Network on Risk Assessment in Animal Health and Welfare

Minutes of the meeting on methodological approaches to improving representativeness of wildlife surveillance

Held on 11-12 03 2014, Parma

(Agreed on 28 03 2014)

Participants

- Network Representatives of Member States:

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- Other country representatives
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  - Kosovo, Bafi Murati
  - FYR of Macedonia, Elena Nakova
  - Norway, Kjell Handeland
  - Serbia, Tamas Petrovic
  - Turkey, Ilkay Demirhan

- Speakers
  - Marc Artois
  - Mariana Boadella
  - Marie-Pierre Ryser
  - Christoph Staubach
1. Welcome
The Chair welcomed the participants. All meeting participants introduced themselves in a tour de table.

2. Adoption of the agenda
The agenda was adopted with/without changes.

3. Topics for discussion
3.1 Background of workshop
Andrea Gervelmeyer presented the background of the workshop. In the context of assessing Member States’ (MS) reports on the Echinococcus multilocularis surveillance carried out under Regulation (EU) No 1152/2011, difficulties in achieving a representative sampling of wildlife host species were identified. Particularly, the knowledge gaps regarding the size, the age and sex structure of the targeted wildlife populations as well as its geographical distribution in addition to the collection of convenience samples through road kills and hunters are considered critical for an infection that clusters in age groups and geographical locations. Hence, the workshop was convened to provide an opportunity to countries’ wildlife surveillance experts to exchange with each other and invited speakers on methodological approaches to improve the representativeness of wildlife surveillance, with a specific focus on methods establishing the size, age, sex structure and geographic distribution of target wildlife populations and on obtaining (representative) samples from the target wildlife population.

Gabriele Zancanaro presented the statistical background of demonstrating freedom from infections. He explained how the necessary sample size can be calculated and highlighted the main issues of a simple random sampling and risk based sampling.

3.2 Overview of wildlife surveillance activities in MS as reported to EFSA
Justyna Jaskiewicz presented an overview of the information on wildlife surveillance and monitoring systems submitted by Member States and Norway to EFSA. Prior to the meeting an Excel sheet was sent to workshop participants, containing questions regarding the wildlife species targeted and pathogens under surveillance, the surveillance system type and objective, the sampling unit as well as the sampling point and sampling period, the population size estimation methods applied and the most difficult aspects of the wildlife surveillance.

Responses were received from 21 countries (Austria, Belgium, Croatia, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, UK). In the responding countries, 37 pathogens are under surveillance in wildlife. The most frequently monitored pathogens are avian influenza (AI) viruses, rabies virus, classical swine fever virus (CSFV), and Trichinella spiralis. The most frequent objective of surveillance is early detection of introduction of pathogens; the most frequent surveillance type is active surveillance of the entire country, though for a given pathogen, often more than one surveillance type is carried
out, e.g. active (targeted) and passive (scanning) surveillance for CSFV. The wildlife species under surveillance ranges from terrestrial and marine mammals to birds and bats. The methods for estimating the size of the wildlife species under surveillance were mainly hunting records, but also census, wildlife observation (e.g. by bird watchers) and opportunistic use of trapping or sampling during marking programmes are applied to this end. The most frequently stated difficulties encountered in wildlife surveillance were financial and logistic constraints, difficulties to collect the required number of samples (timeliness, small population); mobilisation of hunters and other sample collectors, who sometimes are reluctant to report dead/symptomatic animals; difficulties for the local veterinary services to organize and coordinate the surveillance system and lack of systematic networking.

In the following plenary discussion, participants discussed that high risk areas are often difficult to identify. The specifics of the pathogen and the host species as well as the involved modes of pathogen transmission need to be considered when planning the approach to surveillance. Also the clinical course of the infection is important as some infections do not cause disease in their host; therefore passive (scanning) surveillance is not indicated in such cases (e.g. *Echinococcus multilocularis* in foxes). Spain reported problems in detecting West Nile virus-positive birds in their 2012 surveillance activities. Serbia indicated good results with chickens as sentinels for early detection of West Nile virus. A frequently encountered problem is the often low quality of samples from wildlife. Experiments of repeated freezing-thawing to assess the diagnostic value of hemolysed sera have been carried out in Spain, indicating that even low quality samples can be used in ELISA assays. A number of non-invasive sampling methods such as the collection of droppings, the use of net trapping combined with cloacal swabbing, as well as chewing ropes for collection of wild boar saliva are currently being assessed with view to overcome some of the obstacles to obtain samples. The need for a good communication of the veterinary authorities with the people collecting the samples from wildlife, e.g. conservationists involved in bird ringing, was considered crucial by many participants. The establishment of wildlife sample archives (biobanks) for future testing for new diseases or pathogens and multiplex diagnostic techniques such as the one developed under the WildTech project, that allow to test samples for a large range of viral and bacterial antigens, are considered useful tools.

