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Accepted: 26 September 2007

Public information needs after the poisoning of Alexander Litvinenko with polonium-210 in London: cross sectional telephone survey and qualitative analysis

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BMJ 2007;335:1143-6

doi:10.1136/bmj.39367.455243.BE

This article is an abridged version of a paper that was published on bmj.com on 1 November 2007. Cite this version as: *BMJ* 1 November 2007, doi: 10.1136/bmj.39367.455243.BE (abridged text, in print: *BMJ* 2007; 335:1143-6).

ABSTRACT

Objectives To identify public perceptions of the risk to health after the poisoning of Alexander Litvinenko with polonium-210 (²¹⁰Po) in London and to assess the impact of public health communications.

Design Cross sectional telephone survey and qualitative interviews.

Setting London, United Kingdom.

Participants 1000 people completed the cross sectional survey and 86 potentially exposed people completed the qualitative interviews.

Main outcome measures Perception of risk to personal health after the ²¹⁰Po incident. Qualitative interviews were analysed with an emphasis on information needs.

Results 11.7% of the survey sample (n=117) perceived their health to be at risk. Aside from personal variables the main predictors of perceived risk to health were believing that the incident was related to terrorism (odds ratio 2.7, 95% confidence interval 1.5 to 4.6) rather than to espionage, that it was targeted at the wider public rather than one person (5.9, 3.2 to 10.9), and that it could affect people who had not been in the contaminated area (3.2, 2.1 to 5.1). Participants in the qualitative interviews were generally satisfied with the information they had received, although they would have preferred more information about their individual risk of exposure, the results of their urine tests, and the health implications of the incident.

Conclusions Perceptions of the public that the ²¹⁰Po incident in London 2006 was related to espionage helped to reassure them that the risks to personal health were low. In the event of future incidents it is important to ensure that detailed, comprehensible information about the risks of any exposure is available.

INTRODUCTION

During major incidents that impact on public health, agencies often need to reassure the public about the risk involved, advise on measures being taken to

safeguard health, and specify what personal actions can minimise risk.¹⁻³ This communication can be challenging.

We assessed the public's perceptions of risk from the release of polonium-210 (²¹⁰Po) in London when Alexander Litvinenko was poisoned.⁴ We also assessed the public's knowledge and perceptions of the communication strategies used at that time by the UK's Health Protection Agency. We did a telephone survey of a representative sample of adult Londoners to test whether knowledge about ²¹⁰Po or perceptions of the incident were associated with a reduced perception of risk. Qualitative interviews were also carried out with people who had been in two areas contaminated during the incident to assess factors associated with increased anxiety and how effective the information provided by the Health Protection Agency was.

METHODS

After the death of Litvinenko in November 2006 from ²¹⁰Po poisoning, the Health Protection Agency responded by assessing risk to potentially exposed people.⁴ Investigations centred on a restaurant and a hotel bar. People were advised to telephone NHS Direct if they had been in either venue on 1 November, and were asked about symptoms. The Health Protection Agency returned phone calls when requested by callers and offered a urine test if indicated. On 7 December this protocol changed after several of the hotel's staff tested positive for ²¹⁰Po: people were now asked to contact the Health Protection Agency if they had been in the bar between 31 October and 2 November, and were offered a test. The Health Protection Agency produced information almost daily.

Cross sectional telephone survey

Between 8 and 11 December 2006 Ipsos MORI carried out a telephone survey of 1000 adult Londoners representative of London's population for

sex, age, employment, residential location, home ownership, and ethnicity.⁵

The primary outcome was whether participants perceived their health to be at risk as a result of the incident, defined as a response of 3 or 4 on a scale of 0 (not at all) to 4 (a lot), when asked to what degree they felt their health was at risk as a consequence of the incident. Predictor variables consisted of personal details; how well informed participants believed they were about the incident; accuracy on nine true or false items relating to ²¹⁰Po; whether participants believed the incident was best described as terrorism, a public health threat, a crime, or espionage; whether participants believed the incident was intended to harm one person, a small number of specific people, or the public; and whether participants believed that the advice to contact NHS Direct was an under-reaction, over-reaction, or about right.

