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Future pandemics and vaccination: Public opinion and attitudes across three European countries

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ABSTRACT

Background: Understanding public opinion and attitudes regarding vaccination is crucial for successful outbreak management and effective communication at the European level.
Methods: We explored national differences by conducting focus group discussions in The Netherlands, Poland and Sweden. Discussions were structured using concepts from behavioural models.
Results: Thematic analysis revealed that participants would base their vaccination decision on trade-offs between perceived benefits and barriers of the vaccine also taking into account the seriousness of the new outbreak. Except for those having chronic diseases, participants expected a low infection risk, resulting in a low willingness to get vaccinated. Information about the health status of cases was considered important since this might change perceived susceptibility. Participants displayed concerns about vaccine safety due to the limited available time to produce and test vaccines in the acute situation of a new pandemic. Swedish participants mentioned their tendency of doing the right thing and following the rules, as well as to get vaccinated because of solidarity with other citizens and social influences. This appeared much less prominent for the Dutch and Polish participants. However, Swedish participants indicated that their negative experiences during the Influenza A/H1N1 2009 pandemic decreases their acceptance of future vaccinations. Polish participants lacked trust in their national (public) health system and government, and were therefore sceptical about the availability and quality of vaccines in Poland.
Conclusions: Although participants overall expressed similar considerations, important differences between countries stand out, such as previous vaccination experiences, the degree of adherence to social norms, and the degree of trust in health authorities.

1. Introduction

Outbreaks of communicable diseases will cross borders, with Influenza A/H1N1 [1] and Ebola [2] being recent examples, and increased international travel and migration will facilitate their speed and spread [3]. Cross-border collaboration in the management of future outbreaks within Europe is therefore necessary. Since public health professionals and authorities will be focused on controlling the spread and impact of the new disease during such an outbreak [4], it is essential to timely update and improve existing European pandemic preparedness plans, preferably before outbreaks begin [5].

The success of mitigating a new outbreak is largely dependent on the willingness of the public to comply with recommended preventive measures. Understanding the public opinion and attitudes regarding preventive measures is thus crucial for successful outbreak management and effective communication. Reasons to

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Table 1
Summary of participants' characteristics ($n = 41$).

	Dutch participants[a] ($n = 17$)	Polish participants[a] ($n = 12$)	Swedish participants[a] ($n = 12$)
Median age in years (range)	47 (22–77)	46 (19–61)	40 (21–80)
Female	8/17	6/12	6/12
Low educational level[b]	12/17	6/12	8/12
Having children	9/17	8/12	3/12
Belonging to risk group	8/17	2/12	2/12
If yes, seasonal influenza vaccine	7/8	0/2	1/2
Vaccinated against H1N1	9/17	0/12	10/12
Preventive measures against H1N1, other than vaccination	4/17	2/12	9/12
If yes, type of preventive measures[c]			
Hygiene[d]	4/4	2/2	6/9
Use nose-mouth mask	–	–	1/9
Avoid travelling abroad	–	–	1/9
Avoid crowded places	–	–	1/9
Not specified	–	–	3/9

[a] We conducted two focus group discussions in The Netherlands with nine and eight participants, respectively. In Poland and in Sweden six persons participated per discussion.
[b] In all countries, high educational level was defined as tertiary education; all other educational levels were defined as 'low'.
[c] Some participants stated that they applied multiple measures.
[d] Hygiene includes washing hands more often, use hand sanitizer, cleaning desktop more often, etc.

accept or decline preventive measures in pandemic situations have been described [4,6–12], but very little is known about potential differences herein across Europe.

We therefore conducted focus group discussions in three countries across Europe to explore (1) the public opinion and attitude regarding future pandemics and vaccination and (2) potential differences in opinions and attitudes between participants in The Netherlands, Sweden, and Poland.

