

New Influenza A/H1N1 ("Swine Flu"): information needs of airport passengers and staff

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Background Airports are the entrances of infectious diseases. Particularly at the beginning of an outbreak, information and communication play an important role to enable the early detection of signs or symptoms and to encourage passengers to adopt appropriate preventive behaviour to limit the spread of the disease.

Objectives To determine the adequacy of the information provided to airport passengers and staff in meeting their information needs in relation to their concerns.

Methods At the start of the influenza A/H1N1 epidemic (29–30 April 2009), qualitative semi-structured interviews ($N = 101$) were conducted at Frankfurt International Airport with passengers who were either returning from or going to Mexico and with airport staff who had close contact with these passengers. Interviews focused on knowledge about swine flu, information needs and fear or concern about the outbreak.

Results The results showed that a desire for more information was associated with higher concern – the least concerned participants did not want any additional information, while the most concerned participants reported a range of information needs. Airport staff in contact with passengers travelling from the epicentre of the outbreak showed the highest levels of fear or concern, coupled with a desire to be adequately briefed by their employer.

Conclusions Our results suggest that information strategies should address not only the exposed or potentially exposed but also groups that feel at risk. Identifying what information these different passenger and staff groups wish to receive will be an important task in any future infectious disease outbreak.

Keywords Anxiety, influenza, risk communication.

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Introduction

Airports are common entrances for infectious diseases, and air travel has become the most effective route for the international spread of emerging infectious diseases. Some infectious diseases are manageable at the airport with conventional medical screenings like temperature monitoring¹ because patients are only contagious after they show symptoms (e.g. SARS²). Other infectious diseases like influenza require special screening efforts, because patients may transmit the disease before they show symptoms. Therefore, early detection of suspect cases among airport staff and passengers was one aim of the public health measures put in place at the beginning of the 2009 'swine flu' (influenza A/H1N1) outbreak. One major strategy underpinning this effort was to inform airport passengers about the early signs and symptoms of the disease and to provide advice

on what passengers should do if they suspected that they had the disease. It was hoped that this would enable and encourage travellers to protect themselves and to prevent the spread of infection by promoting the uptake of hygiene measures such as hand washing and tissue use. In the absence of specific prophylaxis, using communication to increase hygiene behaviours may be the most effective strategy to interrupt the chain of infection among members of the public.^{3,4} At the same, providing airport passengers and staff with relevant information about the outbreak might also be expected to reduce levels of concern,⁵ by reducing levels of uncertainty about the nature, prevention or treatment of swine flu.⁶

Identifying the most appropriate type of information to provide the passengers or staff in the very early stages of any infectious disease outbreak is not straightforward, however. While scientific and medical experts may present

options as to what they consider to be the most important points to convey to the public, if communicators do not also consider what information the target audiences want to receive, then there is a chance that any messages will be disregarded as irrelevant.⁵ Equally, it may be a mistake to assume that everyone should receive the same type of information. Previous work has demonstrated that an individual's desire for information about a given health risk, and the type of information that they want, can be determined by social and demographic factors and by the individual's perception of the amount of risk that they face.^{5,7}

In this research, we investigated what information passengers and staff at Frankfurt International Airport wished to receive in the very earliest stages of the 2009 swine flu pandemic. Frankfurt airport is one of the world's major air travel hubs. While the main peaks of that pandemic are now over, the results may have implications for how we react to future outbreaks and evolving pandemics.⁸ In addition to contrasting the potential information needs of passengers and staff, we also assessed whether their level of fear or concern about the swine flu outbreak, and whether passengers were arriving from or going to a region of the world that was heavily affected by swine flu, had any effect on the desire for more information or the type of information that was requested. Although various studies have assessed information needs and behavioural changes among the general public in response to the swine flu outbreak,^{9–11} airport passengers and staff represented groups of particular interest at the early stages of the outbreak because of their high potential to spread the disease. In addition, previous research has normally taken several days, if not weeks, to begin collecting data. Because levels of public concern can change very quickly during a major public health incident, in this study, we decided to gather data over a 2-day period beginning 2 days after swine flu first started to be reported in the German media.

