

**High Level Summary  
of  
Animal Health Surveillance Activities  
in  
Canada**

July 2015

## Table of Contents

<b>Executive Summary .....</b>	<b>3</b>
<b>Introduction .....</b>	<b>4</b>
<b>Summary of Current Surveillance Components and Activities .....</b>	<b>5</b>
<b>Classic Surveillance Activities .....</b>	<b>6</b>
Mandatory Reporting .....	6
Active Surveillance for Specific Disease Hazards .....	6
Passive Surveillance at Laboratories, Abattoirs, Markets and Dead-Stock.....	7
Laboratories, CAHSN and CAHLN.....	7
Abattoirs, Markets and Deadstock .....	8
Cluster and Trend-Change Detection Algorithms .....	8
Export Testing and Certification .....	8
<b>Provincial or Regional Activities .....</b>	<b>10</b>
RAIZO and OAHN.....	10
AVSN .....	11
<b>Sector or Animal-Type Activities.....</b>	<b>13</b>
CSHIN, WCSHIN and ECHWC .....	13
Fish.....	14
Other Industry Sector Initiatives.....	14
CWHC.....	14
<b>Activities Emphasizing Zoonotic Diseases and Public Health .....</b>	<b>16</b>
Rabies, West Nile, Lyme, Salmonella, AMR .....	16
CEZD-IIR .....	16
<b>Moving Closer to the Source.....</b>	<b>16</b>
Veterinary Practice Data .....	17
Farm Animal Production/Morbidity/Mortality Data.....	17
<b>Communication, Interpretation, Distribution, Storage, and Use of Information.....</b>	<b>18</b>
CCVO and CCMOH.....	18
Controlled Access Data/Information Systems and Repositories .....	19
Make Information Easily Available to Customers .....	20
Use of electronic mailing lists, social media and smart-phones .....	20
<b>Discussion .....</b>	<b>21</b>

## Executive Summary

- The objective of this document is to provide a high-level summary of the existing components and activities of the current Canadian animal health surveillance system.
- The components are summarized under headings of:
  - Classic surveillance activities
  - Provincial or regional activities
  - Sector and animal-type activities
  - Activities emphasizing zoonotic diseases
  - Moving closer to the source
  - Communication, interpretation, distribution and use of information
- There is much good work currently being done among the many existing components of the Canadian animal health surveillance system.
- However, it is believed that improvements can be made to coordination of the system and overall value received from the system.
- This may be achieved through the implementation of a network-of-networks approach and better use of technology.

## Introduction

- The World Animal Health Organization (OIE) defines surveillance as the systematic ongoing collection, collation and analysis of information related to animal health and the timely dissemination of information so that action can be taken.
- Consistent with this definition, the objectives of the Canadian animal health surveillance system could be considered to be:
  - To detect changes in animal health (negative or positive, domestic or international), which are important to stakeholders in the Canadian Agri-Food system and to society.
  - To validate the status of animal health in Canada, thereby assisting in the assurance of quality and safety in support of trade.
  - To distribute accurate, clear, useful animal health information to stakeholders, enabling them to make good decisions.
  - To do so in a timely and cost-effective manner, maximizing marginal return on investment.
  - To build relationships and trust among stakeholders to work collaboratively on animal health issues.
- The Canadian animal health surveillance system has evolved over many years, to now include several components.
- Notwithstanding the excellent contributions those activities make to surveillance, there have been calls to further improve and to better coordinate surveillance.
- Examples of reports calling for such improvements include:
  - “Surveillance in a Time of Transition in Farmed Animal Health”, 2011, Willis et al
  - “Developing a Framework for Improved National Coordination of Animal Health Surveillance in Canada”, 2013, Pettit et al
  - “Further Evolution of Animal Health Surveillance in Canada Through a Focus on Governance”, 2014, Workshop Report
- At the December 2014 Annual Forum of the National Farmed Animal Health and Welfare Council (NFAHWC); the CFIA and NFAHWC jointly announced an intent:
  - To move forward with the development of a “network-of-networks” (of existing, modified and new components of surveillance), to improve and better-coordinate overall surveillance, and to provide a better return on investment.
  - To govern the system through the creation of:
    - a Champions Group
    - a Directors Group
    - a coordinator
    - a secretariat
- The objective of this document is to provide a high-level summary of the existing components and activities of the current Canadian animal health surveillance system.
- This will provide a picture of the system to the Directors Group, to help them move forward in the development of the “network-of-networks”.

## Summary of Current Surveillance Components and Activities

- The following is not an exhaustive list of every single activity currently contributing to animal health surveillance. However, it is intended to provide a quick overview of the main components.
- There are many ways the components could be grouped. There are advantages and disadvantages to each potential approach.
- This document has grouped activities under headings of:
  - **Classic Surveillance Activities**
    - Mandatory reporting
    - Active surveillance for specific disease hazards
    - Passive surveillance of laboratories, abattoirs, markets
      - Canadian Animal Health Surveillance Network (CAHSN) and the Canadian Animal Health Laboratorians Network (CAHLN)
      - Abattoirs, Markets and Dead-Stock
      - Algorithms for the detection of clusters and trend-changes
    - Export testing and certification
  - **Provincial or Regional Activities**
    - le Réseau d'alerte et d'information zoosanitaire (RAIZO)
    - Ontario Animal Health Network (OAHN)
    - Alberta Veterinary Surveillance Network (AVSN)
  - **Sector and Animal-Type Activities**
    - Canadian Swine Health Intelligence Network (CSHIN)
    - Equine Canada Health and Welfare Committee (ECHWC)
    - Fish
    - Other Industry Sector Activities
    - Canadian Wildlife Health Cooperative (CWHC)
  - **Activities Emphasizing Zoonotic Diseases**
    - Rabies, West Nile, Eastern Equine Encephalitis, Lyme disease, Salmonella
    - Canadian Zoonotic and Emerging Disease –Integrated Intelligence and Response (CZED-IIR)
  - **Moving Closer to the Source**
    - Veterinary practice data
    - Farm animal production/morbidity/mortality data
  - **Communication, Interpretation, Distribution and Use of Information**
    - Council of Chief Veterinary Officers (CCVO) and Council of Chief Medical Officers of Health (CCMOH)
    - Data and Information Repositories
      - Canadian Network for Public Health Intelligence (CNPHI) platform
      - Centre for Emerging and Zoonotic Disease – Integrated Intelligence and Response (CEZD-IIR)
    - Use of electronic mailing lists, social media, and smart-phones

