

**SURVEY QUESTIONNAIRES – SURVEILLANCE ACTIVITIES AND UNIVERSITY
RESEARCHERS IN ANIMAL HEALTH RISK ASSESSMENT**



Survey Questionnaires – Surveillance Activities and University Research Activities in Animal Health Risk Assessment

Knowledge required to support applied animal health research activities can be broken down into two general areas: surveillance data (knowledge about disease prevalence and incidence in populations of interest) and applied animal health research (knowledge about various disease aspects of concern such as methods of transmission and validity of detection tests, etc.). Surveillance activities are primarily carried out by federal and provincial government organizations, as well as in academic and private laboratories, often working with industry. Applied animal health research is primarily conducted by academic institutions, again often working with industry.¹

To better understand the state of knowledge generation that provides input into animal health risk assessment, the Expert Panel on Approaches to Animal Health Risk Assessment (the Panel) surveyed the two main groups most directly involved: Canadian surveillance organizations and researchers at Canadian veterinary colleges. The full versions of the two survey questionnaires used for this purpose – the *Survey of Surveillance Activities in Animal Health Risk Assessment* and the *Survey of University Researchers in Animal Health Risk Assessment Science* – are presented in this document. This document also provides further detail about the methodology used in compiling and analyzing the data. The findings of the two surveys, and a discussion of the results, can be found in Chapter 6 of the report of the Council of Canadian Academies: *Healthy Animals, Healthy Canada*, available at:

www.scienceadvice.ca/en/animal-health.aspx.

1. Survey of Surveillance Activities in Animal Health Risk Assessment

The *Survey of Surveillance Activities in Animal Health Risk Assessment* was distributed to 30 individuals conducting surveillance activities in various organizations across Canada. A total of 19 responses were received. One incomplete response could not be analyzed, leaving 18 completed surveys. The respondents were distributed across Canada and represented different types of surveillance organizations. The full version of the questionnaire is presented in Box 1.

¹ This is a supplementary document for the Expert Panel on Approaches to Animal Health Risk Assessment report *Healthy Animals, Healthy Canada*. The findings of this document are further discussed in the report, available at www.scienceadvice.ca/en/animal-health.aspx.

Box 1**Survey of Surveillance Activities in Animal Health Risk Assessment**

Welcome to the Survey of Surveillance Activities in Animal Health Risk Assessment.

The Council of Canadian Academies (www.scienceadvice.ca) has convened an Expert Panel to conduct an assessment of “the state and comprehensiveness of risk assessment techniques in animal health science, specifically pertaining to risks that may have an impact on human health.” This assessment has been requested by the Minister of Agriculture and Agri-Food, on behalf of the Canadian Food Inspection Agency (CFIA).

As part of its work, the Panel is seeking to gather more information about the research and surveillance activities that are being conducted in areas relating to animal health risk assessment across Canada. As a key contributor to these areas, we ask that you take 10-15 minutes to complete this survey. All individual responses will be treated as confidential, and data will be reported in aggregate format only.

For the purposes of this survey, we have identified two areas of research relating to surveillance activities in animal health risk assessment. For each of these areas, we have provided examples of the types of surveillance activities that might be addressed to provide context for the survey questions. The examples specifically relate to anaplasmosis and swine influenza. However, the questions relate to the full range of diseases that might be encountered in animal health risk assessments. Consequently, when addressing the following questions, please interpret them broadly in terms of the diseases you might consider in your specific area of surveillance.

These are the surveillance activities you will be asked to consider:

Section 1: Disease frequency – Herd and animal-level incidence and prevalence estimates

Section 2: Evaluation of surveillance systems for the disease/pathogen

Section 3: Other surveillance activities

Questions about the survey should be addressed to Marc Dufresne. (marc.dufresne@scienceadvice.ca).

You cannot save your answers and return to continue the survey later, so prepare enough time to complete the survey once. Questions marked with an asterisk (*) are required.

For each section, the respondent was asked this series of questions:

- 1- Do you currently conduct the type of research or surveillance activity that would address questions such as those below, or have you conducted this type of activity during the past 5 years?