2. Methods

We opted for focus group discussions (FGDs) [13,14] to explore public opinion and attitudes. FGDs were chosen because these enable unforeseen topics to arise and to be explored in depth [15]. We developed a theory based semi-structured question route based on the Health Belief Model and two elements from other behavioural models (Supplementary files A and B). The question route was pilot tested, evaluated and improved where necessary.

The Medical Ethics Committee of the Erasmus University Medical Center Rotterdam approved the study protocol (MEC-2012-263). Independent research agencies recruited 6–9 participants per FGD and used purposive sampling methods to ensure a diverse sample regarding age, sex, and educational level. Participants received a financial incentive for their contribution, adapted to the national norm.

In each country, moderators trained in performing qualitative research conducted two FGDs in large cities in 2012. One of the authors (DD) debriefed the Polish and Swedish moderators before the discussion about background of the study and the question route. All participants gave written informed consent prior to the discussions. FGDs lasted for approximately 90 min and were conducted in the native language. All FGDs were audio taped and field notes were made during each discussion. At the end of the FGDs all participants completed a short questionnaire on socio demographics and previous experiences with preventive measures.

The discussions were transcribed verbatim and identifiable data was removed. The entire Swedish and Polish transcripts, and the selected Dutch quotes were translated into English. A thematic analysis was performed [14,16]. First, two authors (DD and IK) independently read all transcripts in-depth. Second, they created a provisional coding tree, based on the themes that emerged from the data. Third, they each identified and coded relevant text passages in one transcript per country and refined the coding tree. Perceived discrepancies between coders were discussed until consensus was reached and the coding tree was finalized. Fourth, one author (DD) coded the three remaining transcripts using the final coding tree (Supplementary file C) and discussed her findings with IK. All transcripts and codes were imported into NVivo software (version 10, http://www.qsrinternational.com/) to enable systematic comparisons between different countries. We followed the COREQ-checklist when writing this paper [17].

3. Results

In total, 41 people participated in six FGDs (Table 1). The median age ranged from 40 (Sweden) to 47 (The Netherlands). Approximately half of the participants were female. Lower and higher educated people participated in each FGD.

The results are presented according to the themes that emerged from the data and were used in the final coding tree (Supplementary file C). Representative quotations for each theme were selected to illustrate the results. If a quotation characterizes a minority opinion, it is indicated. The quotations are numbered; an additional label refers to the FGD ID.

3.1. Pandemic outbreak

Participants of all countries argued that their degree of concern for a new disease would depend on the mode and speed of transmission. They also would want to know the consequences of a disease, especially if potentially fatal, before deciding to take preventive measures or not. Often, comparisons with previous communicable disease outbreaks were made:

> *'I think it is all about this danger. If there is to be a new swine flu, maybe you will not actually get vaccinated, because you think it's not that dangerous. But if there is an Ebola epidemic. . .'* (Q1SE1).

Dutch participants discussed that there would be no immunity for an outbreak with a new virus, thus resulting in uncertainty regarding the course of the disease. Swedish participants reasoned that they would experience the threat of a new disease as severe because they live in such a safe country:

> *'We do not have many other dangerous things to compare* [the disease] *with, so small things become dangerous to us'* (Q2SE1).

Participants stated that they would weigh the threat of a new disease within the context of their own health status. Except for those who belong to a risk group (diabetes, asthma), most participants expected a low infection risk, e.g. thanks to healthy eating and living, and good personal hygiene. Participants considered

information about the health status of infected people important, especially when also young and healthy people are infected, since this might change their perceived susceptibility. In addition, the proximity of cases was considered important; the closer the physical distance or the emotional relationship with a case, the higher the level of perceived susceptibility. However, it was remarked that proximity would be especially important in case of a severe disease. If relatives fell ill and the disease was not severe, participants did not intend to take safety measures. Most participants considered it wise to avoid visiting countries whit many people infected. Dutch and Swedish participants expressed their worry that communicable diseases might spread more rapidly nowadays:

'And now we move so incredibly easily: we fly and sail across the world. It can spread so easily' (Q3SE1).