Qualitative sampling

Participants from four groups were selected for our qualitative interviews. The first comprised people who had been in the restaurant on 1 November, had contacted NHS Direct, and had said the Health Protection Agency could contact them. The other groups comprised people who had been in the bar between 31 October and 2 November and who had accepted or refused the test or failed to reply to the Health Protection Agency after being informed about eligibility for testing.

Eligible participants were interviewed by telephone. Interviewers followed scripts but also probed further in areas that seemed important to respondents. For the restaurant sample, interviews focused on reasons for contacting NHS Direct; how participants would describe the incident; what information was received from NHS Direct or the Health Protection Agency and how helpful or reassuring that was; and what effects the incident had had on their lives. Although these participants were not routinely offered testing, we asked whether they would have accepted a test if offered, and why. Interviews with participants from the hotel groups were similar but also included questions on why they had accepted or declined testing, what their understanding of the results were, and whether they would have liked more information on the test. In addition, participants were asked to rate how much they thought their health was at risk before contacting NHS Direct.

Analyses

We weighted the survey data to ensure that the groups were representative of Londoners. We calculated odds ratios for the association between each personal variable and perceived risk to health. We used being Muslim as the reference category for religion, given an identified association between being Muslim and experiencing heightened distress after the London bombings in 2005.⁶ To assess whether perceptions of, or knowledge about, the incident had any impact on risk perceptions over any effects of the personal

variables, we calculated odds ratios for non-personal predictors using separate binomial logistic regressions adjusting for sex, age, income, ethnicity, and religion.

RESULTS

One thousand of 11 058 eligible respondents contacted for the survey completed interviews (9.1%). Overall, 117 (11.7%) perceived their health to be at risk as a result of the ²¹⁰Po incident during which Alexander Litvinenko was poisoned (see bmj.com). Knowledge about ²¹⁰Po was generally poor, with recognition of messages from the Health Protection Agency ranging from 15% (²¹⁰Po can be removed from clothes using a washing machine) to 58% (²¹⁰Po is usually dangerous only if it enters the body; see bmj.com). The exception was for the statement about there being no risk to health if someone had not been in a contaminated area, with 71% recognising this as correct. Most participants believed that the incident was related to crime or espionage (68%) and that it was not targeted at the wider public (86%; see bmj.com). Most also thought the Health Protection Agency's response to the incident had been appropriate or about right (80%).

Personal variables associated with risk perception

Unadjusted odds ratios showed that being female (1.7, 95% confidence interval 1.2 to 2.6), being of non-white ethnicity (2.8, 1.9 to 4.1), having an income of <£30 000 (£43 000; \$61 000) yearly (4.6, 2.6 to 7.9), being in rented accommodation (1.7, 1.2 to 2.5), and travelling into central London less than once a week (1.5, 1.0 to 2.3) were associated with perceiving health to be at risk. Subscribing to no religion (0.2, 0.1 to 0.4) or any other religion (0.4, 0.2 to 0.7) was associated with a lower likelihood of perceived risk to health than being Muslim (see bmj.com).

Knowledge or perceptions of the incident and risk perception

Odds ratios adjusted for age, sex, income, ethnicity, and religion showed that believing that ²¹⁰Po can be dangerous even if it does not enter the body (1.6, 1.0 to 2.5) and believing that ²¹⁰Po can pose a risk to people who have not entered a contaminated area (3.2, 2.1 to 5.1) were associated with increased perceptions of risk to health (see bmj.com). Participants who thought the incident was related to terrorism (2.7, 1.5 to 4.6) or was a threat to public health (1.9, 1.1 to 3.4) were more likely to believe their health was at risk than those who reported that it was related to crime or espionage (see bmj.com). Participants who thought that the incident was aimed at the wider public were more likely to perceive that personal health was at risk than those who believed that it was targeted at only one person (5.9, 3.2 to 10.9).

