



Report

One Health Workshop

Saskatoon, December 13-14, 2011

Background and Context

One Health has been defined as *“the collaborative efforts of multiple disciplines working together locally, nationally and globally to attain optimal health for people, animals and the environment. (American Veterinary Medical Association 2008)* In 2010, One Health was identified as one of six Signature Research Areas for the University of Saskatchewan by the Office of the Vice-President Research, and as a priority for interdisciplinary education by the Council of Health Science Deans. It was agreed in the fall of 2011 that in order to move the One Health initiative forward, specific research foci and teaching initiatives needed to be identified. A two day workshop was planned to bring together both faculty and partners to identify these specific directions. Patricia Farnese, Cheryl Waldner, Douglas Clark, Volker Gerdts and Bruce Reeder served as a planning group for this workshop.

Workshop Objectives were to:

1. Identify selected areas of research focus
2. Identify key teaching initiatives
3. Identify steps to achieve a vibrant One Health community at the U of S.
4. Promote networking and information sharing

Workshop attendees included representatives from the Colleges of Veterinary Medicine, Medicine, Nursing, Pharmacy and Nutrition, Law, Agriculture and Bioresources, Education, School of Public Health, School of the Environment and Sustainability, Gwenna Moss Centre for Teaching Effectiveness, Vaccine and Infectious Disease Organization, Office of the Vice-President Research, Saskatchewan Ministry of Health, Saskatchewan Ministry of Agriculture, Public Health Agency of Canada and the Canadian Food Inspection Agency (Appendix A).

Workshop Summary

Introductory Remarks:

Dr. D. Hill, Chair, Council of Health Science Deans, and **Dr. B. Horsburgh**, Associate Vice-President Research – Health and Vice-President Research and Innovation, Saskatoon Health Region.

On behalf of the Council of Health Science Deans, Dr. Hill welcomed participants to the workshop. He emphasized the importance that the Council attributes to collaborative, interdisciplinary education and research, and urged participants to advance the One Health agenda at the University of Saskatchewan with this in mind. Dr. Horsburgh outlined the rationale for the identification of One Health as one of the six Signature Areas of research excellence at the University and the strong support of the Office of the Vice-President Research for advancing this area.

Keynote Address: Dr. Marguerite Pappaioanou

One Health – An International Perspective

Dr. Pappaioanou reviewed the origins and key features of the One Health approach to human-animal-environmental health. She noted that this approach implies an interdisciplinary, multi-sectoral development of policies, delivery of services, education and research by multiple partners in government, industry, academia and NGOs. In recent years it has included such initiatives as the Global Early Warning and Response System (WHO/OIE/FAO), the Emerging Pandemic Threats Program (USAID), international conferences held in Winnipeg (2009) and Stone Mountain, Georgia (2010), and the development of international collaborations (One Health Initiative). Current challenges to the advancement of the One Health approach to health issues include: confusion over the scope of One Health, in particular its environmental dimensions; lack of meaningful engagement by medicine, public health, WHO; lack of political will to adopt this approach; modest funding opportunities and fear for the loss of resources by existing sectors. Gaps in the field include: evidence for the cost-effectiveness of this approach; identification of 'best practices' and indicators of success for One Health approaches; exploration of the application of the approach to non-communicable diseases; and mechanisms to create and administer a 'multi-sectoral' funding pot that is optimal for the required joint activities. Dr. Pappaioanou noted that only five other universities in North America have the constellation of health science colleges present at the U of S and identified a number of academic strengths at this institution. She encouraged faculty to capitalize on these strengths, identify priority areas for research and training and take advantage of the developing funding opportunities in the field.

Research –Areas of Focus

The first day of the One Health Workshop was dedicated to the selection of research foci that met the Selection Criteria jointly developed by participants prior to the workshop. (Appendix B)

The large group of participants was divided into five multidisciplinary small groups each with a member of the One Health planning committee present to facilitate discussion. The discussion was based upon:

- Dr. Pappaioanou's keynote address
- The Inventory of U of S and partner agency research activities and strengths (Appendix C)
- The Environmental Scan of North American One Health research and training programs
- The Selection Criteria for areas of research focus (Appendix B)

All three of the latter documents had been developed and provided to participants in advance of the workshop.

