Appendix C
One Health Initiative Draft Proposal for Funding

Executive Summary:
One Health is the collaborative effort of multiple disciplines – working locally, nationally, and globally – to attain optimal health for people, animals, and our environment. The mission of One Health is the establishment of closer professional interactions, collaborations, and educational opportunities across the veterinary and medical professions, together with their allied sciences, in order to improve public health and animal health. Principal drivers for One Health are the increasing threats posed by emerging zoonotic diseases, food- and water-borne diseases and environmental change, which demand a fundamentally new, integrated effort by multi-disciplinary health professions. In addition, One Health is built on the foundation that the health of people, animals and our environment represents a continuum where improvements in health in one domain often produces positive health affects in the others; thus, plans and actions to improve health demand collaborative efforts across disciplines, organizations and communities.

The One Health Initiative (OHI) described in this proposal has four long-term goals that support achievement of its mission.

Goal 1: Develop, implement and sustain a national strategy for improved public health based on the principles of One Health
Goal 2: Create national awareness within the veterinary and medical professions; the broad scientific community; government institutions; the political leadership; and the general public of the power of One Health to improve the health of people, animals and the environment.
Goal 3: Illustrate the value of implementing One Health principles through specific Demonstration Projects
Goal 4: Extend the One Health Initiative to the international community to achieve tangible improvements in global health for both people and animals.

Achieving these goals will require a sustained effort, leadership, and sufficient funding to bring One Health into routine practice worldwide. Achieving this end point of One Health is truly one of the critical challenges facing humankind today. This proposal lays out a practical plan and modest investment strategy to achieve these goals.
1. Background and Rationale

Today, the convergence and interactions of people, animals and our environment has created a new dynamic in which the health of each group is inextricably interconnected and totally dependent. The challenges associated with this dynamic are demanding, profound, and unprecedented. At the same time, new opportunities have emerged to protect and promote health in the rapidly changing human, animal and environment domains. However, these opportunities and our abilities to improve health will not be based on strategies and mind-sets of the past, but rather, on a new integrated approach that reflects both our profound interdependence and realization that we are part of a larger ecological system, exquisitely and elaborately connected.

The key strategy to better understand and address the contemporary health issues created by the convergence of human, animal, and environmental domains is adopting the mind-set and requisite actions that underpin the concept of One Health. The term One Health can be defined as the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals, and our environment. Achieving the end point of One Health is truly one of the critical challenges facing humankind today.

Central to the concept of One Health is the control of infectious diseases which have helped shape the course of human history. There is every indication that infectious diseases will continue to be significant global events and the emergence and re-emergence of pathogens will threaten the health and well being of people and animals throughout the 21st century. A large majority of these diseases are produced by zoonotic microbes, such as HIV, avian influenza, SARS, Ebola, West Nile, Hantavirus, hepatitis E, and many others. Of the 1461 diseases now recognized in people, approximately 60% are due to multi-host pathogens which are characterized by their movements across species lines. Over the last 3 decades, approximately 75% of new emerging human infectious diseases have been zoonotic diseases (infections of animals transmitted to humans). At the same, time environmental insults will continue to create favorable environments for the development of new infectious diseases as well as an expanding number of non-infectious and chronic diseases and conditions.
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Figure 1. Recent emerging infectious diseases that have caused outbreaks of human disease. The majority are zoonotic diseases transmitted to humans via insect vectors or contact with wild or domesticated animals.

In a recent publication by the Institute of Medicine entitled “Microbial Threats to Health, Emergence Detection, and Response”[^3], the authors suggested that a group of factors have simultaneously converged to create a “perfect microbial storm.” The most important of these factors include: adaptation of microbes, global travel and transportation, host susceptibility, climate change, economic development and land use, human demographics and behavior, a break down of both public and animal health infrastructures, poverty and social inequality. Most of these factors of emergence are manmade, and have produced a remarkable new milieu referred to as the global mixing bowl where microbes have much greater possibilities to create new niches, cross species boundaries, travel worldwide very quickly and establish new beachheads in the populations of people, animals and are also invading our environment where they are being uniquely maintained in nature outside of living hosts.