Methods

Context

In Germany, public health measures relating to airline travel began on Monday, 27 April 2009. These consisted of on-board screening of, and information provision to, passengers on flights coming from Mexico, where swine flu was believed to have originated. Roughly 460 passengers per day arrived on direct flights from Mexico and were seen by two doctors, one from the airport and one from the health authorities. These doctors provided information to passengers on board the plane shortly after it landed. They also asked for passengers who were not feeling well to make themselves known. The detection of ill passengers was based on voluntary notice by sick passengers themselves or on a doctor's appraisal. Between 27 April and 30

April, a leaflet (the 'airline leaflet') was given out to passengers at the airport of origin and/or at destination in three languages (German, English and Spanish). It contained health information for travellers coming from and going to affected regions and was designed to raise awareness of the symptoms of swine flu and to encourage passengers to contact the flight crew if they had these symptoms or to consult a physician if they developed the symptoms within the next 7 days. The leaflet was based on information given by the German National public health institute (the Robert Koch-Institute), the local health authorities and the airport authorities (see Additional Material: Passenger leaflet). Other international airports distributed their own leaflets (external leaflets). Passengers arriving at Frankfurt therefore had various levels of knowledge and information. Starting on April 27, airport staff were provided with a different leaflet and a document (the "reading file") containing information about the disease and its transmissibility. Staff also received a workplace risk assessment that advised against the need for any protective equipment. This information highlighted the symptoms of swine flu and advised employees to contact a physician if they felt ill after close contact with a symptomatic passenger (see Additional Material: Staff leaflet).

Design of the study

We conducted qualitative semi-structured interviews on 29 and 30 April at the beginning of the swine flu outbreak. These interviews were conducted at Frankfurt Airport. Interviews were conducted with passengers who were either returning from or going to Mexico and with airport staff who had close contact with these passengers. We were only able to conduct data collection during a 2-day window, partly as a result of airport security regulations and partly out of a desire to obtain a 'snap shot' of public responses at the earliest stages of the outbreak to inform policy. Because of these time constraints and the fact that interviewing could only be conducted by one member of our team, a convenience sampling method was chosen, with participants approached as they waited for their bags, queued, or were arriving at the airport.

Participants

Passengers aged 14 upwards who were arriving from Cancun or Mexico City or going to Mexico City were eligible for inclusion. This sample frame included all inbound and outbound flights between Frankfurt and Mexico during the period with a total of 1418 passengers [Personal Communication from the Airline]. A smaller number of interviews were also carried out with airport staff who were likely to have close or physical contact with passengers coming from affected regions. These included baggage claim personnel who assisted travellers with enquiries about lost baggage,

special care service employees who looked after passengers with special needs in the terminal and customs officers who are often required to have body contact with passengers while screening for contraband. All staff groups in close contact with the returning passengers were therefore represented in the sample.

Interview questions and procedure

Interviews were conducted in the secure areas at the gate, the international bus arrival or the baggage reclaim. The interviews were conducted by one interviewer and took around 5 minutes to complete. Interviews were held in either German or English. Outbound passengers were approached in the waiting area in the order of their seating. Inbound passengers were approached in the order of their appearance at the terminal. Participants were not asked to provide their names or contact details.

Passengers were asked five questions concerning their departure and arrival destination; what information they had already received at their departure airport; what information or advice would be helpful at their destination; how concerned they were “about coming into contact with swine flu during your air travel today” on a scale of 0 (not at all) to 4 (very much); and their demographics (age and sex). The questions asked are provided in Appendix A. All questions apart from the concern and demographic questions were open-ended.

Airport staff were asked eight questions about their place of work and duties; whether their working shift had overlapped with the start of the swine flu outbreak; when and how they had first heard about the outbreak; when their employer had informed them about the outbreak; whether they would like to receive more information from their employer; what information they would want to receive; their “fear of contracting the virus” on a scale of 0 (not at all) to 4 (very high); and the demographics (age and sex). The questions asked are provided in Appendix B. All questions apart from the fear and demographic questions were open-ended.