The goal of the exercise was for each group to recommend four research initiatives. Following the small group discussion, the One Health planning committee reviewed and merged ideas of similar themes. The outcome of this initial exercise was the identification of a total of nine different potential areas of research focus. The nine research foci were:

1. Antimicrobial Resistance (AMR)
2. Food Safety and Security
3. Global Environmental Change
4. Nutrition
5. One Health Services for Communities in Transition
6. Policy and Science
7. Tuberculosis
8. Water Quality and Availability
9. Zoonotic Diseases: risk perception, assessment, and communication of zoonoses in high risk groups

Spokespeople for each of the nine areas of research were asked to present a summary of the area to the large group, describing the goals, objectives, rationale, participants, and potential funding sources. Participants then returned to their small groups to discuss the themes presented, and to choose their top four choices. As a result of this exercise, the groups identified **five research foci** as potential initiatives to pursue. These were:

1. Antimicrobial Resistance (AMR)
2. Food Safety and Security
3. One Health Services for Communities in Transition
4. Water Quality and Availability
5. Zoonotic Diseases.

During the exercise, participants agreed that regardless of which areas of focus were selected, they would all have the following elements:

1. basic sciences
2. clinical/observational research
3. policy development and implementation
4. social, economic, cultural dimensions
5. education and knowledge translation
6. health services research.

The participants were asked to come prepared to select their top four choices at the beginning of the second day of the workshop. At that time, each participant was given four stickers to select their top choices from the list of five options. The vote resulted in the following **top four initiatives** which are described in further detail in Appendix D:

1. Food Safety and Security merged with Antimicrobial Resistance (26 + 16 votes)
2. Water Quality and Availability (24 votes)
3. One Health Services for Communities and Transition (22 votes)
4. Zoonotic Diseases: risk perception, assessment, and communication of zoonoses in high risk groups (20 votes).

Participants of the workshop were also asked to indicate their willingness to participate in, or be a champion for, any of the top four initiatives that were identified. Volunteers for these working groups are identified in Appendix E.

Teaching

Keynote Address: Dr. Baljit Singh

One Health: An Ideal Platform for Integrated Experiential Learning

Dr. Singh described the key features of experiential learning as a cycle: from abstract conceptualization to active experimentation to reflective observation to concrete experience and back to abstract conceptualization. He noted that the U of S is committed to this approach as seen in its Foundational document on Teaching and Learning, its commitment to aboriginal engagement, the leadership of the Council of Health Science Deans, and the recent \$2.5 million investment in the Academic Innovation Initiative. The university provides a growing number of opportunities for experiential learning: SWITCH, CLASSIC, the Service and Justice Project of St. Thomas More College, field courses in biology, geology, engineering, and interdisciplinary sessions in the health sciences. One Health is an ideal platform to expand integrated experiential learning. A proposed Integrated Training Program in Infectious Disease, Food Safety and Public Policy was recently submitted to the NSERC CREATE competition. Dr. Singh, the Principal Investigator in this proposal, outlined the features of this interdisciplinary, international One Health graduate training program. He closed by identifying some of the challenges involved in delivering such a training program: novel curricular structure, the allocation of additional time and resources, the challenge of outcome assessment, professional support for integrative modules, and departmental boundaries which govern the assignment of academic duties and recognition of academic work.

Guest Speaker: Dr. Trevor Crowe

Graduate Course and Program Approvals

Dr. Crowe outlined the process of new graduate course and program approval at the U of S. He described a continuum of alternatives that provide progressively increasing visibility and recognition while at the same time requiring increasing cost and effort: do nothing, market current offerings, revise current offerings, create new courses, create a One Health concentration in the current Interdisciplinary Graduate Program of CGSR, create a new graduate certificate, create a new joint/combined graduate degree, create a new stand-alone graduate program. CGSR requires that a designated body administer a

graduate certificate or program; this may be a College or School, but could also be a Centre or collaborative Management Committee.

Identification of Key Teaching Initiatives

Graduate and Undergraduate Teaching Initiatives

To achieve the second objective of the workshop – to identify key teaching initiatives – the workshop participants were asked to split into two groups; one assigned to graduate teaching and the other to undergraduate teaching. Each group was led by a member of the One Health planning committee who asked the following questions to trigger reflection and discussion:

- What structure should the One Health graduate/undergraduate program take? (*its formal design*)
- What supplementary activities should be considered? (*its informal design*)

The desired outcome for each group was to identify one formal and one informal initiative for their respective area of teaching (graduate or undergraduate).