In a global economy, food for human and animal consumption is no longer produced and consumed locally. Contamination of food exported globally with microbial agents, pesticides, and exogenous toxins have become increasingly frequent, with resulting disease affecting animals and humans[^4]. The building global demand for animal-based protein is on target to increase by 50% by the year 2020. The welfare of the animals and sustainability of today’s agricultural food systems represent growing and difficult challenges which clearly fall into a new global health agenda for animal agriculture and food supply veterinary medicine. Two examples are noted below:

- **Bovine Spongiform Encephalopathy (BSE)** emerged in the 1980s as a disease of cows produced by an aberrant protein (prions). This disease is a food-borne human pathogen producing new variant Creutzfeld-Jakob Disease in people. This event has changed how cattle are fed and the standards of global agricultural trade. The investigation of this disease, and its ultimate solution required an integrated approach by scientists and health policymakers across multiple disciplines. A similar disease, chronic wasting disease (CWD) of elk, deer and moose is spreading in North America. The mechanism of transmission is not understood. There is a risk of spread to cattle and other food animals and ultimately to humans, since the prion protein of CWD can be efficiently converted to a form that apparently overcomes the structural barriers between more distant species. A One Health approach to CWD envisions the convergence of human, veterinary, wildlife disease and research scientists to establish improved surveillance and diagnostic methods, define the transmission chain, risk of cross-species spread, and control strategies.

- In 2006 a significant outbreak of *E.coli* 0157:H7 occurred in the U.S. affecting people in 26 different states. Almost half of the cases were hospitalized and ~ 25% suffered from hemolytic uremic syndrome (HUS). Human infections were linked to contaminated fresh spinach. If viewed from only the lens of human health, this outbreak focused primarily on morbidity, mortality, outbreak investigation, laboratory diagnosis and clinical treatment. However, when viewed through the lens of animal health, the same causative organism with an exact laboratory finger-print match, was found in cattle close to where the spinach was produced in California. From the wildlife diseases perspective this exact strain was recovered from wild hogs that ran through the same fields. When considered through the lens of an ecologist and hydrologist, the ground water and surface water in this high production agricultural region was being mixed together due, in part, to old porous agricultural wells, a drought followed by heavy

[^3]: Institute of Medicine, Microbial Threats to Health, Emergence Detection, and Response
[^4]: The building global demand for animal-based protein is on target to increase by 50% by the year 2020.
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rains and an irrigation system that was being stained to keep up with intensified agricultural production. Thus, when a Once Health construct was used, we were able to understand that the spinach field was likely contaminated through irrigation water that contained E. coli and/or from the infected hogs running through the fields and that the organism could survive in the spinach plant throughout processing and distribution. Only by using our knowledge of the environment and ecology could this investigation be completely understood. More importantly, only through this knowledge, can appropriate intervention and prevention strategies be properly implemented which must be “upstream” at the source. A pure human health approach would result in the focus on clinical care and individual treatment rather than on possible sites for prevention of contamination and infection.

Wildlife is under increasing pressure to survive and further loss of biodiversity is a highly probable outcome. This represents a potential pernicious erosion of animal populations, loss of biodiversity and an unnecessary increase in animal suffering. Infectious disease affecting wild animals contributes to this phenomenon. We are now experiencing major declines in amphibian populations worldwide. The cause is the fungal disease chytridiomycosis that is threatening biodiversity and ecosystem sustainability. Ebola virus not only affects humans but threatens the survival of great apes already under pressure from ecosystem degradation and hunting. One Health is now needed to consider, study, and devise integrated strategies for the control and prevention of these and other threats across human and animal health and the environment. There is nothing on the horizon to suggest that any of these threats are abating. New threats and risks to health of unprecedented scope and scale and with potential global economic devastation much greater than experienced during any previous time in history are likely to emerge.

