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To report or not to report: a psychosocial investigation aimed at improving early detection of avian influenza outbreaks

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Summary

The aim of this study was to identify difficulties and barriers to reporting clinically suspect situations, possibly caused by avian influenza (AI), and to explore possible incentives to reporting such situations, with the ultimate aim of facilitating early detection of AI outbreaks. Focus group sessions were held with policy-makers from the competent authority, representatives of veterinary practitioners and poultry farmers. Personal interviews with a group of poultry farmers and practitioners were held to ascertain the difficulties and barriers they perceived and their proposed solutions. An electronic questionnaire was put on the websites of a poultry farmer union and the Royal Dutch Veterinary Association to investigate perceptions and attitudes concerning AI-suspect situations in the Netherlands. Six themes emerged identifying factors that hinder the reporting of a clinically suspect situation: lack of knowledge and uncertainty about clinical signs of AI; guilt, shame and prejudice; negative opinion of control measures; dissatisfaction with post-reporting procedures; lack of trust in veterinary authorities; lack of transparency in reporting procedures and uncertainty about the notification process. Recommendations to facilitate early detection of AI are discussed.

Keywords

Avian influenza – Disease reporting – Early detection – Socio-psychological factors – Syndromic surveillance – Vigilance.

Introduction

Outbreaks of notifiable animal diseases (NADs), such as notifiable avian influenza (NAI) have large societal and personal consequences. Livestock farmers and veterinary practitioners are at the frontline of surveillance, and hence it is widely recognised that they play a key role in detecting and reporting suspicions of the occurrence of NADs (6). In theory, notification of contagious livestock diseases by farmers to the competent authority can be an effective early detection tool. Therefore, formal rules for reporting clinically suspect situations in livestock by farmers and veterinary practitioners are laid down in national and international legislation all over the world. In the Netherlands it started with the Dutch Cattle Act, which

officially came into force in the year 1870 (43). It consisted of a list of contagious diseases such as rinderpest, anthrax, rabies and foot and mouth disease. Furthermore, it contained regulations for the obligatory reporting of affected and suspect livestock to the mayor of the municipality by farmers and veterinary practitioners, the isolation of sick and suspect livestock, the prohibition of transport of these animals, etc. In essence, not much has changed with respect to the reporting and eradication process for NADs since those early days. Yet, we cannot conclude that the regulations produce a desirable effect: in spite of strict rules and regulations, experience has shown that the time between the first clinical appearance of AI and the actual reporting by farmers of clinically suspect situations to the competent authority is often too long. This time lag results in extensive spread of the disease to other farms because control measures are not put in place in time (7, 8, 14).

Syndromic surveillance

Syndromic surveillance is the practice of tracking disease in a population using health-related data that do not allow for a definitive diagnosis of specific disease conditions but signal a sufficient probability of a case or an outbreak to warrant further investigation (10). In a syndromic surveillance system, clinical signs are grouped into disease syndromes on the basis of a common organ system (e.g. respiratory disease), a common clinical feature (e.g. progressive mortality, decreased feed intake) or a common likely cause (e.g. influenza-like disease). Populations are surveyed for disease syndromes of interest, and further epidemiological or diagnostic investigation is performed when the rate of a particular syndrome exceeds a certain predetermined threshold (4). Because they track information that is available before definitive diagnoses of specific disease conditions can be made, syndromic surveillance programmes typically allow anomalies in disease trends to be detected more rapidly than would be expected with methods that rely on obtaining a definitive diagnosis (15, 16, 17, 42). Analyses of the H7N7 highly pathogenic avian influenza (HPAI) epidemic in the Netherlands in 2003 showed that increased mortality, decreased feed and/or water intake and a drop in egg production are excellent disease syndrome surveillance indicators (14, 17). After an analysis of the H7N7 HPAI epidemic, specific syndromic surveillance notification thresholds were established (15). These surveillance thresholds were incorporated into European Commission Decision 2005/734/EC (20) and the Dutch Ministerial Regulation 'Prevention, eradication and monitoring of contagious animal diseases, zoonoses and TSEs' to provide an early detection system for AI outbreaks (35). Article 89 of the Ministerial Regulation stipulates that a poultry farmer has to report the following to the competent authority:

a) increased mortality
– in layers, reproduction birds or broilers: 0.5% mortality or more per day for two consecutive days
– in turkeys: 1% mortality or more per day for two consecutive days
– in AI susceptible birds: 3% or more mortality per week. Poultry farmers have to consult their veterinary practitioner if they observe increased mortality in AI susceptible birds

b) a clinical problem

c) a reduction in feed intake or water intake of 5% or more per day for two consecutive days

d) a reduction in egg production of 5% or more per day for two consecutive days.

Investigation of the scarce empirical data on delayed reporting and under-reporting of clinically suspect situations shows that the problem thus far has mostly been approached as a technical veterinary problem (18). Only recently have psycho-social factors such as the behaviour, attitude and perception of farmers and veterinary practitioners become the focus of interest as possible predictors of delayed reporting (23, 25, 30). Increasing the reporting rate and shortening the delay in reporting are crucial. Finding ways to do this is complicated by the fact that little is currently known about the way farmers behave in clinically suspect situations, more specifically, about their perception and appraisal of the situation, the decision processes they follow, and the intentions and behaviours that flow from these perceptions and decisions.

The purpose of this study was to identify what poultry farmers, veterinary practitioners and the competent authority perceived as barriers (and possible solutions for those barriers) to reporting clinically suspect situations, possibly caused by AI, with the ultimate aim of improving early detection of AI outbreaks.