## Classic Surveillance Activities

### Mandatory Reporting

- Reporting or periodic-notification of listed diseases is mandatory under various federal and provincial acts and regulations.
- Examples of such Acts and Regulations include:
  - Federally reportable diseases under the Canadian *Health of Animals Act*  
<http://laws-lois.justice.gc.ca/eng/regulations/SOR%2D91%2D2/page-1.html#h-2>
  - Provincially notifiable diseases in Ontario under the *Animal Health Act*  
<http://www.omafra.gov.on.ca/english/food/inspection/ahw/aha-regs-guidelines.htm>
  - Alberta, *Animal Health Act*  
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/acts12272](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/acts12272)
  - Web sites of other provinces may be used to view their respective documents
- Placement of specific diseases or hazards on such regulatory lists has always essentially been based on the impact component of the risk of such diseases; including negative impacts on: trade, public health (zoonoses), animal health (pathogenicity, treatability, impact on production, etc.) Such assessment of impacts (and decisions to include specific diseases on such lists), is becoming increasingly systematic (e.g., CFIA decision tree).
- In theory, since reporting is mandatory, they cover all respective geographic areas, species, and production-types for diseases deemed to be of sufficient seriousness to be listed.
- In general, the reporting system is believed to work well. However, it is dependent on animal owners/custodians' observation of their animals and contacting a veterinarian or animal health official when appropriate. It is also dependent on veterinarians and laboratories detecting cases and notifying officials.
- Findings have international linkages in that some must be reported to the OIE, and evidence of freedom from specific diseases is required to support export certification.
- Validation of, and statistics from, this component will be increasing important to support trade.
- Data and reports on findings are held in various government and laboratory systems and posted on the web sites of some organizations (e.g. CFIA), but accessibility to and consistency of data and summary reports varies.
- There is room for improvement in: ongoing access to data and findings, ease-of-collation, summary reports, demonstration of coverage, and consistency in follow-up.

### Active Surveillance for Specific Disease Hazards

- Active surveillance for specific disease hazards, using formally designed plans, is one example of a classic tool of surveillance.
- This tool is used as needed in both specific projects and in ongoing programs.
- Specific projects are usually driven by a need for more epidemiological information on: a specific disease, in a specific species or animal-type, in a specific area or jurisdiction. Many Epidemiology PhD studies contribute to such projects.
- Ongoing programs in such active surveillance are often driven by ongoing needs to address export or public health concerns.
- Examples of such initiatives include:
  - Canadian Notifiable Avian Influenza Surveillance System (CanNAISS)  
[www.inspection.gc.ca/animals/terrestrial-animals/diseases/surveillance/avian-influenza-surveillance/eng/1329693810008/1329694298513](http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/surveillance/avian-influenza-surveillance/eng/1329693810008/1329694298513)
  - BSE Surveillance Program  
[www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/bse/enhanced-surveillance/eng/1323992647051/132399271867](http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/bse/enhanced-surveillance/eng/1323992647051/132399271867)

- While the specifics of such projects and programs change over time, there will always be a need for this type of surveillance work and skill-set.
- In general, Canada has many highly trained-people and much infrastructure in government, academia and industry, to carry out such work as needed, provided required funding is available.
- Each initiative varies as appropriate in:
  - Contacts
  - Infrastructure used
  - Level of participation and collaboration
  - Coverage – geographic area, species, production type
  - Who values the information
  - Weaknesses / Challenges
  - Availability of data / information going into the study, and reports coming out
  - Decision making
  - International linkages

### **Passive Surveillance at Laboratories, Abattoirs, Markets, and Dead-Stock**

#### *Laboratories, CAHSN and CAHLN*

- Diagnostic laboratories hold a wealth of animal health surveillance data in electronic format.
- Most laboratory data systems are designed to run laboratories. They are rarely designed to harvest epidemiological information. Some simply cannot query their data, whereas others can.
- Unfortunately, differences in test protocols, case-definitions, database-formats and data-coding make it very challenging to collate and interpret the data.
- Also, ease-of-access to data varies among government, university, and private laboratories.
- The **Canadian Animal Health Surveillance Network (CAHSN)** has helped to standardize some of the above, at least for major federally reportable diseases (namely, FMD, classical swine fever, notifiable avian influenza, exotic Newcastle disease)
- Similarly, the **Canadian Animal Health Laboratorians Network (CAHLN)** meets annually encouraging networking, standardization and exchange of protocols among labs.
- The networking of CAHSN and CAHLN has assisted greatly in surveillance for, and response to, emerging non-federally reportable diseases (e.g., H1N1, PED)
- CAHSN has also strived to collate laboratory data on the Canadian Network for Public Health Intelligence (CNPHI) secure-data-platform in Winnipeg. Unfortunately, given the lack of standardization in test protocols, case-definitions, database-formats and data-coding, it has proved to be very challenging to collate and interpret the data.
- Currently, BC and Manitoba upload all their provincial veterinary laboratory data into the CAHSN component of CNPHI.
- However, until methods of standardizing coding or methods of re-coding in a CASHN/CNPHI repository are developed, it remains challenging to interpret these data and data from other laboratories. An interim or alternative solution may be for laboratories to analyze and interpret their own data and then upload “disease-counts” to CAHSN/CNPHI (rather than raw non-standardized data).
- Private veterinary laboratories also hold significant information. However, they suffer from the same issues of standardization, plus issues of accessibility. For some private laboratories, their database servers and even some testing do not reside/are not conducted in Canada.
- Notwithstanding these challenges, some private laboratories are sharing some data with some animal health authorities (e.g. Gallant Laboratories in Ontario).

