

Report on the Canada-PAHO Veterinary Public Health Workshop



May 31st and June 1st, 2007
Ottawa, Canada



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The Inter-American Institute for Cooperation on Agriculture (IICA)
The Public Health Agency of Canada (PHAC)
The Canadian Food Inspection Agency (CFIA)

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Executive Summary

Canada has been a member of the Pan American Health Organization (PAHO) since 1971. Health Canada manages relations with PAHO on behalf of the government and has been an active partner on numerous health issues in the hemisphere. Given an identified need to bring together Canadian and PAHO expertise on veterinary public health (VPH) issues, a joint workshop was held on May 31st and June 1st, 2007, in Ottawa, Canada.

The Canada-PAHO Veterinary Public Health Workshop's aim was to bring together Canadian and PAHO experts in the Americas to exchange information on current and future activities and to develop strategies to work together more effectively to reduce risks to public health from animals.

The information exchanged during the workshop illustrated the strengths and needs of both Canadian and PAHO partners and highlighted several areas for potential collaboration. From the PAHO presentations, there emerged a sense of the tremendous challenges in VPH facing its member countries, due to factors such as poverty, the importance of animal products to the region's economy and (in the case of the Caribbean) their dependence on tourism. However, there also emerged a portrait of a valuable infrastructure as well as networks that are important to support, as they provide a solid foundation for VPH and for collaboration with Canada.

From the Canadian presentations, there emerged a vision of VPH based on a holistic ecosystem approach that sees human and animal health as a continuum and that is based less on responding to specific disease threats than on acting to prevent disease by developing healthy, resilient animal populations of all kinds—wildlife, farm animals and companion animals. Canada has demonstrated leadership in institutional development to link agriculture and public health both domestically, for example the Canadian Food Inspection Agency (CFIA) and the Public Health Agency of Canada (PHAC), and internationally, supporting collaboration between key agencies such as the Pan American Health Organization (PAHO), the Inter-American Institute for Cooperation on Agriculture (IICA) and the Food and Agriculture Organization of the United Nations (FAO). Presentations from the academic sector provided innovative perspectives that informed discussions on future directions.

Key themes that emerged included the importance of people and reciprocity in partnerships. The importance of people to the process was woven through all the presentations as well as the discussions they generated. The development of networks, both formal and informal, was an obvious ingredient in the success of the many initiatives described. Equally important was the focus on training, exchanges and teamwork within and between institutions as important strategies for collaboration.

Reciprocity was another important concept that emerged. Collaboration is a two way venture, with benefits for all partners. This element of benefit for Canada, not just PAHO, needs to be brought out as a strategy for gaining support in Canada for VPH collaborations in the Americas. The benefits to Canada range from enhanced protection of the health of Canadians through actions beyond our borders to the development of language as well as cross-cultural skills and perspectives that Canadian professionals increasingly require to function effectively in a global context.

Through small group discussions, it became apparent that the opportunities for collaboration are wide ranging, including training, collaboration on diagnostics and surveillance and working together to advance a more holistic view of VPH, closely tied to public health in humans.

It was agreed, however, that developing a plan to move forward, with concrete tasks, timelines, and funding sources, was beyond the scope of a two-day workshop. The workshop therefore concluded with a commitment that Canada and PAHO would collaborate in the establishment of a steering group to develop such a plan and to work closely on its general adoption and implementation.

Introduction

In 2006, Health Canada's International Affairs Directorate was invited to be part of a special External Advisory Committee to the Director of the Pan American Health Organization (PAHO) on veterinary public health (VPH). As a result of the Committee's discussions, it became clear that Canada needed to be better engaged and more cognizant of PAHO's activities to address VPH in the Americas. Furthermore, it also became apparent that the considerable technical expertise available in Canada was not being fully utilized by PAHO. The Canada-PAHO Veterinary Public Health Workshop was thus organized as an opportunity to reflect on how Canadian and PAHO experts can best coordinate their efforts in the hemisphere.

About 75% of new emerging diseases, including the West Nile virus, avian influenza and Severe Acute Respiratory Syndrome (SARS), are linked to animals. Zoonotic pathogens have caused 11 of the past 12 significant human epidemics. Food safety issues continue to be of concern, as the numbers of people and amount of food that transverse the Americas continue to grow.

Given these concerns, VPH is an issue of increasing importance and representatives from Canada and PAHO gathered in Ottawa on May 31 and June 1, 2007, to exchange information on current activities and future directions and to develop strategies to work together more effectively to reduce risks to public health from animals.

Among the participants were representatives of Health Canada, the Public Health Agency of Canada (PHAC), the Canadian Food Inspection Agency (CFIA) and Agriculture and Agri-Food Canada (AAFC), as well as PAHO, including two of its regional bodies, the Pan American Centre for Foot-and-Mouth Disease (PANAFTOSA) and the Caribbean Epidemiology Centre (CAREC).¹ Other institutions in attendance included the Inter-American Institute for Cooperation on Agriculture (IICA), which provided support in facilitating the meeting, the International Development Research Centre (IDRC) as well as representatives of Canadian universities and PAHO/WHO Collaborating Centres.

The workshop was structured to elicit the maximum amount of information in a short period. The first day featured overviews of PAHO and Canadian government activities, while the second day featured presentations from Canadian academic centres of innovation. Following these presentations, participants broke into two groups to consider the following questions:

1. What are the current high-risk/priority VPH issues in the Americas?
2. What are the potential areas for collaboration (e.g. filling knowledge gaps, surveillance, public education)?
3. How can we work together more effectively (e.g. collaborating networks, teams)?

The full agenda for the workshop can be found in Appendix A and a full list of participants in Appendix B.