### 3.3 Target wildlife populations – knowing their size, age, sex structure and geographic distribution

The session was chaired by Marc Artois who introduced the speakers.

#### 3.3.1 Target wildlife populations – knowing their size

Marie-Pierre Ryser gave a presentation on the need to know the size of the wildlife population under surveillance. She highlighted several methods of establishing the occurrence and abundance of wildlife populations, gave examples of counting methods and the difficulties linked to establishing abundance estimates. Reference was made to the APHAEEA project which, among other things, aims at harmonized methods for establishing wildlife host abundance. Ryser continued with explaining sample size calculation and the selection of sampling units, highlighting that these two important steps strongly depend on the objective of the study while the estimated population size is less important. She concluded by listing the major steps in planning wildlife studies.

During the ensuing discussion in break-out groups, it was noted that although the knowledge about wildlife population size originates from several sources (monitoring, reporting and research), it remains insufficient. In case of monitoring, it is primarily driven by tailoring activities to budget availability and hence varies between MS. In spite of financial limitations, planning of pathogen investigations should be performed for low and high budget scenarios with clear explanation of the scientific sacrifices made for low budget options and their
consequences with view to validity of the outcomes. While some MS have useful population records derived from hunting bags, in others this is not a case due to social pressure against hunting. Typically, multi-annual continuous programmes (e.g. AI surveillance in Sweden) establish a good knowledge about population size by exploring different techniques and international networking. Also, non-quantitative information on estimated population distribution on the country level is potentially useful, e.g. the Fauna Europea database (http://www.faunaeur.org/index.php).

Participants agreed that considerable knowledge gaps regarding the size of the different wildlife populations exist. These often result from insufficient communication between the different involved parties. Due to this bad or lacking communication, a lot of existing data on wildlife population size remains inaccessible to official authorities or health scientists. A major challenge mentioned is the limited motivation and sometimes also the lack of understanding of the needs by crucial actors providing data on population size: biologists, veterinarians, hunters, and hobbyists. Here, legislation (e.g. to make data exchange mandatory, to connect groups accessing wildlife with official authorities) and good explanation of objectives and provision of feedback of the wildlife surveillance to the sample/data providers could help.

Participants also mentioned that information obtained from the field or laboratory sometimes suffers from wrong identification of species and their geographical origin. In addition, intentional overestimation as well as underestimation, of population size by hunters to influence the hunting plans in their favour takes place. Reaching those data providers through networking allows for their recognition as legal partners, identification of their needs, delivery of training and creation of a platform for informative dialogue. This mutual dialogue is also needed between the authorities responsible for agriculture, animal health and public health (in the case of zoonotic diseases) and those responsible for wildlife, to overcome bureaucratic obstacles and enable organisation of monitoring.

It was further outlined that due to the changing nature of wildlife population dynamics, data quickly loose their validity and need to be continuously updated. Also, the results from scientific studies sometime lost practical interest, due to delays related to publishing. Lastly, it was acknowledged that estimating the size of migrating wildlife populations requires international collaboration efforts.

3.3.2 Target wildlife populations – knowing their age and sex structure

Mariana Boadella explained the importance of knowing the age and sex structure of the target wildlife population and, even more, of the age- and sex-composition of a wildlife sample. She illustrated this using the practical examples of brucellosis in wild boar, bluetongue in red deer and tuberculosis in wild boar.

During the discussion in break-out groups, participants agreed that availability of information about age and sex composition of a wildlife sample varies between species and that its relevance for surveillance depends on the pathogen. As most of the samples come from hunting bags, the availability of animal data strongly depends on hunters’ awareness, motivation and skills to identify age and sex of the hunted animals. Ideally, all wildlife samples should be submitted with basic animal data, such as age class and sex, time and location of collection and collection method. Even if irrelevant for current health monitoring programmes, these data may gain value in the future if samples are archived. However, lack of communication with sample collectors results in poor understanding of the significance of animal data and a lack of recording or forwarding of recorded information. Therefore, establishment of good collaboration with hunters is crucial to build motivation and understanding of the objectives for animal data collection. This can provide an opportunity to educate hunters, to brief them on current needs, to provide feedback on their sample
collection efforts and to receive their comments. Potentially, making the collection of animal data together with sample collection mandatory could be a solution for these data gaps. Because not all species show sex dimorphism and clear age features, correct recognition of sex and age requires skills and experience. The status of knowledge and skills varies between Member States and reflects the different intensity of compulsory training needed to obtain a hunting license. In result, apart of research-based population data, available knowledge is often unreliable if extracted from hunting bag or laboratory records. Through collaboration with biologists, hunter’s knowledge and skills can be improved to limit bias arising from wrong recognition of animal characteristics. Provision of training material was recognized as useful: on definitions, techniques for age estimation /sex determination, species cards, data sheets, most common mistakes (e.g. age estimation by weight). Also, agreement on harmonised data models across species would help in systematic collection of data and their comparison. For these reasons, networking and acknowledgement of biologists as knowledge advisors is considered to improve the quality of data collection on individuals and on populations.

