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Formal and informal surveillance systems: how to build bridges?

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Summary
Within the framework of highly pathogenic avian influenza (HPAI) surveillance in Vietnam, interviews were carried out with poultry breeders and local animal health operators in 2 communes of the Red River Delta (RRD) with a view to documenting the circulation of sanitary information concerning poultry and the economic and social incentives for disseminating or withholding information. The main results demonstrate that (1) active "informal" surveillance networks exist, (2) the alert levels vary and the measures applied by the breeders are myriad and often far-removed from the official recommendations and (3) the commune veterinarian represents an interface between the formal and informal systems.

Introduction
Against a backdrop of growing emergence or re-emergence of sanitary problems, surveillance has become an essential tool of international sanitary governance: "*without well-functioning surveillance and reporting systems, we are stuck*" declared Dr D. Nabarro, United Nations System Influenza Coordinator (1), in 2009. In the case of animal health, numerous problems are associated to the low level of breeders' participation in the surveillance networks and their reluctance to implement recommended biosafety measures (2, 3). We thus occasionally call on the social sciences to explain this fact based on individual perceptions and local cultures. These disciplines are nevertheless somewhat unwilling to be made the tools of the normative procedures underlying these calls and are reluctant to participate in the associated education projects (modifying perceptions by means of "awareness") of social groups deemed to be poor implementers of strategies defined by the actors of the public area (veterinary services, international community etc. in the present case).
The study presented here is the result of collaboration between the fields of socio-anthropology and epidemiology. Socio-anthropology, as reflected by the works of J.-P. Darré (4) is called upon initially to identify the operators' practices and rules governing these practices and to understand the specific rationales underlying them. In the context of the present study, it is a question of analysing the dynamics at work to assess and confront the sanitary risks in a community of breeders. Particular attention is paid to the role of sanitary information produced and circulating locally. These results are then discussed from an epidemiological standpoint: comparing the reasoning of the breeders with the rationales of the parties responsible for implementing national or international surveillance networks.
In Vietnam**,** at present, the breeders have to declare cases of HPAI (as well as cases of porcine reproductive and respiratory syndrome – PRRS – and foot and mouth disease). These declarations must be made to the commune veterinarian who then refers them to the local authorities, the communal People's Committee. From the committee, the information has to be sent to the district authorities, and then to the provincial authorities and finally to the Ministry of Agriculture. Theoretically, confirmation of the existence of one of these diseases leads to the zone being placed in quarantine and the animals may be culled. This action is accompanied by compensation measures, officially variable over time and place, and for which operational implementation is somewhat unclear.

Materials and methods
Our study examines two communities of breeders on the front line of the fight against the emergence of sanitary problems: the poultry breeders of two communes in the RRD in Vietnam facing HPAI outbreaks.
The choice of the communes studied was dictated both by the importance of poultry breeding in the local production systems and by familiarity acquired with farmers and local authorities during previous research works. These two communes will be referred to as A and B. Commune A, highly specialised in poultry breeding, is located in one of the provinces early and seriously affected by the H5N1 virus when it appeared in Vietnam in 2003 and 2004. However, since then no outbreak has officially been declared in this province. In the province where commune B is located, outbreaks have regularly been declared during the subsequent epidemic waves.
The breeders in these communes breed poultry (chickens, ducks and Muscovy ducks) by combining different production systems (meat, eggs and chicks). While certain breeders have relatively "large" farms in the local context (more than 500 heads), the vast majority of breeders work on a more limited scale (100-400 heads). We eliminated from our study families with only a small number of poultry primarily intended for home consumption.
In 2010, we interviewed 19 breeders as well as commune veterinarians (private veterinarians with a public mission) and veterinary drug sellers working in the areas concerned.
The interviews dealt with the circulation of sanitary information concerning poultry: content of the information; method, scope and speed of circulation; actors involved; actions triggered as a result of the information received; the economic and social incentives for disseminating or withholding information and for treating animals; the role of the veterinarians, etc. The interviews were recorded and a written interview sheet was produced for each interview.

