakeholders in the participating countries – such as the Ministry of Health and the regional public health authorities – appeared to be comprehensive: the Irish authorities in particular were very experienced in dealing with VTEC, while norovirus in Iceland was well known among hospital- and clinic-based health workers. However, community knowledge of the two diseases is limited in both countries.

Availability of protocols and preparedness plans

Protocols and preparedness plans exist for a wide range of disease and natural disaster emergencies in Iceland, but since the country is not seen to be at high risk of a major outbreak of gastroenteritis, plans specific to these diseases are not available. In the southern part of the country, efforts have been made to improve community participation in long-term recovery planning at the municipal level, including stakeholder mapping, awareness weeks, public meetings and by using an all-hazards approach. In contrast, VTEC-specific protocols do exist in Ireland, but these do not always outline the need for the authorities to engage in a listening process or an active dialogue with the community.

4.3 Incident phase

Use of protocols

The responses to the two outbreaks were very different, insofar as the Icelandic norovirus event was entirely unexpected and fast-moving, while VTEC in Ireland is a more familiar challenge for the public health authorities. Protocols are closely followed with VTEC in Ireland: the regional Department of Public Health closed the crèche that was visited as part of the case study within hours of learning of the second case, and they initiated a comprehensive, pre-defined set of procedures. In Iceland, however, there was consensus after the event that the full civic response system should have been activated for this outbreak, which was initially perceived as a low-grade emergency.

Engagement of affected communities in response activities

There was considerable community support in the responses to both outbreaks. In Iceland, the community-based organisations that were involved were obliged – due to the surprise and speed with which the outbreak developed – to shoulder considerable responsibility for the response. While the response actors did manage collectively to control the spread of the disease, according to our respondents the efficiency and effectiveness of the response lacked coordination and a clear set of procedures. In the crèche that we visited in Ireland, there was strong community collaboration and support for the deep cleaning that was required prior to re-opening. It was in everyone's interest to work quickly and efficiently to get the building ready, and many local people gave their time and resources to facilitate this process.

Communications and the media

Communication strategies in both countries followed the broad principles of openness and accuracy. In Iceland, the national broadcaster, RUV, has a formalised relationship with the emergency response system whereby they are obliged to cover any public warnings on radio, TV and the internet; and indeed, all the main Icelandic newspapers and news broadcasters covered the norovirus outbreak throughout its five-day duration. Most media reports emphasised the authorities' plans for containment and disinfection, the speedy return of the scouts, first to the campsite and then to their home countries, and the negligible risks to the wider population due to the effective management of the situation. During VTEC outbreaks in Ireland, regional departments of public health follow a clear communications protocol, which includes using crèche owners as the intermediary between themselves and parents for the dissemination of information about VTEC, control measures, and updates on the outbreak. Media reports on VTEC outbreaks are uncommon, since these occur on a regular basis and are not usually considered to be especially newsworthy.

Logistical issues

Challenges were noted with the systems for deciding upon suitable accommodation for the large numbers of patients who appeared within hours (Iceland), and the perceived delays in receiving laboratory results (Ireland). The parents of some children who had extended VTEC infection in Ireland also faced difficulties in accessing stool sample pots, which were needed for their children to be tested in order to receive clearance to return to the crèche.

Financial issues

Financial losses were incurred by community-based stakeholders – both organisational and individual – during both outbreaks. In Iceland, the costs were associated with the disinfection cleaning of the school where patients were temporarily housed, and the scout centre. There was also loss of income due to the closure of the scout centre. Since the outbreak was never formally declared an emergency, the Red Cross and the scout centre, rather than the national treasury, had to cover the costs of the cleaning. In Ireland, the crèche itself lost income as a result of the enforced closure, as well as the costs incurred through the deep cleaning of the premises. Moreover, parents were obliged to take time off work to care for their infected children, thus losing income. This was especially challenging for the parents of children with longer-term infections. Calls were made for appropriate compensation from the authorities.

4.4 Post-incident phase

Post-event evaluations

Institutional post-event evaluations were conducted in both Iceland and Ireland. In Iceland, the unusual nature and scale of the norovirus outbreak prompted post-event evaluations among all the key institutional stakeholders, while both the scouting organisations involved and the Red Cross conducted internal evaluations. In Ireland, regional departments of public health are obliged to produce a formal report for VTEC outbreaks. However, these have a relatively limited focus on the community engagement activities that are conducted by health protection nurses in affected crèches, for example.