Section 1: Disease frequency – Herd and animal-level incidence and prevalence estimates

Examples:

- (a) “What is the animal-level prevalence of serologic titres to anaplasmosis in Canadian cattle?”
(b) “What is the herd-level incidence of swine influenza outbreaks in Canada (or your region of Canada)?”

Section 2: Evaluation of surveillance systems for the disease/pathogen

Examples:

- (a) “How strong is the evidence that Atlantic Canadian cattle are free from anaplasmosis?”
(b) “What proportion of swine influenza outbreaks are identified through provincial or private laboratories?”

Section 3: Are there any other surveillance activities that you are involved with?

If yes, respondents were directed to question 2. If no, respondents were asked to skip to question 8.

- 2- Can you provide examples of research questions (or surveillance activities) in this area that you have been involved with during the past 5 years?
3- What have been your sources of funding for conducting this type of research/surveillance during the past 5 years? Check all that apply, leaving blank the ones that don't. Rank in order of importance.

(Choices were: NSERC, CIHR, Other federal government funding, Provincial government funding, Industry funding, and Other.)

- 4- When you complete research in this area, how do you disseminate the results? Check all that apply, leaving blank the ones that don't. Rank in order of importance.

(Choices were: Peer-reviewed literature, Public report, In-house report, Industry publication, and Other.)

5- Was any of the research/surveillance that you have conducted in this area during the past 5 years undertaken specifically to provide input into risk assessment?

(Choices were: Yes – All of it, Yes – Some of it, No – None of it.)

6- Have you involved students in this type of research/surveillance during the past 5 years?

(Choices were: Yes, No.)

7- Approximately how many students have you involved in this type of research/surveillance, and at what level of study? (indicate total number in each category over the last 5 years for Undergraduate, M.Sc., PhD, Post-doc, DVM, Other.)

After answering question 7, respondents were sent to the next section to restart the set of questions, until all sections were completed.

8- If you have not conducted this type of research/surveillance activity during the past 5 years, please rank the main barriers. Check all that apply, leaving blank the ones that don't. Rank in order of importance.

(Choices were: Not within my institution's mandate, Personally not interested, Lack of funding opportunities, Lack of time, Inadequate graduate student support, Lack of industry support, Don't have the expertise in this type of research, and Other.)

After answering question 8, respondents were sent to the next section to restart the set of questions, until all sections were completed.

Thank you for taking the time to answer this survey. The information you provided is greatly appreciated and will contribute to the development of the report of the Expert Panel on Approaches to Animal Health Risk Assessment.

For more information about the Council of Canadian Academies or our completed and ongoing assessments, please visit our website at www.scienceadvice.ca.

2. Survey of University Researchers in Animal Health Risk Assessment Science

The *Survey of University Researchers in Animal Health Risk Assessment Science* was distributed to 38 individuals conducting research at the five veterinary schools in Canada. A total of 27 responses were received. Two were removed from the final sample (one was incomplete and the other was out of scope), leaving 25 completed surveys. Most of these respondents were either full or associate professors, and several were directors or chairs of research centres. The full version of the questionnaire is presented in Box 2.

Box 2

Survey of University Researchers in Animal Health Risk Assessment Science

The Council of Canadian Academies (www.scienceadvice.ca) has convened an Expert Panel to conduct an assessment of “the state and comprehensiveness of risk assessment techniques in animal health science, specifically pertaining to risks that may have an impact on human health.” This assessment has been requested by the Minister of Agriculture and Agri-Food, on behalf of the Canadian Food Inspection Agency (CFIA).

As part of its work, the Panel is seeking to gather more information about the research that is being conducted in areas relating to animal health risk assessment at veterinary schools across Canada. As a leading researcher in these areas, we ask that you take 15-20 minutes to complete this survey. All individual responses will be treated as confidential and data will be reported in aggregate format only.

For the purposes of this survey, we have identified several areas of research that may provide input for risk assessment. For each of these areas, we have provided examples of the types of research questions that might be addressed to provide context for the survey questions. The examples specifically relate to anaplasmosis and swine influenza. However, the questions relate to the full range of diseases that might be encountered in animal health risk assessments. Consequently, when addressing the following questions, please interpret them broadly in terms of the diseases you might consider in your specific area of research. Individuals are likely to only conduct research in one, or a few, of these areas.