In one of the Dutch groups it was put forward that lack of herd immunity due to large groups of unvaccinated people [e.g. in the so called 'Bible belt' in The Netherlands] might increase the risk of getting the disease. Polish participants did not discuss perceived seriousness of the disease and perceived susceptibility to the disease frequently.

3.2. Vaccination

Across all countries, preventing the disease or reducing the severity of its symptoms was considered the most important benefit of vaccines. Participants stated that the need for an effective vaccine would be higher when a disease was perceived as more serious. Anticipated regret made Dutch participants less hesitant to get vaccinated (Q4), even if the effectiveness of the vaccine was unclear.

'Doing something is better than doing nothing. . . if something is available you need to try it' (Q4NL1).

Several Swedes expressed that getting vaccinated would not only be beneficial for themselves but would also prevent them from infecting other people. Polish participants however were sceptical about the availability and quality of the vaccines in their country:

'Still you have to consider the fact that even if you got a loan just to get vaccinated, there probably wouldn't be any vaccines available in Poland, as usual' (Q5PL2).

[Participant 1] *'Don't you get this impression, which I have, that they* ['like France, Denmark, the West'] *get better vaccines while we get just the worst sort?'*. [Participant 2] *'Yes'*. [Participant 3] *'They get the first grade while we get the fourth grade. We import it, so we get the leftovers'* (Q6PL2).

Several participants were opposed to vaccination in general as they believed it is healthiest if a body clears the virus without taking drugs:

'Why protect yourself against everything, while, in my opinion, it's more beneficial to have the disease and fight it yourself' (Q7NL2).

The most common view however was to weigh potential benefits and barriers of the vaccine against the threat of the disease:

'What's worse? Getting very sick and dying, or suffering from side effects? You do have to make a choice' (Q8NL1).

In general, the more severe the disease was seen, the less important the barriers to vaccination were considered:

'I got vaccinated against flu once and it's taken a great toll on me. I had high fever and headaches for three days. . . though if my life was in danger. . . I'd get vaccinated' (Q9PL1).

Participants displayed concerns about the safety of the vaccine due to the acute situation of a new pandemic, and limited time to produce and test vaccines and their safety:

'It will probably go damn fast, and they will not have time to test it. And therefore we will have no clue about the possible side effects' (Q10SE1).

Dutch participants expected their government to only introduce vaccines if they were considered safe:

'I do not expect the government to introduce a vaccine if they do not trust it themselves, or if they do not have insights into the side effects' (Q11NL1).

Across all countries, costs of the vaccine appeared to be a strong motivator in favour or against vaccination. Some participants stated that the price of a vaccine should not matter because life is precious, while others suggested that a vaccine should be available for the whole population and thus provided for free (e.g. by the government) (Q12, Q13). However, Polish participants did not believe that providing a vaccine for free would happen in their country (Q14).

[Participant 1] *'I think that if we have something so dignifiedly called public health, we should make it free'*. [Participant 2] *'I think so too'*. [Participant 3] *'I think so too, not everyone can spare a hundred and fifty Swedish Kronor'* (Q12SE1).

'The costs are, in my opinion, the responsibility of the government. The government should simply protect its people, without putting a price tag on it' (Q13NL1).

'We would see the Prime Minster or the Minster of Health, who would tell us that the Polish government has decided to buy this vaccine and to provide it to us for free [laughs], *which we wouldn't believe'* (Q14PL1).

3.3. Social influences

Across all FGDs, it was expected that the new disease and vaccination would be discussed extensively by traditional mass media and on the Internet. Participants also frequently mentioned that this kind of information should be approached critically and that the source of information would really matter. One similar message disseminated across all media would be considered as more reliable. In general, Swedish participants were most trustful towards the national media (Q15), although some were critical (Q16).

'We have serious news reports, what is said in the news that is true' (Q15SE1).