The purpose of this report is to provide participants with a record of the presentations and discussions as well as of the decisions made on future steps.²

1- The Pan American Centre for Foot-and-Mouth Disease (PANFMD) is most commonly referred to by its Spanish Acronym PANAFTOSA (Centro Pan-Americano de Febre Aftosa).

2- Electronic copies of all PowerPoint presentations are available from the International Affairs Directorate at Health Canada.

Day 1: PAHO Overview

The morning of Day 1, six speakers from the Pan American Health Organization and its regional bodies provided an overview of their activities in the area of VPH.

The Pan American Health Organization is the World Health Organization's Regional representative as well as the Organization of American States' (OAS) specialized health agency.

Overview of the Area of Health Surveillance and Disease Management (HDM)

Dr. Jarbas Barbosa, Area Manager, HDM, PAHO

After providing a brief overview of PAHO, Dr. Barbosa outlined the four units in the HDM Division: Communicable Diseases, Non-communicable Diseases, Veterinary Public Health and Health Analysis and Statistics.

In the VPH unit, areas of activity include zoonoses, food safety, food security (including foot-and-mouth disease) and emerging zoonotic diseases, such as avian influenza, leishmaniasis and human rabies transmitted by bats.

Dr. Barbosa observed that zoonoses are the biggest challenge, given that 75% of new emerging diseases affecting humans are zoonotic, but also noted that this is an opportunity to work with the agricultural sector and improve relations between the health and agricultural sectors for the greater health and safety of the region.

Status of VPH in the Americas

Dr. Albino J. Belotto, Chief of the Veterinary Public Health Unit, PAHO

In his presentation, Dr. Belotto characterized the VPH unit as a space for dialogue between the health and agricultural sectors. He highlighted the unique nature of the focus on VPH within PAHO, noting that the World Health Organization (WHO) does not have this kind of initiative in any other region. He also mentioned the network of associated agencies and partnerships that enable the VPH unit to function and that reduce duplication of effort and competition. He emphasized the desire for more opportunities for collaboration with Canada, noting that there are currently two PAHO/WHO Collaborating Centres that work on VPH issues in Canada, both in the Ottawa area.³

As part of his presentation, Dr. Belotto noted the experience that exists in the Americas in epidemiological surveillance systems, including a rabies surveillance system that has collected human and animal data for more than 30 years.

He also outlined the Unit's expected results in three key areas of VPH work:

- **Food safety:** improved safety of food destined for human consumption;
- **Animal health:** improved animal health and increased production in order to provide safe food and contribute to socioeconomic development; and
- **Zoonoses:** Surveillance, prevention and control of zoonoses important to public health.

3- These two centres are:

- the PAHO/WHO Collaborating Centre for Control, Pathogenesis and Epidemiology of Rabies and Carnivores, Canadian Food Inspection Agency, 3851 Fallowfield Road, P.O. Box 11300, Station H, Ottawa, Ontario K2H 8P9.
- the PAHO/WHO Collaborating Centre for Food Contamination Monitoring, Health Products and Food Branch (HPFB), Health Canada, 2203G2 Sir Frederick Banting Building, Tunney's Pasture, Ottawa, Ontario K1A 0L2.

Dr. Belotto identified the key issues for the VPH Unit to focus on as:

- Strengthening the infrastructure of services for animal disease control in the region's countries;
- Local development projects; and
- Studies on the use of veterinary drugs in food destined for human consumption.

In the coming years, the VPH Unit will make progress on these issues by:

- Continuing to promote coordination between health and agriculture;
- Focusing on regional reference services, quality control, biosecurity, training and capacity building in member states;
- Stimulating applied research and the development and transfer of technology for the production of strategic reagents for diagnosis and vaccine control;
- Promoting harmonization with international procedures and norms;
- Enhancing strategic alliances with the private sector and other organizations;
- Optimizing human and technological resources available in the region through the promotion of networks; and
- Focusing on the entire food production chain, from farm to table.

Discussion

Discussion focused on the opportunities for Canada to collaborate in what is an already-well-established network, as well as on some of the constraints of collaboration, including the sharing of diagnostic specimens, isolates and reagents and problems with their transportation. Dr. Belotto noted that the issue of exchanging specimens, isolates and reagents is under discussion among PAHO countries. Dr. Barbosa also noted the need to develop national capacities, rather than sending these materials to another country.

PAHO Overview of Food Safety

Dr. Genaro Garcia, Regional Food Safety Advisor, PAHO

Dr. Garcia delivered the first talk of this two-part presentation on food safety. He outlined some of the challenges and opportunities around food safety, noting the huge toll that malnutrition and food-borne disease (FBD) exact on human life. He noted recent disruptions in agricultural trade due to FBD, such as pesticide residue in vegetables and pathogens in seafood, and to zoonotic diseases, such as avian influenza, SARS and Bovine Spongiform Encephalopathy (BSE).

Dr. Garcia identified key drivers of the food safety agenda, ranging from international organizations such as the World Trade Organization to food retailers and consumers.

While food safety is a global concern, it is dealt with through national programs, comprising both regulatory (legislation, enforcement) and educational (training of food handlers, consumer education) approaches. These programs generally include an integrated approach (farm-to-fork), based on multi-disciplinarity and team work, partnerships and coordination.

Dr. Garcia also outlined the PAHO/WHO strategy for strengthening FBD surveillance, which focuses on promoting quality assurance in diagnosis; active surveillance of selected pathogens; and studies on social and economic impacts of FBD. He noted the importance of networks and collaboration, citing the Inter American Network of Food Analysis Laboratories (INFAL) and PulseNet as examples of this collaboration.

Another area of focus is health education, training and risk communication for food handlers, consumers and schoolchildren.

Finally, Dr. Garcia noted current collaborations between PAHO and Canada on food safety.