3.3.3 Target wildlife populations – knowing their geographical distribution

Christoph Staubach gave a presentation on geographical representative sampling. The knowledge of the geographical distribution of the target wildlife population is crucial to identify and limit the region of interest when designing surveillance campaigns. It is also needed for interpreting and mapping sampling results and for assessing surveillance success. However, for this a detailed knowledge of the individual species wildlife behaviour and habitat is necessary. Also, abundance data on a large geographical scale are rarely available. Usually, habitat features influence the distribution of wildlife populations, but this could be misleading on large scale without knowing the true local habitat and hunting conditions. For example, the structure of the landscape, food supply, the presence of hiding places, natural borders and hunting pressure have an influence on wild boar distribution. He concluded that geographical representative samples should be always considered in a space-time framework, taking into account the species behaviour, habitat and movement characteristic. For some host-pathogen combinations, it might be useful to collect samples in “behaviour hot spots” and to collect spatial risk-based samples. It should be noted that geographical representative samples help to identify lacks in the surveillance coverage and allow estimating the confidence limits of the prevalence, space and time trends.

3.4 Obtaining (representative) samples from the target wildlife population

The session was chaired by Mariana Boadella who introduced the speaker.

3.4.1 Obtaining (representative) samples from the target wildlife population

Christoph Staubach presented various aspects related to obtaining representative samples from wildlife populations, using mainly examples from wild boar and classical swine fever (CSF) surveillance. The objective of the sampling could be to declare a region free from the disease or to establish the extent of the infection in the wildlife population, i.e. the prevalence of infection in the susceptible wildlife population. He highlighted the value of European databases with the example of the “Classical swine fever in wild boar database”. A brief explanation of Bayesian models and their use for wildlife surveillance was given. He concluded that surveillance and control measures of wildlife diseases need to be applied on a long-term scale and that for the evaluation of the effectiveness of disease control measures, surveillance needs to cover affected regions as well as the surrounding areas.
During the discussion in break-out groups, participants recognised that sample availability depends largely on recreational hunting plans. The lack of possibilities to influence hunting plans or to impose hunting restrictions creates serious limitations for collection of representative samples. A better coordination of hunting plans, sampling plans and current monitoring needs must be achieved through communication and outreach to hunters’ organisations. If official sampling plans were communicated to hunters in a timely manner, they could be taken on board appropriately (e.g. during the right season, etc.). Appointment of a focal point in the hunting association/region would be helpful by providing a personal contact with local hunters, a better understanding of hunters’ behaviour, exchange of feedback and build-up of trust. The creation of contact information databases could provide an overview of available hunters, their hunting activities and interest and would facilitate networking among wildlife specialists and hunters. Another alternative to improve representative sample collection is to take advantage of capture-recapture and trapping activities e.g. bird ringing. It was proposed to promote the creation of sample banks and an increased sharing of samples within the wildlife network. It was emphasized that to improve the quality and representativeness of samples, a systematic collection of population data related to samples must be in place.

3.5 Networking and coordination with other groups

The session was chaired by Christoph Staubach who introduced the speakers.

3.5.1 OIE surveillance system, OIE country Focal Points for Wildlife Diseases, WAHIS-Wild database

Marc Artois presented the OIE surveillance system, which covers the reporting of the first occurrence, the re-occurrence, emergence or increase and change of listed diseases both in domestic livestock and in wildlife. The different reports and map outputs were shown. The WAHID Interface provides access to surveillance data held within OIE’s World Animal Health Information System (WAHIS) both on in domestic, and, when relevant, wild species. All listed diseases which occurred in a country, have to be notified through WAHIS, but notification of infection in wild animals shall not impact transboundary and international trade, as far as livestock is not concerned. He explained that the recently launched WAHIS-Wild database refers to diseases in wild animals that are not listed and therefore cannot impact trade. Those are reported on a voluntary basis and are displayed on a specific website. Each OIE member country has to appoint a Focal Point for Wildlife Diseases who has to establish a network of wildlife experts within its country and, under the OIE Delegate (i.e. CVO), collect and submit data to WAHIS-Wild. The Focal Point also acts as a national contact point, who is receiving and commenting on OIE reports.