'I was very sceptical of all the media pressure, and how they pointed out people, saying they were not showing solidarity because they did not get vaccinated, that everyone has to do it' (Q16SE1).

It was stated in the Dutch discussions that to prevent public panic, the government is expected to spread complete and trustworthy information as early in the pandemic as possible. Both Poles and Swedes agreed that in case of a pandemic a representative expert needs to step forward with the truth regarding the disease and vaccination (Q17), although Poles questioned the availability of such a person with that level of power and knowledge (Q18).

'You have to hope and believe that the medical community will step forward and honestly declare that it is safe, or that forty percent can experience side effects' (Q17SE2).

[Participant 1] *'So it's reliable knowledge provided by someone who's competent'*. [Participant 2] *'We have no such authorities'*. [Participant3] *'All the good professors, specialists moved to the West'* (Q18PL2).

Swedish participants considered the advice of relatives helpful in the decision about vaccination, while Polish participants did not:

'We [Polish people] *might discuss it with someone, but everyone makes such decisions on their own'* (Q19PL1).

The majority of Dutch participants expected to be personally invited by their general practitioner should they belong to a target group for vaccination:

'I think that if I belonged to the target group, I would be invited automatically by my general practitioner' (Q20NL1).

In the Dutch and Swedish discussions participants suggested that they would contact people who already have been vaccinated, to learn from their experience. However, participants were unsure if those opinions would alter their decision. Participants mentioned that seeing friends or family suffer from the disease, would make them feel not only more susceptible to the disease, but also more willing to get vaccinated:

'I think that if someone close to me or an acquaintance of mine died of this disease, then it would decidedly make me get vaccinated faster' (Q21PL2).

The vaccination decision of quite some Dutch and Swedish participants would be influenced by the vaccination behaviour of the majority of their peers. Although some stated that revising their opinion would depend on the number of and their relation with vaccinated peers:

'If everyone in your vicinity gets vaccinated, it is clear that it will affect my decision. Then I will begin to wonder: should I really ignore this?' (Q22SE2).

3.4. Population characteristics

It was mentioned by Swedish participants that during the H1N1 pandemic applying preventive measures was an automatic response to the government's call to get vaccinated, and that it was an exception if one did not get vaccinated. They concluded that they were a generally risk aware, obedient, and very serious and equality focused population:

'It was true that the authorities stepped forward and told everyone to get vaccinated. It was almost a command. You felt a bit guilty if you did not do it, I think' (Q23SE2).

'We [the Swedes] *are quick to agree with each other, and then we go home and grumble a little on our own. It's a mentality. We are such herd animals; we do what everyone else does*' (Q24SE2).

'We want to do the right thing. When you are sitting in your car, you should wear your seat belt. And if someone says that we will all get sick, so now you should take a vaccine, then I take that vaccine' (Q25SE2).

Polish participants mentioned being sceptical and reluctant regarding vaccines and to be somewhat lacking in trust in doctors and the production process of vaccines:

'I think they ['conscious societies', Norway is given as an example] *would obediently arrive for the vaccination, and they wouldn't hesitate. Whereas here* [in Poland], *people would start to speculate just like we're speculating now. Should we do it, or maybe it's not worth it, or maybe the devil's in the detail'* (Q26PL1).

'Abroad everyone trusts doctors. It's scary in a way. They have a completely different attitude to doctors' (Q27PL1).

3.5. Prior contact with similar diseases or vaccinations

Participants frequently referred to their experience with the Influenza A/H1N1 2009 pandemic throughout the discussions, also without the moderators introducing this topic. Dutch and Swedish participants stated that due to their experience with the H1N1 pandemic they would perceive any new disease as less serious (Q28). Additionally, Swedish participants were sceptical regarding the safety of vaccines because of the debate concerning narcolepsy as a side effect of the 2009 pandemic vaccine (Q29).

'The risk when a new one [a new outbreak] *comes. . . Many may think that it is exaggerated, like the swine flu was'* (Q28SE2).

