

Communicating to increase public uptake of pandemic flu vaccination in the UK: which messages work?

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Abstract

Background: Vaccination is considered the most effective preventive measure against influenza transmission, yet vaccination rates during the 2009/10 influenza A/H1N1 pandemic were low across the world, with the majority of people declining to receive the vaccine. Despite extensive research on the predictors of uptake of influenza vaccination, little research has focused on testing the effectiveness of evidence and theory-based messages.

Aims: To examine the persuasiveness of messages promoting vaccination and antiviral use either as health-enhancing or as risk-reducing, as well as messages which conveyed evidence-based information about the costs and benefits of vaccination, or which applied anticipated regret as a motivator for vaccine uptake.

Method: We conducted 11 focus groups with forty-one members of the general population in England including young and older adults, those with lower education, parents, and those with elevated health risk. The data were analysed using thematic analysis.

Results: The factual, evidence-based messages were well received with participants finding them the most convincing and useful, particularly where they gave cost-benefit comparisons. Health-enhancing messages were received with scepticism and concern that the messages were not honest about the potential lack of safety of vaccination. In contrast, risk-reduction messages were perceived as being more balanced and credible. Messages aiming to elicit feelings of anticipated regret for not getting vaccinated were generally perceived as patronising and unprofessional.

Conclusions: Vaccination messages should be kept brief, but convey balanced, evidence-based information, and be transparent in their communication of potential side-effects. The general public seem to prefer messages that are factual and emphasise the costs and benefits of vaccination, particularly with regards to vaccine safety.

Keywords: influenza; pandemic; risk communication; vaccination

1. Introduction

Influenza pandemics arise when little or no immunity to a new virus exists, leading to transmission and spread of disease (WHO, 2013) and creating levels of uncertainty and unpredictability that have the potential to severely impact populations worldwide (1, 2). Public health experts consider vaccination to be the most effective mechanism for minimising the impact of an influenza pandemic (3), but this relies on public engagement. In the United Kingdom, many people declined vaccination during the 2009/10 influenza A/H1N1 pandemic, even among specifically targeted patient groups (4) and healthcare workers (5, 6) with uptake ranging from 20.8% (the lowest), in those aged 16-25 years, to 48.2% (the highest), in those aged 60-65 years in a clinical risk group (4).

Research investigating psychological predictors of vaccination uptake found that uptake is associated with a history of previous vaccination for seasonal influenza (5, 7), perceiving the disease as more severe (8, 9) and the vaccine as effective and safe (5, 7). Factors reducing vaccination intentions include scepticism about the level of threat, not perceiving oneself to be at risk, especially if one is currently healthy, and concerns about vaccination safety and potential negative side-effects (10-14). Research suggests that these barriers might be addressed by emphasizing the positive benefits of vaccination (15, 16), while also allaying public concerns about vaccination safety and side-effects. To increase vaccination uptake during future pandemics, one way to communicate effectively with the public is to draw on relevant theories of risk communication pertaining to behaviour change. Given that the lay public relies on social trust to make decisions about risks and benefits particularly when they lack personal knowledge about a hazard (17), messages advocating vaccination could be made more transparent and thus trustworthy, e.g. by acknowledging uncertainty around the benefits of vaccination. Also, given that any situation involving risk can be 'framed' in two different but logically equivalent ways, e.g. *lives saved* vs. *lives lost*, attention should be paid to how the risk of pandemic influenza is communicated. Message framing can impact persuasiveness and thus risk perception, as highlighted by Prospect Theory (18), with gain-framed messages being more effective than loss-framed messages at encouraging prevention behaviours (19, 20).