PAHO Overview of Food Safety

Dr. Lisa Indar, Program Manager, CAREC

Dr. Indar then spoke about the CAREC/PAHO/WHO Foodborne Diseases Surveillance Program. She noted that three things are required to ensure food safety:

1. Effective food safety systems (including laws and regulations; food control management; inspection services; epidemiological surveillance and laboratory services; and education, communication and training);
2. Effective integrated surveillance of FBD; and
3. Proper food preparation and handling.

She noted that such a system requires a holistic, coordinated and integrated team approach along the “farm-to-table” continuum that underscores the link between food safety, agricultural health, international trade and tourism.

Data on the Caribbean indicate that FBD is a major cause of economic burden, illness and death and that the number of outbreaks is increasing. Dr. Indar outlined CAREC’s FBD surveillance program, which was established in February 2003, as a PAHO initiative. She noted the importance of integrating people, structures, data, surveillance and response. She then highlighted some of CAREC’s achievements in several key areas, including integrated national and regional surveillance systems; strengthened laboratory infrastructure and technical

capacity; human resource training and development; applied research; and upgraded food safety at the public health and tourism levels.

Dr. Indar concluded by outlining the major challenges for effective food safety systems:

- Getting people to work together—across sectors, countries and regions;
- Recognizing food safety as a priority health determinant;
- Absorptive capacity in countries;
- Varying capacity in countries;
- Tourism dependency; and
- Limited resources and competition for resources.

Discussion

Discussion centred on integrated FBD surveillance and its impacts and related challenges, as well as on programs to address the area of fruit and vegetable safety and scaling up the policy response to lower the number of FBD outbreaks. The latter was identified as a key challenge: bringing surveillance and outbreak response teams together is relatively easy, as they belong to the same groups; however, working at the policy and legislative level is more difficult.

Also discussed were the recent Cricket World Cup and its successful mass gathering surveillance plan, as were the strong working relations between PHAC and CAREC regarding FBD surveillance activities.

PAHO Overview of Zoonosis

Dr. Christina Schneider, Regional Advisor on Zoonoses, PAHO

Dr. Schneider positioned zoonoses at the intersection of human and animal health. It is a critical issue in Latin America because of widespread poverty, income disparities between and within countries, close proximity between people and animals and the importance of animal products for the region's economy.

The most relevant zoonoses at the present time are:

- **Human rabies:** after concerted regional efforts, rabies transmitted by dogs has decreased by 90% since 1982 and is close to being eliminated. However, the transmission by vampire bats is an issue in remote areas. PAHO offers support for national programs, lateral technical cooperation, review of the regional plan and educational materials on rabies.
- **Neglected zoonotic diseases,** including plague, bovine tuberculosis and hydatidosis.
- **Emergent zoonotic diseases,** which include avian and pandemic influenza.

Dr. Schneider described a partnership between PAHO and the Inter-American Development Bank (IDB) to address the need for integration between health and agriculture in preparedness plans for avian and pandemic influenza. A joint study concluded that Central America has the lowest levels of integration between the health and agricultural sectors and is most vulnerable to an outbreak given the large rural population, the high levels of poverty, the high percentage of workers in the agricultural sector and the central role of poultry in the population's diet.⁴ The study recommended five areas for continued integration, including policy development; funding strategies; training; access to data and information dissemination; and interdisciplinary research.

PAHO Overview of Foot-and-Mouth Disease

Dr. Victor Saraiva, Advisor in Vesicular Diseases, PANAFTOSA

Dr. Saraiva provided an overview of the foot-and-mouth disease (FMD) situation in South America in 2002-2006. Outbreaks over this period show a constant endemic situation in specific areas of the Andean region and international border zones in the Southern Cone region, particularly in specific areas where livestock is concentrated.

Dr. Saraiva noted the difficulty in finding the origins of some of the outbreaks registered, which supports the need for better surveillance programs. He called for an integrated strategy for the Southern Cone countries particularly, comprising vaccination, transit control, identification of animals and common surveillance of suspected occurrences. An integrated strategy would help to overcome the challenges of working in border areas and would most effectively address animal health in the region.

Areas for cooperation include diagnosis and disease surveillance (including an early warning network and preparedness plans for intervention in case of an outbreak).

4- The study report, entitled "Avian and Human Pandemic Influenza: Addressing the Need for Integration between Health and Agriculture in the Preparedness Plans in Latin America" is available at: <http://www.iadb.org/sds/doc/rur-avianandhumanpandemicinfluenza.pdf>. It can also be obtained from the Rural Development Unit of the Inter-American Development Bank by emailing rural@iadb.org.

PAHO Overview of Avian Influenza, BSE and Laboratory Techniques

Dr. Jorge López, Advisor in Laboratory Diagnosis, PANAFTOSA

Dr. López presented an overview of PAHO's activities related to BSE and avian influenza as well as its technical cooperation in VPH.

BSE:

- PAHO's objective concerning BSE is to give technical cooperation to countries of the Americas for the prevention and surveillance of related risk factors, to ensure that BSE-free status is recognized internationally.
- PAHO's actions in relation to BSE are carried out by PANAFTOSA and include epidemiological surveillance; diagnostics; prevention; and training.
- Challenges include: risk analyses for BSE and Variant Creutzfeldt-Jakob disease (vCJD) are not performed in many countries; gaps in surveillance of neurological diseases; animal feed and rendering that claimed BSE-free status could not be certified; and the need to integrate efforts among VPH and human health services to assess the risk to human health posed by BSE and vCJD.

Avian Influenza:

- No cases of avian influenza in the Americas, but there is a risk because of migratory birds and trade.
- Significant potential economic impact—26% of the world's poultry production is from Latin American countries.
- Introduction of the virus into the region would have disastrous consequences; inadequate preparation constitutes a high risk of exposure for humans.
- Regional plan for surveillance, prevention and control that integrates health and agricultural sectors is urgently needed.