Methods

To learn more about why poultry farmers decide to report or not to report clinically suspect situations, possibly caused by AI, the study combined qualitative and quantitative research. For the qualitative part of the study, the authors used participatory epidemiology methods (26): focus group sessions were held with stakeholders to detect patterns and trends, as follows:

– policy-makers from the Dutch Ministry of Agriculture, Nature and Food Quality, which is responsible for animal health policy and regulation (four people);

– representatives of the Food and Consumer Product Safety Authority, which is responsible for the actual emergency response when a suspicion is reported or an outbreak is detected (two people from the head office with responsibility for disease eradication);

– board members of the livestock sections of the Royal Dutch Veterinary Association (six people: livestock practitioners with an interest in veterinary policy-making);

– board members (poultry farmers) of the two poultry farmer unions present in the Netherlands (two people).

Subsequently, personal in-depth interviews with five randomly selected poultry farmers and four poultry veterinary practitioners were held to check if there might be other difficulties or barriers, solutions and incentives with respect to reporting clinically suspect situations, as suggested in the focus group meetings. Some of the interviewees had experienced an AI outbreak in their neighbourhood in the past (not necessarily on their own farm) and a few of them had been visited by the competent authority after a suspect clinical situation had been reported. Based on the results of the qualitative research, an electronic questionnaire was posted on the website of a poultry farmer union for several weeks. The questionnaire was also posted on the website of the Royal Dutch Veterinary Association for three weeks, inviting veterinary practitioners that work with poultry to respond. The questionnaire was subdivided into four sections. Section A asked when and under what conditions they would report a clinically suspect situation. Section B asked about the feelings and (economic) consequences they expected after reporting a clinical suspicion. These questions were formulated both for the case in which, retrospectively, clinical signs would indeed turn out to be caused by AI (true positive), as well as the situation in which, retrospectively, it would become clear that they were not caused by AI (false positive). Section C asked about barriers to reporting, and Section D asked about opinions on national regulation explaining when and how to report a clinically suspect situation. The questionnaire did not just probe into possible difficulties, but also possible solutions to breaking down the barriers.

A grounded theory approach (37) was used to analyse the content of focus group and in-depth interviews. Each discrete incident, idea, or event was given a name or code word that represented the concept underlying the observation. Coded data were then isolated, reviewed, and interpreted line by line, to form categories and sub-categories until theoretical saturation was assumed (31). Finally, categories and sub-categories were integrated to form substantive themes. Overall, six themes emerged from the data. With respect to the electronic questionnaire, relative differences in opinions and attitudes between veterinary practitioners and poultry farmers were tested with a χ^2 statistic or, when more appropriate, with Fisher's exact test (36).

Results

Focus groups

A summary of items indicated by the competent authority, veterinary practitioners and poultry farmers as factors that prevent the reporting of clinically suspect situations, possibly caused by AI, is shown in Table I. In Table II, a summary of possible solutions to the problems surrounding reporting, put forward by the focus groups, is shown. After triangulating the responses of the competent authority, veterinary practitioners, representatives of farmer organisations and poultry farmers in the focus groups and in-depth interviews, six themes emerged across all groups.

Theme 1: lack of knowledge and uncertainty about the clinical signs of avian influenza

Specific syndromic surveillance reporting thresholds were set after the H7N7 HPAI epidemic in the Netherlands in 2003 (35). However, the responses of poultry farmers indicated that they did not agree with these thresholds. Poultry farmers did not understand why they should report clinical signs that they interpreted as being linked to other diseases or other causes. Furthermore, from the discussion it became clear that many poultry farmers only assume that there is an AI problem if the mortality is exponentially increasing, a sign which is linked to HPAI. They do not recognise low pathogenic avian influenza (LPAI) to be a problem for poultry farmers.

Theme 2: guilt, shame and prejudice

Public opinion and social norms were identified by farmers as significantly influencing their practice of biosecurity. Farmers interviewed in the study felt that if they reported, and especially if they were the first farmer to report, other farmers might think they had done something wrong. This relates to Theme 1, namely, many people have erroneous opinions on how diseases spread. A reflection from the focus group meeting was as follows: 'Many people would agree that farmers with poor hygiene who have illegal practices run a higher risk of introducing an animal disease onto their farm. Hence people who admit they may have an animal disease on the farm are afraid others may think they are unhygienic and have illegal practices'. A farmer commented that farmers who are the first to report 'should be made heroes in the public opinion instead of criminals'. On the same theme, many farmers expressed their dissatisfaction with what they called the obtrusive 'circus' of procedures after reporting. They were referring to the visits of the specialist team of veterinarians and governmental officials that investigate the seriousness of

Table I
Reporting clinically suspect situations, possibly caused by avian influenza, on poultry farms: difficulties and barriers identified by three focus groups