Analysis

Concern and fear scores were categorised as “0” no concern or fear; “1–2” moderate concern or fear; and “3–4” high concern or fear. For statistical analyses, contingency tables were performed as well as chi-square tests for trend; where appropriate the Fisher’s exact test was used. For the comparison of concern or fear levels, the Kruskal–Wallis test was performed. Responses to open-ended questions were written down verbatim by the interviewer and subsequently categorized into the semantic answer. Similar answers which appeared to reflect the same underlying theme were then grouped together (e.g. “What do I have to do when I discover symptoms” and “Where should

I call when I am feeling ill” were grouped together as needs more information about public health procedures). For our quantitative analyses, we categorised participants who gave any indication that they still wanted more information about the swine flu outbreak as wanting more information.

Results

Participants

Of a total of 1418 passengers, we approached 91 (6.4%), of whom 88 (97%) agreed to be interviewed. Fifty of these passengers were arriving at Frankfurt Airport and 38 were departing for Mexico. Of the staff groups, we interviewed all customs officers who were responsible for returning passengers from Mexico on 29 April ($n = 4$); all special care service staff who were working on 29 April ($n = 2$), half of the special care service staff working on 30 April ($n = 1$); and half of the baggage claim staff working on 29 April ($n = 6$). The other staff members declined to participate. The demographic characteristics of both groups (travellers and staff) are given in Table 1a/b. The final destinations of the participants are given in Table 2.

How much information had passengers received?

Only 19 of 50 (38%) inbound passengers had received the airline leaflet. We have no information why only 38%

Table 1 Basic data of participants – (a) Passengers; (b) Airport staff/employees

	Inbound		Outbound		
	No.	Age	No.	Age	
Gender					
Female	24	14–79	17	14–69	
Male	26	26–61	21	18–69	
Total	50		38		88
Gender	No.		Age		
Baggage claim staff					
Female	4		42–52		
Male	2		26; 40		
Sum	6				
Customs officer					
Female	1		26		
Male	3		36–50		
Sum	4				
Special care services					
Female	2		27; 59		
Male	1		55		
Sum	3				
Total	13				

Table 2 Direction of passengers after arriving to destination (inbound)

Means of transportation	Direction	No.	Sum
Train	National	13	17
	International	4	
Aircraft	National	8	17
	International	9	
Car	National	4	4
	International	0	
Unknown		2	2
Sum			40
Frankfurt City		10	10

received information at the departing airport in Mexico. However, for those who had received it, it was their main information source. The information provision at Mexico City Airport (external leaflet) was described by passengers as poor. Twelve passengers said they had received no information at all at the airport. Despite this, 35 of 50 (70%) felt sufficiently informed, primarily because of external information sources, for example the tour operator information service (mentioned by 13 participants), information from the media (mentioned by 19 participants) and information given by the doctors in Frankfurt on every plane from Mexico who checked the passengers at arrival. For outbound passengers, 26 of 38 (68%) had received the airline information leaflet. Again, we do not know why more people did not receive it. Four participants told us that they had consulted their GP before departure and travelled with Oseltamivir, masks and other protective equipment in their luggage. Consulting a GP was only reported on the second day of our investigation, possibly as a result of increased public alertness.

Desire for additional information among passengers

Thirty-five of the 50 (70%) inbound travellers reported that there was no further information or advice that they needed about swine flu. Those who reporting wanting further information typically wanted more information about medical (“what are the symptoms of swine flu”) and organisational (“what to do if I develop symptoms”) issues. For the outbound passengers, only 12 of 38 (32%) had no further desire for information. Most requested more information about protective behaviour (mentioned by 14 participants), the management of disease (eight participants), precise information about ongoing situation (six participants), contact details for health care services (five participants) and the impact on daily life and future public health restriction (four participants).

Level of concern among passengers

The level of concern about swine flu for outbound passengers was significantly higher than for inbound passengers ($P < 0.05$). In addition outbound passengers were significantly more likely to want additional information ($P < 0.001$) compared to inbound passengers (Table 3; Figure 1). There was a highly significant relationship between higher level of concern and wishing to receive more information about swine flu ($P < 0.001$). Passengers who had a high level of concern typically reported continuing information needs, whereas passengers with a low or moderate level of concern reported that they had sufficient information (Table 3). This relationship was not affected by gender.