Result

Active "informal" surveillance networks

The first observation from our interviews is that an informal sanitary information network exists. The information circulating within this network concerns the symptoms observed on different farms (mortality, diarrhoea, etc.); it does not relate exclusively to poultry but also to pigs, common in this area. It also includes technical economic information (prices of animals and inputs, breeding techniques, etc.). It is shared between neighbours and parents, on markets and during encounters with other breeders in the veterinary drug store. According to the breeders, the volume of sanitary information circulating since the appearance of avian influenza has increased.

What we call here the *breeders' epidemiological territory* (which we define as the radius within which the information is considered useful by the breeder and may trigger the implementation of measures on his own farm) is nevertheless limited (from 500 m to 3 km). The information relating to more remote farms, which nevertheless share the same stakeholders for feed or chicks supply, do not seem relevant by the breeders interviewed, showing that they consider the disease dissemination more by proximity than by the value chain.

The breeders claim to be satisfied by this informal network (nature, scope, speed, reliability). They judge the information issued from this network more useful than that disseminated by the veterinary services by the loudspeakers placed in residential areas and through the intermediary of the commune veterinarians because it is considered to arrive late and to be too general in nature.

It is interesting to note that the breeders clearly distinguish two types of information: (a) information relating to common diseases (for example Newcastle Disease, *Ga Ru* and Gumboro Disease, *Gum*), which the breeders feel they can control (even if they cause numerous deaths) and (b) information concerning new diseases or symptoms with regard to which the breeders feel powerless to act. PRRS falls into this second category. However, while HPAI belongs to this category in commune B, this is not the case in commune A. How can this be explained?

A variable alert level and differing measures, often far-removed from the official recommendations.

In commune A, breeders mention frequent cases of avian influenza among their entourage. These events would appear to be a part of the breeders' routine; they believe that they are capable both of clearly identifying HPAI cases (in particular due to the speed at which mortalities occur) and of coping with them. However, the criteria used to identify the disease vary considerably from one person to the next. There is no fear of possible consequences for human health and the measures taken by the breeders are essentially aimed at protecting the health of their animals and limiting economic losses: the breeders can thus decide to anticipate the date of the booster vaccination against avian influenza (the poultry vaccination seems to be common practice except in backyard farms), to increase disinfection measures in the poultry pens and their immediate surroundings and to limit their own movements. The animals can also be given vitamins and various supplements. However, this information can also trigger destocking measures if the animals have a commercial value: to avoid potential losses, the farmers sell broilers close to their sale weight or laying hens close to the end of their production life. Animals which are already infected or dead are often sold (to the usual collectors) even if the prices are very low. We thus see that numerous measures are taken by the breeders (and that, in their own way, they act as risk managers), but that the main measure officially recommended is not mentioned, i.e. report to the commune veterinarian. According to the breeders themselves, they feel confident that they can manage this situation, : "*with experience; we have succeeded until now in controlling the extent of the epidemic with outbreaks here and there, so there is no need to inform the district or the province*" explained one breeder. This is even more so the case as they consider the public sector veterinarians (including the commune veterinarian) to be incompetent. On the other hand, the breeders are more willing to consult veterinarians in the private sector who give them medicines and advice. Furthermore, there is nothing to indicate that the breeders concerned are trying to evade administrative authority or social control by hiding sanitary events. This is supported by two facts: first because, in their own words, it is important for breeders to provide each other with information in order to be protected and, in any case, it would be impossible to hide a massive number of animal deaths in the context of very close living conditions of Vietnamese villages. Second, because these cases only rarely result in the implementation of restrictive measures by the authorities.

In commune B, however, breeders indicate no cases of avian influenza other than the last cases officially declared in 2007. The breeders therefore have only a very limited experience which would explain why avian influenza is referred to as a new disease which is dangerous to people and with regard to which breeders feel powerless to act. The breeders state that in the event of new cases, they would immediately inform the commune veterinarian as they would not know what to do.