- PAHO is supporting member states in the development of national preparedness plans.
- VPH unit is acting as an interface between animal and human health to increase collaboration in areas including quarantine systems, border control activities, training, vaccination of poultry workers, improved communications and information systems and development of risk communication guidelines and materials.
- Overall goal is to control disease in animals, thus reducing the risk of transmission of the virus to humans by detecting and monitoring such transmissions rapidly if they occur.

Technical cooperation:

- Cooperation aims to promote national plans that integrate animal and human health; the avian influenza laboratory network will be an important complement to surveillance programs.
- Accomplishments: improvements in surveillance and diagnosis; some countries have complete plans for prevention, early detection, surveillance and coordination between health and agriculture; significant improvement in capacity of countries to react to a public health emergency.
- Challenges: detection at small rural holdings more difficult than at commercial farms; need to strengthen integration between the health and agricultural sectors, including surveillance systems for animal and human disease; insufficient training of professionals in prevention and control of zoonotic diseases, especially on avian influenza; inadequate levels of preparation in many countries, particularly in terms of veterinary services and biosafety of the poultry industry; chronic insufficiency of diagnosis reagents; critical deficiency at the regional level in emergency management, particularly in terms of support to countries with structural weaknesses related to timely diagnosis and outbreak interventions.

Discussion

Discussion focused on the opportunities for collaboration through mechanisms such as internships, secondments and joint projects. The need to create linkages was highlighted, such as involving the private sector and political leaders, as well as expanding the role of epidemiologists in existing laboratory networks.

The difficulty in involving epidemiologists in VPH was noted, given their responsibility for a wide range of diseases. Training programs and networks were raised as possible means for increasing their involvement.

Day 1: Overview from Canadian Organizations

The afternoon of Day 1 featured five Canadian speakers from the Canadian Food Inspection Agency (CFIA) and the Public Health Agency of Canada (PHAC) who provided an overview of the Canadian government's technical activity in VPH.

The Canadian Food Inspection Agency and VPH

Dr. Paul Kitching, Director of the National Centre for Foreign Animal Disease (NCFAD), CFIA

Dr. Kitching gave an overview of the CFIA, including its human resources and laboratory services, which are used for both research and diagnostic services. He identified food safety as the CFIA's top priority and listed the four top challenges in food safety as being:

- Pathogens in fruit and vegetables;
- Anti-microbial resistance (AMR);
- Chemicals in food; and
- Need for faster results.

Protecting animal health is seen as central to public health and to national and international confidence in Canada's agricultural products. Animal health activities include:

- Risk assessments and scientific advice to support CFIA science-based decisions;
- Consultations with sector stakeholders;
- Disease control;
- Disease surveillance;
- Verifying that exports of animals/animal products meet foreign requirements;
- Verifying that such imports meet Canadian requirements; and
- Research and development on zoonotic and emerging/foreign animal diseases.

Dr. Kitching then turned to the NCFAD, whose mandate is to provide the CFIA's National Animal Health Program with scientific and laboratory services for the rapid and accurate identification and reporting of foreign animal diseases. Dr. Kitching emphasized the location of the NCFAD, which is in the same facility as the PHAC Microbiology Lab, saying it provided a great opportunity for interaction between human and animal health specialists, as well as being the only large level 4 animal laboratory in North America. As a result, the NCFAD is prepared to handle foreign animal diseases, zoonotic diseases and emerging diseases, with a wide range of diagnostic capabilities. These diagnostic capabilities, along with the NCFAD's vaccine bank provide strong opportunities for collaboration. Dr. Kitching also provided an overview of the NCFAD's scientific programs, with a focus on diagnostics, vaccines and responses to bioterrorism.

Dr. Kitching then turned to the Canadian situation regarding avian influenza. In Canada, avian influenza exists primarily in ducks, with all isolates being of North American lineage and no die-offs. Other areas of activity include arboviral infections, such as Rift Valley fever, rabies and bovine tuberculosis, which has been nearly eradicated.

The Changing Role of Veterinary Services in Public Health

Dr. Brian Evans, Chief Veterinary Officer, CFIA

Dr. Evans' presentation was notable for its broad focus on health and on the interface between animal and human health. He emphasized that health is more than the absence of disease, and while there are public health risks from emerging zoonotic disease or food-borne disease (FBD), there are also health impacts of prolonged exposure to stress, anxiety and fear among individuals and communities who rely on animals for their livelihoods. The related health care costs can be significant and long term. Furthermore, social impacts can include domestic violence, marital/family breakdown or suicide. Dr. Evans noted the impact on those responding to emergencies and those involved in food production and the lack of support programs for these people. These are all issues that the veterinary profession has to consider.

Dr. Evans also outlined the steps required to place VPH firmly within this broader context—calling for a shared commitment to prevention and preparedness in both animal and human health—and stressed the need to prevent disease in animals to prevent it in humans.

The need to focus on this continuum between animal and human health has implications for VPH. Internationally, it is resulting in increased collaboration between the World Health Organization (WHO), the Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE). Cooperation is taking the form of:

- Building common reporting systems based on epidemiological criteria instead of disease name;
- Collaboration among laboratories to facilitate modeling and trend analysis; and
- Working international developments into the domestic experience.

In Canada, this collaboration was manifested in the first-ever meeting of Chief Veterinary Officers and Chief Medical Officers of Health. Other small steps are being taken in veterinary colleges, Masters of Public Health programs and the National Health Services Student Association.

An important point that emerged is that Canada is not a large player in animal health because of its very small animal populations. However, Canadian investments in things like E. coli vaccines are a source of innovation that could benefit other countries.