1. Graduate Teaching Initiatives

The group began by considering the structure of a future One Health graduate program. They used the NSERC CREATE proposal described by Dr. Singh as a basis for the discussion. The key elements of the One Health graduate program are:

- A thesis-based graduate program with a MSc and PhD degree;
- Multi-disciplinary student enrolment and course offerings;
- A combination of core courses and electives, some offered through summer schools;
- National/International exchanges between partnering institutions to expose students to different environments;
- Industry and government placements to prepare students for future careers in academia, industry or government.

The group proposed two-stages of program development: Stage One would see the University initially offer a Certificate in One Health to students enrolled in current graduate degree programs across campus; Stage Two would subsequently see the development and delivery of a One Health graduate degree program, offering M.Sc. and Ph.D. degrees in One Health under the aegis of an existing academic unit.

The group identified key attributes of the proposed program:

- An opportunity to learn in all core areas of One Health
- The promotion of integrated, systems thinking and critical analysis
- Recruitment of students from diverse academic disciplines
- Training of Highly Qualified Personnel
- The promotion of scientific publications and presentations
- Preparation of students for the real world of government and industry
- Enhancement of linkages across campus and with partner agencies

2. Undergraduate Teaching Initiatives

Objective: to provide students from a variety of disciplines with an opportunity to develop core capacities in systems thinking through One Health-focused, problem-based learning.

Challenges:

- Collaboration competes with other priorities for our limited time.
 - To facilitate more collaboration, an accurate and regularly updated inventory of researchers, their course offerings, and subject matter expertise needs to be created. Moreover, that inventory must be made readily searchable.
 - From this inventory, a 'Speakers' Bureau' could be created where researchers list One Health topics in which they would be willing to provide a guest lecture.
 - In addition, the opportunity to network and build trust among potential co-teachers is needed.
- Physical space for collaborative teaching is a problem in some colleges.
- Administrative support to find and coordinate meetings with colleagues would assist in facilitating more collaborative teaching.
- Likewise, support to build course materials that are appropriate across disciplines in the area of One Health is needed.
- Participants also felt it was important to ensure that non-university partners, such as industry, non-profit sector, community groups, and government be engaged in developing One Health offerings to ensure content is relevant and attractive to potential employers. Students may be open to One Health learning if they see it is viewed as important to future employers.
- In order to ensure that students get the most out of collaborative teaching, participants feel that there must be more opportunities for faculty to learn about collaborative teaching pedagogy particularly as it relates to problem-based learning and interdisciplinary course design.

Opportunities:

- Many student interest groups exist that might be approached to pilot One Health course offerings.
- The new health sciences complex has the potential to offer more space and opportunity for collaboration. For example, the health science deans are moving towards standardizing timetables across departments and colleges to make room in student schedules for interdisciplinary experiences. To this end, the Council of Health Sciences Deans and the committee of Associate Deans are potential sources of financial and administrative support.
- New technology such as Skype provides the opportunity to connect students with people the students otherwise would not have contact with. To this end, the University of Saskatchewan must cultivate relationships outside the University that can support One Health teaching.

Plan:

A working group will be created to develop a number of problem-based case studies to pilot with student groups in the fall 2012. Patricia Farnese offered to convene the first meeting of the working group. The initial goals of the working group are to identify the target audience for One Health course offerings, to establish learning objectives, and to create problem-based case studies. This working group may also facilitate other training opportunities.

Building a U of S One Health Community

As a means of gathering collective input into building a vibrant U of S One Health community, three different 'stations' were set up, each led by one of the planning committee members. The participants moved through each of the stations to review and add input to the recommendations of the previous group. The stations addressed the following three topics:

1. **Building Collaboration**--to identify early wins for One Health and consider who would be involved in collaboration.
2. **Communication**—to identify methods to enhance communication.
3. **Administrative Support**—to identify the administrative support and structures needed to move the initiative forward.

Building Collaboration

Making time and space in busy schedules will always be a challenge for faculty, so it will be important that their investment of time and effort is worth it in tangible terms (i.e. publications or resources). One specific tactic would be to produce short, multi-authored synthesis papers for high impact journals (this idea refers to a specific genre of (usually) synthesis papers in *Nature* or *Science* that have a large number of authors and appear to have been largely prepared at a single workshop).