One way to frame precautionary messages is to highlight the reduction of risk vs. the enhancement of benefits. The main aim of this study was to compare the persuasiveness of messages promoting vaccination as entailing health benefits (*health-enhancing*) versus those communicating vaccination as reducing risk of infection (*risk-reducing*). Messages conveying health enhancement were expected to be viewed more positively than messages presenting vaccination as a means of risk reduction (14). Additionally, we tested messages presenting evidence that the risk of harm from pandemic influenza is greater than the risk of vaccination side-effects by prompting people to imagine how they might feel if they refused vaccination and then became ill (*anticipated regret*), and presenting factual messages about the relative costs and benefits of vaccination of the A/H1N1 pandemic (*transparency*). It was expected that evoking anticipated regret may strengthen the message impact, in light of research showing that vaccination intentions tend to be stronger when failing to act is associated with negative emotions that people wish to avoid (27).

Additionally, we examined reactions to messages about antiviral medicines, as besides treatment, these can play a prophylactic role against pandemic influenza, yet little is known about public attitudes towards their use. During the A/H1N1 pandemic in 2009/10, Australian research participants were willing to take a full course of antiviral drugs if exposed to a person with pandemic influenza (21), while US pregnant and recently pregnant women participating in focus groups indicated being poorly informed about antivirals and concerned about using them in pregnancy (22). Recent research with the UK public has indicated that lay people knew little about influenza antivirals, confusing them with antibiotics, yet viewed antivirals advice as sensible and acceptable (14).

2. Methods

2.1 Design

Eleven focus groups (40-60 minutes) were conducted with 41 members of the UK general public between October 2014 and July 2015. We used maximum variation sampling to include participants from populations varying in their likelihood to suffer complications as a result of influenza infection, e.g. parents of babies, younger and older adults, to examine a variety of views on vaccination.. As we were particularly interested in assessing the impact of messages on increasing vaccination intentions amongst non-vaccinators, we recruited wherever possible participants who were not annual influenza vaccinators (80.5% of our sample). Given the large number of messages to be tested individually ($n=23$), we used small-sized focus groups to be able to gauge in-depth the participants' reasoning around the messages.

Recruitment was by email and paper adverts through the University of Southampton and community groups. Each participant received an information sheet explaining the study and that participation was both confidential and voluntary, and £10 for participating in the research. Written consent was obtained before any data collection and ethical approval was granted by the University of Southampton Ethics Committee.

2.2 Procedure

Participants were presented with a brief, hypothetical scenario describing what might happen during a pandemic influenza outbreak (Figure 1), including information on health consequences, impact and vaccination advice. This was based on existing work (14, 15), which involved extensive consultation with public health and primary care practitioners. Open questions elicited participants' initial reactions before a series of messages, each containing four statements, were shown (Table 1). Messages were designed for dissemination through Twitter and social media networks, as during the A/H1N1 influenza pandemic the public obtained information from social media as well as from official health sources (23). Two message sets covered vaccination, and two, antiviral medications, with messages framed both negatively (focus on risk-reduction) and positively (focus on health-enhancement), with order of message presentation altered for each focus group. Participants were shown two further message sets: one set of three emotion-focused messages elicited anticipated regret and one set of

four factual messages provided cost-benefit information about the A/H1N1 vaccination. Positively- and negatively-framed messages were based on previous research showing that participants denied being at risk of infection, arguing that they were 'fit and healthy', with a strong immune system or 'healthy lifestyle' (14, 15). -The emotion-focused messages were developed based on the omission bias and anticipated regret literature: omission bias refers to perceiving the potential harm from action (e.g. vaccination) as more negative than the potential harm from inaction (e.g. not getting vaccinated) (24, 25); anticipated regret refers to the level of regret one expects to feel when choosing (or not) a particular course of action (26). The fact-based messages were designed to test whether transparent, evidence-based information could increase trust and vaccination intentions as suggested by earlier work (5). After each set of messages, the moderator (first or second author) asked a series of open questions about participants' thoughts, reactions, and feelings, about the messages. Demographic data were collected after each group.

2.3 Data analysis

Focus groups were digitally audio-recorded and transcribed verbatim. Inductive thematic analysis of each transcript was carried out (27), supported by use of QSR NVivo 10.0 software, and coded into emerging themes, which represented prevalent patterns of meaning within the dataset without these necessarily being highly frequent (28). Analysis was iterative, with two researchers independently reading and re-reading each transcript. Following consultation, the initial coding structure was revised to develop a consensus on the codes and themes. Coding followed the aims of the research, focusing on participants' reactions to each message set.