In the last century, as scientific knowledge expanded and became more complex, there was a trend toward specialization and separation of disciplines, education, strategies and professions in human medicine, veterinary medicine, wildlife diseases, ecology and environmental health. The resulting separation is counterproductive at many levels in the current context of emerging diseases. Rather these domains must be considered as closely interconnected and linked worlds. With a One Health perspective, multiple disciplines can work, learn and act together. This collective work of the health, life, and social sciences will both enhance our understanding of the complex dynamic of diseases within our changing web of life and our global environment and will help create more effective interventions and prevention strategies to address future disease issues and adverse health events that are certain to be a profound part of our existence.

The power of cooperation and an integrated approach to address microbial threats to health, improve vaccination coverage, enhance prediction and early discovery of disease emergences, and enhance economic development is increasingly evident. However, many challenges exist to the recognition of the potential of One Health and to its practical implementation.

The concept and goals of One Health have been endorsed and embraced by many professional organizations, including the American Medical Association (AMA), the American Veterinary Medical Association (AVMA), the American Society for Microbiology (ASM), the American Society of Tropical Medicine & Hygiene (ASTMH), and others.

What is needed now is a coordinated effort to establish a worldwide commitment to One Health with acceptance of actionable objectives and integration of these into local, national and international policies for health. This effort will require vision, leadership, advocacy and initial funding. We believe that success in the early stages will be amplified through additional public-private partnerships leading to a sustained strengthening of public and animal health.
2. Mission and Goals

One Health is the collaborative effort of multiple disciplines – working locally, nationally, and globally – to attain optimal health for people, animals, and our environment.

The mission of One Health is the establishment of closer professional interactions, collaborations, and educational opportunities across the veterinary and medical professions, together with their allied sciences, in order to improve public health.

The One Health Initiative (OHI) described in this proposal has four long-term goals that support achievement of its mission. Achieving these goals will require a sustained effort, leadership, and sufficient funding to bring One Health into routine practice worldwide.

**Goal 1:** Develop, implement and sustain a national strategy for improved public health based on the principles of One Health

**Goal 2:** Create national awareness within the veterinary and medical professions; the broad scientific community; government institutions; the political leadership; and the general public of the power of One Health to improve the health of people, animals and the environment

**Goal 3:** Illustrate the value of implementing One Health principles through specific Demonstration Projects

**Goal 4:** Extend the One Health Initiative to the international community to achieve tangible improvements in global health

3. Objectives and Implementation

Each long-term Goal is linked to a series of specific Objectives, which in turn will be achieved through a series of Major Activities.

**Goal 1: Develop, implement and sustain a national strategy for improved public health based on the principles of One Health**

**Objective 1.1:** Form a National Commission for One Health to develop and implement a sustainable national agenda for One Health; to oversee the Major Activities listed below (Section 3); to identify critical needs for integrating the medical, veterinary, and other scientific communities; to set an agenda for research and establish new funding lines for research on emerging diseases; and to formulate recommendations for policymakers, national and global organizations, governments, and other stakeholders. We envision a small staff of talented and committed individuals and an oversight and/or advising council to give the commission direction, ensure performance, and drive toward measurable outcomes. March 1, 2009 would be the target date for commencement of this customer-oriented Commission. The Commission is also essential to help build a large following, develop a website, and facilitate the completion of the remaining recommendations. The timelines are outlined in Section 5.

The Commission will develop a comprehensive national action plan to attain sustainable integration at the global, national and local levels.
The Commission will be established as a non-profit corporation, and will comprise representatives from:

**Member status:**
The American Medical Association (AMA)
The American Veterinary Medical Association (AVMA)
The American Society for Microbiology (ASM)
The American Public Health Association (APHA)
The Association of State and Territorial Health Officials (ASTHO)
The American Society of Tropical Medicine & Hygiene (ASTMH)
The Society of Tropical Veterinary Medicine (STVM)
The Association of American Medical Colleges (AAMC)
The Association of American Veterinary Medical Colleges (AAVMC)
The American Phytopathological Society (APS)
The Association of Schools of Public Health
Government agencies: CDC, USDA, and EPA
The Wildlife Conservation Society

**Observer status: representative from:**
The World Health Organization (WHO)
The World Organization for Animal Health (Office International des Epizooties (OIE))
The Food and Agriculture Organization (FAO)

The Commission will have established Articles of Incorporation and By-Laws. It may appoint Task Forces to undertake specific activities or studies.
The Commission will meet quarterly. It will monitor the follow-up process on specific activities of its work and that of appointed task forces, which includes a stock-taking event every year.