Difficulty/barrier	Focus group		
	Veterinary authorities	Veterinary practitioners	Poultry farmers
Difficulties with risk assessment	Unfamiliarity with clinical signs of AI, especially among farmers and veterinary practitioners with only a few poultry farmers as clients. More problematic if last outbreak is some time ago. Farmers perceive that there is a higher risk of AI on their neighbour's farm than on their own farm	There is a large grey area, e.g. increased mortality combined with non-specific clinical signs. There are several (non-defined) factors playing a role in the decision process to report a suspicious situation. Even with very high mortality, some farmers do not think there is a real problem	There are clear rules with respect to reporting a situation without clear clinical signs but with increased mortality, decreased feed intake or a dip in egg production. However, poultry farmers do not agree with these rules. Poultry farmers do not see why they should report such situations when they encounter signs they judge as being linked to other diseases or other causes. The veterinary practitioner is indeed the first one to be consulted in such situations by the farmer, but in practice the veterinarian will almost never be consulted
Characteristics of disease		The higher the probability of infection, the faster a practitioner would report. When there are no outbreaks in neighbouring countries, the probability of infection is perceived to be low	
Negative consequences	Both for farmers and veterinary practitioners. They are both vulnerable due to specialisation. When there is a real outbreak, limitation of movement or stamping-out policies applied in the neighbourhood may lead farmers to feel guilty for having reported the suspicion	The social consequences are high when a false alarm is raised (strangers on the premises, large amounts of paperwork). In general, farmers are not very willing to spend money on veterinary supervision, especially if it concerns the protection of the interests of the poultry industry as a whole rather than their own personal interest	
Guilt, shame and prejudice	Farmers having an outbreak of AI are perceived as being non-hygienic and are suspected of having used illegal practices	Farmers do not want to have strangers with unfamiliar cars on their premises to be seen by the neighbours or have the mayor of the town visiting them for a serious talk	
Earlier experience with reporting	There is an association between earlier negative experiences and the tendency to not report quickly	If a practitioner has never reported a suspicion before, they do not know what to do and/or what will happen	If there has been experience with AI outbreaks in the neighbourhood,farmers are more inclined to report. Self-experience with an AI outbreak will increase alertness. However, there are many negative experiences communicated via informal channels picked up by non-experienced farmers
Negative image and mistrust of veterinary authorities	Farmers and veterinary practitioners have a negative image of the veterinary authorities due to experiences with procedural mistakes and lack of expertise of veterinary officers	Perceived unfairness with respect to the reporting station. The person answering the phone at the reporting station has no veterinary knowledge. It is not possible to discuss the situation with them to try to come to a mutually satisfactory conclusion. The state veterinary officer visiting the farm is sometimes not competent. State veterinary officers are not always sufficiently aware of appropriate hygiene standards	Veterinary authorities have a negative image among poultry farmers: no poultry expertise and sometimes a detached and arrogant attitude
Unclear procedures		Procedures are particularly unclear for non-experienced practitioners	Lack of transparency about the clinical situations in which exclusion diagnostic tests can be used (without isolation of the farm)
Lack of recognition of the ethical component of veterinary work	The consciousness of veterinarians of the ethical component of their work often begins to decrease the day they leave veterinary school and start working in a veterinary practice	There is only a small core group of active veterinary practitioners in the field that is concerned about this item	
Conflict of interest	Farmers may postpone a report of a suspect situation until a planned shipment of poultry has been delivered; they may quickly ship-out birds when there are rumours of an AI outbreak. Farmers, traders, and veterinary practitioners with farmers as clients all have strong personal interests	The interest of the individual farmer (economic) versus public health interests; the interest of individual farmers versus the interests of industry; conflicting interests of the veterinary practitioner: integrity versus a good relationship with client	
Non-transparent or conflicting legislation		In some sectors (e.g. dairy in the cattle industry, broilers in the poultry industry) with frequent contact between farmer and practitioner, unclear procedures or legislation is not a problem because the two parties can fix the problem together. In other sectors (e.g. layer sector) with less contact between farmer and practitioner, veterinary practitioners need all the support of the law not to surrender to the pressure of poultry farmers	
Procedural injustice			Veterinary authorities have started to ask for money for regular inspections on the farm, but they may have no specific poultry knowledge and may not be able to judge situations on the farm properly; poultry farmers perceive this to be unfair

AI: avian influenza

Table II
Reducing barriers to reporting clinically suspect situations, possibly caused by avian influenza, on poultry farms: solutions proposed by one or more focus groups

Solution	Focus group		
	Veterinary authorities	**Veterinary practitioners**	**Poultry farmers**
Shorter isolation period	Already accomplished for AI because of the use of the PCR test in the framework of exclusion diagnostics	A procedure for fast exclusion of a possible notifiable disease causing a suspect but non-specific situation must be made available	In theory, this is already accomplished, but in practice it does not always work that way. Preferably the isolation period should be 24 hours, and certainly not longer than 48 hours
Reduced social consequences		A minimum of publicity, no external signs	Poultry farmers feel that after the 2003 epidemic in the Netherlands this is not as important anymore; if it is a highly pathogenic AI outbreak everybody should be aware of the seriousness of the situation
Improved procedures		Make it possible to have an alternative way of reporting: exclusion diagnostics in a situation with non-specific clinical signs, without isolation of farm	More communication of operational procedures in peace time, not the first time there is a real outbreak; procedures and protocols should be more transparent; absolute guarantee that a false positive report will be cleared within a maximum of 3 days. The procedures should allow for exclusion diagnostics to be used without the need to isolate the farm and with minimal costs for the individual farmer
Better diagnostic tests	A more accurate and reliable diagnostic test is needed. It is not yet clear if this should be made available on-site	A fast diagnostic result after testing; testing done by practitioners themselves; diagnostic testing to exclude a possible AI infection; availability of on-site tests	If improved tests are available, this should be communicated to farmers
Better communication between authorities and farmers	In the winter period, or when there is a higher awareness due to outbreaks in neighbouring countries, have presentations about notifiable diseases	More frequent consultation between authorities and the Royal Dutch Veterinary Association about specific reports of clinically suspect situations (debriefing) and protocols	Better communication is absolutely necessary; there is a need to improve the website of the veterinary authorities; protocols used should be transparent and farmers should be aware of the content before they are used; specific legislation for farmers is difficult to access
Costs of testing not for individual farmer	Start a campaign to promote use of PCR tests by veterinary practitioners and farmers		
Financial reward to support disease control	Reward a report from a communal fund (financed by industry and government)		
Punishment	Lift the cutback in compensation when administrative mistakes by farmers are ascertained during farm visits by authorities; punishment for administrative mistakes is very demotivating for the farmer and has led to many legal problems		
Support for veterinary practitioner		An intermediary, a service you could contact to discuss your clinical findings and to decide if you should report the situation to the authorities: an expert system or a competent person you could consult by phone (second opinion)	Annual extension/education programme about disease in poultry
Support for farmer			Internet-tools with pictures/video material on poultry diseases (avian influenza and Newcastle disease among others)
Ethical consciousness	Refresher courses for veterinary practitioners	Distribution of information on ethical problems via the newsletters of poultry producers; scientific meetings on this subject among veterinary specialist groups	
Anonymous 'squeal' phone line	Will not work, everybody will cover for each other	Do not report without telling the farmer, otherwise you will lose their trust; reporting without consent of farmer will create problems for the veterinary practitioner	
More transparent and specific legislation		Specific and unequivocal legislation (use practical field knowledge from veterinary practitioners)	