3. Results

Thirty-two (78%) women and nine (22%) men participated, with an age range of 19-77 and a median age of 33 (SD=15.9). Of the participants, 19.5% had regularly received the seasonal influenza vaccination since the A/H1N1 pandemic. Full demographic details are available in Table 2.

Results for vaccination and antiviral messages were combined due to similarity in participant responses; we highlight differences where present.

3.1 Positively framed, health-enhancing messages

Participants within each group had concerns that the health-enhancing messages (messages 1b-8b) down-played the severity of the situation, or expressed scepticism surrounding the validity of health-enhancing claims and the seemingly counter-intuitive message that a vaccine could boost the immune system. Such claims were seen as unfounded given the novelty of the vaccine. For most, scepticism stemmed from a belief that the messages were misleading, implying that only vaccination or antiviral treatment could improve health. Several participants mentioned other measures may also improve health and that further information was needed about how treatments worked:

'It'll prevent you from getting flu, but it's not going to prevent you from getting other infections, so it's kind of misleading.' (FG5, female, 20)

Some participants expressed concerns that the messages seemed too "casual" or "relaxed" for a pandemic emergency, while others felt that the language and style of the messages seemed more appropriate for vitamin pills rather than vaccination or antiviral medication. For some, the messages came across as "pushy" or "intimidating". Several participants reported feeling that the messages were implying that their own natural defences or current health state were inadequate:

'It tells you that maybe your natural defences aren't good enough. I think mine are fine.' (FG3, male, 65)

However, there were some who viewed the messages more positively, feeling that the statements would not cause alarm or overburden people with medical terminology. They liked how the language of the messages allowed for personal choice as the tone felt more advisory than threatening. Overall, participants felt that the messages could be improved through the inclusion of more evidence about effectiveness and the way treatments work.

3.2 *Negatively framed, risk-reducing messages*

Participants had mixed reactions to the risk-reducing messages (messages 1a-8a), i.e., some participants held ambivalent views on the four risk-reduction messages, liking some more than others. . However, feedback on the risk-reduction messages tended to be positive, particularly when compared with the health-enhancing ones. Messages were found to be clear and convincing, and written in sensible language that did not feel patronizing or threatening. Language such as ‘reduces risk’ increased the perceived accuracy and trustworthiness of the message by allowing room for the admission that vaccination or antiviral medications may not be 100% effective for all people, thus appearing more open and honest:

‘The ones that say ‘reduce the risk’ are more convincing than the ones that say ‘prevent’.
Everybody’s heard of having the flu jab and still getting ill afterwards, so it’s more convincing.’
(FG2, female, 30)

Focusing on risk reduction provided participants with more information about the consequences of refusing vaccination, which they felt would help them to make a decision regarding treatment uptake. For others, the message that being vaccinated or taking antivirals would prevent the spread of illness to their family or colleagues was the most persuasive:

‘...my concern is spreading it to my parents at some point because they’re less likely to be able to fight it off successfully without complications.’ (FG1, female, 30)

Negative evaluations of the risk-reducing messages were less common, but were discussed by all groups and were more evident in relation to the antiviral messages than the vaccination messages. Several of the antiviral messages were aimed at those in a ‘priority group’, e.g. people with an underlying health condition (messages 5a & 8a), which some participants reported finding worrying as they did not know if this related to them, or because it sounded like special treatment being reserved for some groups.