We need to know who we are, and who's interested in what we're doing on One Health. One specific suggestion is to establish a directory of interested parties that is:

1. Up-to-date, maintained and accessible
2. Searchable for participants' activities
3. Describes the methodologies participants are using
4. Includes participants' courses and teaching activities

For a broader audience, a website announcing ongoing activities would be useful. Regular networking events were seen by participants as useful and specific suggestions included:

- workshops to bring people together to learn and work together
- seminars series
- guest researchers
- presentations on research
- conferences

We need to identify project ideas and needs, and find external collaborators (e.g. industry, governments, and community members). Early and continuous communication with those collaborators will be necessary.

A collaboration friendly environment will be crucial to the success of any One Health initiative. From potential collaborators, this will require deeper learning about each other's skills and discipline. Collaborators will need to build trust and take leaps of faith in order to build a community of practice. A widely-acknowledged point is that collaborative teaching is a "way in" to broader research collaboration. There are steps that the University should take as well to ensure sufficient recognition and tangible support for building a collaboration-friendly environment within which a One Health initiative could flourish. Tenure and promotion processes were noted as a particular barrier. Most existing tenure and promotion standards contain disincentives for interdisciplinary research and teaching. As a new School, SENS (School of Environment & Sustainability) has developed standards that explicitly recognize the challenges of interdisciplinary scholarship, and have been approved. These standards may be helpful in

other Colleges/ departments since One Health is by definition an interdisciplinary concept. The pending Transparent Activity-Based Budget System (TABBS) implementation should support One Health collaboration. There is widespread concern among faculty across campus that this new budgeting system will penalize collaborative efforts. Implementation of the system must ensure that doesn't happen, and faculty and staff need to be trained and specifically prepared to use the budgeting system to support collaboration among multiple academic units.

Communication

The communications plan has 2 components:

1. an internal component to enhance the One Health research communication on the U of S campus
2. an external component to help raise the profile of the program and to attract funding and potential graduate students.

The first piece of *the internal communications* plan would be a restricted web site where access was limited to those with a U of S ID. This website could also be further divided into specific areas for faculty. One such area could include a repository for teaching tools, a searchable database for funding opportunities and current One Health research on campus, and finally a message board where faculty could request input or case material for lectures or specific expertise for research applications and project work. This site would also highlight current graduate students, recent achievements, conference presentations, and publications by group members. It would list group interests and contain the rationale for the One Health initiative on campus.

Internal communication to share on-campus resources and expertise would be enhanced by a regular series of informal meetings and presentations (pizza and beer format) and/ or a series of short retreats focused on specific research themes.

The *external communication strategy* would allow targeted off-campus website to highlight group membership, publications, conference presentations, and other achievements. This would serve as a contact portal for interested collaborators, partners, and graduate students. The site could contain a frequently updated activities blog. The web page would be supplemented by Facebook pages and Twitter accounts specifically targeting potential students.

The group supported the idea of a *formal hard copy newsletter* similar to "Horse Health Lines" to highlight specific research projects and help attract funding while raising the profile of the program. To be successful these initiatives would require the input of a dedicated marketing/ communications person, possible as an in-kind contribution of one of the participating units.

Participants also suggested forming a *scientific advisory board* to actively engage influential policy makers and industry persons as advocates of this program. The need to have strong connections with Saskatchewan residents was also emphasized. Contact groups would include Saskatchewan Rural Municipalities Association (SRMA), Saskatchewan Urban Municipalities Association (SUMA), Federation of Saskatchewan Indian Nations (FSIN), the local health regions and the First Nations and Inuit Health Branch (FNIB) of Health Canada.

Finally, participants recommended the U of S obtain funding for a *conference* to publicize One Health research on campus and increase our visibility on the national and international stage. Possible funding sources include: SHRF, MITACS, CIHR, and SSHRC.

Administrative Support

It is proposed that a *One Health Management Committee* be established as a standing subcommittee of, and reporting to, the Council of Health Science Deans (CHSD). This multidisciplinary committee would be appointed by the CHSD with representation from various colleges and schools on campus. The One Health Management Committee would:

1. promote and oversee research initiatives
2. promote and manage graduate and undergraduate training
3. interact with governmental, industry and international partners
4. receive advice from a Scientific Advisory Board
5. oversee an administrative office.

