

Students' attitudes to the communications employed during an outbreak of meningococcal disease in a UK school: a qualitative study

David Taylor-Robinson¹, Katy Elders², Beth Milton³, Hilary Thurston²

¹Division of Public Health, School of Population, Community and Behavioural Sciences, University of Liverpool, Liverpool L69 3GB, UK

²Health Protection, Kirkby, Merseyside L33 7XW, UK

³Division of Public Health, University of Liverpool, Liverpool L69 3GB, UK

Address correspondence to Dr David Taylor-Robinson, E-mail: dctr@liv.ac.uk

ABSTRACT

Background Following an outbreak of meningococcal disease in a school in the North West of England, the communication methods employed by the Health Protection Agency (HPA) were evaluated in order to explore ways of improving communication with the public.

Methods Qualitative questionnaires were distributed to Year 12 (sixth form) students. The Framework approach was used to analyse the data, which were coded, and emergent themes identified.

Results In the absence of clear communication from official sources, many participants suggested that circulating rumours caused confusion and anxiety in the student population. Rumours were spread through informal networks in person or through text and MSN messaging. It was generally perceived that accurate information in this period would have been useful to allay potentially unfounded anxiety. Most students surveyed reported that they were sufficiently aware of the situation prior to receiving official announcements. The information provided by the HPA through the school was generally perceived as being useful, but it came too late.

Conclusion In outbreak situations, rumours will spread rapidly in the absence of early communication, and this can be a significant cause of anxiety. The use of digital communication strategies should be considered, since they can seed dependable information that will disseminate rapidly through peer groups.

Keywords communicable diseases, educational settings, public health

Background

Outbreaks of meningococcal disease can cause anxiety in communities and effective communication is paramount.^{1–3} Despite this there seem to be no qualitative studies of attitudes to communication issues in disease outbreaks in the UK. Following an outbreak of meningococcal disease in a school in the North West of England, we evaluated the communication methods employed by the Health Protection Agency (HPA) to explore ways of improving communication with the public.

Description of outbreak

Two Year 12 (sixth form) students from the same large school in the North West of England were admitted to hospital on a

Friday evening with probable meningococcal disease, defined as meningitis and/or septicaemia caused by *Neisseria meningitidis*. The HPA Consultant in Communicable Disease Control (CCDC) was notified by the hospital via the Public Health on-call system on Friday evening, and began taking appropriate action immediately. This involved assessing the affected students and ensuring that antibiotics were given to their close contacts. Close contacts were defined as people sleeping

David Taylor-Robinson, Clinical Lecturer in Public Health

Katy Elders, Locum Consultant in Health Protection

Beth Milton, Research Fellow

Hilary Thurston, Consultant in Health Protection

overnight in the same house as an affected person in the week before the illness started, and intimate kissing contacts.⁴ The case definition for this outbreak was defined as a probable/confirmed case of meningococcal disease occurring in the sixth form college (staff or student) within 4 weeks of the date of onset in the first case.⁴

Over the weekend, the CCDC ensured any further suspected cases were reported to the HPA immediately and were assessed by the CCDC and lead clinician. The CCDC also kept in regular contact with the local health services (Primary Care Trust, Acute Trust and Primary Care Walk-in Centre) and a representative from the school.

An outbreak control team meeting was held on the following Monday morning at which the decision was made to distribute prophylactic antibiotics to the whole of the sixth form, and the staff teaching them. The necessary arrangements were put in place for this on Monday, and on the following day (Tuesday) a team of doctors and nurses attended the school and delivered the antibiotics. Over this period a number of students attended A&E and local GPs with concerns, but no-one else was confirmed to have meningococcal disease.

During the outbreak, the on-call CCDC followed standard HPA communication procedures.⁴ The timeline for communications is outlined in Box 1.

Box 1: Timeline for communications during outbreak

Friday

Two cases of probable meningococcal disease identified from same year in a school in the North West of England.

Weekend

Local health services and the school alerted about cases and updated about situation as it developed.