A Chairman will be elected by the membership of the Commission, and will have a term limit of one year. The Commission will have a Director, a junior staff member and an administrative assistant funded under this grant, as well as funds for office space, travel, printing, and other logistical functions.

The Commission will terminate 3 years after its incorporation, unless extended by consent of its membership and a renewal of support by a Foundation or other entity.

The Commission and its Director will appoint an Advisory Council to help guide its actions, enhance linkages, communicate the principles of One Health and serve in an advocacy role.

Four Major Activities are proposed that will contribute to the achievement of this objective.

**Major Activity 1:** Identify strategies to address critical issues
The Commission will define a roadmap for achieving the steps needed to improve public health through integration of the medical, veterinary and allied sciences. This will be achieved through specific events (the One Health Summit), sponsored studies (Institute of Medicine), taking testimony from key leaders in multiple disciplines, tapping into existing databases and published and unpublished reports, and other means the Commission deems appropriate.

**Major Activity 2:** Obtain endorsements
1. Including the American Medical Association Medical Student Section (AMA-MSS).
2. Including the Student American Veterinary Medical Association (SAVMA)
The Commission will obtain key endorsements of the One Health Initiative from its own constituent organizations, other professional organizations, academic institutions, opinion leaders, leaders in Congress and government agencies, and the biopharmaceutical industry.

**Major Activity 3:** Establish a research agenda for One Health

The Commission will establish research priorities for the One Health. The goal will be to identify major gaps in current focus and funding, such as field research on the ecology of disease, the factors responsible for cross-species transmission, the health impact of rapidly changing practices in food production, and improved surveillance and diagnostic methods for zoonotic diseases.

It is envisioned that one or more appropriate panels will be constituted with representatives from governmental agencies, academic institutions, and private corporations. The Institute of Medicine study (Objective 2.2) will provide important inputs and guidelines for this process. A final research plan will then be shared with Congress, staffers, and other decision-makers. This agenda will serve as a roadmap to address researchable questions and generate research funding and interest from multiple journals.

**Major Activity 4:** Oversee activities of the One Health Initiative objectives

The Commission will be responsible for setting the agenda for the One Health Summit (See Goal 2, Objective 2.1).

The Commission will oversee the activities of a professional firm charged with developing and implementing a Communications Plan (See Goal 2, Objective 2.3).

**Major Activity 5:** Inform Congress and Government Agencies

The Commission will develop broad lines of communication to policymakers and agencies responsible for public and animal health, national security and environmental health for funding research and programs of interest to One Health.

**Goal 2:** Create national awareness within the veterinary and medical professions; the broad scientific community; government institutions; the political leadership; and the general public of the power of One Health to improve the health of people, animals and the environment.

**Objective 2.1** Hold a One Health Summit. At the One Health Summit, leaders from the medical, veterinary, public health, and other allied science professions, governmental agencies, non-governmental organizations, private corporations, and other stakeholder entities will present, illustrate, discuss and debate the value of One Health to improved health in all dimensions and domains and will formulate recommendations for specific actions addressing critical needs. The Proceedings of the Summit will be published and made available to stakeholders and policymakers.

Funds for the Summit and publication of the Proceedings are sought under this grant application.

**Objective 2.2** Institute of Medicine Study. An IOM study is proposed as a compelling approach to a blue print for sustainable One Health integration to meet the needs of improved public health, education, and national security. The IOM report will make specific recommendations for Congress to direct the U.S. Departments of Agriculture, Homeland Security, EPA, National Science Foundation and Health and Human Services to establish
programs with the authority, expertise and resources necessary to set priorities for enhancing the interactions of the medical, veterinary, public and environmental health communities, for strengthening relevant institutions, improving disease surveillance, and the priorities for research on diseases of animals transmissible to humans.