Discussion

Discussion touched on several topics, including:

- The need to be aware of the impact of companion animal diseases that extends beyond the owner;
- The role of stress in animal as well as human disease;
- The role of veterinarians in dealing with systemic origins of disease;
- The importance of facilities with both animal and human health experts;
- The environmental and public health impact of intensive animal production; and
- The importance of community-based approaches to public health.

Status of VPH in Canada

Dr. Robert C. Clarke, Deputy Chief Public Health Officer, PHAC

Dr. Clarke provided an overview of the past, present and future of VPH in Canada from a public health perspective. In the overview, he made a distinction between VPH and veterinarians working in public health and touched on the need for interoperability between VPH and public health systems, as well as the need for VPH practitioners to be trained in a variety of disciplines.

Past Activities:

- Eradication and control of major public health threats (rabies, tuberculosis);
- Development of a strong national animal health and meat hygiene system;
- Strong support for OIE's international disease control; and
- Some integration into public health system as issues demanded, but then back into silos.

As a result of SARS:

- Creation of the PHAC and the Public Health Network (new group bringing together all public health groups in Canada—but does not have animal health representation);
- First-ever meeting of Chief Veterinary Officers and Chief Medical Officers of Health;
- Joint planning for avian influenza;
- Co-location of PHAC and CFIA laboratories in Winnipeg;
- Creation of new schools of public health; and
- Recognition of the need for increased interoperability.

Future Courses of Action:

- Full integration of veterinarians into public health;
- Interoperability between animal and human disease control programs;
- Joint training programs;
- Increased coordination between the OIE, the WHO and the FAO; and
- Shift from disease control to prevention.

Discussion

Discussion focused on:

- The problems of interoperability/trans-disciplinarity in terms of getting funding and the importance of motivating funders through partnerships; and
- The difficulty in integrating animal health into public health once a specific disease threat has passed and the importance of having people in place who understand the need for integration and push for it.

PHAC–Zoonoses: Strategies and Initiatives

Dr. Peter Buck, Epidemiologist/Section Manager, Foodborne, Waterborne and Zoonotic Infections Division (FWZID), PHAC

Dr. Buck focused on non-enteric zoonoses. He examined national and international trends leading to increased exposure to zoonoses, among them changes in habitat use, movements of people, poverty and lack of access to health care, the introduction of non-native species, as well as demographic changes such as an aging population and urbanization.

Focusing on the West Nile virus, Dr. Buck traced its spread and Canada's decision to be proactive by forming the West Nile Virus National Steering Committee, a group whose activities include surveillance; national coordination, committees and guidelines; education; research; national meetings; and outbreak preparedness and response. He noted the involvement of a wide group of partners, including laboratories, health professional organizations and federal and provincial bodies. He referred to the importance of the Public Health Network, with its National Non-enteric Zoonotic Disease Committee (NN-EZDC), which the Committee already reports to.

The NN-EZDC is working to enhance existing capability and capacity to predict, detect and prevent disease outbreaks; manage and coordinate outbreak response; provide advice for the development of related policies, protocols and guidelines, including risk communications activities; improve information sharing and information flow; improve disease prevention and management through training and education; and develop or update national recommendations identified by independent lessons learned reports subsequent to issues, events, and outbreaks.

Discussion

Discussion brought out more details of the PHAC's risk assessment process, which originated with the UK's Health Protection Agency and features monthly, multi-sectoral, multi-disciplinary meetings.

Overview of Foodborne Disease Programs in Canada

Dr. Andrea Ellis, Section Manager, FWZID, PHAC.

Dr. Andrea Ellis finished the afternoon with a survey of FBD programs. She noted the systemic approach of the programs that integrate animals, humans and the environment.

She noted the existence of different surveillance systems, including those used for early alert, exposure and antimicrobial resistance (AMR). She also highlighted C-Enternet, a farm to fork approach to identifying the sources of different pathogens through questionnaires and active surveillance on farms.

Dr. Ellis also noted increasing trends toward produce-related pathogens and the importance of collaboration in this area, given Canada's vulnerability due to its dependence on imports. As an example of collaboration, she cited Canada's work with PAHO on the Global Salmonella Surveillance Program, through which Canada provided trainers to PAHO countries and worked closely with the CAREC. Dr. Ellis also emphasized the health risk modeling that PHAC uses to provide policy advice.

Dr. Ellis shared her vision of a whole-system approach for upstream control of FBD, along with potential areas for collaboration to achieve this vision, such as integrated AMR surveillance across the food chain, systematic reviews and regional emergency response teams.

Discussion

Discussion focused on the need to look at travel-related diseases more seriously, as well as opportunities arising from advances in genomic sequencing technologies. The importance of relationships at different levels was highlighted, as surveillance, outbreaks, etc. all begin at the local level and move up to the national level.

Reflections from Day 1

Before the second day of the workshop began, participants paused to reflect on some of the themes that had emerged from the first day of presentations, especially the many opportunities for collaboration and involvement. Among the themes that had emerged were:

- The importance of people: learning and working together through sharing of tools, experiences, best practices and through secondments, interchanges, and internships;
- Moving forward: moving beyond the traditional boundaries of VPH to incorporate areas such as depopulation, environment, non-infectious health factors; and interoperability as a major theme. Behavioural change—whose and how to change it—was another theme; and
- Benefits to Canada: important to build the case for hemispheric cooperation. Main benefits are in two areas: managing threats caused by the movement of people, animals and food; and developing Canadian professionals by strengthening their language skills and enhancing their familiarity with other countries, cultures, activities and structures.

Day 2: Academic Innovations

The second day began with three presentations featuring innovative perspectives from the academic sector.

An Ecosystem Approach to VPH

**Dr. David Waltner-Toews, Professor,
University of Guelph and President,
Veterinarians without Borders**

Dr. Waltner-Toews drew from his own experiences in Nepal, Peru, Kenya, Uganda, Canada and Honduras, as well as the experiences of the IDRC's international EcoHealth program, to make the case for taking an ecosystem approach to VPH.