5. Lessons learned

The lessons learned presented below were identified by one or more of our interviewees, and as such they represent the perspectives of community members and experts involved in the two case studies. Some have been partially implemented in one or both of the participating countries, but all of them are presented as issues that need further attention in both countries. It is also hoped that they can be taken into consideration by other EU/EEA Member States, both for outbreaks of acute gastroenteritis and for other public health threats.

Unless otherwise specified, the target audience for these lessons learned is the public health authorities, both at national and regional level. Note that the list is not presented in any perceived order of importance.

Recognise the community as a partner in outbreak preparedness and response

According to our respondents, community-based actors want their voices to be heard in the outbreak preparedness and response process, and they want to be seen by the authorities as genuine partners: a feeling of disconnection was reported by some of the community respondents in these case studies. By keeping this principle of community partnership at the core of their thinking and actions, public health authorities may facilitate the prevention or softening of emotional and financial grievances that can arise within communities during and/or after an outbreak; and this in turn can facilitate fuller community engagement in outbreak response and recovery activities.

Participatory engagement with community-based actors

Positive collaboration during an outbreak between community-based actors and authorities is more likely if community members have been actively engaged in the development of preparedness plans during the pre-incident phase. This pre-incident work includes, but is not restricted to the mapping of stakeholders, vulnerable populations, potential diseases, available resources, appropriate communication protocols, and training needs. In order to ensure that longer-term concerns are addressed, it is also important to involve community-based actors in identifying needs and priorities during the post-incident phase of an infectious disease outbreak. This would require ongoing stakeholder mapping efforts to ensure that all relevant groups and individuals are included.

Maintenance of registers for vulnerable groups

The stimulation of a shared sense of responsibility for both authorities and community actors (such as crèches and scouting organisations) regarding the establishment and maintenance of registers (if these registers do not already exist) for vulnerable and at-risk groups in the event of health threat appeared desirable. Since the specific health threats will vary between epidemiological contexts, they could be prioritised by the national and/or regional public health authorities through a risk assessment exercise. The authorities could consider including peoples' contact details in the registers, along with additional information that may be necessary for the authorities to reach them during a public health event. GDPR should, of course, be taken fully into consideration in any such process.

Training

As partners in response activities, community-based actors – identified on the basis of their specific leadership or professional capacities – need to be included in training on how to respond to a public health crisis. Training could be conducted on a routine basis, but also as refresher courses. Health workers also need to be well informed in order to provide consistent advice to the community. Furthermore, regional authorities and community-based volunteers require easy access to training materials and guidance on the use of personal protective equipment (PPE), routes of transmission and protective measures. For example, this could include publicly available video-based instructions on using PPE and cleaning, and lists of competent (or certified) companies that can clean premises contaminated during an outbreak. The provision of simulation exercises is particularly useful when there is little historical experience with outbreaks, and these should ideally include community stakeholders as response partners. Finally, response training on how to deal with more than one incident at the same time should be considered.

Logistics and equipment

Three major issues have been identified by the respondents with regard to logistics and equipment for use both by local authorities and by community-based partners who may be engaged in the response to a public health threat. First, it is important to distribute personal protective equipment (PPE) both centrally and through local response networks, particularly when there are large distances involved. Second, ongoing provision for affected community-based actors of sample pots, protective gear and supporting information can be important for maintaining well-functioning relationships, especially if the outbreak continues for an extended period. Third, in the event that regular staff are unavailable to respond to an outbreak, replacement staff should always be provided with clear written instructions as well as ongoing access to reliable information and advice from pre-defined experts at national or regional level.

If using an all hazards approach, recognise the special character of infectious disease outbreaks, and act accordingly

The all-hazards approach is efficient and allows for response structures with limited staffing to deal with unexpected threats. Furthermore, this approach can link community-based stakeholders (e.g. in the tourist sector) to the generic preparedness process. However, while there are several core principles that are shared between the responses to infectious disease outbreaks and those of other emergency events – such as the possible tension

between population and individual rights, and the need at all times for the authorities to listen to community needs and to show respect – there are also important differences in perception and process. For example, decisions to activate response systems are more difficult to make during relatively small outbreaks than during natural disasters. Furthermore, a shelter designated for use during natural disasters may not be appropriate for an infectious disease outbreak: in an outbreak scenario there can be complications regarding cleaning and a fear of lingering contamination. Local authorities therefore need to be engaged, in advance of an outbreak, in decision-making regarding the most suitable places for disease outbreak control quarantine shelters.