Funds for an IOM study are sought under this grant application.

**Objective 2.3. Develop and implement a Communications Plan.** A key success factor is to increase awareness of the rationale for One Health and the ways in which stakeholders can participate in improving public health by implementing principles of One Health. Targets for enhanced communication include the entire medical, veterinary, and public health professions, related scientific organizations, policymakers, and the public at large.

To achieve this objective, funding is sought for a Communications and Public Relations activity that will be contracted to a professional firm specializing in this area. The firm will report to the National Commission for One Health or a designated task force of the Commission.

Three Major Activities are proposed that will contribute to the achievement of this objective.

**Major Activity 1:** Prepare white papers

The Commission will define a roadmap for achieving the steps needed to improve public and animal health through integration of the medical, veterinary and allied sciences. To communicate this roadmap, a series of White Papers addressing critical issues will be commissioned. Authors will be sought with special insight and expertise.

**Major Activity 2:** Promote a flow of information

The Communications activity will maintain news flow through the Newsletters and Journals of Professional Associations and Societies (AMA, AVMA, etc), timely press releases, Op Ed pieces, concept papers, and media interviews. A national speaker bureau will be established. A publication series will be initiated which will also support the soliciting of champions and key endorsements.

**Major Activity 3:** Establish and maintain a One Health website

The website will contain a wide array of information, with links to other relevant sites, publications, and educational materials.

**Major Activity 4:** Continuing Medical, Veterinary Medical and Allied Health Sciences Education

The Commission and the Communications activity will take steps to promote the granting of reciprocal continuing education credit for scientific meetings and training activities across disciplines. This will encourage professional cross training and education, and foster interactions and collaborations.

**Objective 2.4. Incorporate One Health in the national agenda for improving the health of Animals, People and our Environment.**

The Department of Health and Human Services issues 10-year plans that represent a comprehensive, nationwide health promotion and disease prevention agenda. These plans contain specific objectives designed to serve as a framework for improving the health of all people in the United States during the next decade. The overarching goals—to increase quality
and years of healthy life and to eliminate health disparities—serve to guide the development of objectives that would be used to measure progress. The objectives are known as Leading Health Indicators selected based on their ability to motivate sustainable action, measurability of progress, and relevance to broad public health issues. The current plan (Healthy People 2010) will be succeeded by a new plan (Healthy People 2020).

Similarly, the AVMA has developed and adopted Healthy Animals 2010 which is a 5-year commitment to promoting and sustaining good health and long life in animals. Healthy Animals 2010 provides a framework for prevention of avoidable injuries and diseases in the nation's animal population. It is a statement of national animal health objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce these threats. Healthy Animals 2010 enables the veterinary profession and interested persons and organizations in the public, private, and government sectors to work together towards a significant and sustainable increase in the quality of animal health and welfare within the broader context of public and environmental health. A new plan (Healthy Animals 2020) will build on Healthy Animals 2010 to develop the next set of priorities for the succeeding decade.

Steps will be undertaken to ensure that the two Plans contain objectives that integrate the medical and veterinary professions to achieve improvements in public health and that Leading Health Indicators contained in Healthy People 2020 include measurable outcomes that illustrate improvements based on One Health principles. Some examples include:

- Obesity is a growing problem of both humans and companion animals that adversely affects health by increasing the prevalence of cardiovascular disease, cancer, and diabetes. The prevention and control of obesity in humans and their pets requires similar approaches. Research on the underlying metabolic disturbances that drive obesity linked disease can be studied in animal models.

- Emerging zoonotic infectious diseases represent a growing threat. Improved real-time surveillance through integrated human, veterinary, and wildlife disease systems will reduce time to recognition and enhance disease control.

- Antimicrobial resistance of pathogenic bacteria is a growing concern for humans and animals. New approaches to reducing the risk of antimicrobial resistance are required.

- Passive smoke is increasingly identified as a cause of cancer and lung disease in both humans and their companion animals. Public health interventions can be enhanced by addressing this problem in an integrated way.