An ecosystem approach brings together various disciplines (including science, anthropology and sociology) and includes stakeholders to develop a more complete understanding of a problem, achieve more comprehensive buy-in to a solution and address many other problems at the same time.

This means taking into account population changes such as urbanization, wealth disparities, globalization, climate change and other major underlying trends. It also means focusing on wildlife and companion pets as well as domesticated animals and on understanding that activities related to animal health can be a road out of poverty for many people and, therefore, an important pathway to health.

An ecosystem response requires changes in:

- How we think—there are no silos, there is no local, there is no status quo;
- How we act—we must adapt to change; and
- Whom we act with—collaborations and networks are critical.

In terms of VPH, this means paying attention to:

- Feedback loops;
- Different perspectives;
- Different scales;
- Power, information and adaptation to change—who defines the problem?; and
- Combining social and scientific processes.

In the long run, health is promoted not only by identifying and controlling risks but also by identifying and promoting the positive impacts of animals.

Discussion

Discussion focused on the importance of understanding that community priorities may not be the same as scientific or political priorities. The complex nature of the vampire bat problem in Latin America was cited as an example of an issue where an ecosystem approach is needed. There was also interest in how stakeholders' views are sought. Dr. Waltner-Toews emphasized that unstable situations are opportunities for change and that the world is particularly destabilized right now. He also took the opportunity to note that Veterinarians without Borders is hoping to establish internships and that this was a potential area for Canada-PAHO collaboration.

Modeling Zoonoses Epidemiology and Public Health

Dr. Michel Bigras-Poulin, Director of the Groupe de recherche en épidémiologie des zoonoses et santé publique (GREZOSP), University of Montreal

Dr. Bigras-Poulin made a case for mathematical modeling in VPH and for not making artificial differentiations between animal health and human health.

He argued that most problems within VPH are related to the complexity of biological systems, characterized by non-linear dynamics and lack of agreement among stakeholders, which leads to complex behaviour. Epidemiology centres on populations, which are in themselves complex biological systems involving many species, a complex structural organization and evolving ecosystems in both time and space.

Good science integrates theory with empirical data gathering—mathematical models are a way of developing and testing these theories. They facilitate both logical and conceptual validation. They can be

used for preparedness and sometimes for predictions. They are useful for targeting observations in time and space. Models allow theoretical studies of what cannot be observed (such as future projections of climate change) and assist in targeting empirical studies.

Dr. Bigras-Poulin provided several examples of applications of mathematical modeling, including a theory of surveillance used to develop and evaluate surveillance programs, a model predicting the effect of climate change on the seasonality of Lyme disease and a multi-criteria decision model used to manage surveillance of the West Nile virus in Quebec.

Discussion

Discussion focused on the degree to which modeling could account for everything going on in the field. Dr. Bigras-Poulin responded by pointing out that modeling is one tool, but not the only tool, and that although modeling can help define problems rather than simply relying on statistics, other tools are important as well. He also pointed out that, on a limited budget, mathematical models provide a lot of value for money—but that they aren't a panacea any more than statistics are.

Applying Veterinary Services for Early Detection, Prevention and Response

Dr. Craig Stephen, Associate Professor, University of Calgary and Director, Centre for Coastal Health

Dr. Stephen began by noting that his veterinary school is new and includes a department of ecosystems and public health.

He then outlined four contributions of VPH to emerging infectious disease programs:

- Detecting changes in animal health that may be public health sentinel events;
- Predicting the future behaviour of these sentinel events;

- Assessing the risk to public health; and
- Implementing a response to prevent/contain the risk to animals and prevent/reduce spillover into public health.

He noted, however, a poor history of public health acting on animal data for a number of reasons.

Dr. Stephen called for a new approach to veterinary services that would:

- Focus on building healthy, resilient populations among farm animals, wildlife and companion animals; and
- Change the focus of veterinary medicine from a private good, which excludes wild and unowned animals, to a public good that focuses on animal population health.

Public health's role encompasses prevention, surveillance, interrupting disease transmission, case management and population-based control. VPH has a role to play in all of these, but mostly for known diseases. The challenge is applying that role to unknown diseases—seeking to prevent them before they become a direct threat. The most successful strategy seeks to create resilient animal populations; the least successful tries to predict disease emergence. Yet, the latter is too often seen as the role of VPH.

Dr. Stephen presented his recommendations for developing an integrated VPH program:

- Facilitate networking, knowledge exchange and experience sharing;
- Strengthen the front line—veterinarians working on farms conducting primary prevention to enable a faster response;

- Put the “public” in VPH—research social determinants of prevention and control success;
- Show that it works—build evaluation into program or research design;
- Work toward a public health approach—focus on the resilient, healthy population, not just zoonoses and drug residues;
- Invest in research and training of VPH specialists to identify strategies to prevent emergence, detect index cases and rapidly achieve containment and elimination of emerging infectious diseases in animal populations; and
- Develop an explicit and innovative national VPH policy that focuses on risks rather than pathogens and that cuts across agencies and jurisdictions.

In conclusion, Dr. Stephen noted that most funding support has been to models, microbes and medicines, with insufficient attention to populations, partners and planning. He called for citizens, professionals and programs that encourage collaboration and work toward prevention.

Discussion

Discussion centered on the difficulty of proving prevention—who will pay for a problem we don't have and how do you measure what does not happen? Dr. Stephen responded that a different approach is needed—one that focuses on the economic benefits of a healthy herd. Avoiding infectious diseases, in this case, is a secondary benefit.

Day 2: Break-out Groups

At this point, participants were divided into two groups and asked to respond to the three key questions identified:

1. What are the current high-risk/priority VPH issues in the Americas?
2. What are the potential areas for collaboration (e.g. filling knowledge gaps, surveillance, public education)?
3. How can we work together more effectively (e.g. collaborating networks, teams)?