3.3 *Emotion-focused, anticipated regret messages*

The message comparing the risk of experiencing vaccination side-effects to the risk of harm from pandemic influenza (message 11) was the most popular as participants liked the way the message showed two sides to the issue: acknowledging that vaccination side-effects are possible, yet weighing these against the risk of contracting influenza:

'That statement does say the risk of side-effects, but it says the risk of harm from flu is higher than the risk of side-effects, which sort of minimises the possibility.' (FG3, female, 67)

Although participants preferred the risk comparison message over others, many reported that they only liked this section of the statement and would change or remove the section that explicitly mentioned regret. Across all groups, participants largely disliked the use of the terms 'regret' and 'upset' within messages which they considered "unprofessional" and "less authoritative", and not necessarily reflecting how they would respond emotionally:

'I think [the statement] is a bit patronizing, I don't want to be told when I'm likely to feel upset about something.' (FG7, female, 35)

The majority of participants also disliked the message which mentioned a small risk of unknown, long-term effects from vaccination (message 9), as this would provoke fear or alarm, reduce levels of trust, and draw attention away from the positive aspects of vaccination. Participants generally reported that they would like more detailed information about potential side-effects, although a couple mentioned finding this unnecessary as it could make vaccination sound "too risky". In addition, participants mentioned that the most trusted and credible information source during a pandemic would be health authorities such as the UK's Department of Health, and that they would not expect to receive these emotion-focused messages from professional sources.

3.4 Fact-focused messages

Balanced messages presenting the risks and benefits of the past A/H1N1 pandemic were generally well received due to their inclusion of factual information (messages 12-15), as the facts and numbers made the messages more striking and convincing, particularly as it appeared that they were providing

“evidence” and not just unsubstantiated “advice”. Several participants spoke about preferring these messages to others as the amount of information included enabled them to make their own decision about vaccination or treatment:

‘They don’t feel manipulative. It feels just like you’re being sent information for you to be able to make your own decision.’ (FG7, male, 36)

The statistical information gave participants a reference point from which to make more meaningful judgements about the risk and severity of both the pandemic threat and the vaccination. In addition, several participants felt that the messages were made more compelling by focusing on the impact of the A/H1N1 pandemic on children, as they could have the potential to invoke stronger emotions in others (e.g. fear), particularly those with children, although they did not necessarily elicit stronger emotions. There were no gender-specific responses to these fact-based child-focused messages among the participants.

Some participants found the factual messages less accessible, saying the statistics might confuse people and mentioning side-effects such as narcolepsy could cause concern as not everyone would understand such terms. It was considered preferable to avoid mentioning serious side-effects as these may discourage some people from getting vaccinated. There was also some scepticism about the messages, particularly the claim that vaccination would have saved the lives of children who died during the A/H1N1 pandemic (message 14).

4. Discussion

This study offers novel insights into how the general public may be likely to respond to messages advocating vaccination and antiviral medicines. Participants largely preferred the risk-reducing messages, perceiving them as more balanced and credible, particularly when compared to health-enhancing messages, which elicited greater scepticism. Factual, evidence-based messages emphasising the costs and benefits of vaccination were well received, while emotion-focused

messages explicitly aiming to evoke feelings of anticipated regret were generally seen as patronising or unprofessional.

Previous research indicates that those who view themselves as healthy are less likely to accept influenza vaccination (14, 16, 29, 30). Despite our aim to reinforce healthy identities by framing vaccination as a way to maintain or improve health in the health-enhancing messages, we found that these were unexpectedly perceived as challenging participants' existing perceptions of themselves as healthy. The present vaccination messages served as the basis of a companion study employing an online experimental design which found that the health-enhancing messages were as effective in promoting vaccination intentions as those framed as risk-reducing (31). . Perhaps this difference can be explained by focus group participants spending greater time critically reflecting on each message in order to engage in discussion, compared with the online experiment where participants may have engaged with the messages in a more cursory and/or passive manner. This corroborates research showing that when more time is spent carefully evaluating messages, negatively phrased information is perceived as more convincing than equivalent positively phrased information (32).