The *One Health Management Committee* would have dedicated office space and part-time administrative support: 0.5 FTE Administrator, 0.5 FTE Research Facilitator, 0.5 FTE Graduate student secretary, 0.2 FTE technical support (IT, website). A pool of start-up funds would be available on a competitive basis to research groups developing full research proposals for national competitions in one of the four research priority areas. It is proposed that up to two one-year grants of \$20,000 be available annually in each of the four areas.

Next Steps

Champions and participants in each of the One Health research and teaching initiatives were identified during the workshop. Early in 2012 each group will meet to further develop that initiative's goals, objectives, rationale, strategic plan, and resource requirements. This work will be coordinated by a working group with the aim of preparing a full One Health proposal by the spring, 2012. This proposal will be presented to the Council of Health Science Deans, the Office of the Vice-President Research, the Planning Committee of University Council, and the Provost's Committee on Integrated Planning for consideration and support.

Appendix A

List of Workshop Participants

<p>WCVM</p> <p>Dr. Wolfgang Koester, VIDO/WCVM Dr. Ted Leighton, WCVM Dr. Hugh Townsend, VIDO/WCVM Dr. Baljit Singh, WCVM Dr. Cheryl Waldner, WCVM Dr. Tasha Epp, WCVM/SPH Dr. Emily Jenkins, WCVM/SPH Dr. John Campbell, WCVM Dr. Volker Gerdts, VIDO/WCVM Dean Douglas Freeman, WCVM</p>	<p>Medicine</p> <p>Dr. John Gordon, Medicine Dr. Shelley Kirychuk, Medicine Dr. Niels Koehncke, Medicine Dr. Oscar Larios, Medicine Dr. Stephen Whitehead, Medicine/SPH Dr. Bruce Reeder, Medicine Dean William Albritton, Medicine</p>
<p>Nursing</p> <p>Dr. Philip Woods, Nursing Dr. Karen Semchuk, Nursing Dean Lorna Butler, Nursing</p>	<p>Pharmacy and Nutrition</p> <p>Dr. Jane Alcorn, Pharmacy and Nutrition Dean David Hill, Pharmacy and Nutrition</p>
<p>School of Public Health</p> <p>Dr. Suresh Tikoo, VIDO/SPH Dr. George Mutwiri, VIDO/SPH Dr. John Moraros, SPH</p>	<p>Law</p> <p>Dr. Patricia Farnese, Law</p>
<p>Agriculture and Bioresources</p> <p>Dr. Andrew van Kessel, Ag Bioresources Dr. Natacha Hogan, Ag Bioresources Dr. Colleen Christensen, Ag Bioresources</p>	<p>Education</p> <p>Dr. M. J. Barrett, Education/SENS</p>
<p>School of Environment and Sustainability</p> <p>Dr. Ryan Brook, SENS/Ag Bioresources Dr. Douglas Clark, SENS</p>	<p>CGSR</p> <p>Dr. Trevor Crowe, CGSR</p>
<p>OVPR</p> <p>Dr. Jim Thornhill, OVPR Dr. Beth Horsburgh, OVPR</p>	<p>Gwenna Moss Centre for Teaching Effectiveness</p> <p>Dr. Sheryl Mills, U of S Learning Centre</p>
<p>Partner Agencies</p> <p>Dr. Saqib Shahab, Ministry of Health Dr. Keith Campbell, CFIA Dr. Erin Leonard, PHAC Dr. Joanne Tataryn, PHAC</p> <p style="text-align: right;">Dr. Phillip Curry, Ministry of Health Dr. Betty Althouse, CFIA Dr. Wendy Wilkins, Ministry of Agriculture Dr. Sheryl Gow, PHAC</p>	