- Another challenge is the lack of capture of unique premises identification in laboratory data (in provinces other than Quebec and Manitoba). Lack of recorded premises ID in lab data makes it next to impossible to count cases at the premises-level, because analysts cannot tell if laboratory results apply to one or separate premises.
- For more information on CAHSN see: [http://www.ahwcouncil.ca/pdfs/forum-2013/NFAHWCForum%20final\\_CAHSN.pdf](http://www.ahwcouncil.ca/pdfs/forum-2013/NFAHWCForum%20final_CAHSN.pdf)
- For more information on CAHLN see: [www.cahln-rctlsa.com](http://www.cahln-rctlsa.com)
- Both CAHSN and CAHLN are self-governed and make decisions by consensus.
- Given the overlap in people, objectives, and activities of CAHSN and CAHLN; it may make sense to merge the two into one organization.
- See more on data-repositories including CNPHI and CZED-IIR below.

#### *Abattoirs, Markets and Deadstock*

- Data from abattoirs and markets can provide good surveillance information including demonstration of coverage. This can include data on: a) throughput, b) rejections and c) reasons-for-rejections, by species, animal-type, geographic-source-area, and date.
- Similarly, numbers of animals through deadstock, by: species, animal-type, date, and geographic area of source can provide good surveillance data.
- Although significantly more expensive, data on: body-systems-involved, lesions, tests-results, and cause-of-death could serve as excellent sources of surveillance information.
- Much, but not all, of these data are being collected locally, but are currently not well collated, analysed, and summarized.
- Given the investment in infrastructure already made; improvement of data collection, collation, analyses and summary should provide a good marginal return on investment.

#### *Cluster and Trend-Change Detection Algorithms*

- Highly sophisticated software and algorithms exist to detect unusual clusters and changes in trends in observed data, which in turn serve as flags or alerts for further investigation.
- Such systems are being applied to some extent (e.g. University of Guelph Animal Health Laboratory) but there is room for much wider application (e.g. laboratory, abattoir, market, and deadstock data)
- Also, while data-systems and algorithms are useful, one should never underestimate the power of making it easy for someone to pick up the phone to discuss a perceived unusual situation with a knowledgeable, experienced, member of a well-connected-network so that an appropriately balanced follow-up is achieved, in a pleasant and helpful manner.

#### **Export Testing and Certification**

- Export programs serve as an important component of the surveillance system.
- The demands made by importing countries (for exports from Canada), both: a) serve as important drivers of surveillance-needs to meet those demands, and b) contribute additional information to overall surveillance, through the actual testing and certification conducted for export.
- Examples of export requirements may be found at: <http://www.inspection.gc.ca/animals/terrestrial-animals/exports/live-animals/health-certificates/eng/1369504254506/1369504339901>
- The infrastructure needed for export testing and certification (e.g., accredited veterinarians, district offices, laboratory test capability, secure documentation and communications systems), are all of value in: export work, routine surveillance, and surveillance during a response to an emergency (e.g., during an FAD response).

- While coverage tends to be limited to exporters, it still contributes to surveillance and has important international linkages in the promotion of the image of Canada's surveillance system.
- There is room for improvement in linkages between export programs and surveillance programs, both: a) to provide better information to support and expand export markets (for a better return on investment), and b) to make better use of export testing data to contribute to overall surveillance.
- Every test-negative provides additional evidence in support of Canada's animal health status.

## Provincial or Regional Activities

- Individuals within a given province or within a group of provinces (e.g., Atlantic or Prairie provinces), share common interests. Accordingly, networks based upon those common interests are self-sustaining by the value its members receive through participation.
- Examples of such networks include:
  - le Réseau d'alerte et d'information zoosanitaire (RAIZO) in Quebec
  - the Ontario Animal Health Network (OAHN) in Ontario
  - the Alberta Veterinary Surveillance Network (AVSN) in Alberta