Qualitative analysis of the data suggested that the level of concern and whether participants were inbound or outbound also impacted on the type of information that they wanted to receive. Inbound passengers with high concern reported wanting more information about how to recognise the symptoms of swine flu and more information about how the disease could be contracted. For the different levels of concern for outbound passengers, we observed that the information wanted differed according to the concern level: low-concern participants needed information about *protective behaviour*; moderate-concern participants needed information about *symptoms*; high-concern participants needed both: protective behaviour and symptoms. Outbound passengers with high level of concern typically requested more advice on what to do if they caught the disease.

Information, Exposure and Level of Concern

We found no significant relationship between level of concern and actual or potential exposure. In the inbound and the outbound group, lack of information was associated with concern, irrespective of exposure.

Table 3 Level of concern and information needs of passengers and airport employees/staff

	Outbound passengers (n = 38)	Inbound passengers (n = 50)	Airport staff (n = 13)
Level of concern			
None (0)	14 (37%)	34 (68%)	1 (8%)
Moderate (1–2)	14 (37%)	10 (20%)	5 (38%)
High (3–4)	10 (26%)	6 (12%)	7 (54%)
Receipt of leaflet			
Yes	26 (68%)	19 (38%)	6 (46%)
No	12 (32%)	31 (62%)	7 (54%)
Information needs			
Yes	42 (71%)	17 (29%)	11 (85%)
No	8 (28%)	21 (72%)	2 (15%)

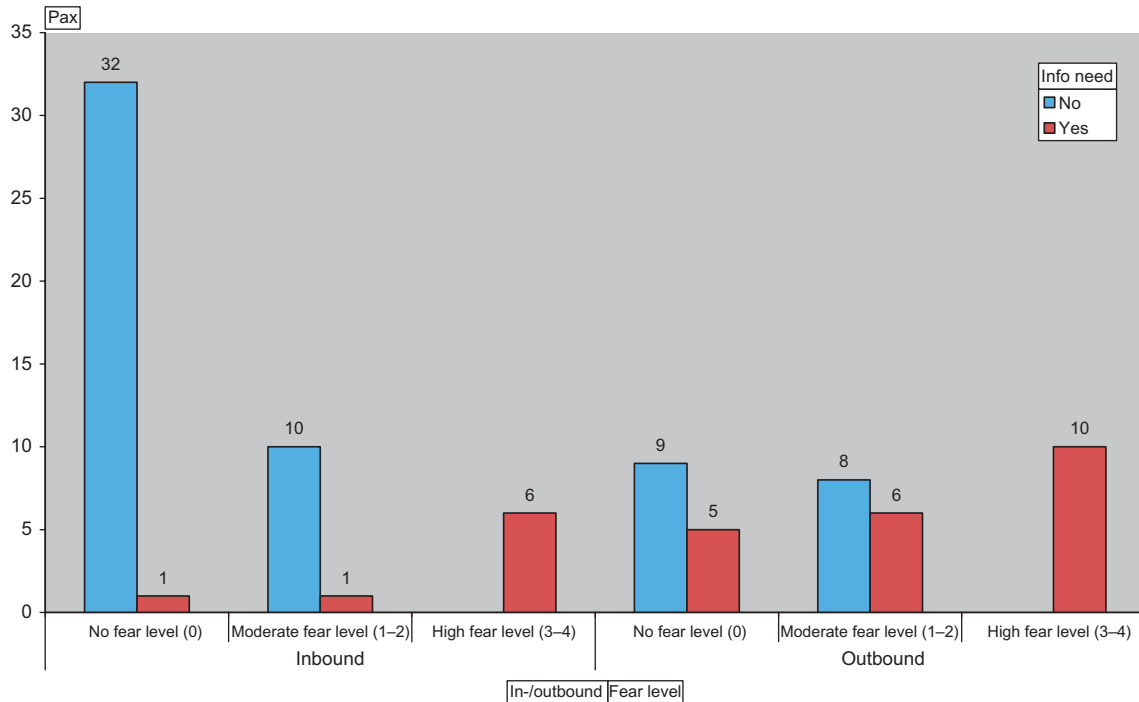


Figure 1. Information need: Level of concern and inbound/outbound flight.