- Bioterrorism remains a high priority security issue for the US Government and the G8 nations. Zoonotic diseases represent the leading biological threat agents for human health; moreover the introduction of foreign animal or plant diseases could have potentially disastrous consequences. Although some coordination exists between human, veterinary and agricultural agencies, there is a need for considerable improvement to address the broad threats to health and the economy.

Inclusion of One Health in Healthy People 2020 will result in greater integration of health strategies and there will be increased visibility of One Health as the concept will be embedded in their material plans to improve health.

Funding is sought in this grant application for activities required to promote the incorporation of One Health principles in the plans for Healthy People 2020 and Healthy Animals 2020 and to develop measurable outcomes. The National Commission will be charged with driving this effort, though a designated task force.
Goal 3: Illustrate the value of implementing One Health principles through specific Demonstration Projects

Objective 3.1 Initiate and support ‘One Health Challenges’. Challenge Days are conferences at which a specific public health challenge is taken up by participants from the medical, veterinary and allied science professions, with the objective of demonstrating the value of integrated action. Students from medical and veterinary schools will play a key role, instilling specific learnings from the conference into their educational programs and fostering a long-standing interest in One Health issues.

- An example of a successful One Health Challenge is the World Rabies Day. In 2006, a group of researchers and professionals formed the Alliance for Rabies Control. They began inviting partners to join the World Rabies Day initiative. The World Rabies Day initiative now involves human and animal health partners at the international, national, state/provincial, and local levels, veterinary, medical and other specialized professional and student organizations, and corporate and non-profit partners. Meetings are held annually to focus on progress from research and public health and to invigorate prevention and control measures.

Funding is sought to increase student participation in World Rabies Day and to create at least one other Demonstration Project with parallel goals. The priorities for the latter project will be established by the National Commission and the One Health Summit. Possible subject areas include:

- Emerging Disease Surveillance
- Neglected Diseases of Animals and Humans
- Avian Influenza
- Food Safety

Public-Private Partnerships also represent a rich collaboration where One Health can be a focus of attention and action. One Health has a number of aspects that can be converted into a strong business proposition where new opportunities are likely to emerge. For example, agribusinesses, food companies, retailers and suppliers could work with government agencies and university researchers to improve the understanding of the ecologies of food-borne illnesses and initiate better interventions and prevention strategies to reduce the risks of human illness but implement strategies at agricultural and environmental points along the food continuum.

Because One Health is built on the concept of collaboration and cooperation, new skills and knowledge will be needed to be learned and used by participants. Working across disciplines and organizations in today’s complex and rapidly changing world is progressively more difficult. Thus, demonstration projects where new leadership and managerial skills are taught to participants will help ensure new ways of collaborating and also ensure that leaders have the requisite skills and experiences to succeed. The new concept of Meta-leadership that stresses the ability to work across organizations and jurisdictions yet often without clear authority is a new reality and represents a new skill critical to the execution of One Health strategies and activities.

Objective 3.2 Integrated Medical Education. For the most part, medical schools and veterinary colleges follow separate education streams and students do not benefit from interactions and the cross-fertilization of ideas and information. There is a little teaching on zoonotic infections arising from wild animals, disease ecology, transmission of infections from pet animals to humans, and other subjects that would be best taught in an integrated way to medical and veterinary students. Similarly, while some schools have active departments of Comparative Medicine, which are productively engaged in the exploration of animal models of human diseases, this discipline is woefully underfunded. The disciplines of veterinary pathology and human pathology
are operationally separated\(^9\), despite the obvious benefits that would accrue from an integrated approach to cancer biology, genetic diseases and the pathogenesis of infectious diseases. While a national agenda for change will be the subject of study by the Commission, there is considerable value in a project to demonstrate the value of integrated programs and to develop Case Studies.

The concept of One Health merits the attention of students in and out of the health professions. Their understanding, enthusiastic support, and commitment to One Health will be essential. Early experience suggests that One Health is tantamount to a social cause in the viewpoint of students. Promoting and improving human, animal, and environmental health is a calling as much as it is a scientific principle, which resonates well with our students and young professionals. Recruiting students to the effort not only gives energy to One Health but also helps assure sustainability to further generations.