'But this [debating about the safety of vaccines] *is a new phenomenon. Before the swine flu came, we had never had this debate. People have been vaccinated for who knows how many years'* (Q29SE2).

Participating Poles reflected positively on their governments' decision not to buy the pandemic vaccine:

'Well, there was this propaganda to get vaccinated. Of course there was! There was propaganda all around the world. But it was limited in Poland and that's good, because it turned out we were the only country in Europe that didn't lose face then' (Q30PL1).

In addition, experiences with a previous pandemic or seasonal flu may affect choices to get vaccinated for a new disease, in these cases positively:

'My neighbour, a healthy boy of 13 years old, died of it [the Hong Kong flu]. *In my opinion, it is not relevant that there is a chance that the shot doesn't work or that the outbreak will not end in an epidemic. . . if there are no horrible stories about it* [the vaccine], *I'll take the shot'* (Q31NL1).

'I had severe flu complications several years ago. I ended up in the hospital, it was horrible. A disease like that makes you change the way you think [regarding vaccination]' (Q32PL2).

3.6. Health authorities

Many participants put forward that doctors do not always agree on the use of preventive measures during pandemics. National Public Health Institutes were frequently mentioned as being trustworthy and reliable sources of information during Dutch (Q33) and Swedish discussions, but not mentioned in the Polish discussions. Instead, participants complained about the status of the public health system in Poland (Q34).

If the outbreak is as severe as you describe just now, the RIVM [National Institute for Public Health and the Environment in The Netherlands] *needs to play an active role, and inform us, instead of us being dependent on subjective information'* (Q33NL2).

'Prevention is more common there [in the West of Europe]. *Maybe they feel protected by the state more. We don't have that comfort'* (Q34PL1).

Polish participants were sceptical and distrustful when discussing their government, while the Swedish groups frequently discussed their trust in government and the tendency to obey the government, in spite of the decrease in trust since the H1N1 pandemic (Q35, Q36). They also mentioned the lack of trust in the government elsewhere.

'You were really taken by surprise: My God, the state has given us something that was not good. You're not used to it, after all' (Q35SE2).

'During the swine flu days, the initial stand on the vaccine was: Everyone should take it, and it's safe, we're all going to die, so you have to get vaccinated. And then suddenly it changed: No, no, Sweden has signed an agreement about this vaccine. We [the Swedish nation] *had to buy it, which meant that they* [the pharmaceutical companies] *wanted to sell it, and then it turned out that it had not actually been tested. I think that is crazy'* (Q36SE2).

All groups discussed that people would want to make money on new vaccines. These expectations influenced participants' opinion on getting vaccinated negatively, although several Dutch and Swedish participants tended to trust and defend their governments:

I cannot keep on being so terribly sceptical. . . I have decided that there are some government bodies that you trust. Otherwise I would probably feel that there is no point that they exist' (Q37SE1).

In both Dutch discussions, the advantages of international cooperation regarding the outbreak and vaccination were put forward.

4. Discussion

We explored public opinion and attitudes regarding vaccination during future pandemics and possible national differences by conducting FGDs in three European countries: The Netherlands, Poland and Sweden. Participants stated that they would base their vaccination decision on trade-offs between perceived benefits and barriers of the vaccine, also taking into account the seriousness of a new pandemic outbreak. Except for those who belong to a risk group, most participants in the present study expected a low infection risk, resulting in a lower willingness to get vaccinated. A questionnaire study on seasonal Influenza vaccination coverage and reasons to refrain among high-risk persons in four European countries, including Poland and Sweden [18] showed that individuals did not perceive themselves as susceptible to seasonal Influenza either. During future outbreaks, it is therefore necessary to provide the public with information regarding the health status of first cases, especially when also young and healthy people are infected, with information about the general level of susceptibility and a specification of which groups are considered vulnerable and are thus being targeted for vaccination. The displayed concerns regarding the safety of newly developed vaccines were also observed in a Canadian focus group study [4]; people were hesitant to accept vaccines during future pandemics due to the perceived uncertainties considering novel vaccines and seriousness of disease.