Other issues raised by passengers

Arriving passengers had a generally positive perception of the public health measures adopted by the airport authorities. Even though we did not specifically ask about it, 13 of 50 (26%) respondents spontaneously gave positive feedback about the doctors on their plane as good communicators and as a primary source of information. Only 3 of 50 (6%) were critical about the public health measures, saying that the doctors screened people too quickly.

Other comments made by inbound passengers included suggestions that they would appreciate a website by the airport, offering relevant information about the situation and public health measures that arriving travellers could expect to encounter. Outbound passengers wished to have more protection equipment provided (masks) and needed more security advice for their trips.

How much information had staff received?

All employees had heard about swine flu over the weekend (25 and 26 April) in the media. In addition, two were phoned by colleagues over the weekend and informed about the swine flu situation at the airport. Although they were exposed to returning passengers from the beginning of the outbreak, employees received their first official information from their employer relatively late. Only two received a reading file on Monday (27 April), two received an email on Monday, two received a leaflet on Tuesday (28 April), three reported that they received information only

after their own request on Wednesday (29 April) and one read information on the intranet on Wednesday. Three employees reported that they had received no information at all from the employer. Despite the worrying news from the media, staff members typically said that their employer's message had been that there was no need to worry, because planes were assessed by the public health officials to be 'clean'.

Desire for additional information among staff

Eleven employees reported having further information needs about the protection measures, symptoms and treatment and about their employer's policy regarding staff protection. The main communication problem identified was the recommendation by the employer that they should not wear masks even when in close contact with passengers from affected regions. This recommendation caused concern and confusion, particularly because many of the passengers the staff members were in contact with were wearing masks.

Level of fear among staff

The fear levels of the airport staff were high (Table 3). Seven respondents (54%) reported a fear level of 3 or 4 out of 4. Given the low sample size for this group, we did not attempt to compare the level or type of additional information requested in the staff group between participants who reported high and low levels of fear.

Other issues raised by staff

The airport staff reported a desire to have a better medical and organizational briefing by a 'real' person and not just through leaflets or a reading file (mentioned by 11 participants). They felt at risk as first responders and sought not only information but also attention and care from their employer. Most of them requested more practical advice for personal protection behaviour because the recommendation being given out in the mass media – keep your distance and wash your hands frequently – did not seem feasible for their work place. All felt the need for an understanding by their employer of their work in terms of care, attention and acknowledgement.

Discussion

Our data suggested that a close relationship exists between being concerned or fearful about an emerging infectious disease and wishing to receive more information about it: passengers and airport staff with a high concern or fear level also had a greater tendency to want more information. While we cannot be certain about the direction of causality implied by this association, one conclusion is that better information may assist in reducing anxiety.¹² An association between poor information, uncertainty and anxiety has been noted several times before in the literature.^{13,14} Particularly for incidents where the health threat comes from a novel pathogen or chemical, uncertainty about the threat, conflicting messages from experts and the media and confusing terminology or jargon can all result in increased levels of fear among members of the public.¹⁵ Reducing uncertainty through the provision of clear information is therefore seen as important in its own right⁶ and may also help to increase uptake of recommended protective behaviours.^{5,16}

Identifying the right type of information to give to people is not always easy. Information materials should be factually correct and convey messages that promote recommended protective behaviours. Yet if they fail to tackle issues that are important to their recipients, they run the risk of being ignored or dismissed. By asking participants what information they felt would be helpful to them, we identified several factors that could be useful to include in future leaflets or reading files provided to airport passengers and staff. These included information about the symptoms of swine flu, how to protect oneself from contracting the disease, what to do if symptoms developed, information about the impact of the disease on daily life, likely future reactions by public health officials and contact details for the health services. Notably, however, the type of information that was requested by our participants differed according to whether they were inbound passengers, outbound passengers or staff members. While inbound pas-

sengers wanted information about the management of the disease and medical and organisation procedures, outbound passengers wanted to know more about protective behaviour, the evolving situation and contact details should they develop symptoms. Airport staff needed more information about the infectivity of the disease and appropriate protective behaviour in their work place. In future infectious disease outbreaks, ensuring that information materials are carefully targeted to meet the needs of these different groups may be beneficial.