Conduct and act upon the findings from evaluations of the responses to previous outbreaks

Ongoing efforts should be made to ensure that the lessons learned from public health events are documented through 'after-action reviews', hot debriefs, or more comprehensive evaluations, and archived accessibly for any stakeholders – both institutional and community-based – who may subsequently need to use them. Part of this process should include specific references in any reports to community engagement activities that have been undertaken during outbreaks, such as details on meetings, activities relating to samples, and the provision of information to community-based actors. Such activities would promote formal recognition of the importance of community-based partners in a response. In addition, a synthesis of the recommendations from previous outbreak reports along with an active dissemination process to the relevant authorities and other stakeholders could help to ensure that the lessons learned from previous experiences are remembered, referenced and acted upon.

Optimise communications with communities affected by outbreaks

In order to ensure that community-based actors are properly equipped to prepare for, respond to, and recover from disease outbreaks, they need to be informed about many aspects of the disease in question, as well as the official response to it. The three communications issues below were identified by our respondents as potentially valuable here.

- Despite the inevitable resource limitations, efforts should be made to maximise the number of face-to-face meetings between the public health authorities and affected communities during an outbreak. The dialogue may provide an opportunity to learn about and dispel any rumours that are circulating and learn about any community concerns regarding the outbreak and the response, while also providing a channel for distribution of prevention messages during an outbreak.
- Provide community members with an estimated timeframe for the outbreak, if possible and aspects of the response, based on previous knowledge and experience. Even if it is understood that an outbreak situation is inherently open-ended, people need to have some information or guidance – however uncertain this may be – to assist with their own planning.
- Facilitate the production – with involvement of civil society organisations, if appropriate – of guidance documents for communities that may be affected by outbreaks. Such documents could include a checklist or set of standard operating procedures that indicate what communities may expect to happen over the course of an outbreak; an estimated timeframe for the outbreak (given the proviso explained in (b) above); who they should contact and under what circumstances; and what other activities they may need to consider undertaking during the outbreak and the recovery period.

Provide funding for research into the key outstanding areas of scientific uncertainty about diseases with potentially high community impact (for scientific research funding bodies)

Conducting scientific or operational research on diseases with outbreak potential may bring about significant reductions in the burden of control measures on affected communities by facilitating more targeted public health approaches during an incident. This, in turn, may potentially enhance the speed and effectiveness with which outbreaks are controlled. The specific topics of research would naturally depend on the particular epidemiological and social contexts of the studies, and would vary between Member States. Funding for the research would most probably come from national research councils or from international sources such as the EU. As such, this point is directed more towards funding agencies who may want to consider the benefits of supporting this type of research.

Financial responsibility of state authorities towards the community (for ministries with responsibility for providing social security support to people in need)

The development and implementation of clear, operational protocols to use compensation funds to cover expenses incurred by communities affected by infectious disease outbreaks could have significant and positive public health benefits. While funds for response and recovery may be available to regional authorities, outbreaks can be costly for individuals and local companies in affected communities, who might have to invest significant financial, material and human resources to deal with the outbreak itself or the aftermath. Examples of these costs can be covering the fees of professional cleaning services to sanitise shelter facilities used during an outbreak; compensation for material losses or losses from clients, students, staff or patients; or compensation for the wages or jobs lost by those who had to suspend professional activities in order to care for family members or vulnerable members of the community while sick. Such financial burdens can severely affect community organisations, groups, households and individuals, and they can also undermine adherence to response activities.

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Annex 1. Study context

Iceland and norovirus

The Icelandic public health system for outbreak response

The Icelandic Directorate of Health consists of six Divisions, including Health Security and Communicable Disease Control led by the Chief Epidemiologist. The Icelandic Act on Health Security and Communicable Diseases [12] establishes the responsibilities of the Chief Epidemiologist, including monitoring and surveillance (including national registries), analysis and risk assessment, and public health event response. The Chief Epidemiologist reports to the Minister of Health, but can act independently without his or her approval if necessary. The country is divided into seven health regions with 15 regional/district epidemiologists (there are 9 civil protection regions).