The commune veterinarian, an interface between the formal and informal systems

Despite apparently playing a limited role in the local information networks, the commune veterinarians nevertheless claim to be well informed of the sanitary situation of the farms, in particular via the drug sellers who are at the heart of the information circulating within the commune and a have no problem about sharing the information. So why are there not more control measures or official declaration in this commune? In all probability, it is the result of economic considerations as the province is an important source of poultry and chicks for the capital Hanoi and the Northern provinces. The drug seller admits that it is important to give the breeders the chance to sell their animals before taking the matter to the next level. Similarly, the People's Committee would also appear to exercise its own judgement concerning the speed at which the information is to be communicated in the official network. Furthermore, while the breeders claimed several times to be sure of their own diagnoses, the commune

veterinarians pointed to the fear to launch a false alarm which would discredit them in the eyes of their superiors.
It can therefore be seen that the logic of the commune veterinarian, and probably of the local authorities as well, is primarily to temporise. This does not enter into conflict with the rationale of the breeders. In this way, the commune veterinarian has found a compromise between the position of the breeders and the demands of the official system, acting as an interface between the two.

Discussion

From an epidemiological point of view, if we consider the objective of monitoring and controlling the disease, the situation described reveals numerous obstacles to a fully operational national HPAI surveillance system in a context where the disease has become endemic.
From the point of view of surveillance, the cases recognised as HPAI would appear to take varying forms depending on the actors and their experience. It would appear that the breeders keep a *case definition* close to the outbreaks experienced before the vaccination starts, involving massive and sudden mortalities, and cannot imagine that the disease can take a different form among a partially immunised population. The epidemiology of the disease therefore changes more quickly than the knowledge of local breeders. Similarly, in a national context which aims to identify and index every case, the logical strategy would be to adopt a sufficiently sensitive case definition. However, at local level, key actors – the commune veterinarians– only trigger an alert when they are absolutely sure of their clinical diagnosis, which can nevertheless prove to be problematic for this disease in certain contexts.
From the point of view of control, a local body of knowledge was quickly created within this breeders' community focussing on the recognition and monitoring of outbreaks of what, rightly or wrongly, they associate to HPAI. This knowledge, which we could compare to that of the experts in order to assess its real efficiency, corresponds to a means of managing an endemic disease. This is out of step with the crisis management approach still applied by the government, in particular in response to pressure from the international community (5). This discrepancy between control policy, the current epidemiology of the disease in certain areas and the vision of the local actors hampers the constitution of expert knowledge, primarily because the sanitary information relating to this disease remains sensitive.
If the breeders do not necessarily see any interest in declaring cases as they feel confident in their management approach, do they nevertheless feel any obligation? The *legal framework* governing the incentive or obligation to report suspected cases of regulated diseases is a pivotal question in a surveillance system. In the case of a commune where the disease is no longer exceptional, the only incentive to declare a case would appear to be the social incentive to inform neighbours so that they can protect themselves. It is rarely a question of a legal obligation. While it exists and is recognised (the breeders know that they are supposed to inform the commune veterinarian), the regulatory incentive framework is ineffective. However, in the case of commune B where the disease is still an exceptional occurrence and the breeders have yet to learn how to manage it themselves, the commune veterinarian would appear to be the favoured contact partner to whom they turn. Consequently, while the surveillance system is based on the declaration of specific diseases or syndromes, the breeders identify levels of "seriousness" and "loss of control" which justify recourse to the commune veterinarian and thus to the official system.
Finally, the local objectives do not always appear to correspond to the national objectives of the surveillance and control system. Locally, it would seem that a balance between the economic interests of the commune and the control of the disease is reached. The objective being to keep the disease to a level considered to be acceptable by the operators. Our study was unable to clearly identify this level, although it would appear to correspond to outbreaks capable of causing high mortality rates but the progression of which is contained or diminished. At the central level, an accurate estimation of the disease prevalence throughout the entire territory is a key element for the assessment of control policies. However, local management of cases using criteria defined locally gives a biased vision of the real epidemiological situation.
In conclusion, the commune veterinarians, who represent the interface of the two systems, must therefore reconcile the technical demands of the ministry which they represent with the political and economic requirements of the local authority (under whose direct control they fall) and with the individual rationales of the breeders. As repositories of valuable sanitary information, they should be given more responsibility in their role by their technical superiors while following a more comprehensive professional training with a view to increasing their legitimacy vis-à-vis the local operators.
With regard to the breeders it would appear necessary to accompany them in redefining the risk, in particular by providing them with more information concerning the sanitary risk linked to the value chains. This could thereby extend their epidemiological territory and the number of operators to whom, professionally speaking, they feel committed.

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