What are the current high-risk/priority VPH issues in the Americas?

Members of both groups started off talking about specific diseases, such as avian influenza, but quickly moved away to focus on issues that would enhance capabilities to deal with multiple diseases.

Many issues arose with both groups, but under different categories. For instance, Group 1 mentioned avian influenza as a priority issue, while Group 2 placed it under areas for collaboration. Similarly, diagnostic capabilities were a priority issue for Group 1 and an area of potential collaboration for Group 2.

Group 1

- **Avian influenza**
 - Need to coordinate responses; funding available.
- **Understanding FBD/zoonoses**
 - Need baseline information before success can be measured.
 - Coordinated interventions among countries to ensure consistency.

- **Diagnostic capabilities**
 - Different levels and abilities—smaller countries (i.e. Caribbean) can't afford their own laboratories.
 - Collecting and shipping samples.
 - Sustainability, particularly in terms of human resources.
 - Need for more specialists, such as microbiologists and entomologists, and for state-of-the-art infrastructures to retain them.
 - Tests and human resources available.
- **Need to be more strategic, proactive and theoretical, rather than simply reacting to crises; need system to provide strategic oversight**
- **Focus on improving animal health, with foot-and-mouth disease as a model**
- **Information sharing—national and regional systems**
- **Need for expert body to evaluate priority areas for research**

Group 2

- **Building local capacity (municipal, provincial/state)**
- **Improving surveillance (and early detection)**
- **Education (training in public health and veterinary services)**
- **Addressing global changes (climate change, urbanization, etc.)**
- **Antimicrobial resistance**
- **Strengthening networks (sharing and updating information)**

What are the potential areas for collaboration?

Again, areas for collaboration had more to do with process—surveillance, laboratory work and approaches to VPH—than with specific diseases.

Group 1

- **Interlink human and animal health systems**
 - Linked disease reporting system.
- **Meet the requirements of the International Health Regulations**
 - Canada has a system it can share, and other countries can adapt it to their needs.
 - Need political buy-in to make it a priority.
- **Adopt “one medicine” ecosystem approach**
- **Implement burden-of-illness studies at the national and regional level**
 - Meet to review data regularly.
- **NCFD/PANAFTOSA**
 - Maintain relationships already developed and extend them to other countries.
 - Leverage international investment by linking initiatives.
- **Develop tools for surveillance and intervention**
 - Build on Canadian expertise, e.g. validation of diagnostic tests.
 - Share best practices.
- **Increase health awareness**
 - Increase public awareness.
 - Increase political awareness.

- **Examine potential for adding to the two PAHO/WHO Collaborating Centres already in Canada**

Group 2

- **Avian influenza**
 - Funds are available.
 - Use surveillance as a model for future collaborations.
- **Diagnostics**
 - Harmonization.
 - Training.
- **Implementing the International Health Regulations**
- **Food security/food safety strategies**
- **Modeling of system dynamics (integrating an ecosystem approach)**

How can we work together more effectively?

This part of the break-out discussions was less detailed, in part because of a lack of time—coming at the end of the hour—and, in part, because participants recognized the difficulty in developing concrete actions in such a short time. Where there were specific recommendations, they often focused on people—bringing people together to learn from each other and share their expertise. Group 2’s recommendation that a small working group develop a concrete plan for collaboration between Canada and PAHO was met with general approval.

Group 1

- **Different modalities**
 - Internships.
 - Secondments.
 - Veterinary/medical practitioner exchanges.
- **Technology transfer**
 - Human and veterinarian medical practitioners need more interaction within and between countries.
 - Curriculum changes?
- **Developing joint research protocols and projects designed to mobilize resources**
- **Raising the profile of VPH, make it an attractive career path**

Group 2

- **Need for a plan and for someone to develop it—tasks, timelines, funding sources**
 - Requires small working group.
- **Possible elements of such a plan**
 - PAHO-wide VPH training program.
 - Specific projects—one possibly in Haiti (funds from CIDA may be available for this).
 - Notion of reciprocity—must be apparent benefits to Canada and PAHO countries.

Plenary Discussion

Participants generally agreed on the need for a small working group to develop a more concrete plan for Canada-PAHO collaboration. Participants were excited about the possibilities for collaboration in training, noting that some form of “virtual” PAHO University could allow students in different parts of the world to receive training and collaborate across national boundaries.

It was noted that platforms already exist to enable this kind of online training. One particular platform was the Institute for Connectivity of the Americas, which is building virtual linkages and has funding available. A consortium to run a masters degree in food safety in several different Latin American countries also exists.

Other opportunities noted included the annual meeting of the Canadian Association of Veterinary Epidemiologists, which also incorporates courses for students. CFIA will be hosting one on the topic of VPH and will look to PAHO to play a role in setting directions for the meeting.

Dr. David Waltner-Toews took the opportunity here to discuss some of Veterinarians without Borders’ plans. VWB wants to place veterinarians overseas at the farm level and plan to develop educational materials that can be distributed at cost to other countries.

Participants were also excited about the possibility of Canada and PAHO beginning their formal collaboration in Haiti, the poorest country in the region, particularly given Canada’s special relationship with Haiti. In this context, there may also be an opportunity for PAHO and IICA to deepen their collaboration in the field of VPH as two OAS agencies with mandates for reconstruction initiatives in that country.

Next Steps

Following this animated discussion, the workshop was brought to a close with the remark that getting this many people together in one room for two days is a tremendous accomplishment that gives credence to what the group is trying to do.

Next steps are:

- The meeting report will be distributed to all participants;
- Health Canada will continue working closely with PAHO to form a joint steering group to develop a plan according to PAHO's rules and regulations and PAHO Governing Bodies' mandates; and
- Health Canada will follow up with PHAC, CFIA and other participants as appropriate about forming a steering group to develop the plan to move forward.