AI: avian influenza
PCR: polymerase chain reaction

the report. In order to prevent the possible spread of AI, these officials park their cars outside the premises, and walk to the farm wearing white protective suites and carrying red suitcases with sample materials and instruments. In the densely populated agricultural areas in the Netherlands it is easy to spot at least half a dozen farm houses in the flat scenery, which means that the village knows about a possible suspect situation within no time.

Individual farmers accused each other of giving their own farm interest priority over sector interest. 'When farmers suspect animal diseases, they just quickly sell their suspect animals to the slaughterhouse and wait at least a few days before reporting, so that they can carry out important deliveries before a possible isolation of the farm.' During group discussions, several individual farmers also admitted that they had sold clinically suspect animals to the slaughterhouse, but not to other farmers. In summary, fear of destruction of personal image and being looked upon as a criminal, and fear of deteriorating social networks were among the reasons for not reporting possible early cases of AI.

Theme 3: negative opinion on control measures

Farmers held the opinion that the control measures applied by government officials in the Netherlands are long and tedious. After notification, in some cases, if animals are tested to exclude AI, the farms may be isolated until test results are announced. This normally takes less than 48 hours. However, on some occasions it may take longer, and the majority of farmers who had not had any personal experience with reporting an AI-suspicion all knew this.

Dutch farmers do not receive compensation for losses suffered during this period of examination after the notification, although farmers said that the 'reward' of notifying AI as quickly as possible is that the financial compensation for further consequences, such as the need for eradication if there is indeed an NAI-infection, may be higher: healthy animals that are eradicated are fully compensated and sick animals are compensated at 50%. Animals that die from the disease are not compensated.

Theme 4: dissatisfaction with post-notification procedures

Several farmers who had experiences with reporting to the competent authority about clinically suspect situations were not satisfied with post-notification procedures. After notification, a team of three veterinarians visits the farm. These include the veterinary practitioner of the farmer, a veterinarian of the Animal Health Service (a private, profit organisation), and a state veterinarian. In some instances in the past, state veterinarians who may not always have the necessary specific knowledge – had made a bad impression by showing this lack of knowledge. In addition, farmers were dissatisfied if officials had displayed 'detached and arrogant attitudes', and spent most of the time writing instead of personally talking to the farmers. Although in many cases farmers praised the professionalism and attitude of the specialist team, in some cases state veterinarians were perceived by farmers as people with limited knowledge on animal disease control. These experiences had a de-motivating rather than a stimulating effect on farmers and they did not feel encouraged to report the next possible case of AI they came across.

Theme 5: lack of trust in government bodies

Farmers not only know the state veterinarians from notification procedures, but also from other contacts, such as commodity inspections and eradication campaigns. Most officials currently are aware of the sensitive nature of the procedure after reporting, and are especially trained to deal with farmers' uncertainties and emotions while performing their duties. Their attitudes during commodity inspections, however, may be totally different, which relates to the different role they are fulfilling during these activities. Farmers sometimes do not discriminate between these roles, and know governmental officials only in their corrective role of commodity inspectors.

In addition, the results indicate that farmers have concerns about earlier animal disease interventions by government bodies. Farmers felt that during past animal disease eradication campaigns they were pushed aside and they were not in control of their business anymore.

Moreover, common to all the farmers was the belief that disease prevention measures launched by government bodies were not consistent and hence not fair. They felt that the government was often giving priority to trade and economic interests. Overall, many farmers currently have a lack of trust in government officials and as a result find it difficult to accept that government could or would work together with farmers to control AI. This will be a challenge for both the government and farmers.

Theme 6: lack of transparency in notification procedures and uncertainty about the reporting process

Farmers lacked insight into reporting procedures and, perhaps more importantly, the process that would follow notification. The uncertainty about how long the farm might be closed, already mentioned under Theme 3, is but one example of the uncertainty about possible consequences of a notification. Tension caused by uncertainty starts with the fear of the test result. Farmers hope for negative test results, but once they have notified the competent authority, they often expect that the test results will be positive. Farmers expressed the need for a website that they could regularly visit to check the progress

of the notification, or a phone number that they could call. This uncertainty is also reflected in the complaints about specific steps in the reporting procedure, such as making the first telephone call to the competent authority. In all cases the farmers felt that the person answering the calls needed to be an expert with whom they could discuss the seriousness of their report. However, in practice the person answering the phone is an administrator and not an animal disease expert.

Transparency and confidence in the information that is presented are prerequisites for controlling animal disease outbreaks. Currently, farmers are hesitant in using formal channels because they feel that these sources of information are not up-to-date or reliable.