While ensuring that the information contained within communication materials addresses the concerns of the target audience is important, so too is ensuring that this information is conveyed in a suitable manner. In this regard, both the inbound passengers and the staff group appeared to agree that receiving the information from a real person would be useful. For the inbound passengers, the doctors who checked the arriving flights from Mexico were seen as an appreciated, authentic and trustable source of information. Most participants welcomed their offer to address questions on the plane. For the staff group, a common request was for a 'real person' to inform them about the situation and to explain and answer questions. Similar results have previously been found elsewhere.⁷ In terms of their practical implications, these findings may have most relevance for public health organisations tasked with dealing with any future major incident. While the medical personnel sent to screen potentially affected people may see this screening as their main task, the members of the public whom they encounter are likely to view them as important information sources. It is therefore important that these medical staff have sufficient information, training and resources to handle the enquiries that are addressed to them. Alternatively, where a situation requires that medical staff focus solely on screening, ensuring that they are accompanied by other personnel who can deal with enquiries from the public should enable this screening to proceed quickly while also allowing affected members of the public to access detailed, up-to-date information from a reliable source.

Methodological limitations

Spreading outbreaks of potentially life-threatening diseases can have an enormous effect on global economy, social life and health security.^{17,18} During the 2009 swine flu outbreak, government and health protection authorities had a legitimate and pressing duty to prevent the import of swine flu cases, where possible. Assessing the impact of such measures and the information materials that were provided as part of them needed to be carried out swiftly to inform policy. We therefore started this study within 2 days of the onset of the crisis in Germany. In addition to the rapid start, data collection was only possible over a 2-day per-

iod, partly because of aviation security legislation limiting access to secure areas for non-essential staff. This time restriction also ensured that we were able to feed our results back to the relevant policy makers very quickly. The trade-off for generating the data rapidly, however, was the need to use methods that may be less robust than traditional epidemiological or qualitative procedures. Several specific caveats should therefore be borne in mind when evaluating this study.

First, our use of convenience sampling may have biased the sample, with only those travellers or members of staff who were particularly interested in the topic being included in the sample. It is possible that we over-estimated the true level of concern within the population.

Second, because of logistical reasons, we were unable to conduct interviews in Spanish, meaning that we may have a particularly unrepresentative sample for travellers arriving from Mexico.

Third, given the open-ended nature of our questions, it is difficult to determine what the frequency of the various issues that we identified was in our sample. Had we used direct questioning with specified response options, the frequencies that we obtained may have been different.

Fourth, the location of our interviews may also have created some artefacts in our results. As travellers had not yet left the airport by the time of their interview, it is possible that some would have obtained more information after our interviews were concluded. We may therefore have underestimated the effectiveness of the communication within the airport.

Conclusions

Airports are likely to be at the front line of any future major infectious disease outbreak. Public health measures at a country's airports will therefore play a large role in determining whether and when a novel infectious disease enters the country. Providing information to inbound and outbound passengers, and to airport staff, should be seen as an integral part of these measures. Although the methodological caveats highlighted previously limit the extent to which we can generalise from our findings, this study has identified three broad principles that may help to maximise the effectiveness of information given out at airports. First, different groups exist within an airport who may require qualitatively different types of information. Passengers going to an affected region of the world may have wish to receive different information from those coming back from it, while members of staff interacting with these groups may also be different. A single information source is unlikely to meet the diverse needs of all three groups. Second, supplementing written information with an in-person briefing by a trusted source such as a doctor

appears to be an effective way of reducing anxiety. This is particularly valuable if the communicator is able to take questions from the passengers and staff members. Finally, formative research, of the type used here, can be helpful in informing communicators as to what information the public wish to know. This research can be conducted quickly and should be seen as an integral part of the public health response to any future emerging infectious disease outbreak.

Conflict of interest

None of the authors have a conflict of interest.

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Author contribution

PD had the original idea for the study, devised the questionnaire, carried out the interviews and wrote the paper. GJR refined the questionnaire, advised on statistics and commented on the manuscript at all stages. WG assisted with the organisation of the study and commented on the manuscript. SW (London) assisted with the conception of the study and rewrote the draft. SW (Frankfurt) and HS commented the statistics and the draft. RG did the statistics and tables and commented on the draft. He made the final approval of the version to be published and supervised the project. All authors contributed extensively to the work presented in this paper.

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