Monday morning

Outbreak meeting held with representatives from the HPA, Community Health Services, Local Authority and the school.

Monday afternoon

Standard letters issued to sixth form students to take home to parents.

Press release issued with subsequent broadcast on local radio.

Tuesday morning

Briefing held for all school staff and all nursing staff prior to distribution of antibiotic prophylaxis.

Tuesday afternoon

Public meeting was held for students, parents and school staff to address any questions.

Interviews with the CCDC, which were broadcast on local radio.

Methods

We used questionnaires to collect qualitative data in order to explore attitudes to the communications strategy employed during the outbreak. Questionnaires were distributed through the school to all the students in the same year group as the affected cases. The questionnaires were handed out to all students at assembly, and a collection point was established in the school office. Students were asked to complete the questionnaires ($n = 198$), and to return them within a week to the collection point. The questionnaires contained a description of the outbreak and the rationale for the study, including the timescale for key events and communications. Fixed response, tick box style questions then followed regarding basic demographics, how and when the student first heard about the incident, and the relationship with the pupils that developed meningitis. Open questions with spaces for free text then followed exploring how students found out about the incident; whether they required and sought more information; how useful they found the information provided by the HPA; and how communication could be improved. Qualitative data were generated as students wrote detailed answers in response to these open-ended questions. We used the Framework approach to data analysis, and sought to identify and to interpret both the manifest and latent content of the qualitative data.^{5,6} K.E. and D.T.R. developed a thematic framework which K.E. applied to all the data through a series of codes. All of the qualitative data were systematically coded, charted in an Excel spreadsheet and mapped. The analysis then sought to identify associations between themes and to carry out an exploration of the emergent findings.

Ethics

We sought advice regarding ethical approval from the appropriate committee and were advised that the project did not require formal ethical review.

Results

Eighty-eight out of 198 questionnaires were returned, a response rate of 44%. All of the students were aged 16–17, and the majority of the respondents were male (63%). The sample is broadly representative of the whole year with regard to sex, where two-thirds of the pupils are male. Over 70% of the students reported hearing about the incident over the weekend, prior to information being released by the school and the HPA (Table 1). The majority of students reported finding out about the incident in-person, with

Table 1 When did you find out about the incident?

Day	n	%
Friday	29	33.0
Saturday	18	20.5
Sunday	18	20.5
Monday	17	19.3
Tuesday	0	0.0
Other	3	3.4
No response	3	3.4
Total	88	100.0

online instant messaging, SMS (short message service) messaging, phone calls and email all being reported as means of communication (Table 2).

How did students find out about the incident?

The qualitative responses suggest that many of the students were communicating with each other through friendship groups over the weekend to ascertain information. The responses indicate that in the early stages many students knew that something was happening, but there was little 'solid' evidence circulating. Initial information about the outbreak appeared to have originated as communication between the cases (and their families) and close friends in Year 12, possibly as part of the need to track down close contacts to receive antibiotics:

We were at a friend's house when there was a phone call from the victim's parents and they told all her friends.

After the cases' families had contacted close friends with details of the outbreak, those close contacts then began to disseminate the information to other friends in Year 12. This dissemination process seemed to follow existing friendship networks, so that those in closest relationship to the cases heard first. The news then passed next to the friends of those close contacts:

A friend who knew one of the pupils who got meningitis texted me on the Sunday.

I was at a party with a girl's friends who was diagnosed on the Friday and the phone line was red hot with gossip.

Those in Year 12 who were outside the cases' friendship networks therefore heard the news later than others who knew the cases well.

When I came in to school on Monday, I heard from other pupils. I hadn't heard over the weekend as I didn't really know the people affected.

Table 2 How did you first find out about the incident?

	n	%
In person	41	46.6
Phone call	11	12.5
Text message	9	10.2
Email	4	4.5
On the radio	0	0.0
HPA letter	1	1.1
Instant messenger	14	15.9
No response	2	2.3
Other	6	6.8
Total	88	100.0

Information was disseminated in waves over the course of the weekend informally through friends, and subsequently further details were given at school the following Monday. Many students reported hearing repeatedly about the outbreak from a number of different sources:

[I] heard of it from a friend on MSN on Saturday, heard more on Sunday, then found out more details on Monday at school.