Qualitative results

Sixteen women and 15 men (mean age 35 (SD 10) years) were interviewed for the restaurant sample. For the hotel samples, 37 men and 18 women (mean age 43 (SD 12) years) were interviewed, including 24

people who accepted a urine test, 21 who failed to respond to the Health Protection Agency's letter, and 10 who declined testing. Of the 78 participants who answered the question, 65 (83%) had annual incomes of >£30 000. Two of 31 (6%) participants from the restaurant sample reported believing their health to be at risk before contacting NHS Direct, compared with 7 of 53 (13%) from the hotel sample.

Initial sources of anxiety

Symptoms were the most prominent factors affecting initial levels of anxiety. Participants without symptoms often took this to mean non-exposure. Concern tended to be higher for participants who had had symptoms.

Anxiety was also related to the perceived likelihood of exposure, with perceptions being driven by the participant's temporal or physical proximity to Litvinenko. Comparisons were also made with other presumably more at risk groups, such as the restaurant staff, who tested negative. Uncertainties about the nature of ^{210}Po caused anxiety for some, as did its radioactivity. Personality traits and fatalism also played a part.

Information needs

Some participants found their calls to NHS Direct and the Health Protection Agency reassuring, others less so. The most common complaint was a lack of information. Although callers were offered general reassurance, many noted this was no substitute for specific information.

Participants' information needs fell into three areas. Firstly, there was a desire for up to date information. The daily updates that appeared on the Health Protection Agency's website were praised by several participants, although others seemed unaware that these existed. Secondly, a need for individualised information on the likelihood of exposure was often mentioned. Those who received specific information to suggest that their risk of exposure was low tended to be reassured. Others who wanted to make their own risk assessment based on when Litvinenko was in either venue were left feeling uncertain when this information was not provided to them. Thirdly, participants wanted information about short term health effects and derived reassurance from answering "no" to the questions on symptoms. For participants who had had symptoms, however, this aspect of the phone call could be more troubling.

Factors affecting the desire for testing

Thirteen of 21 non-respondents to the Health Protection Agency's letter could not recall receiving it. Five others failed to understand they were being offered testing. For the remaining three, plus the 10 who declined testing, the main reason for declining was a perception that the likelihood of exposure was low. An apparent lack of personal benefit was also cited by some whereas others believed that the way in which testing had been offered implied that it was not

important. Those who accepted the offer most often cited "peace of mind" as their rationale, although pressure from friends or relatives also played a part. Participants who were at the restaurant and were not offered testing were usually quite accepting of this fact. Although a minority believed they had a right to be tested, most believed that this was "probably unrealistic since there were so many of us." For these participants a lack of symptoms and a low likelihood of exposure were the most salient reasons for probably declining screening if it was offered, whereas peace of mind was the reason most often given for probably accepting.

Impact of test results

Most participants in the hotel sample and who underwent testing described their results as reassuring and as expected. These participants repeatedly spoke of their need for more information, however. Many had been told only that their results were "of no concern." This left some confused or even suspicious. The other question often raised was what the results meant for potential long term health effects. Most thought that "of no concern" implied that long term effects were unlikely, but many would have preferred this to have been made explicit.

Impact on life

Few participants reported that the incident had any major impact on their life. Some mentioned heightened anxiety, but was temporary for most. One person reported stigmatisation

DISCUSSION

Shortly after the Health Protection Agency revised its risk assessment for people attending the hotel bar where Litvinenko had been, 11.7% of our survey sample thought that their own health might have been at risk. Although there was no risk to people who had not been in a contaminated location, given that radiation is rated as one of the most feared environmental hazards,⁷ it is surprising that rates of perceived risk were not higher.

Two factors helped to limit perceptions of risk. Firstly, the Health Protection Agency's communication about the restricted nature of the risks seems to have been successful. Although our survey suggested that public knowledge about ^{210}Po was limited in many respects, 71% of respondents knew that there was no risk to their health if they had not been in one of the contaminated areas. This knowledge was strongly associated with a lower likelihood of perceived risk to health.