### RAIZO and OAHN

- le Réseau d'alerte et d'information zoosanitaire (RAIZO) in Quebec, and the Ontario Animal Health Network (OAHN) in Ontario, are examples of such networks.
- RAIZO has been active for more than 20 years, and OAHN (which is modelled after RAIZO) has been actively growing since July 2014. (see [www.OAHN.ca](http://www.OAHN.ca) )
- The key building-blocks of both RAIZO and OAHN are sector-specific expert committees, each with representation from private veterinarians, laboratory, veterinary college research, and provincial government employees, who are active in the respective sector.
- Thus, each sector-specific committee serves as sub-network of knowledgeable, experienced, interested, and well-connected people.
- Members of each committee agree on (and can modify) the list of diseases they wish to monitor.
- They review and discuss summaries, trends, and changes in clinical and laboratory diagnoses on quarterly and ad-hoc conference calls, as appropriate.
- Value is provided and received because each committee is discussing their respective sector and diseases of interest to them.
- Also each member-type (i.e. private veterinarian, laboratory-specialist, veterinary-college-researcher and provincial-government-sector-specialist), contributes and receives information of value to them, to the group, to the sector and to respective connected sub-networks (e.g. veterinary and producer organizations, laboratory organizations, research programs, government organizations).
- Each group is tailored to the needs of (and what works for), that sector-group, in that province or region.
- Producers receive value from their own network producer reports e.g. <http://www.ontariogoat.ca/ontario-animal-health-network/>
- Social network software may be used. For example, interested parties (veterinarians, producers, government officials, the public), may receive information from OAHN on Twitter, which is used for rapid distribution of information.
- The combination of sector-specific-committees provides cross-sector-value to the province or region.
- Mutual trust and understanding is achieved through routine interaction on routine production-limiting diseases of concern.
- This provides pre-practiced trust and communications when dealing with unusual issues or emergencies.
- Their linkages to national networks provide value to national industry sectors and Canada overall; and return value to the provincial level by better understanding other provinces and regions.
- For more information on RAIZO see: [www.mapaq.gouv.qc.ca/raizo](http://www.mapaq.gouv.qc.ca/raizo) or contact Dr. Luc Bergeron  
phn: (418) 380-2100x3106 eml: [Luc.bergeron@mapaq.gouv.qc.ca](mailto:Luc.bergeron@mapaq.gouv.qc.ca)

- For more information on OAHN see: [www.OAHN.ca](http://www.OAHN.ca) or [www.uoguelph.ca/omafra\\_partnership/en/partnershipprograms/DiseaseSurveillancePlanDSP.asp](http://www.uoguelph.ca/omafra_partnership/en/partnershipprograms/DiseaseSurveillancePlanDSP.asp) or contact Dr. Melanie Barham (519) 824-4120 x 53364  
eml: [barhamm@uoguelph.ca](mailto:barhamm@uoguelph.ca)
- Concerning coverage and participation, RAIZO has sector-committees in: swine, poultry, bovine, equine, small ruminants, fish, bees, and wildlife and zoos.
- As of July 2015, OAHN has active sector-committees in each of: bees, bovine, equine, fish, poultry, small ruminants, and swine. Committees in companion animals and wildlife are under development.
- Concerning funding: Participating government, veterinary college, and laboratory employees are paid through their regular salaries. Whereas participating private veterinarians are paid for their time to participate in conference calls from funding for the programs. In OAHN a coordinator is paid from funding for the program.
- The groups are self-governed and make decisions by consensus.
- RAIZO and OAHN provide valuable “go-to links” for government and industry.

### AVSN

- The Alberta Veterinary Surveillance Network (AVSN) defines itself as an infrastructure (including people, processes and technology), for systematic, continuous observation of Alberta livestock and poultry, including the collection and analysis of data from many sources for:
  - rapid detection (or identification) and timely, appropriate response to important livestock, poultry, food safety, and public health events, and
  - production and communication of valid information and knowledge about the health and disease status of Alberta livestock and poultry and safety of their products
- The AVSN has used a collaborative approach to event detection method development, engaging specialists from private industry and several academic domains including mathematics, computer science, and engineering. Methods have been adapted from public health event detection, time series analysis and modeling, process control, artificial intelligence, data mining, and computational intelligence.
- In addition, a 1-800 number available, with someone on-call 24/7, so that producers and veterinarians are encouraged to call anytime to discuss any unusual animal health observations.
- Regardless of how events are detected, the AVSN has two investigative components, including: investigative pathology and outbreak investigation. Both of these components have discretionary funds available, allowing investigators and diagnosticians the ability to respond quickly to unusual or important disease events. AVSN has developed engagement criteria for both components enabling investigators and diagnosticians to make decisions and to move quickly when needed, without requiring higher-level approvals.
- The AVSN actively engages private veterinarians including the development and implementation of a real-time web-based Veterinary Practice Surveillance (VPS) application, run on a secure, controlled-access website. Veterinary practices that service the Alberta cattle and swine industries voluntarily participate by entering data, for which they are paid a fee per record. Data collected include: number on farm, number affected, animal-type, age group, clinical syndrome, clinical diagnosis, laboratory diagnosis, and other data. Data are reported and collated daily and analyzed automatically to detect potentially important disease events. Producer identities are not reported by veterinarians who act as gatekeepers; both protecting the confidentiality of their clients, and, in the case that a potentially important disease is detected, providing the only access between the AVSN and the producer for disease investigation or other responses.

- In addition, information is collected and distributed through regular conference calls that are set up among Alberta and regional governments, industry, and veterinary stakeholders as appropriate on an issue-by-issue basis (e.g. PED, or *Salmonella* Enteritidis).
- Summary reports are produced, one example being “Alberta Health Watch”. In addition to providing summary statistics on observed syndromes, the report also documents surveillance coverage.
- Members of the unit noted that it is challenging to get reports out in a timely manner and challenging to maintain computer systems because software and hardware are continuously being updated.
- Decisions are made through consultation.
- For more information on the AVSN, see: [http://www1.foragebeef.ca/\\$department/deptdocs.nsf/all/afs10442](http://www1.foragebeef.ca/$department/deptdocs.nsf/all/afs10442)  
Or contact: Dr. Delores Peters, phn: 403-948-1527 eml: [delores.peters@gov.ab.ca](mailto:delores.peters@gov.ab.ca) or