APPENDIX A:

Canada-PAHO Veterinary Public Health Workshop

Date: May 31 and June 1, 2007
Ottawa, Canada

Purpose: To bring together Canadian and PAHO experts in veterinary public health (VPH) to exchange information on current and future activities and to develop strategies to work together more effectively to reduce risks to public health from animals.

The workshop will allow the Pan American Health Organization as well as key Canadian government departments and agencies an opportunity to describe their activities. It will also provide opportunities to hear about innovations from academic centres of excellence related to VPH.

The Workshop will focus on three or four key questions designed to elicit discussions on risk levels, knowledge gaps, organizational challenges and recommendations for strengthened collaboration.

Key Questions:

1. What are the current high risk/priority VPH issues in the Americas?
2. What are the potential areas for collaboration (e.g. filling knowledge gaps, surveillance, public education)?
3. How can we work together more effectively (e.g. collaborating networks, teams)?

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May 31, 2007:		
8:30 – 9:00	Registration (coffee and muffins available)	
9:00 – 9:10	Opening Remarks – Bersabel Ephrem, Director General, IAD, Health Canada	
9:10 – 9:15	Remarks from Facilitator – Dr. Barry Stemshorn, IICA	
Overview from PAHO:		
9:15 – 9:25 (10 min)	Overview of the Health Surveillance and Disease Management Area (HDM)	Dr. Jarbas Barbosa, Area Manager, HDM, PAHO
9:30 – 10:00 (30 min)	Status of VPH in the Americas	Dr. Albino J. Belotto, Chief, Veterinary Public Health Unit, PAHO
10:00 – 10:15	Q&A/Coffee Available	
10:15 – 11:00 (45 min)	PAHO Overview of Food Safety	Dr. Genaro Garcia, Regional Food Safety Advisor, PAHO, and Dr. Lisa Indar, Program Manager, CAREC
11:00 – 11:15	Q&A on Food Safety	
11:15 – 11:35 (20 min)	PAHO Overview of Zoonosis	Dr. Cristina Schneider, Regional Advisor on Zoonoses, PAHO
11:35 – 11:55 (20 min)	PAHO Overview of Foot-and-Mouth Disease	Dr. Victor Saraiva, Advisor in Vesicular Diseases, PANAFTOSA
11:55 – 12:15 (20 min)	PAHO Overview of Avian Influenza, BSE and Laboratory Techniques	Dr. Jorge López, Advisor in Laboratory Diagnosis, PANAFTOSA
12:15 – 12:30	Q&A on Zoonoses	
12:30 – 13:30	Lunch	
Overview from Canadian Organizations:		
13:30 – 14:00 (30 min)	The Canadian Food Inspection Agency and VPH	Dr. Paul Kitching, Director, NCFAD, CFIA
14:00 – 14:15	Q&A	
14:15 – 14:45 (30 min)	The Changing Role of Veterinary Services in Public Health	Dr. Brian Evans, Chief Veterinary Officer, CFIA
14:45 – 15:00	Q&A	
15:00 – 15:30 (30 min)	Status of VPH in Canada	Dr. Robert C. Clarke, Deputy Chief Public Health Officer, PHAC
15:30 – 15:45	Q&A	
15:45 – 16:00	Coffee Break	
16:00 – 16:20	PHAC - Zoonoses: Strategies and Initiatives	Dr. Peter Buck, Epidemiologist/Section Manager, FWZID, PHAC
16:20 – 16:30	Q&A	
16:30 – 16:50	Overview of Foodborne Disease Programs in Canada	Dr. Andrea Ellis, Section Manager, FWZID, PHAC
16:50 – 17:00	Q&A	

June 1 st 2007: Morning: Innovations from the Academic Sector		
8:30 – 9:00	Coffee and muffins available	
9:00 – 9:15 (15 min)	Introduction/Recap/Goals for the Day	Dr. Barry Stemshorn, Senior Advisor, IICA
9:15 – 9:45 (30 min)	An Ecosystem Approach to VPH	Dr. David Waltner-Toews, Professor, University of Guelph and President, Veterinarians without Borders
9:45 – 10:00 (15 min)	Discussion	
10:00 – 10:30 (30 min)	Modeling Zoonoses Epidemiology and Public Health	Dr. Michel Bigras-Poulin, Director, Groupe de recherche en épidémiologie des zoonoses et santé publique (GREZOSP)
10:30 – 10:45 (15 min)	Discussion	
10:45 – 11:00	Coffee Break	
11:00 – 11:30 (30 min)	Applying Veterinary Services for Early Detection, Prevention and Response	Dr. Craig Stephen, Associate Professor, University of Calgary and Director of the Centre for Coastal Health
11:30 – 11:45 (15 min)	Discussion	
12:00 – 13:00	Lunch	
Afternoon: Break-out Groups and Discussion of Key Questions		
13:00 – 13:10	Introduction to Working Group Discussions – Key Questions	Dr. Barry Stemshorn, Senior Advisor, IICA
13:10 – 14:10 (60 min)	Break out sessions to discuss key questions	
	Coffee Available	
14:10 – 15:30 (80 min)	Discussion on key questions and next steps	Recommendations for Action
15:30 – 15:40	Closing Remarks: Nick Previsich (Health Canada) & Dr. Albino Belotto (PAHO)	
15:40 – 16:30 (optional)	For those interested, Health Canada will be leading a brainstorming session to identify VPH projects for a potential funding submission to the Counter-Terrorism Capacity Building Program sponsored by DFAIT.	

APPENDIX B: Participant List

Canada-PAHO Veterinary Public Health Workshop

May 31 and June 1, 2007
Ottawa, Canada

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