A significant positive trend is the establishment of links by medical and veterinary schools with schools of public health. Today, more than half of the U.S. veterinary colleges have formal dual DVM(VMD)/MPH degree programs. This has been a major change of emphasis and coordination just over the last five years.

Over half of the 28 US veterinary colleges are co-located in a city that also contains a medical school (Table 1), creating the potential for interactions and collaborations. Leadership at the top is essential to establishing such interactions, and the demonstration of value of doing so is in turn critical to bringing leadership to bear on the problem. There are some examples of universities that have taken steps towards integrating activities of departments and colleges within the University system. Most universities with strong potential for collaborations and integration have been slow to recognize the potential benefits of integrated programs and to implement them. In some university systems, significant health science centers have been created where exciting programs in One Health would be a natural fit and would help drive further integration and collaboration in teaching and research.
Table 1. Co-localization of medical and veterinary colleges and schools

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<th>School</th>
<th>Location</th>
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Funding is sought to develop two Case Studies of a university system that has taken positive steps toward improved integration and one that has not. In each case the rationale for change, the improvements, gains, barriers, challenges, and unrecognized potentials will be explored. Measurable outcomes will be evaluated. The Case Studies will provide examples and roadmaps for change in other academic institutions, and models that can be used by the AAVMC and AAMC in formulating policy. Resource requirements for enhancing facilities and access will be identified, and the impact on future generations of physicians and veterinarians will be assessed.
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Goal 4: Extend the One Health Initiative to the international community to achieve tangible improvements in global health

Zoonotic diseases threaten the global health of animals and humans. Rapid air travel, commerce and trade in domesticated and wild animals, demographic changes including urbanization, climate change, deforestation, and many other factors increase the potential spread of infectious diseases. Migratory birds and bats are capable of introducing infectious diseases across international borders. Recent examples illustrating the potential of zoonotic diseases to affect human populations and animal species across wide regions of the world include HIV, SARS, avian influenza, Chikungunya, West Nile, and Nipah viruses.

Food safety is another obvious concern, since the global economy depends on importation and exportation of a wide array of animal and plant materials that can be the source of human infectious diseases. The introduction of exotic animal, insect and plant pathogens can have damaging effects on local economies.

To mount an effective response to such global threats, it is necessary to coordinate the knowledge, expertise, and experience of a multi-disciplinary force of physicians, veterinarians, and allied health professionals. The key success factor will be the extension of One Health to the local and community levels worldwide. This effort could be most effectively catalyzed by the existing United Nations organizations that are concerned with health worldwide, i.e. the World Health Organization (WHO), the Food and Agriculture Organization (FAO), and the World Organization for Animal Health [Office International des Epizooties (OIE)].

To achieve outreach of the One Health Initiative internationally, the UN organizations and the OIE listed above will be engaged in the following ways:

- The UN and OIE organization leadership will have observer status in the National Commission for One Health and their participation will be promoted and encouraged by the Commission
- The UN and OIE organizations will be invited to play a key role in the One Health Summit
- Reciprocal arrangements will be sought to engage the Commission in relevant meetings of the UN organizations, and to seek ways to promote One Health initiatives within those organizations
- The UN organizations will be encouraged to promote One Health initiatives at the regional level (through the Regional offices of WHO, FAO, OIE, etc) and thereby to the national level.
- One Health Communications Plan deliverables (white papers, op-ed articles, etc.) will be made available to UN and OIE organizations and their global distribution encouraged
- World Challenge Days (see Goal 3, Objective 3.1) will engage health professionals worldwide
- Global organizations listed are critical to reducing health disparities in vulnerable populations and helping to protect the almost 800 million poor livestock and poultry keepers worldwide. These populations experience dual threats – economic devastation of diseases to their animals and also complications of acquiring zoonotic illnesses especially in women and children who mostly care for these animals.