Iceland applies a one health/one hazard approach to crisis preparedness and management, using the principle 'one area – one force'. According to the Health Security Act 82/2008, health crisis preparedness planning and management is conducted in close coordination with the Civil Protection System that falls under the Ministry of Justice. The Civil Protection System is managed by the National Commissioner of the Icelandic Police (NCIP) and includes several community linkages, such as municipal authorities and the civil protection committees that include Mayors, as well as first responders, many of whom are volunteers (e.g. Red Cross, Iceland or "ICE" Search & Rescue). The NCIP operates a National Crisis Coordination Centre in Reykjavik.

Infectious disease outbreaks automatically fall under the joint responsibility of the Ministry of Welfare and the Ministry of Justice (formerly Ministry of Interior). In each local government area there is a civil protection committee appointed by the local authority; the local authority determines the number of committee members. The civil protection committee consists of the district commissioner of the Civil Protection district in which the local government area lies, representatives of the local authority and local authorities who take care of emergency service [13]. These include Police, ambulance services, and fire and rescue services. The civil protection committee also includes the Red Cross, which, although a community-based organisation, has a contract with the Icelandic government to service around 100 shelters around the country in case of evacuation (by providing lodging, food, psychosocial support).

Norovirus

Norovirus infection can cause vomiting, diarrhoea, and stomach pain, as well as low fever, chills and headache [14]. Fluid loss can be high as a result from sudden and frequent vomiting and diarrhoea. Recovery occurs usually in one or two days. Sometimes symptoms can be milder and last for a week. No chronic infection has been reported. In high income settings, death is rare but remains as a risk especially for elderly or persons with weakened immune system. About 25% of individuals infected by norovirus may remain asymptomatic [15]. In symptomatic cases, the incubation period ranges between 12 and 48 hours.

Noroviruses are the leading cause of epidemic gastroenteritis in all age groups, causing more than 90% of non-bacterial and half of all-cause epidemic gastroenteritis worldwide [16]. Noroviruses cause 12% of severe gastroenteritis cases among children under 5 years of age and 12% of diarrhoea cases among persons of all ages. In industrialised countries noroviruses are estimated to cause 64,000 episodes of diarrhoea requiring hospitalisation and 900,000 clinic visits among children each year.

Noroviruses are highly contagious. Noroviruses are transmitted either by consumption of contaminated food or water, or by spreading directly from person to person, such as through contact with aerosolised particles from vomiting, or by direct exposure to contaminated surfaces. During one single outbreak of norovirus gastroenteritis, several modes of transmission usually occur and the origin of the outbreak is often difficult to confirm. For example, initially food or water borne transmission is often followed by secondary person-to-person transmissions to close contacts. Viral shedding usually starts with the onset of symptoms and may continue for two weeks after recovery. Infection can happen several times in a lifetime and may affect individuals of all ages.

The norovirus outbreak at Úlfjótswatn Outdoor and Scout Centre

An outbreak of norovirus started during an international scouting event at the Úlfjótswatn Outdoor and Scout Centre in Southern Iceland on 11 August 2017. After 38 children were identified sick, the decision was made by the regional response crisis team to evacuate all 181 international scouts (aged from 11-17 years) to a nearby primary school in the town of Hveragerdi. Laboratory analysis subsequently confirmed norovirus. In total, 71 children were infected and taken ill. No local Icelandic children were affected by the outbreak as the school was in recess during the time of the event. However, on Saturday 12 August many of the international scouts were relocated elsewhere to allow the school to open after the summer holidays. School cleaning started on Sunday 13 August. On Monday 14 August ten scouts who had returned to the scouting camp fell ill again with the same symptoms, leading to closure of the camps for two more weeks. All recovered.

Ireland and verocytotoxin-producing *Escherichia coli* (VTEC)

The Irish public health system for outbreak response

The Health Service Executive (HSE) is a large organisation of over 100,000 employees, mandated with the task of running all of the health services in Ireland [17]. Public health is an important component of HSE's work.

The country has eight public health regions, each of which is led by a Medical Officer of Health (MOH), who has responsibility for the coordination of regional or local level outbreak responses. To this end, MOHs have considerable legal authority under the Infectious Diseases Regulations, 1981. National level outbreaks or those with an international element are led by the National Medical Officer of Health (also known as the Assistant National Director for Health Protection), with the assistance of the Health Protection Surveillance Centre (HPSC). HPSC is a specialist centre for the surveillance of communicable diseases, and it works to 'protect and improve the health of the Irish population by providing timely information and independent advice, and by carrying out disease surveillance, epidemiological investigation and related research and training' [18].