Appendix B

Primary Criteria for the Selection of Research Focus

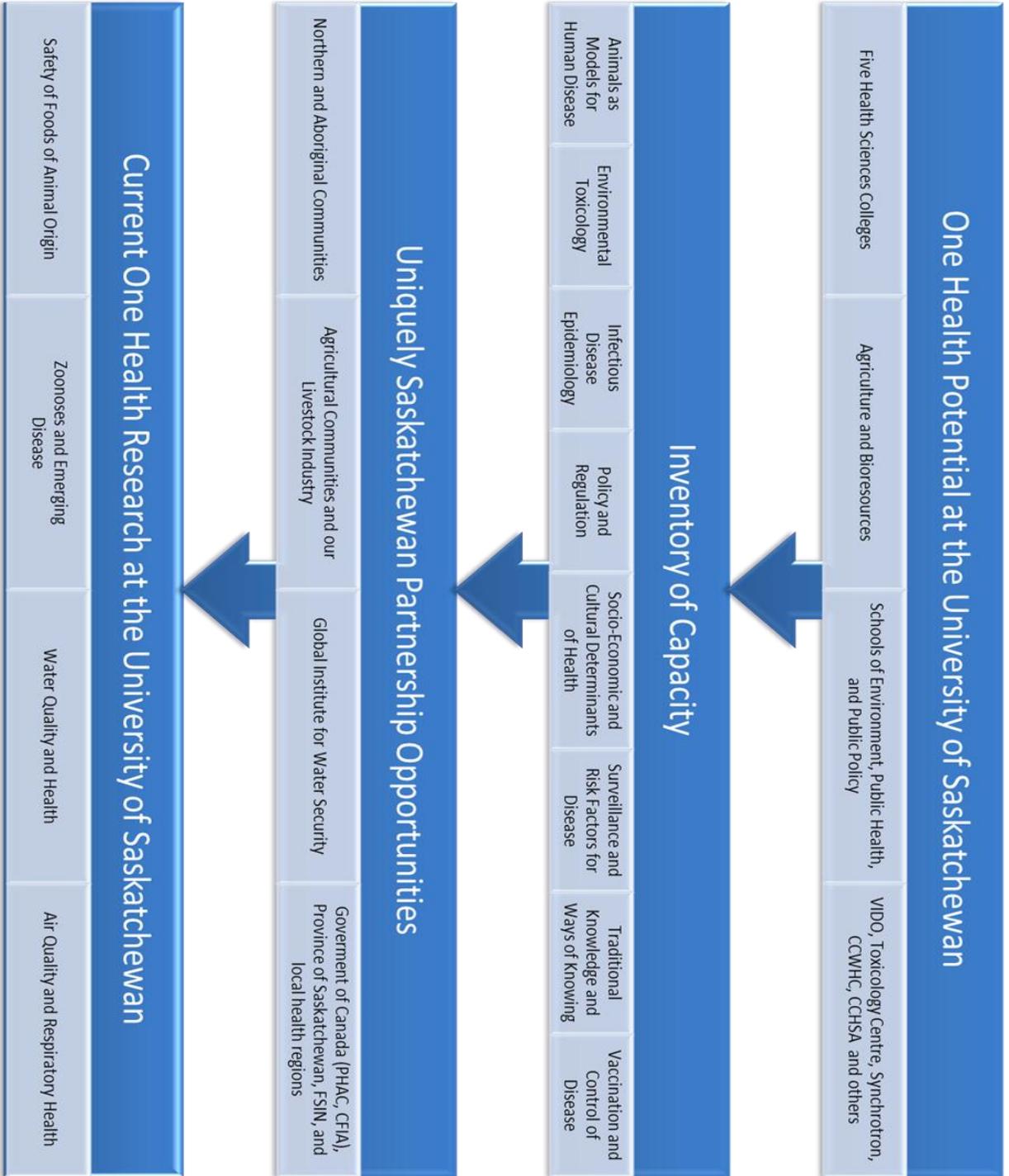
<i>Criterion</i>	<i>Rationale</i>
The area should be one of central importance to the future of animal-human-environmental health	Research in the area would be highly relevant, fundable, and sustainable
The area should build on existing research strengths at the U of S	The area would thereby have momentum and sustainability, and be able to demonstrate early success
The area should align with the priorities of research funding agencies (CIHR, NSERC, SHRF, Ag Canada, CFIA, etc.) and the Science and Technology Committee of government	Such alignment is necessary for research momentum and sustainability
The area should involve multiple disciplines and ways of knowing	Most modern complex problems are best addressed in a multi-disciplinary manner; there is increased emphasis by funding bodies and training programs to take this approach
The area should be one in which the U of S is uniquely positioned to lead	This will create a unique niche for U of S research endeavors
The area should have the potential to be translated to settings outside of the Canadian prairies	This will significantly enhance the impact of U of S One Health research