Questionnaire

A total of 33 poultry farmers and 334 veterinary practitioners responded to the questionnaire. The results of the quantitative study underscored the qualitative results. However, in some instances poultry farmers and veterinary practitioners differed significantly in their opinions and attitudes towards reporting clinically suspect situations (Table III). To highlight a few differences, although both poultry farmers and veterinary practitioners were reluctant to report false alarms, this tendency was stronger for poultry farmers than veterinarians. For example, poultry farmers wanted more certainty before reporting to the competent authority. When asked: 'if you thought that a clinical problem on your farm might be caused by AI, how certain would you want to be before you reported to the competent authority?' 27% of poultry farmers, compared with 7% of veterinarians (χ^2 statistic, $P < 0.001$) needed more than 90% certainty. In addition, relatively more veterinarians (72%) would seek a second opinion before reporting it than would poultry farmers (55%), if they thought there was a small chance of AI on the farm ($P = 0.04$). Relatively more poultry farmers (72%) than veterinarians (49%) indicated that they would report 'faster' or 'much faster' a suspect clinical situation if clinical signs of AI were more specific ($P = 0.01$). In addition, relatively more poultry farmers (45%) than veterinarians (13%) indicated that they would report 'faster' or 'much faster' a suspect clinical situation if there was a strong relationship between the poultry farmer and the veterinarian ($P < 0.001$).

Relatively more poultry farmers (36% and 16%) than veterinarians (5% and 5%) indicated that they would feel 'awful' and 'ashamed', respectively, if they reported a suspicion which later proved to be a false alarm ($P < 0.001$). In addition, a total of 47% of poultry farmers and 49% of veterinarians thought that reporting a suspect situation which proved to be a false alarm, would result in 'negative' or 'very negative' consequences for the financial situation of the farm. A total of 44% of poultry farmers and 13% of veterinarians ($P < 0.001$) thought that reporting a suspicion which later proved to be a false alarm would create a 'negative' or 'very negative' image of the farm. Reporting a suspicion which proved to be a false alarm was expected by 12% of poultry farmers and 26% of veterinarians to have a negative effect on the relationship between the veterinary practitioner and the client ($P = 0.09$).

Only 53% of poultry farmers and 43% of veterinarians trust that all poultry farmers will do their utmost to prevent an outbreak of AI in the poultry sector. Twenty per cent of poultry farmers and 19% of veterinarians feel that it is more terrible to report a suspicion that proves to be a false alarm than to miss a real case of AI.

Poultry farmers (31%) and veterinarians (31%) alike indicated that the fuss linked to reporting a suspect situation is often a reason for not reporting such a situation. However, the threat of paying a possible penalty for negligence is perceived as an important reason to report a suspicious clinical situation by 58% of poultry farmers and 31% of veterinarians ($P < 0.001$). Guidelines in the legislation and regulations explaining when and how to report a clinically suspect situation possibly caused by AI, are perceived as 'clear' by only 52% of poultry farmers and 33% of veterinarians ($P = 0.03$), and 'well thought-out' by 39% of poultry farmers and 24% of veterinarians ($P = 0.05$).

Discussion

Only 33 poultry farmers responded to the electronic questionnaire, which was considered a low number (the response rate was less than 5%, based on the number of members of the poultry farmer union). The response of 334 veterinary practitioners was good (a response rate of around 40%). The subject of reporting clinically suspect situations possibly caused by NADs to the competent authority is considered a very sensitive issue within the poultry industry, and this might be an important reason why not many poultry farmers responded to the questionnaire. Another issue might be that not all of the poultry farmers had an internet connection. Nevertheless, results of the quantitative study underscored the result of the qualitative studies and the authors are therefore confident that they have captured what is felt by farmers and practitioners in the field.

If livestock farmers and veterinary practitioners are familiar with the clinical signs of a NAD, they are in the best position to detect NAD suspects. However, often these diseases have not been in the country for many years or sometimes even decades, and farmers and some veterinary

Table III
Responses of Dutch poultry farmers (n = 33) and veterinary practitioners (n = 334) to a web-based questionnaire designed to investigate perceptions and attitudes towards reporting clinically suspect situations, possibly caused by avian influenza

Item / question	Response rate (%)		Difference between farmers and veterinarians: (P-value of χ^2 statistic)
	Farmers	Veterinarians	
I have reported a suspicion of a notifiable disease to the Veterinary Authorities in the past	18	70	< 0.001
Conditions required for reporting a clinically suspect situation			
If you thought that a clinical problem on your farm might be caused by AI, how certain would you want to be before you reported it?			
≥ 50%	67	51	0.08
≥ 80%	33	20	0.08
≥ 90%	27	7	<0.001
If I thought there was a small chance of there being AI on my farm, I would wait a few days to see how the disease was developing before reporting	39	54	n.s.
If I thought there was a small chance of there being AI on my farm, I would seek a second opinion before I reported it	55	72	0.04
Farmers and veterinarians have a well thought-out plan in their head about how to react if they encounter an AI situation that must be reported	53	49	n.s.
I would report a suspect clinical situation (much) faster if clinical signs of AI were more specific	72	49	0.01
I would report a suspect clinical situation (much) faster if there was a strong relationship between farmer and veterinarian	45	13	<0.001
Feelings and economic consequences expected after reporting a clinical suspicion			
After reporting a suspicion which proved to be a false alarm I would feel awful	36	5	<0.001
After reporting a suspicion which proved to be a false alarm I would feel ashamed	16	5	0.02
After reporting a suspicion which proved to be a false alarm I would still think the report was useful	50	65	n.s.
Reporting a suspicion which proved to be a false alarm would have (very) negative financial consequences for the farm	47	49	n.s.
Reporting a suspicion which proved to be a false alarm would create a (very) negative image of the farm	44	13	< 0.001
Reporting a suspicion which proved to be a false alarm would have a (very) negative effect on my relationship with my clients	12	26	0.09
Reporting a suspicion which proved to be a false alarm would create a (very) negative image of the veterinary practitioner	9	30	0.01
Reporting a suspicion which proved to be a false alarm would have a (very) negative influence on the relationship between farmer and veterinarian	6	21	0.06
Barriers to reporting			
I trust that all poultry farmers will do their utmost to prevent an outbreak of AI in the poultry sector	53	43	n.s.
The legal obligation to report a clinically suspect situation is the most important reason for reporting	41	39	n.s.
The fuss linked to reporting a suspect situation is often a reason for not reporting	31	31	n.s.
The difference in the compensation received for sick and dead animals is a good incentive to report	58	44	n.s.
The threat of possibly paying a penalty for negligence is perceived as an important reason to report a clinically suspect situation	58	31	0.002
It is more terrible to report a suspicion which proves to be a false alarm than to have missed a real case of AI	19	20	n.s.
The decision to report or not to report a suspicion of AI is totally in my hands	33	72	< 0.001
Opinion on national regulation explaining when, where and how to report a clinical suspicion			
National guidelines explaining when and how to report a clinically suspect situation, are perceived as:			
well thought-out	39	24	0.05
clear	52	33	0.03
There is a need for more information (website: photos, video) on AI characteristics (clinical signs, transmission routes, etc.)	44	60	0.05