When an outbreak is declared, various stakeholders are invited to join in the response. Different stakeholders would participate in different sorts of outbreak; in the case of VTEC in a crèche, for example, the following agencies (all of which are a part of HSE) may be involved:

- Department of Public Health
- National Reference Laboratory-VTEC, Public Health Laboratory, Cherry Orchard Hospital
- Health Protection Surveillance Centre (HPSC)
- Environmental Health Service - National and Regional teams.

VTEC in Ireland

Verocytotoxin-producing *Escherichia coli* (VTEC) are gastro-intestinal bacteria that produce a highly infectious diarrhoea. VTEC is counted as a zoonosis as it is mainly acquired by contact with animals and/or their faeces and by consuming contaminated food or water. Up to 15% of patients under 10 years of age can develop serious illness, specifically haemolytic uraemic syndrome (HUS), which can be fatal in up to 1 out of 10 cases. The incidence of VTEC has increased substantially in Ireland over recent years, with 839 cases notified in 2016 and 923 in 2017: the country has the highest incidence of the disease in the EU [19]. This is partly attributed to the massive social changes that the country has undergone over the past two decades, with women increasingly entering the workforce and a consequent need for rapid increases in the country's child care capacity. Some crèches care for several hundred small children each day, and such settings provide a favourable environment for VTEC to spread from an index case into the wider community.

A VTEC outbreak in a crèche

During the course of our visit to Ireland, we visited a crèche where there had been a VTEC outbreak in recent months. The regional Outbreak Control Team had become aware through the Communicable Infectious Disease Reporting System (CIDR) of a single case of VTEC in a child who was attending there, so they were alert to the possibility of an outbreak. Communications were initiated with Cherry Orchard National Reference Laboratory, with a request for them to look out for further cases. A second VTEC case in a child attending the same crèche emerged a few days after the first, at which point an ongoing outbreak was declared.

Following national guidelines, the crèche was then immediately closed until:

- Screening of all children and staff attending the crèche had been conducted, with two negative samples collected more than 24 hours apart required before re-entry;
- A site visit was conducted by the Department of Public health, HSE officials, and the Environmental Health Services;
- Thorough deep cleaning of the premises (i.e. disinfection of all surfaces and objects, including toys and furniture).

Public health nurses were deployed to the crèche to provide face-to-face information for parents and staff about the protocols for safely collecting stool samples, for distributing sample pots, and, later, for collecting samples. The nurses were present there for the first few days of the outbreak.

An epidemiological investigation was also conducted via questionnaire at the house of the index case and that of her grandparents (where she regularly stayed), regarding their food consumption and their water supplies. Water samples were taken from their well on two occasions, and also at the grandparents' home, but the results were VTEC-negative: the source of infection in this case was never identified.

The reopening conditions for the affected crèche were all met within two weeks, upon which the crèche opened its doors again, with children and staff allowed to return once they had provided the requisite two clear stool samples. In total there were fewer than 10 cases in this outbreak, none of whom developed HUS. One child remained VTEC-positive for nearly three months, and was therefore excluded from crèche for the full duration of this period.

Annex 2. Interview and focus groups questions

Two sets of questions have been produced for this study: one for interviews with institutional respondents and one for focus group discussions with community representatives. Many questions are the same for both groups, allowing us to examine given issues from these different perspectives. The questions are presented below.

a) Questions for institutional representatives

Part 1: Mapping the different stakeholders

1. Please tell us how you and the institution you work for have been or are involved with the norovirus outbreak event.
2. Could you map out on a piece of paper the different stakeholders or groups that have been or are involved with preparing for and/or responding to the outbreak event? Which of these would you define as coming from the community, and which would you define as "Authorities"? Do you think there are any stakeholders – institutional or from the community – who are missing from this map, but who *should* be included in order to ensure a better response?

Part 2: Issues arising during each of the three phases of the public health event

Pre-incident phase (prior to the outbreak)

3. To what extent were there any sort of public health preparedness exercises, consultations, or training activities involving both the community and the authorities prior to this case? Please describe these. Do you consider these activities to have been sufficient? If not, what could have been done in addition?
4. In general, do you think that the community trusted the public health and scientific authorities in this area prior to the event? Had there been any prior specific events (such as other disease outbreaks) that promoted or undermined trust?