Secondary Criteria for Selection of Research Focus

Criterion	Rationale
This area should be future-oriented.	While it needs to be grounded in the present, the research needs to look forward to new emergent paradigms in health care.
The area should work to actively and explicitly engage with Aboriginal Peoples and scholarship.	One Health takes a holistic approach. Indigenous worldviews are by nature holistic, yet are under-represented in our group. They have much to contribute. Aboriginal scholarship is also a tri-council priority for SSHRC.
The area should have the potential to involve partners in industry and government agencies	This would enhance the impact and sustainability of the research focus
The area should have the potential to involve a large number/proportion of those working in, or wishing to work in, the field of One Health at the U of S. It should have a broad reach.	This would enhance the engagement of the U of S community in field of One Health
The area should be specifically relevant to the context of the Prairie provinces/Western Canada	This would be consistent with the university's Sense of Place
The area should position the U of S to be internationally competitive	The U of S initiative should aim to achieve success at an international level

Appendix C

Summary of University of Saskatchewan One Health Strengths



Source: Dr. C. Waldner, 2011

Appendix D

Priority Areas of One Health Research

1. Food Safety and Security

Goal: To improve food safety and security in Western Canada by providing safe and healthy food for all.

Objectives:

- Pathogen reduction
- Identification and control of emerging diseases
- Control antimicrobial resistance (AMR)
- Mitigation of microbial transmission to humans and animals
- Reduction of environmental contaminations (toxins) of foods
- Enhance local food production, regulations, and education

Rationale: This area of research is very broad, encompassing policy (industrial vs. non-industrial food production and processing), ethics, microbiology, vaccinology, environmental toxicology, sociology, economics/health disparities, the needs of aboriginal communities and Western Canada.

Participants: WCVM, VIDO, Medicine, SPH, Toxicology, SENS, Geography

Potential funding sources: CIHR, NSERC, ALMA, CFIA

2. Water Quality and Availability

Goal: To identify and address the human and animal health effects of changing water quality and availability.

Objectives:

- Prediction of the health effects of hydrological changes; to include the collection of baseline data and the use of predictive modelling
- Assessment of the impact of changing water quality and availability on agriculture and Aboriginal communities
- Evaluate the health impacts of adaptations to hydrological changes
- Prediction of patterns of change in rural/urban development, land use, processes of mineral extraction
- Assessment of the impact of land use on water quality
- Human and animal health risk assessment
- Infectious disease consequences of changes to water quality and availability, particularly from small water sources (wells)
- Examination of potential translational benefits to the developing world (influence the international agenda)

Rationale: Human and animal health research in this field would complement existing strength at the U of S: the work of CERC Chair, Dr. H. Wheeler; the Global Institute for Water Security (GIWS); the Toxicology Centre. Health science faculty expertise exists in computer modelling, clinical infectious diseases, antimicrobial resistance, toxicology, and infectious disease epidemiology. This initiative is relevant to the Canadian prairies and fits well with the One Health selection criteria.

Participants: SPH, WCVM, Medicine, SENS, Geography, GIWS, Toxicology Centre, VIDO

3. One Health Services for Communities in Transition

Goal: To improve health and provide health services to communities in rural or remote areas, such as northern Saskatchewan, viewing health services through a “One Health Lens”

Objectives:

- Identify issues in human and animal health service provision. Conduct a needs assessment
- Identify areas of commonality for service delivery
- Examine water services, water and waste management and the effects of climate change
- Examine the role of Energy healing in these settings
- Explore an integrated approach to the provision of veterinary, human and agricultural health services
- Pursue an integrated approach to enhance wildlife and environmental health
- Explore the legal and professional dimensions of such health service delivery

Rationale: Communities in rural and remote areas of Canada have decreased access to health services for humans and animals. In developing countries, projects are underway to combine holistic services of human/animal health; similar models might work in Canada. There are common issues of service provision in remote locations in human medicine, veterinary medicine and agriculture.

Participants: Federal and provincial human health services (PHAC, Ministry of Health); veterinary medicine service (Ministry of Agriculture – large and small animal); wildlife management (NGO’s, ministry of environment); academic units (College of Medicine, Nursing, Vet Med, Ag and Bioresources, SPH, Sociology, Law, Public Policy; private sector; ICENG on campus; industry involvement (pharmaceutical companies).