Where did students look for additional information?

On hearing about the incident, many respondents suggested that they sought further information. Informal sources included friends and peer groups, whereas formal sources included the school, local hospitals, the Internet and local radio. Many of the respondents reported finding the information limited.

I listened to local radio news bulletins, searched the web, including school website but nothing was available.

I looked at BBC News to check if it was true.

A number of students or their parents tried to contact the school over the weekend in order to clarify the situation, but the responses generally suggest that the information was not perceived to be as useful as it could have been:

Contacted the school, but was told nothing.

Emotions and psychological distress

Many respondents reported shock, confusion and concern. Some pupils did not want to come into school for fear of 'catching' meningococcal disease. Concern appeared to be heightened among those whose close friends were cases and

where individuals had a history of closer contact with the affected cases. There was a lot of concern that meningitis was highly contagious. There was also concern about the outcomes for the meningococcal cases and their families and how individuals would be affected by the incident. One respondent expressed concern about the possibility of one of the meningococcal cases dying.

I was concerned about them. I didn't want to go to school and did not want to catch it.

I was very concerned/worried. I was concerned about (the meningococcal case) dying. I was worried about my friends.

I was worried as it can be caught easily.

Reduced levels of concern seemed to be associated with students who felt they were aware of symptoms of meningococcal disease and knew what to look out for; students who had little or no contact with affected cases; and students who felt that the situation was under control.

I wasn't too concerned as I knew what to look out for in terms of symptoms and I knew if caught early it was treatable. I was concerned about the welfare of the pupils who had meningitis.

I was not concerned as I had none of the symptoms and had already been in hospital that week and nothing had been found before I heard about it.

Not very concerned, as tablets were distributed with great speed.

Judgment of information given

Many respondents reported that the letter provided through the school was helpful in terms of explaining the symptoms of meningitis, how it is transmitted, as well as information on antibiotics. One individual said it was good to receive official notification to counter rumours. None of the respondents reported that they had called the telephone numbers provided on the letter for further information.

[The letter] provided information about how meningitis is caught and what the symptoms are. It was very useful but I called none of the numbers.

It was good to receive official notification to discount rumours.

However, many respondents suggested that they already knew what was happening by the time they received the letter.

By the time the letter was out, we knew what was happening anyway.

It was boring and unhelpful. . . we knew what was happening anyway.

How to improve communications

There was generally a perceived long delay between awareness of the cases and official confirmation, and the feeling

that information should have been provided more quickly. It was suggested that a reliable source should have notified pupils and parents quickly rather than allowing word of mouth to disseminate information.

Need to act quicker (than) Monday.

The communication was limited. Most of what we were told was already around the school as rumours. I think we should have been told everything from day 1.

One respondent highlighted the effect of MSN messenger and its potential to quickly disseminate information. It was felt that a pre-emptive statement on the school website might have mitigated against this.

I don't think people were aware of the power of MSN and how easily this caused confusion. I think the school needs to respond or alert to situations like this much more promptly. A statement on the school website on the Sunday would have clarified the situation.

What additional information was sought?

Respondents were primarily interested in information about who was involved in the incident, whether they were critically ill, and information about the condition. Some would have preferred to know about the incident before they came into school. A number of respondents suggested that there was uncertainty about whether it was appropriate to attend school on the Monday morning, and that this should have been addressed with appropriate communication over the weekend.

It was good in that we were provided with information which was suitable in school. But I would have preferred to have known before I came into school.

Discussion

Main findings of this study

We conducted a qualitative survey of students following an outbreak of meningococcal disease at a school in the North West of England, with the aim of exploring the effectiveness of the communications strategies employed. We found that many of the students felt that the school and the HPA should have acted earlier to distribute authoritative information and to dispel rumours.