Participants often reported perceiving the risk-reduction messages as more credible and balanced, suggesting that presenting health messages positively may not be advisable when uncertainty exists around the effectiveness of recommended behaviours (33). Some participants viewed the mention of risk in the risk-reduction messages as acknowledging that vaccination could not guarantee good health, whereas the health-enhancing messages appeared 'one-sided' due to focusing only on how vaccination can improve health. This links to earlier research showing that two-sided messages are viewed more credibly (34), and highlights the importance of directly addressing vaccination concerns (15).

Participants largely perceived the messages aiming to evoke feelings of anticipated regret as patronising. Previous studies examining the impact of anticipated regret on various health behaviours have produced inconsistent results, such as studies investigating the role of anticipated regret in

vaccination intentions (26). A review of the literature on inducing regret (35) suggests that strong pre-intervention intentions to engage in a behaviour (36) and a lack of defensive resistance (37) may predict the success of anticipated regret as a driver of behaviour change. Therefore, the rejection of our messages may be explained by our purposive sampling of people who had not previously been vaccinated, and who were thus likely to have weak vaccination intentions. It may also be possible to induce regret less explicitly, which may be viewed more positively by the public.

4.1 Recommendations

The present findings, albeit based on a small sample of participants, suggest that transparent and balanced messages have the potential to encourage the general public to vaccinate during a pandemic influenza outbreak, and we propose several ways to do so. First, messages could incorporate more evidence-based information, particularly in relation to the safety of vaccines or antiviral medicines. Messages that present vaccination costs and benefits, or compare risks posed by vaccination to those posed by contracting pandemic influenza, allow people greater opportunity to feel that they have control over their own health. Indeed, previous research has demonstrated that appraising one's ability to cope with a given health threat, including cost-benefit perceptions, are an important predictor of intentions and behaviour (38, 39). Uncertainty surrounding pandemic emergence and vaccine development can affect the public's willingness to vaccinate (40), so it is imperative that communicators provide certainty wherever possible, while also being transparent about where uncertainty exists and why. Our present findings on the positive reactions to the transparent, fact-based messages warrant further research on how to improve trust in risk communicators as a precursor of vaccination acceptance. Given that the public prefer health advice from official health authorities (41), communicators should think about how to build trust by challenging existing misconceptions about pandemic influenza and vaccination, as well as the governance of their risks. Finally, this study illustrates that public health messages may not always be received as intended (42), suggesting that further work into the impact of emotion-focused messaging could be beneficial.

4.2 Limitations

This study employed a relatively small sample and as such cannot be held to represent the views of the general public. Nor could we draw any conclusions to reflect the views of any specific sub-group, e.g. mothers of young babies. Yet, we believe our study has ‘information power’ (43), as the study aim was narrow, the study design was informed by theory, the participant sample was dense, and the quality of the dialogue was strong. We would have preferred to include a greater number of men, older adults and patients with chronic health conditions, but in line with previous findings (44, 45), many who expressed interest to participate were ineligible. Further research with these populations is needed to ensure generalisability of the present results Opportunity sampling was used due to time and monetary constraints, but future research should sample a wider swathe of the UK public to increase representativeness. Furthermore, we used a scenario to elicit behavioural intentions. Although behaviour can only be directly measured during a pandemic, it is important to note that intentions are not always a completely accurate indicator of behaviour (46). For example, the emotional impact of messages may have direct effects on behaviour that are not accessible to participants’ awareness.

4.3 Conclusions

Pandemic influenza communication should convey transparent, evidence-based information. The general public appear to prefer factual messages that emphasise the costs and benefits of vaccination, particularly with regards to vaccine safety. It would also be advantageous to challenge existing misperceptions and address topics of uncertainty where possible. Although it is not feasible to pre-test messages for all potential pandemic situations and populations, it remains important to test the key components of messaging as this is the best way to ensure maximum effectiveness and reduce the chances of unintentional, negative impacts.

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Author contributions

All authors contributed to the design of the study. The first and second authors sought and obtained ethical approval for the study, recruited and interviewed all the participants. The first and the last authors led the analysis of the data. All authors participated in the writing of the article, and all authors approved the final article.

Conflict of interest

All authors report no conflict of interest.

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