## Sector or Animal-Type Activities

- Individuals within a given sector or animal-type (e.g. swine, poultry, equine, wildlife, etc.), share common interests. Therefore, networks based on sectors or animal-type are sustainable, when they provide sufficient value to respective members and beyond.
- Examples of such networks include:
  - The Canadian Swine Health Intelligence Network (CSHIN)
  - The Equine Canada Health and Welfare Committee (ECHWC)
  - Other industry sector groups (e.g. Chicken Farmers of Canada (CFC), Ontario Pork Industry Council (OPIC) and its committee [the Ontario Swine Health Advisory Board (OSHAB)])
  - The Canadian Wildlife Health Cooperative (CWHC)

### CSHIN, WCSHIN and ECHWC

- The Canadian Swine Health Intelligence Network (CSHIN) is an example of such a network.
- CSHIN is modeled after RAIZO in that it includes participation from government, veterinary college, laboratory, and private practice veterinarians. But it is organized on a national perspective (rather than provincial), focusing on swine.
- Participants provide and receive value, and thus want to sustain it .
- Like RAIZO, CSHIN collates clinical and laboratory information on a list of diseases agreed upon by members, and has quarterly (and ad hoc) conference calls to discuss trends and changes.
- CSHIN links into RAIZO and OAHN by including members from their respective provincial swine committees, but CSHIN also includes members from Atlantic and Western Canada.
- National CSHIN conference calls are coordinated to occur shortly after RAIZO and OAHN swine provincial conference calls.
- CSHIN provides reports for industry.
- CSHIN also serves as a valuable “go-to link” for government and industry.
- For more information on CSHIN see:  
[http://www.cpc-ccp.com/biosecurity/publications/en/Swine\\_Health\\_Awareness\\_Bulletin\\_Issue\\_4\\_August\\_2012-CSHIN.pdf](http://www.cpc-ccp.com/biosecurity/publications/en/Swine_Health_Awareness_Bulletin_Issue_4_August_2012-CSHIN.pdf)  
or contact Dr. Chris Byra phn: (604) 793-9247 eml: [byra@cshin.ca](mailto:byra@cshin.ca)
- Like RAIZO and OAHN, CSHIN participation by government, veterinary college, and laboratory employees are paid through their regular salaries, whereas participating private veterinarians are paid for their time to participate in conference calls, from funding for the initiative. A CSHIN coordinator, software, and IT support are currently funded by industry for the initiative. But funding is soft and must be re-authorized regularly.
- CSHIN is self-governed and makes decisions by consensus.
- Western-CSHIN (WCSHIN) is an example of a regional network focusing on one species. In addition to RAIZO-like activities described above, WCSHIN includes capture of data on veterinary farm calls by linking into some veterinary practice software and by having developed a smartphone app that facilitates rapid capture of key veterinary-farm-farm-call data.
- Somewhat similar to CSHIN, as of May 2015 the Equine Canada Health and Welfare Committee (ECHWC) is sponsoring a regular national conference call to discuss and exchange current information on equine health issues including observed outbreaks, testing protocols and research.
- For more information on the ECHWC see: [www.equinecanda.ca](http://www.equinecanda.ca)
- Or contact Dr. Scott Weese phn: (519) 824-4120 x54064 eml: [jsweese@ovc.uoguelph.ca](mailto:jsweese@ovc.uoguelph.ca)

**Fish**

- Surveillance of fish health for both farmed and wild fish and the interaction of farmed and wild fish is carried out by over seventy projects and programs run by: governments (federal and provincial, departments of fisheries, agriculture and natural resources), universities and industry (associations and companies).
- Some initiatives focus on specific pathogens, others on multiple hazards threatening one species fish or groups of species, others on diseases important to trade or movement of fish (interprovincial or international), others on ecological regions (e.g. river basin), others on sector components (e.g. hatcheries).
- Also, RAIZO and OAHN have fish surveillance expert committees

**Other Industry Sector Initiatives**

- Examples of other industry initiatives involving sector-specific health surveillance with subsequent follow-up include:
  - The Chicken Farmers of Canada (CFC) Animal Care Program
  - The Ontario Pork Industry Council (OPIC) and its committee [Ontario Swine Health Advisory Board (OSHAB)] Area Regional Control and Elimination (ARC&E) initiatives for PRRS and PED
- The CFC Animal Care Program includes a manual for producers and third-party audit inspections.
  - Examples of the many animal health and welfare requirements outlined in the program, that are particularly germane to health surveillance, include:
    - having a flock veterinarian
    - daily monitoring of flock mortality by producers
    - immediately notifying the flock veterinarian if mortality exceeds 2% in 24 hours
    - culling sick and injured birds
  - For more information on the CFC Animal Care Program see: [www.chickenfarmers.ca](http://www.chickenfarmers.ca)
- The OPIC /OSHAB ARC & E program takes a high level approach to controlling specific diseases by:
  - Encouraging collaboration among producers and veterinarians to:
    - communicate and share information about disease status to facilitate good decisions
    - encourage early diagnosis of disease based on clinical triggers
    - understand the prevalence of disease across all sites in a region
    - develop solutions to reduce disease spread & prevalence & in some circumstances, in the long term, eliminate the disease from a region
  - This voluntary program allows mapping of the disease status. Information about site status, including new disease breaks, is shared electronically within the group of enrolled producers. It gives producers increased knowledge to work with their veterinarians and make better decisions. It encourages participants to be open and transparent. Decisions can be made to reduce the disease threat to each other.
  - For more information on OPIC OSHAB ARC & E initiatives, see:  
<http://www.opic.on.ca/oshab-overview>
  - ☎ Contact Lori Moser phn: 519-577-6742 eml: [lori.moser@rogers.com](mailto:lori.moser@rogers.com)

**CWHC**

- Another example of a national animal type network is the Canadian Wildlife Health Cooperative (CWHC), which has been active for over 20 years.