These are the areas of research you will be asked to consider:

Section 1: Disease frequency – Herd and animal-level incidence and prevalence estimates

Section 2: Evaluation of surveillance systems for the disease/pathogen

Section 3: Diagnostic test evaluation

Section 4(a): Epidemiology (natural history) of disease/pathogen - Transmission mechanisms and survival of pathogen in products

Section 4(b): Epidemiology (natural history) of disease/pathogen – Effectiveness of mitigation procedures

Section 5(a): Epidemiology (risk factors) of disease/pathogen – Determination of risk factors

Section 5(b): Epidemiology (risk factors) of disease/pathogen – Distribution of risk factors in populations of interest

Section 6(a): Economic models of consequences – What is the cost of controlling the disease in the animal?

Section 6(b): Economic models of consequences – What is the cost of controlling an outbreak in an animal population?

Question about the survey should be addressed to Marc Dufresne (marc.dufresne@scienceadvice.ca).

Questions marked with an asterisk* are required. You can't save your answers and come back to continue the survey later, so prepare enough time to complete the survey once.

For each Section, the respondent was asked this series of questions:

1- Do you currently conduct the type of research or surveillance activity that would address questions such as those below, or have you conducted this type of activity during the past 5 years?

Section 1: Disease frequency – Herd and animal-level incidence and prevalence estimates

Examples:

- (a) “What is the animal-level prevalence of serologic titres to anaplasmosis in Canadian cattle?”
- (b) “What is the herd-level incidence of swine influenza outbreaks in Canada (or your region of Canada)?”

Section 2: Evaluation of surveillance systems for the disease/pathogen

Examples:

- (a) “How strong is the evidence that Atlantic Canadian cattle are free from anaplasmosis?”
- (b) “What proportion of swine influenza outbreaks are identified through provincial or private laboratories?”

Section 3: Diagnostic Test Evaluation

Example:

(a) “What is the sensitivity and specificity of a lateral-flow assay for rapid diagnosis of influenza infections in swine?”

Section 4(a): Epidemiology (natural history) of disease/pathogen - Transmission mechanisms and survival of pathogen in products

Examples:

(a) “How long are cattle infective following an initial infection with *Anaplasma marginale*?”

(b) “What proportion of pigs infected with influenza virus remain infective (carriers) after the outbreak?”

Section 4(b): Epidemiology (natural history) of disease / pathogen - Effectiveness of mitigation procedures

Examples:

(a) “How effective is a single dose of chlortetracycline at eliminating the carrier state of *Anaplasma marginale*?”

(b) “How effective are commercially available vaccines at preventing infection with the influenza virus in swine?”

Section 5(a): Epidemiology (risk factors) of disease / pathogen - Determination of risk factors

Examples:

(a) “Do cattle that have been backgrounded have a higher prevalence of *Anaplasma marginale* infections?”

(b) “Are herds with free range sows at greater risk of becoming infected with influenza virus?”

Section 5(b): Epidemiology (risk factors) of disease/pathogen - Distribution of risk factors in populations of interest

Examples:

(a) “What is the prevalence and geographic distribution of ticks capable of transmitting *Anaplasma marginale* in Canada?”

(b) “What proportion of commercial swine barns have effective bird proofing (to prevent the entry of wild birds)?”

Section 6(a): Economic models of consequences - What is the cost of controlling the disease in the animal?

Examples:

- (a) “How much does it cost to eliminate *Anaplasma marginale* infection from an adult cow by treatment with chlortetracycline?”
- (b) “What does it cost to vaccinate weaner pigs with swine influenza vaccines?”

Section 6(b): Economic models of consequences – What is the cost of controlling an outbreak in an animal population?

Examples:

- (a) “What are the costs of eradicating *Anaplasma marginale* from a Canadian beef cow-calf herd that become infected through importation of an infected animal?”
- (b) “What is the economic impact of quarantining a farrow-to-finish herd for a defined period of time?”

If yes, respondents were directed to question 2. If no, respondents were asked to skip to question 8.

2- Can you provide examples of research questions (or surveillance activities) in this area that you have been involved with during the past 5 years?