The qualitative responses suggest that rumours circulating over the weekend may have caused confusion and anxiety in a number of pupils, following identification of the index case on the preceding Friday. Over the weekend period, students reported that they were communicating with each

other in person, over the phone, as well as using text messages and MSN messaging. In the absence of direct communication from formal sources, students were predominantly consulting each other, whilst trying to obtain information from the school, local hospitals and the local media. There was clearly the feeling that accurate information in this period would have been useful. In the event it seems that some students were anxious about attending school on the Monday morning, and over 70% of students surveyed reported being already aware of an incident prior to attending school on Monday. By the time information was provided by announcements in the school and an official letter, many students already felt they were aware of what was going on, and they felt that these communications added little. The information provided by the HPA through the school was generally perceived as being useful, but it came too late.

What is already known on this topic

The HPA meningococcal guidance currently states: 'Accurate and timely information should help to limit the spread of false rumours and anxiety.'⁴ The guidance with regard to communication in this document is limited, and based mainly on expert opinion. It outlines the purpose of the information letter in a school outbreak as being 'to give information about meningococcal disease, assist parents and others in the early detection of the disease, allay anxiety and prevent uninformed rumours.'

Gerrard⁷ advocates for the need for systematic evaluation of risk communication strategies in order to improve practice, including the use of qualitative and quantitative approaches. We are not aware of other studies that have explored communication methods following meningococcal outbreaks in students. We found two studies from the UK where qualitative methods have been used to assess perceptions of risk in other health protection scenarios. Smith *et al.*⁸ used qualitative methods to document the organizational response of a hospital in the UK following a large outbreak of legionnaire's disease. Rubin *et al.*⁹ employed a mixed qualitative and quantitative approach to assess the risk perception following the Litvinenko poisoning incident in the UK. The authors of the latter study highlight the need for timely information in order to appropriately reassure the public in situations where the perception of risk involved is heightened.

What this study adds

The theory of 'social amplification' of risk is well described in the literature, and provides a framework for

understanding how perceptions of risk can be intensified or attenuated in social groups.^{3,10–12} Applying this framework to the qualitative data from our study, it seems that informal sources of information were transmitted through friendship networks, and this seemed to amplify the perception of risk among this group—a classic 'grapevine' situation.³

This study has a number of implications. Consultants in Health Protection leading outbreaks need to be aware of the potential for rumours about an incident to spread rapidly through close-knit groups such as school students. In the absence of clear communications, rumours can significantly raise anxiety levels. The use of digital technologies to communicate is not surprising. Gilk² points out that the ease and access many people have for broadcast and Internet sources have meant that expectations for rapid retrieval of information has increased. Furthermore, there is evidence from surveys in North America that the public has come to expect that risk communication will be delivered through the Internet in outbreak situations.^{13,14} The use of SMS and MSN messaging allow rumours to circulate rapidly. Many of the respondents looked to the Internet, and specifically the school website for information. Careful consideration should be given to using websites to communicate in the early stages of an outbreak like this, prior to it being practicable to hold briefing meetings. It seems likely that once official information is released into a group like this, the networks described would efficiently circulate the information. However, the content of such briefings would need to be carefully worded and the consequences of formally releasing information over a weekend considered. A lone on-call Consultant in Health Protection, with limited support over the weekend, might struggle to manage the increased workload if a formal briefing generated many public and press enquiries. This could compromise the management of the outbreak in its early stages.

Limitations of this study

The response rate in this study was lower (44%) than perhaps could have been expected, given the fact that there was a clear mechanism for distributing and collecting the questionnaires, and reminders were sent to students. In a systematic review of factors affecting response rates in surveys, Edwards *et al.*¹⁵ describe an uptake of 35% in an anonymous questionnaire survey. Weitzman *et al.*¹⁶ explore the potential bias associated with low response rates in school surveys, using a response of under 70% as a sub-optimal response. One possible reason for this was the fact that students were in the middle of an examination period when the questionnaires were distributed, and some

students were on a study break. There is the possibility of non-response bias, and because the responses were anonymous we do not have access to information on non-responders. However, it is reassuring that the responders were broadly representative of the whole population in terms of sex distribution, where two-thirds of the pupils are male (63% of respondents were male). In retrospect, the study could have been improved in such a digitally literate population by using an online survey tool such as SurveyMonkey.