- The CWHC provides a Canada-wide perspective on wildlife health, while providing help to identify and assess emerging issues at the local level
- Partners include the University of Saskatchewan, the University of Guelph, the University of Montreal, the University of Prince Edward Island, the University of Calgary, as well as Ducks Unlimited Canada, the Canadian Wildlife Federation, and Syngenta Crop Protection Canada.
- The CWHC also receives sponsorship and collaborates with the CFIA, Environment Canada, Parks Canada, Public Health Agency of Canada, as many wildlife diseases may also have negative effects on farm animal and public health.
- Examples of some specific CWHC initiatives include surveillance in: avian influenza, bat white nose syndrome, rabies, West Nile virus, botulism, chronic wasting disease, tuberculosis, avian cholera, tularemia, salmonellosis.
- The CWHC maintains a standardized, stable database as a critical component of health information management as it provides a key tool for storing data in a uniform, centralized manner. Members of CWHC believe the data system to be a cornerstone of its ability to deliver critical information to stakeholders in a timely manner. It facilitates the transformation of data into knowledge, which allows effective decision making and policy definition. The database records mortality events, their environmental circumstances and locations, and associated animals along with testing and disease outcome information and a comprehensive cause-of-death coding system.
- Internationally, the CWHC is recognized as an OIE collaborating centre with expertise in wildlife disease surveillance and monitoring, epidemiology, and management.
- As such it assists the office of Canada's Chief Veterinary Officer to report to the OIE on occurrences of diseases in Canadian wildlife.
- For a additional information see: <http://www.cwhc-rccsf.ca>
- Or contact Dr. Craig Stephen phn: (800) 567-2033 eml: [cstephen@cwhc-rccsf.ca](mailto:cstephen@cwhc-rccsf.ca)

## Activities Emphasizing Zoonotic Diseases and Public Health

- Since a primary objective of surveillance is to provide information of value to society, it is important that the animal health surveillance system watch for zoonotic diseases and other hazards to human health.
- Essentially all of the components described above include surveillance for such hazards, but some focus on such hazards more than others.
- In such cases, it is essential to have good cooperation/collaboration and exchange of information, among animal and public health stakeholders.
- One example is the annual joint meeting of the Council of Chief Veterinary Officers (CCVO) and the Council of Chief Medical Officers of Health (CCMOH).
- In general, animal health systems take responsibility for the animal side of zoonotics, while public health looks after the human side of zoonotics.

### Rabies, West Nile, Lyme, Salmonella, AMR

- Some examples of networks and initiatives that benefit from participation by members from both animal health (wildlife and domesticated animals) and public health, include:
  - The rabies surveillance and control program in Ontario [www.health.gov.on.ca/english/public/program/pubhealth/rabies/rabies\\_mn.html](http://www.health.gov.on.ca/english/public/program/pubhealth/rabies/rabies_mn.html)
  - Surveillance for West Nile virus in people, farmed animals and wildlife. Note the linkages between public health, farmed animal health and wildlife health on the West Nile Virus surveillance web page of the Public Health Agency of Canada <http://www.phac-aspc.gc.ca/id-mi/westnile-virusnil/surveillance-eng.php> and similar cross links on the Alberta Health web page for West Nile Virus surveillance <http://www.health.alberta.ca/health-info/west-nile-virus.html>
  - In Alberta, the Ministries of Health and Agriculture and Rural Development collaborate on tick-surveillance for Lyme Disease <http://www.health.alberta.ca/health-info/lyme-disease.html>
  - The Public Health Agency of Canada web page on Salmonella surveillance includes information on isolates from humans and non-humans <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s3/index-eng.php#toc>
  - Similarly, the Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS), looks a AMR in isolates from people, animals, and food. [www.phac-aspc.gc.ca/cipars-picra/index-eng.php](http://www.phac-aspc.gc.ca/cipars-picra/index-eng.php)

### CEZD-IIR

- See more information on the Centre for Emerging and Zoonotic Disease – Integrated Intelligence and Response (CEZD-IIR) below under the heading of Controlled Access Data/Information Systems and Repositories.
- It is included here because it includes (among other benefits) an emphasis on zoonotics.
- Its objective is to enhance intelligence generation capability and capacity in the area of zoonotic and emerging diseases.
- For more information on CEZD-IIR see below and : [http://www.ahwcouncil.ca/pdfs/CFIA\\_ACIA%20-%206153896%20-%20v2%20-%20English%20CEZD%20Forum%20Presentation%20Nov%2025%202014\\_Harry%20Gardiner.pdf](http://www.ahwcouncil.ca/pdfs/CFIA_ACIA%20-%206153896%20-%20v2%20-%20English%20CEZD%20Forum%20Presentation%20Nov%2025%202014_Harry%20Gardiner.pdf) or contact Dr. Harry Gardner phn: (613) 773-5340 eml: [harry.gardner@inspection.gc.ca](mailto:harry.gardner@inspection.gc.ca)

## Moving Closer to the Source

- The surveillance components described above all provide good information (e.g. mandatory reporting, laboratory, abattoir, market, and deadstock data).
- However, there can be advantages to moving back closer to the source by routinely collecting data concerning visits to farms by veterinarians and animal production data.

- Summaries of such data demonstrate good surveillance coverage and detection, and follow-up on unusual findings, trends, or sudden changes of trends can be useful.
- Some of the components described above do some of this work.