3- What have been your sources of funding for conducting this type of research/surveillance during the past 5 years? Check all that apply, leaving blank the ones that don't. Rank in order of importance.

(Choices were: NSERC, CIHR, Other federal government funding, Provincial government funding, Industry funding, and Other.)

4- When you complete research in this area, how do you disseminate the results? Check all that apply, leaving blank the ones that don't. Rank in order of importance.

(Choices were: Peer-reviewed literature, Public report, In-house report, Industry publication, and Others.)

5- Was any of the research/surveillance that you have conducted in this area during the past 5 years undertaken specifically to provide input into risk assessment?

(Choices were: Yes – All of it, Yes – Some of it, No – None of it.)

6- Have you involved students in this type of research/surveillance during the past 5 years?

(Choices were: Yes, No.)

7- Approximately how many students have you involved in this type of research/surveillance, and at what level of study? (Indicate total number in each category over the last 5 years.)

(For Undergraduate, M.Sc., PhD, Post-doc, DVM, Other.)

After answering question 7, respondents were sent to the next section to restart the set of questions, until all sections were completed.

8- If you have not conducted this type of research/surveillance activity during the past 5 years, please rank the main barriers. Check all that apply, leaving blank the ones that don't. Rank in order of importance.

(Choices were: Not within my institution's mandate, Personally not interested, Lack of funding opportunities, Lack of time, Inadequate graduate student support, Lack of industry support, Don't have the expertise in this type of research, and Other.)

After answering question 8, respondents were sent to the next section to restart the set of questions, until all sections were completed.

Thank you for taking the time to answer this survey. The information you provided is greatly appreciated and will contribute to the development of the report.

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3. Methodological Notes on Surveillance Activities and University Research Surveys

Each survey consisted of distinct research areas delineated by the Panel, with three areas in the surveillance activities survey (Table A.1) and nine areas in the research activities survey (Table A.2).

Table A.1**Areas of Surveillance Activities**

Area	Per cent
Disease frequency	72
• Herd- and animal-level incidence and prevalence estimates	
Evaluation of surveillance systems for the disease/pathogen	33
Other surveillance activities	66

(Council of Canadian Academies)

The column on the right of this table shows the percentage of respondents who indicated that their organization was involved in these types of surveillance activities and research.

Table A.2**Areas of Research Activities**

Area	Per cent
Disease frequency	92
• Herd- and animal-level incidence and prevalence estimates	
Evaluation of surveillance systems for the disease/pathogen	52
Diagnostic test evaluation	80
Epidemiology (natural history) of disease/pathogen	56
• Transmission mechanisms and survival of pathogen in products	
Epidemiology (natural history) of disease/pathogen	76
• Effectiveness of mitigation procedures	
Epidemiology (risk factors) of disease/pathogen	80
• Determination of risk factors	
Epidemiology (risk factors) of disease/pathogen	64
• Distribution of risk factors in populations of interest	
Economic models of consequences	24
• The cost of controlling the disease in the animal	
Economic models of consequences	12
• The cost of controlling an outbreak in an animal population	

(Council of Canadian Academies)

The column on the right of this table shows the percentage of respondents who indicated that they were involved in these types of research activities.

In both surveys, respondents were asked if their activities (surveillance or research) related to each specific research area. If yes, respondents were then asked a series of questions regarding the activities conducted in that area (e.g., input into risk assessment, student involvement, dissemination methods, and funding). If no, respondents were asked which main barriers prevented them from engaging in such activities. This line of questioning was repeated for all the categories within each survey. Respondents could have activities contributing to more than one area so it is possible that the data contain some duplication.

For funding, dissemination, and barriers, the respondents were asked to rank the options presented from one to five (or from one to eight in some cases, according to the question), with one being classed as “most important.” This data produced the “most important” category (based on the number of times the answer was selected as “most important”). Respondents could not duplicate rankings (list two options as number one, for example), but they could rank as many choices as they wished. In order to consider the overall results, the answers were pooled (regardless of ranking). This data provided the “frequency” category (number of times this answer was selected at any ranking). Since the respondents could choose more than one answer, the total number of answers may be greater than the number of respondents. Data were first analyzed by section and then pooled together to help create a better understanding of the trends in research and surveillance activities in animal health risk assessment.