n.s.: not significantly different (P > 0.05)

practitioners do not recognise the associated clinical signs anymore (14). Clinical signs of AI are often difficult to distinguish from a large range of other poultry diseases (38). After a considerable period of freedom from AI in a country, farmers and veterinarians will have a tendency to think that clinical signs observed are caused by an endemic disease and not by AI. Consequently, farmers fail to recognise the need to report these early clinical signs of AI and as a result the disease agent may have time to spread before the infection is finally detected (11).

It is clear that laboratory testing of tissue or blood samples for AI antigen or antibodies is necessary in order to exclude AI being the cause of the clinical problems observed. However, if samples are submitted for AI testing to the Reference Laboratory in the case of a possible suspect situation, the competent authority might think that if a farmer is submitting samples to exclude AI this is actually the same as a farmer having a suspicion of AI and so the farmer should notify this suspicion. So, in the past, in the Netherlands, a poultry farmer could only ask for laboratory confirmation after reporting to the competent authority. Hence, asking for laboratory confirmation in the Netherlands was linked to control measures, such as isolation of the farm, until the results of diagnostic testing were available. In Council Directive 2005/94/EC on Community measures for the control of avian influenza (21), Article 5 on 'Notification' indicates that Member States shall ensure that the suspected presence or actual presence of avian influenza is immediately notified to the competent authority. The Council Directive does not explicitly state that asking for laboratory confirmation should be followed by notification of an AI-suspect situation to the competent authority. The way in which the competent authority interprets a submission of samples for AI confirmation will depend on the trust they have in the poultry industry. They will either view it as a suspect presence of AI (and according to the Council Directive 2005/94/EC this would call for an immediate notification) or as the use of exclusion diagnostics by the poultry industry in a clinical situation in which AI is not the first on the differential diagnosis list of possible causes. In the last three years, the Dutch veterinary authority has acknowledged the obvious need to allow the use of AI-exclusion diagnostics in non-specific clinical situations without involvement of the authority and without isolation of the farm. Thus, an important tool to increase the probability of early detection of a suspected case of AI has been introduced.

Farmers' knowledge and awareness of the disease and their willingness to report the disease was called 'vigilance' towards disease by Hopp *et al.* (25). To increase their vigilance, poultry farmers and veterinary practitioners have called for up-to-date photo and video material of clinical signs of AI to be made available via Internet. Summarising, there is a need for continuous training of poultry farmers and veterinary practitioners with respect to recognising clinical signs associated with AI. This can partly be facilitated by offering web-based information. While providing this information, we should ensure that it shows not only the typical high mortality caused by HPAI infections but also the mild clinical signs associated with LPAI infections.

Although specific rules were set with respect to reporting an AI-suspect situation after the H7N7 HPAI epidemic in 2003 (35), poultry farmers indicated that they did not agree with these rules. Farmers did not see why they should report clinical signs that they interpret as being linked to other diseases or other causes. This is an indication of lack of ownership of the surveillance system on the part of the poultry farmers. It is advisable that the process of setting surveillance objectives should also involve poultry farmers so that they gain mutual ownership together with the competent authority (26).

In the case of, for example, a failing ventilation system causing a temporarily high mortality, it is understandable that the farmer would not report high mortality. However, in the case of poultry diseases that produce similar clinical signs to those produced by AI, it is irresponsible and risky for farmers (and sometimes veterinary practitioners) to make a diagnosis purely on the basis of observable clinical signs. Only laboratory diagnostics are able to exclude AI as a possible cause for the disease problems observed. Furthermore, as stated earlier, discussions with farmers revealed that unless there is a rapid increase in mortality, which is an indicator that HPAI may be present, they will not think that there is an AI problem. They do not recognise LPAI to be a problem for poultry farmers. They claim that it is actually not a real AI problem: it is something created by politicians just to bother the farmers. Because of that conviction, farmers are reluctant to report LPAI outbreaks that produce clinical signs that are less pronounced, with mortality that may only be increased temporarily, even if a clear (but temporary in most cases) dip in egg production and feed intake and/or water consumption is seen. They seem to shut their eyes to the fact that LPAI infections might be caused by an H5 or H7 subtype, which are now categorised as notifiable LPAI (LPNAI) and are capable of mutating into HPAI. Another issue is that in the layer sector in the Netherlands there is almost no regular veterinary supervision, and health problems are commonly discussed with technical/non-veterinary advisers from poultry integrations or the feed industry.