#### **Veterinary Practice Data**

- The Veterinary Practice Surveillance (VPS) system within the Alberta Veterinary Surveillance Network collects and summarizes data on veterinary farm calls for cattle and more recently swine. Participation is voluntary. Participants receive some financial compensation for submitting records in an on-line based system. Unusual findings are investigated. Summary reports are produced.
- Similarly, the Canadian Swine Health Intelligence Network (CSHIN) has recently developed a system using smart-phones and a web server to collect data about farm calls made by swine veterinarians in western Canada. CSHIN basing it on software by a European company called CloudFarm5 which has similar systems in several countries. <http://cloudfarm5.com>
- A project was conducted in Ontario in which veterinarians were encouraged to submit information on farm calls on a weekly basis. Participating veterinarians received credits at the laboratory as compensation.
- These initiatives provide data demonstrating surveillance coverage by DVM's interactions with farms and animals and provide data on routine as well as unusual animal health issues facilitating rapid follow-up.

#### **Farm Animal Production/Morbidity/Mortality Data**

- Disease often alters affected animals' water and feed consumption and production.
- Continuous monitoring on-farm of animals-at-risk of disease, their feed and water consumption, production, morbidity, mortality with follow-up of unusual changes or trends provides excellent health surveillance information.
- Some sectors do this better than others already (e.g., poultry, swine, dairy).
- There are likely opportunities to improve these systems, better collate, summarize and use data already being collected and expand use of the techniques.

## Communication, Interpretation, Distribution, Storage, and Use of Information

- Movement of data and information is important, including: collection, collation, analyses, interpretation and distribution.
- This is important both internally among people directly involved in the local system and externally to collect and provide information to broader stakeholders in Canada and internationally.
- Often information must be interpreted with care so that appropriate balanced decisions are made
- Privacy issues are frequently of concern such that the level of detail communicated is on a “need-to-know” basis. Aggregated summaries at a higher level of organization (e.g., county or province) may be used to communicate important information yet retain privacy. However, more detailed data is usually required to be collected (and protected) to facilitate production of aggregated summaries.
- It is important to prevent inadvertent harm.

### CCVO and CCMOH

- Networks of knowledgeable and authoritative people are important to surveillance to ensure activity in detection, interpretation, and communication of findings is ongoing.
- The Council of Chief Veterinary Officers (CCVO) and the Council of Chief Medical Officers of Health (CCMOH) play important roles in this regard as part of the surveillance system, as well as contributing in other ways.
- Regular and ad-hoc conference calls of CCVO and the CCMOH) contribute to this networking given the respective members access to data and information, and authority to request and relay information.
- Chief Veterinarians include:

Jurisdiction	Contact	Phone	Email
Canada	Dr. Harpreet Kochhar	613-773-7472	<a href="mailto:Harpreet.Kochhar@inspection.gc.ca">Harpreet.Kochhar@inspection.gc.ca</a>
Yukon Territory	Dr. Mary VanderKop	867-46-5582	<a href="mailto:Mary.Vanderkop@gov.yk.ca">Mary.Vanderkop@gov.yk.ca</a>
North West Territories	Dr. Brett Elkin	867-920-8067	<a href="mailto:Brett_Elkin@gov.nt.ca">Brett_Elkin@gov.nt.ca</a>
Nunavut	Mathew Fredlund	867-934-2178	<a href="mailto:MFredlund@gov.nu.ca">MFredlund@gov.nu.ca</a>
British Columbia	Dr. Jane Pritchard	604-556-3013	<a href="mailto:Jane.Pritchard@gov.bc.ca">Jane.Pritchard@gov.bc.ca</a>
Alberta	Dr. Gerald Hauer	780-415-9503	<a href="mailto:Gerald.hauer@gov.ab.ca">Gerald.hauer@gov.ab.ca</a>
Saskatchewan	Dr. Betty Althouse	306-787-5547	<a href="mailto:Betty.althouse@gov.sk.ca">Betty.althouse@gov.sk.ca</a>
Manitoba	Dr. Megan Bergman	204-945-7685	<a href="mailto:Megan.bergman@gov.mb.ca">Megan.bergman@gov.mb.ca</a>
Ontario	A/ Dr. Paul Innes	519-826-3127	<a href="mailto:Paul.Innes@ontario.ca">Paul.Innes@ontario.ca</a>
Quebec	Dre. Natalie Cote	418-380-2100 x3035	<a href="mailto:Natalie.cote@mapaq.gouv.qc.ca">Natalie.cote@mapaq.gouv.qc.ca</a>
New Brunswick	Dr. Jim Goltz	506-453-5488	<a href="mailto:Jim.goltz@gnb.ca">Jim.goltz@gnb.ca</a>
Nova Scotia	Dr. Rob Kerr	902-893-3491	<a href="mailto:Kerrw@gov.ns.ca">Kerrw@gov.ns.ca</a>
PEI	Shauna Mellish	902-894-0392	<a href="mailto:smellish@gov.pe.ca">smellish@gov.pe.ca</a>
Newfoundland & Labrador	Dr. Hugh Whitney	709-729-6879	<a href="mailto:hughwhitney@gov.nl.ca">hughwhitney@gov.nl.ca</a>

- Networks are sustainable only if they provide value to participants.