4. Zoonotic Diseases: risk perception, assessment, and communication of zoonoses in high risk groups

Goal: To develop evidence on which to base research priorities and public health policy.

Objectives:

- Determine routes of transmission of specific zoonoses
- Determine risk factors for human exposure to zoonoses (risk and risk perception)
- Assess the impact of zoonoses on high risk human groups (agricultural workers, wildlife/domestic animal health professionals), domestic animals, wildlife and the environment
- To rank and prioritize zoonoses according to level of risk to health
- Assess the impact of climate change and changes in land use on zoonoses
- Assess the impact of zoonoses on public policy and economic development and vice versa
- Interface with HIV, TB research in Saskatchewan
- Assess methods of surveillance of zoonoses

Rationale: Workers in specific occupations and residents of rural and remote areas may be at higher risk of exposure to zoonoses due to occupation, ethnic origin, cultural practices and demographics.

Participants: CCHSA, CFIA-CFAP, PHAC, Saskatchewan Ministry of Health, Health Canada – First Nations and Inuit Health Branch, Health regions, Northern Intertribal Health Authority, Saskatchewan communities, U of S: CCWHC, Medicine, WCVM,

Potential funding sources: SHRF group grant; CCHSA – PHARE (trainee stipend); SSHRC (study of risk perceptions); CIHR; NSERC (mechanisms of disease transmission).

Appendix E

List of Volunteer Participants and Champions for One Health Research and Training Initiatives

Initiative	Participants	Champions
Research		
Food Safety and Security merged with AMR	Dr. Emily Jenkins, WCVM/SPH Dr. Wolfgang Koester, VIDO Dr. Hugh Townsend, VIDO/WCVM Dr. John Moraros, SPH Dr. Philip Woods, Nursing Dr. John Gordon, Medicine Dr. Shelley Kirychuk, Medicine Dr. Joanne Tataryn, PHAC	Dr. Volker Gerdts, VIDO Dr. Cheryl Waldner, WCVM Dr. George Mutwiri, VIDO/SPH Dr. Suresh Tikoo, VIDO/SPH AMR: Dr. Oscar Larios, Medicine
Water Quality and Availability	Dr. Emily Jenkins, WCVM/SPH Dr. Wolfgang Koester, VIDO Dr. Tasha Epp, WCVM/SPH Dr. John Moraros, SPH Dr. John Gordon, Medicine Dr. Ted Leighton, CCWHC	Dr. Lalita Bharadwaj, SPH Dr. Cheryl Waldner, WCVM
One Health Services for Communities in Transition	Dr. Emily Jenkins, WCVM/SPH Dr. Karen Semchuk, Nursing Dr. M. J. Barrett, SENS Dr. Oscar Larios, Medicine Ms. Patricia Farnese, Law Dr. Ted Leighton, CCWHC	Dr. Shelley Kirychuk, Medicine Dr. Doug Clark, SENS Dr. Tasha Epp, WCVM/SPH Dr. John Moraros, SPH Dr. Philip Woods, Nursing
Zoonotic Diseases: risk perception, assessment, and communication of zoonoses in high risk groups	Dr. Karen Semchuk, Nursing Dr. John Moraros, SPH Dr. Volker Gerdts, VIDO Ms. Patricia Farnese, Law Dr. George Mutwiri, VIDO/SPH Dr. Betty Althouse, CFIA Dr. Ted Leighton, CCWHC	Dr. Emily Jenkins, WCVM/SPH Dr. Tasha Epp, WCVM/SPH Dr. Shelley Kirychuk, Medicine
Training		
Undergraduate Initiatives	Dr. Emily Jenkins, WCVM Dr. Karen Semchuk, Nursing Dr. Bruce Reeder, Medicine Dr. Tasha Epp, WCVM Dr. Cheryl Waldner, WCVM	Ms. Patricia Farnese, Law
Graduate Initiatives	Dr. Emily Jenkins, WCVM Dr. Suresh Tikoo, VIDO/SPH Dr. George Mutwiri, VIDO/SPH Dr. John Moraros, SPH Dr. Bruce Reeder, Medicine	Dr. Baljit Singh, WCVM