Clearly, more communication about the risk of LPNAI infections for the poultry industry is needed. Information on this issue should not only reach poultry farmers and veterinary practitioners, but should also be directed at technical/non-veterinary extension workers in the poultry industry.

It goes without saying that if there are disease-specific clinical signs or other not-to-be-missed signs such as progressive and exponential mortality, there should be immediate reporting to the competent authority (17). However, in practice, these black-and-white situations do not often occur, and mild to moderate clinical signs caused by LPNAI may be mistaken for clinical signs produced by other poultry diseases. In these situations, a poultry farmer and/or veterinary practitioner cannot totally rule-out AI solely on the basis of a clinical inspection. As syndrome surveillance programmes clearly have advantages over other diagnostic methods as a means of increasing the probability of early detection (5, 28, 42), the authors proposed that in the case of non-specific clinical signs, possibly caused by LPNAI, veterinary practitioners should be able to submit samples from selected birds to a Reference Laboratory without the involvement of the competent authority and without isolation of the farm. Recently, this recommendation was picked up and this additional diagnostic tool is now operational in the Netherlands.

A total of 58% of responding poultry farmers in the electronic survey indicated that the difference in the financial compensation received for sick and dead animals is a good stimulus to report. Similar compensation arrangements are also in place in most other countries. However, despite the survey results, experience in the Netherlands suggests that compensation is not a good enough stimulus, because in the years after the H7N7 HPAI epidemic in the Netherlands there were several cases of increased mortality in poultry, well above the syndrome surveillance thresholds, that were only reported several weeks after the onset of increased mortality (1). In theory, compensation systems should be effective in encouraging the reporting of HPAI outbreaks, because one cannot miss the clinical picture of massive and progressive mortality, but in the case of the H7N7 HPAI epidemic in the Netherlands this was certainly not the case (14). Furthermore, compensation seems to be particularly ineffective as a means of encouraging the reporting of LPAI outbreaks, because LPAI outbreaks are not perceived by poultry farmers as a serious problem. In order to facilitate reporting of clinically suspect situations or exclude AI as a possible cause for non-specific clinical problems on poultry farms, it would help if tests to exclude AI were offered free of charge to the individual poultry farmer. These costs should be covered by the existing communal Animal Health Fund (financed by contributions from government [50%] and industry [50%]).

An important item arising from this study is the possible value of decreasing the social consequences of reporting a clinically suspect situation on poultry farms, for example, by improving the public opinion of first reports. Furthermore, there seems to be a need to counterbalance the rumours and negative examples from the past that are distributed among poultry farmers very efficiently by hearsay and that stay in the memories of farmers for a long time. The general opinion among poultry farmers towards reporting clinically suspicious situations could be influenced in a positive sense by an active media approach. For instance, poultry magazines could regularly publish case reports from poultry farmers that have had good experiences of reporting such situations and of the post-reporting process.

Another way of facilitating the early detection of LPAI is to test samples from post-mortem material of chickens or turkeys using a reverse transcriptase-polymerase chain reaction test (12). Since 2007, veterinary poultry practices and the Animal Health Service in the Netherlands have been urged to submit throat and cloacal swabs from birds presented for post-mortem examination in specific circumstances. Since it is perceived as not being useful and cost-effective to screen all post-mortem submissions, it is recommended that swabs from birds with the following post-mortem results be screened:

– broilers with severe respiratory problems

– turkeys with severe respiratory problems or diarrhoea or inflamed intestines

– layers with severe respiratory problems or mild to severe peritonitis in combination with a dip in egg production

– all poultry types with no pathological findings during post-mortem, but an anamnesis of slightly increased mortality and/or a dip in production and/or a decrease in feed and/or water intake.

This additional diagnostic tool to detect possible AI incursions is now operational in the Netherlands.

Farmers lacked insight into procedures for reporting a clinically suspect situation and, perhaps more importantly, the process that would follow after a notification. A high level of transparency of the notification process, and what to expect after notification would help to decrease the uncertainty farmers feel. Furthermore, transparency with respect to the notification process will help to build up trust in the competent authorities among the farmer community. It would be helpful to have a clear explanation of the national guidelines explaining when, what and how to report a clinical suspect situation, and a transparent decision-tree on what to expect in the time after the notification up to the final decision to either clear the farm of suspicion or to isolate the farm because of a laboratory confirmation of an AI-infection. This can be facilitated by the competent authority by providing web-based information.

One of the basic issues that underlie the problem of not reporting clinically suspect situations is a low level of trust in government bodies (23, 24). This is an item that also arises from the present study and trust in each other might prove to be a key issue (29) in trying to improve early detection of AI. The lack of trust is associated with negative personal experiences with the competent authority based on responses by the government during NAD outbreaks in the past. A study into Norwegian sheep farmers' vigilance in reporting scrapie-associated clinical signs (25) indicated that reporting was dependent on both economic and non-economic values. Being offered free examination of NAD suspects was among the economic values considered important by farmers. Knowledge of disease-associated clinical signs by farmers and worries about blaming oneself for experiencing the disease ranked high among the non-economic values.

There seems to be a gap between what the competent authority expects from poultry farmers and veterinary practitioners regarding reporting a clinically suspect situation and what poultry farmers and veterinarians really feel is their responsibility. There is a common belief among poultry farmers and farmer unions that AI is the primary responsibility of the government. Changing such attitudes and thinking will take a huge effort in communication and time. Important requirements to achieve that goal are: a credible communicator, a high level of similarity between the audience (farmers) and the communicator, and finally the message and the communicator must be perceived as trustworthy (23). Since government bodies are not perceived as highly credible and/or trustworthy by farmers (3, 24, 32, 40), there is a specific need for an opinion leader arising from the poultry industry to take on that challenge.