Incident phase (during the outbreak)

5. Were there sufficient numbers of dedicated professional staff in the area available to respond to the case? Were there any problems, for example with funding, that may have limited the response?
6. Was there any official guidance for the authorities on how to engage with the community in this case(s)? What form did this guidance take?
7. Were the key actors in the community clearly identified and available when the case(s) first appeared? To what extent was there clarity about who was expected to do what?
8. What were people's sources of information about the event (i.e. press and social media etc.)? How informative, coherent and consistent were these sources of information? Were there any issues that you think people felt they needed to know more about?
9. How was the communication and coordination between the community and the authorities during the response to this event [i.e. shared/democratic/top-down]? Were there any aspects that could have been improved?
10. To what extent did different parts of the community trust and cooperate with each other during the response to this event? Examples?
11. Were there any hard-to-reach or vulnerable groups? What efforts, if any, were made to reach out to them, by whom, and what lessons could be learned from this?

Post-incident phase (after the outbreak)

12. Was there any sort of post-case review of the event, including with reference to community-institutional collaboration? If so, what form did it take, who was involved, and what was the outcome?
13. How much awareness do you think there currently is in the community about this event? Do you think that lessons have been learned by the community regarding prevention and response practices for future events of this nature?

Part 3: Overview

14. Overall, how would you describe (i) the community response and (ii) the official response to the event? Were you satisfied, or do you think some aspects could have been improved?
15. In general, how do you feel the community and the authorities collaborated during this event? What would you say was the most successful aspect of any collaboration? What were the main challenges faced in the collaboration process, and what efforts, if any, were made to overcome these?
16. What do you think are the main lessons learned from this event, in terms of community-institutional collaboration and preparing for future public health emergencies or events?
17. Is there anything else you would like to add?

b) Questions for community representatives*Part 1: Mapping the different stakeholders*

1. Could you map out on a piece of paper the different stakeholders or groups that you are aware of that have been or are involved with preparing for and/or responding to the norovirus outbreak event. Which of these would you define as coming from the community, and which would you define as "Authorities"? Do you think there are any stakeholders – institutional or from the community – who are missing from this map, but who *should* be included in order to ensure a better response?

Part 2: Issues arising during each of the three phases of the public health event

Pre-incident phase (prior to the outbreak)

2. Are you aware of any sort of public health preparedness exercises, consultations, or training activities involving both the community and the authorities prior to this case? If so, please describe these. Do you consider these activities to have been sufficient? If not, what could have been done in addition?
3. In general, do you think that the community trusted the public health & scientific authorities in this area prior to the event? Had there been any prior specific events (such as other disease outbreaks) that promoted or undermined trust?

Incident phase (during the outbreak)

4. Were the key actors in the community clearly identified and available when the cases first appeared? To what extent was there clarity about who was expected to do what?
5. What were people's sources of information about the event (i.e. press and social media etc.)? How informative, coherent and consistent were these sources of information? Were there any issues that you think people felt they needed to know more about?
6. How was the communication and coordination between the community and the authorities during the response to this event? [i.e. shared/democratic/top-down?]. Were there any aspects that could have been improved?
7. To what extent did different parts of these community trust and cooperate with each other during the response to this event? Examples?
8. Were there any groups in the community who, for any reason, were excluded from the response? Details.
9. Were there any hard-to-reach or vulnerable groups? What efforts, if any, were made to reach out to them, by whom, and what lessons could be learned from this?

Post-incident phase (after the outbreak)

10. Was there any sort of post-case review of the event, including with reference to community-institutional collaboration? If so, what form did it take, who was involved, and what was the outcome?
11. How much awareness do you think there currently is in the community about this event? Do you think that lessons have been learned by the community regarding prevention and response practices for future events of this nature?

Part 3: Overview

12. Overall, how would you describe (i) the community response and (ii) the official response to the event? Were you satisfied, or do you think some aspects could have been improved?
13. In general, how do you feel the community and the authorities collaborated during this event? What would you say was the most successful aspect of any collaboration? What were the main challenges faced in the collaboration process, and what efforts, if any, were made to overcome these?
14. What do you think are the main lessons learned from this event, in terms of community-institutional collaboration and preparing for future public health emergencies or events?
15. Is there anything else you would like to add?

**European Centre for Disease
Prevention and Control (ECDC)**

Gustav III:s Boulevard 40, 16973 Solna, Sweden

Tel. +46 858601000

Fax +46 858601001

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