3.5.2 Network of Wildlife Health Surveillance centers, European section of wildlife disease association EWDA, APHAEA project

Marie-Pierre Ryser gave a presentation on the European section of the Wildlife Disease Association, the EWDA network for wildlife health surveillance in Europe and the APHAEA project. The mission of the Wildlife Diseases Association (WDA) is to acquire, disseminate, and apply knowledge of the health and diseases of wild animals in relation to their biology, conservation, and interactions with humans and domestic animals. The EWDA (www.ewda.org) is the European section of the WDA. It has over 150 members from 19 countries across Europe. The EWDA wildlife health surveillance network has the goals of improving the exchange of information among wildlife health surveillance programmes in Europe, to develop common operating procedures for diagnostic investigation in wildlife, to develop common criteria for diagnosis of wildlife diseases, to share expertise and to provide
training opportunities in wildlife health surveillance. The APHAEA project (www.aphaea.eu) intends to establish a European wildlife disease network that is capable of providing reliable estimates of abundance of wildlife species, providing reliable estimates of pathogen distribution in these wildlife species and accurate estimates of the risks caused by infectious pathogens posed by wildlife species throughout Europe for livestock and human health.

3.5.3 Feedback from workshop on ASF in wild boar, 6-7 March, SVA, Uppsala

Torsten Mörner presented the outcome of the workshop on ASF in wild boar that had been organised on 6-7 March at the Swedish National Veterinary Institute (SVA) in Uppsala. The organizers were the Wildlife Disease Association (European and Nordic sections) together with the SVA. It was attended by 80 participants from 17 European countries. The workshop participants agreed that current wild boar population monitoring in Europe is not adequate. Efforts are needed towards the establishment of appropriate population monitoring tools, which cannot rely only on hunting bags, in particularly because some populations are not hunted. It is also needed to understand the actual effect of different hunting strategies on wild boar demography. With view to monitoring for ASF, active search for carcasses, as well as payment for wild boar found dead in infected areas, may be suitable tools to increase detection of the disease by passive (scanning) surveillance. It was considered very important to avoid contacts of wild boar with domestic pigs by enhancing the biosecurity and infrastructures of the pig holdings (small-scale fencing). However, larger barriers (large-scale fencing) to wild boar movements are unlikely to succeed and may have undesirable consequences. Some natural barriers such as mountain chains, rivers and highways (or combinations of the above) may help to reduce wild boar migration rates. This could be combined with a limited ban on drive hunts to reduce disturbance. Feeding is considered a risk factor for disease transmission because of favouring animal aggregation. It also contributes to improve survival during the limiting season. However, complete prohibition of feeding was considered very challenging to impose to the stakeholders, but the current situation and future options should be assessed. Intense hunting (>50% of the estimated population; specifically including sows and piglets) which could reduce wild boar numbers locally, particularly in closed populations, is difficult to maintain. A realistic goal for non-infected areas is to at least halt the demographic increase of wild boar, acting both on the habitat and on hunting pressure. In infected areas, wild boar hunting should continue at similar levels, but without actions that might promote increased movement rates, such as depleting local populations or feeding. In conclusion, hunting may be a useful population management tool. However, two aspects need attention from the animal health point of view: (1) the proper disposal of hunting offal/remains (outside ASF/CSF regions) and (2) restriction of game baiting and feeding. It was also concluded that incentives such as background information and compensations should be provided to hunters to get them involved in ASF control. Further conclusions on diagnosis and surveillance of ASF in wild boar and on ASF prevention and management, as well as the presentations given at the workshop are available at http://www.ewda.org/.
4. Wrap up

Conclusions
Knowledge gaps exist with view to size, distribution and structure of the various wildlife populations.
Systematic collection of metadata on sampled wild animals contributed to the recognition of potential sampling bias and to a more truthful interpretation of results.
Unlike the case of livestock populations, for sampling of wildlife populations official authorities rely on support from non-governmental groups, who access wildlife for different reasons. Better communication is needed to achieve and maintain understanding and trust between official authorities or diagnostic laboratories and groups accessing wildlife populations.

Recommendations
Surveys providing valid information on size, distribution and structure of the various wildlife populations should be carried out, following harmonised methods.
MS’s authorities must know which groups are accessing wildlife populations in their country.
It needs to be understood how groups accessing wildlife collect the samples, to be able to adjust for potential biases when analysing the results of this sampling.
The minimum information provided per wildlife sample should be the location of sampling, the date of sampling, the age and the gender of the sampled animal.
EFSA should actively follow the activities of the OIE working group on wildlife diseases.
EFSA and APHA EA will explore how the harmonisation of approaches to monitoring wildlife can be supported by EFSA. A joint meeting between APHA EA project members and the EFSA Network for Risk Assessment in Animal Health and Welfare in 2015 is envisaged.