It appears that the relationship between farmer and practitioner plays a role in the willingness to report a suspect situation, and that there is also an area of tension between farmer and veterinarian if it comes to reporting a suspicion that proves to be a false alarm: 'Do I (farmer) trust the competence of my veterinarian?' and 'Am I (veterinarian) losing a client (farmer) if my reporting turns out be a false alarm?' The present study indicates that veterinarians have a more negative image of the consequences of a false alarm for the relationship between farmer and veterinarian than the farmer has. This calls for recalibration of the relationship between veterinarians and farmers by the veterinarians.

Conclusion

In conclusion, the authors believe that the study results are applicable not only in the Netherlands but worldwide, and that they are relevant not only for AI (2, 7, 8, 27, 33, 34, 41) but also for other notifiable animal diseases (9, 13, 19, 22). Future steps would be, among others, to make available for Dutch poultry farmers up-to-date photo and video material on the internet of the clinical signs of AI and Newcastle disease and endemic poultry diseases. From the pig industry, there is already a good example of this (visit www.varkensziekten.eu) and in Switzerland an excellent DVD showing clinical signs of AI has also been made available (39). Another useful step would be to build a module on the website of the Food and Consumer Product Safety Authority that explains in a transparent way the reporting process and what to expect after reporting. An active media policy of publishing case reports of poultry farmers who have had positive experiences should be initiated, and from a scientific point of view it would be interesting to measure if such a policy would have a positive effect on the willingness of farmers to report a clinically suspect situation to the competent authority.

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Déclarer ou ne pas déclarer : étude psychosociale destinée à améliorer la détection précoce des foyers d'influenza aviaire

A.R.W. Elbers, M.J. Gorgievski-Duijvesteijn, K. Zarafshani & G. Koch

Résumé
Les auteurs présentent les résultats d'une étude conduite pour déterminer les difficultés et les obstacles qui freinent la déclaration d'incidents suspects évocateurs de l'influenza aviaire, ainsi que les mesures incitatives à envisager pour que ces évènements soient dûment notifiés, dans le but ultime de faciliter la détection précoce des foyers d'influenza aviaire. Des séances de réflexion ont été organisées avec les responsables de l'élaboration des politiques au sein de l'autorité compétente, ainsi qu'avec des représentants des vétérinaires praticiens et des éleveurs de volailles. Des entretiens individuels avec des éleveurs de volailles et des vétérinaires ont ensuite permis de confirmer leur point de vue sur les difficultés et les obstacles perçus, et de recueillir leurs propositions de solutions. Un questionnaire électronique a été publié sur les sites Web respectifs d'une organisation d'éleveurs de volailles et de l'Association vétérinaire néerlandaise afin de mieux connaître les perceptions et les comportements en cas de suspicions d'influenza aviaire aux Pays-Bas. L'étude a relevé six raisons susceptibles de constituer un obstacle à la déclaration d'une suspicion clinique : le manque de connaissances et les incertitudes quant aux manifestations cliniques de l'influenza aviaire ; la culpabilité, la honte et la crainte des préjudices subis ; le jugement défavorable porté sur les mesures de contrôle ; le mécontentement à l'égard des procédures suivant la déclaration ; le manque de confiance en l'Autorité vétérinaire ; le manque de transparence de la procédure de notification et les doutes sur le processus de notification. Les auteurs examinent les conclusions et les recommandations de l'étude sur les moyens de faciliter la détection précoce de l'influenza aviaire.

Mots-clés
Influenza aviaire – Détection précoce – Facteur psychosocial – Notification d'un foyer de maladie – Surveillance syndromique – Vigilance.

¿Notificar o no notificar? Estudio psicosocial destinado a mejorar la pronta detección de brotes de influenza aviar

A.R.W. Elbers, M.J. Gorgievski-Duijvesteijn, K. Zarafshani & G. Koch

Resumen
Los autores describen un estudio encaminado a determinar las barreras y dificultades existentes a la hora de notificar situaciones clínicamente sospechosas, causadas quizá por la influenza aviar (IA), y a definir posibles fórmulas para incentivar la notificación de tales casos, con el objetivo último de facilitar una pronta detección de los brotes de IA. Para empezar se celebraron una serie de reuniones en forma de grupos de discusión con

planificadores de la autoridad competente y representantes de veterinarios clínicos y productores avícolas. También se realizaron una serie de entrevistas personales con un grupo de veterinarios y granjeros para dilucidar las dificultades y barreras que a su entender existían y las soluciones que proponían. Además, se colgó un cuestionario electrónico en los sitios web de un sindicato de productores avícolas y de la Asociación neerlandesa de veterinarios con objeto de estudiar las percepciones y actitudes relativas a situaciones de presunta influenza aviar en los Países Bajos. Aparecieron seis grandes tipos de factores que entorpecen la notificación de una situación clínicamente sospechosa: falta de conocimientos e incertidumbre respecto de los signos clínicos de la IA; culpa, vergüenza y prejuicios; valoración negativa de las medidas de control; insatisfacción con los procedimientos que siguen a una notificación; falta de confianza en las autoridades veterinarias; falta de transparencia en los procedimientos de notificación e incertidumbre respecto al propio proceso. Los autores examinan una serie de recomendaciones destinadas a facilitar la rápida detección de la influenza aviar.

Palabras clave
Detección rápida – Factores sociopsicológicos – Influenza aviar – Notificación de enfermedades – Vigilancia – Vigilancia sindrómica.

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