Importantly, some differences between European countries were observed that have implications for outbreak preparedness. We did observe differences in adherence to social norms and rules. Whereas Swedish participants displayed a tendency to do the right thing and to get vaccinated to protect others, this appeared much less prominent in the Dutch and Polish participants. In countries where there is a culture to follow social norms, such as in Sweden, communication might focus more on the social norm, e.g. by providing normative information, both descriptive (perception of the proportion of people opting for vaccination) and injunctive (perception of what is approved or disapproved by others) [19–21]. Trust in health authorities (or lack thereof) has implications for outbreak planning too. Dutch and Swedish participants displayed more trust in both health professionals as well as in national governments than Polish participants. This was also observed in a survey during the Influenza A/H1N1 2009 pandemic [22]. These different levels of trust have implications for the promotion of and response to public health messages from national governments and their public health agencies [23–26]. The lack of trust in e.g. statements issued by the national government can be problematic, since this has been linked to a reduction in vaccination behaviour [23,25,27,28]. It is important to build trust in the pre-outbreak phase, maintain trust during outbreaks and, if necessary, restore or further develop trust after the pandemic ends [29,30]. To do so, reliable and trusted local representatives of the medical community need to communicate clear public health messages regarding the new outbreak and preventive measures. Swedish participants indicated that their experiences during the Influenza A/H1N1 2009 pandemic would reduce their tendency to accept vaccination advice. These discussions may be rooted in the Swedish government having signed a contract with a pharmaceutical company to buy pandemic Influenza A/H1N1 vaccines years before the outbreak [31] and the high incidence rates of narcolepsy following the Influenza A/H1N1 2009 pandemic, suggesting an association with vaccination [32,33]. The seasonal Influenza vaccination coverage in Sweden decreased since the Influenza A/H1N1 2009 pandemic; it was 65.8% in 2008–2009 but decreased to 44.3% in 2012–2013 [34]. Combined with the Polish participants being proud that their Minister of Health had not bought vaccines during the Influenza A/H1N1 2009 pandemic, these findings confirm what Börjesson et al. concluded in 2013; previous experiences with outbreak situations play a crucial role in public opinions and future behaviour. Our study highlights that outbreak experiences differ between countries in many dimensions: with regard to cultural differences, with regard to government policies, and with regard to vaccination side effects (narcolepsy in Sweden). These differences stress the need to adapt communication strategies to local circumstances.

4.1. Strengths and limitations

Although efforts to include individuals of different gender, age and educational level were successful, there might still be responder bias; individuals who participated might be particularly interested in the topic. This paper provides an illustration of opinions and attitudes regarding future pandemics and vaccination among members of the general public in three different European countries. Future research could also focus on opinions and attitudes of health care workers across European countries because of the example they represent for public opinion. Vaccination history as well as intentions of the general public to be vaccinated are positively associated with recommendations by health care workers to do so [35]. Conclusions drawn from this study should be considered with some caution as the findings are based on a small number of individuals, and may therefore not be generalizable to populations at large. In addition, we cannot exclude the possibility that some of the observed differences relate to individual differences rather than to differences between countries. However, as there is hardly any research examining differences in opinions and attitudes regarding pandemics and vaccination across Europe, our results can be seen as a first step in this process.

Authors' contributions

All authors made substantial contributions to the acquisition and/or design of the study. DD and IK collected the data in The Netherlands and performed the analysis of all the collected data. All authors have contributed to the interpretation of the data. DD, together with IK and EBG, drafted the manuscript. JF, HV, JHR and ED have critically revised the manuscript. All authors read and approved the final manuscript.

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Conflict of interest statement

The authors declare that they have no competing interests.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.vaccine.2015.12.035.

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