Thankfully, meningococcal outbreaks are now relatively rare in the UK, and it is thus important to learn as much as possible from such events, so as to improve strategies in the future. The findings of this study are applicable to other risk communication situations, where events that cause anxiety are evolving over time. We successfully employed a qualitative questionnaire methodology to gain information about how to improve communications with students in a school affected by an outbreak of meningitis. A key issue for healthcare professionals to consider is the fact that rumour will spread rapidly in the absence of early communication, and this can be a significant cause of anxiety. The use of digital communication strategies should be considered, since they can seed dependable information that will disseminate rapidly through peer groups.

References

- 1 Irwin DJ, Miller JM, Milner PC *et al.* Community immunization programme in response to an outbreak of invasive *Neisseria meningitidis* serogroup C infection in the Trent region of England 1995–1996. *J Public Health Med* 1997;**19**(2):162.
- 2 Glik DC. Risk communication for public health emergencies. *Ann Rev Public Health* 2007;**28**:33.
- 3 DH. *Communicating about Risks to Public Health Pointers to Good Practice*. 1997. http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4006604 (27 May 2009, date last accessed).
- 4 HPA. *Guidance for Public Health Management of Meningococcal Disease in the UK*. 2006. http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947389261 (6 May 2009, date last accessed).
- 5 Pope C, Ziebland S, Mays N. Qualitative research in health care: analysing qualitative data. *BMJ* 2000;**320**(7227):114.
- 6 Ritchie JSL. Qualitative data analysis for applied policy research. In: Bryman A, Burgess R (eds). *Analysing Qualitative Data*. London: Routledge, 1993,173–94.
- 7 Gerrard S. Learning from experience: the need for systematic evaluation methods. In: Bennett P, Calman K (eds). *Risk Communication and Public Health*. New York: Oxford University Press, 1999.
- 8 Smith AF, Wild C, Law J. The Barrow-in-Furness legionnaires' outbreak: qualitative study of the hospital response and the role of the major incident plan. *Emerg Med J* 2005;**22**(4):251.
- 9 Rubin GJ, Page L, Morgan O *et al.* Public information needs after the poisoning of Alexander Litvinenko with polonium-210 in London: cross sectional telephone survey and qualitative analysis. *BMJ* 2007;**335**(7630):1143.
- 10 Bennett P. Understanding responses to risk: some basic findings. In: Bennett P, Calman K (eds). *Risk Communication and Public Health*. New York: Oxford University Press, 1999.
- 11 Kasperson RE, Renn O, Slovic P *et al.* The social amplification of risk: a conceptual framework. *Risk Anal* 1988;**8**(2):177–87.
- 12 Krimsky S, Golding D. *Social Theories of Risk*. Westport, CT and London: Praeger, 1992.
- 13 Kittler AF, Hobbs J, Volk LA *et al.* The Internet as a vehicle to communicate health information during a public health emergency: a survey analysis involving the anthrax scare of 2001. *J Med Internet Res* 2004;**6**(1):e8.
- 14 Rizo CA, Lupea D, Baybourdy H *et al.* What Internet services would patients like from hospitals during an epidemic? Lessons from the SARS outbreak in Toronto. *J Med Internet Res* 2005;**7**(4):e46.
- 15 Edwards P, Roberts I, Clarke M, DiGiuseppi C, Pratap S, Wentz R, Kwan I, Cooper R. Methods to increase response rates to postal questionnaires. *Cochrane Database Syst Rev* 2007;**(2)**:MR000008. Review. Update in: *Cochrane Database Syst Rev* 2009;**(3)**:MR000008.
- 16 Weitzman B, Guttmacher S, Weinberg S *et al.* Low response rate schools in surveys of adolescent risk taking behaviours: possible biases, possible solutions. *J Epidemiol Community Health* 2003;**57**(1):63.