- The CCVO and CCMOH are excellent examples of such networks that self-emerged from recognized needs and have been sustained and self governed with 100% voluntary participation because of the value provided by participation.
- They cover all geographic areas, species, and production types, and provide excellent linkages into other important networks and components.
- Group-decision-making is by consensus, while within-jurisdiction-decision-making is up to that jurisdiction
- International linkages occur through CFIA participation
- For reasons of privacy, information exchange cannot be too specific but with care, experience, professionalism, and good judgement, sufficient detail can be exchanged
- Care and trust are required not to over interpret data given regional differences in protocols

### **Controlled Access Data/Information Systems and Repositories**

- Much surveillance data are already being collected and reports produced. Unfortunately, much of the information is not used to its full potential because it is not easily accessible, collated, or standardized.
- Given the investment in collecting the data and conducting the original analyses, there are likely opportunities to obtain a good marginal return on investment by collating such data and information and making them more accessible.
- The Canadian Network for Public Health Intelligence (CNPHI) is an example of a platform that strives to achieve this by providing a controlled-access secure data repository and services to build custom applications to collate and analyze data to provide information for specific needs. Collation of CAHSN laboratory data in CNPHI is an example. There are several significant challenges to such efforts, an important one being variability of data systems and coding within and between labs and over time. In addition to using the CNPHI platform to collate laboratory data, there may be opportunities to use it to systematically store (and make accessible to authorized users) case counts, and other reports (e.g. RAIZO, OAHN, and AVSN reports etc.)
- The Alberta Veterinary Surveillance Network (AVSN) also has a controlled access system as part of its Veterinary Practice Surveillance (VPS) system, as does the Canadian Swine Health Intelligence Network (CSHIN).
- Provincial governments have controlled access data systems housing data of use to surveillance.
- The Centre for Emerging and Zoonotic Disease – Integrated Intelligence and Response (CEZD-IIR) strives to enhance intelligence generation capability and capacity in the area of zoonotic and emerging diseases through:
  - Integration of information and intelligence sources
  - Collaborative analysis of the information via a shared platform (the Canadian Network for Public Health Intelligence (CNPHI)) and
  - Timely distribution of outputs for the use of the community through a range of communications channels
  - Foundational principles include:
    - Employing existing sources of information and build off existing investments in IT platform infrastructure.
    - Make use of non-classified information sources to maximize collaborative access among stakeholders
    - Achieve system sustainability through relevance to the community and effective use of resources.

- For more information on CEZD-IIR see:  
[http://www.ahwcouncil.ca/pdfs/CFIA\\_ACIA%20-%206153896%20-%20v2%20-%20English%20CEZD%20Forum%20Presentation%20Nov%2025%202014\\_Harry%20Gardiner.pdf](http://www.ahwcouncil.ca/pdfs/CFIA_ACIA%20-%206153896%20-%20v2%20-%20English%20CEZD%20Forum%20Presentation%20Nov%2025%202014_Harry%20Gardiner.pdf)  
or contact Dr. Harry Gardner phn: (613) 773-5340 eml: [harry.gardner@inspection.gc.ca](mailto:harry.gardner@inspection.gc.ca)

### **Make Information Easily Available to Customers**

- To promote trade and support exports it is important to demonstrate surveillance coverage and the strength of the system in a consistent and clear manner that makes it easy for potential customers to access the information they need to make a decision to buy Canadian.
- The World Wide Web is a very powerful tool, facilitating easy linking of pages of relevant information authored and stored in several different places.
- This is already used to make surveillance information available, but there is room for improvement (e.g., a go-to and link-to Canadian animal health surveillance system web page)

### **Use of electronic mailing lists, social media and smart-phones**

- Electronic mailing lists are useful to obtain and distribute information. For example, ProMed is used to monitor for information about situations beyond Canada's borders that may pose a threat to Canadian animal health. It is also used to post information about situations in Canada that will be of interest to animal health people monitoring ProMed.
- Social media (e.g. Facebook and Twitter) provide ways to rapidly distribute brief messages, with links to web sites with more detailed information. For example, the Ontario Animal Health Network (OAHN) "tweets" on a regular basis. As a specific example, it was used to distribute updated information concerning the recent outbreak of avian influenza.
- Smart-phones are now extremely common. They can be used to both collect and distribute surveillance information. For example, an initiative in Indonesia uses smart-phones to collect information from producers and to request veterinary farm visits. The same smart-phone system is then used by the veterinarian to collect data about the their farm visits, and links to lab data when samples are submitted to the laboratory. CSHIN has developed swine-veterinarian farm-call-data-system, using smart-phones and a web-server to collect, store and distribute data and information. There is room to expand the use of this technology in the surveillance system.

## Discussion

- There is much good work currently being done among the many existing components of the Canadian animal health surveillance system.
- While it would not be productive to interfere with that good work unnecessarily, it is likely that data and information currently being collected is not being used to its full potential.
- Therefore, there is likely opportunity to receive a good marginal return on investment making better use of that which is already being done. Examples could include:
  - Making existing reports more easily available.
  - Providing a simple clear picture of the extent of the system.
  - Tweaking and better coordinating work already being done.
- During meetings discussing the governance of surveillance, stakeholders indicated:
  - They did not (at this time) want an additional or separate bureaucracy for surveillance, but preferred to leverage existing systems, components, and bureaucracy. This includes respecting local and sector knowledge and work.
  - It was thought useful to facilitate an environment where self-sustaining networks can grow and evolve to meet their respective needs, and interact with other networks as appropriate in a network-of-networks.
  - It was thought useful to provide a clear picture so members of sub-networks understand how they fit in and contribute meaningfully to the big picture. This would also allow external stakeholders (e.g., trading partners and customers), to understand the extent and thoroughness of the system.
- Accordingly, at the 2014 annual forum of the NFAHWC, the CFIA and the NFAHWC jointly announced their intent:
  - To strive to base the Canadian animal health surveillance system on a network-of-networks.
  - Furthermore, that the network-of-networks would be governed by:
    - A Champions Group
    - A Directors Group
    - A Coordinator
    - A Secretariat
- Specific membership of any of the above sub-networks or governance groups is not cast in stone but can evolve as appropriate as sub-networks in and of themselves as needed and as sustainable.