Secondly, perceptions of risk were strongly associated with the perceived motivation of the perpetrators, with respondents who thought the incident was related to espionage or was aimed at one person reporting the least perceived risk and those believing it was related to terrorism or aimed at the general public reporting the most.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Effective communication of risk during public health incidents can reassure the public and provide information to those affected

WHAT THIS STUDY ADDS

Public concern about health risks after the polonium-210 (^{210}Po) incident in London was low because contamination was seen as related to espionage and because the public understood that unexposed people were not at risk

Access to detailed and updated information is important, particularly information on personal risk of exposure and test results

As with the general public, potentially exposed people wanted information about their risk of exposure. Exposed people needed more precise information on their circumstances, with participants citing factors such as lack of symptoms as a reason for believing their risk was low. These factors also played a part in determining whether someone accepted urine testing. Although useful in reducing anxiety, such judgments may not be valid: in particular, the absence of acute symptoms does not necessarily imply non-exposure.

Information needs

A common criticism was that insufficient information was provided during the initial contacts with NHS Direct or the Health Protection Agency. More information would have been preferred on personal risk of exposure and on the implication of the presence or absence of symptoms. Obtaining up to date information was also important. Providing such information is problematic during acute incidents, particularly if staff are working under time constraints.

More information was also wanted on the meaning of test results. Advice that these were “of no concern” was perceived as vague. Participants wanted to know their numerical results and to be given a suitable reference value for comparison. They also wanted explicit information about what the results meant for possible long term health. Given that some did not understand that testing was being offered, perceived the offer as passive, or declined the offer, providing information on the test early might have helped people to make a more informed choice.

Methodological issues

Public perceptions about incidents are liable to change as new information becomes available. We used quota sampling to assess possible predictors of risk perceptions. This allowed us to obtain data from a large, representative sample within a short space of time. The trade-off for this was a low response rate (9.1%). This rate is not unusual for a telephone survey based on quota samples, however, and nor is it as valid an indicator of non-participation in quota surveys as it would be in a random probability survey. However, it is possible that our results may have been different with a higher response rate. In particular it has been shown

that responders to telephone surveys score higher on ratings of civic involvement than non-responders.⁸ It is possible that our sample may have been more attentive to information than the general population and more trusting of the agencies involved, making them less likely to believe their health was at risk.

Participants for the qualitative interviews were purposively sampled from four groups. Selection biases may still have affected these results, however, as we were able to interview only those people who had provided the Health Protection Agency with their contact details. It is possible that those who did not contact the agency after the ^{210}Po incident perceived the event in qualitatively different ways. Recall bias may also have adversely affected our interview data, with participants reporting thoughts and feelings experienced one or two months previously. It is possible that the largely reassuring information that was given out during the intervening period caused participants to re-evaluate how they had initially felt. As such, respondents may have retrospectively considered their risk to be lower.

Conclusion

Our study emphasises the importance of giving people access to detailed, comprehensible information about risks to which they have been exposed and the tests or treatments on offer. The dismissive comments of some participants about attempts to reassure rather than to inform them and the confusion of some over test results illustrates the difficulties of providing this level of detail to a lay audience.

We thank Mark Gill and the participants of an international email forum on the psychosocial effects of terrorism for their comments, and William Hallman and Steven M Becker for their input. Data collection for the cross sectional survey was carried out by interviewers working for Ipsos MORI.

Contributors: See bmj.com.

Funding: None.

Competing interests: OM, HM, MC, and JS are employees of the Health Protection Agency. These authors played no part in the initial analysis of the data. LP is supported by the National Institute of Environmental Health Sciences, NIH, as a Ruth L Kirschstein national research fellow (F32 ES013690).

Ethical approval: The King's College London Research Ethics Committee approved our qualitative interviews. The Central Office for Research Ethics Committees advised that ethical approval was not required for the cross sectional survey.

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Accepted: 12 September 2007