4. Attributable Benefits

Achieving the One Health Initiative Objectives and Major Activities described above will have broad and sustainable benefits. These benefits include:

- Integration of human, veterinary, wildlife disease, and environmental health disciplines
One Health — *a New Professional Imperative*

at multiple levels necessary to face increasing challenges to health, nutrition, security, and economic growth worldwide

- Improved surveillance, early recognition, diagnosis, investigation, prevention and control of emerging and re-emerging infectious diseases, especially zoonoses.
- Increased knowledge of the factors responsible for cross-species transmission of infectious diseases
- Reduced regional and global economic disruption by emerging diseases
- Improved food safety in a global economy dependent on consumable import/export markets
- More rapid sustainable development of emerging economies, through improved human and animal health and productivity of food animals
- More rapid and efficient discovery and development of new drugs for human and animal health
- Increased application of comparative medicine and animal models to resolve major chronic diseases
- Integrated approach to the study and treatment of spontaneously occurring cancers in animals and humans
- Enhanced education and training of veterinarians, physicians, and allied scientists
- Creation and dissemination of new knowledge on infectious disease ecology and One Health to enable our adoption of more effective strategies for diseases control and prevention.

5. Monitoring and Evaluation

5.1 Milestones

Major milestones and expected outcomes are shown in Table 2, and timelines are illustrated in Figure 2.

**Table 2.** Major milestones

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Milestone</th>
<th>Target date (completion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1 (National Strategy)</td>
<td>1.1 Form National Commission</td>
<td>Commission stood up</td>
<td>1Q09</td>
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<tr>
<td></td>
<td></td>
<td>Finalize national strategy/road map</td>
<td>1Q10</td>
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<tr>
<td></td>
<td></td>
<td>Obtain endorsements from professional organizations</td>
<td>2Q09</td>
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<td></td>
<td></td>
<td>Establish research agenda for One Health</td>
<td>4Q09</td>
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<tr>
<td>Goal 2 (Create awareness)</td>
<td>2.1 One Health Summit 2.2 IOM Study 2.3 Communications Plan 2.4 Include OHI in national agenda plans</td>
<td>One Health Summit held IOM Study PR firm hired Prepare series of white papers Website established Healthy People 2020 Plan Healthy Animals 2020 Plan</td>
<td>3Q09 1Q10 2Q09 4Q09 1Q09 4Q11 4Q11</td>
</tr>
<tr>
<td>Goal 3 (Demonstration projects)</td>
<td>3.1 One Health Challenges 3.2 Integrate medical education</td>
<td>World rabies day One Health Challenge Day 1 One Health Challenge Day 2 Case Study 1 Case Study 2</td>
<td>4Q09 2Q10 2Q10 4Q09 4Q09</td>
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</table>
**Fig. 2** Timelines for objectives and tasks

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<td>2</td>
<td>Objective 1.1. Form a National Commission for One Health</td>
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<td>3</td>
<td>Activity 1: Identify strategies to address critical issues</td>
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<tr>
<td>5</td>
<td>Activity 2: Obtain endorsements of professional organizations</td>
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<td>6</td>
<td>Activity 3: Establish research agenda</td>
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<tr>
<td>7</td>
<td>Activity 4: Oversee activities of initiative elements</td>
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<td>8</td>
<td>Set agenda for the One Health Summit</td>
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<td>9</td>
<td>Oversee Communications Activity</td>
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<td>10</td>
<td>Activity 5: Inform Congress and Government Agencies</td>
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<td>11</td>
<td>Objective 2: Create national awareness</td>
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<td>12</td>
<td>Objective 2.1 Hold a One Health Summit</td>
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<td>13</td>
<td>Objective 2.2 Institute of Medicine Study</td>
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<td>Objective 2.3 Develop and implement a Communications Plan</td>
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<td>17</td>
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<td>18</td>
<td>Activity 4: Continuing Medical and Veterinary Medical Education</td>
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<td>Objective 2.4. Incorporate One Health in the national agenda for</td>
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<td>improving the health of Animals and People</td>
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<td>Goal 3: Illustrate the value of implementing One Health principles</td>
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<td>through specific Demonstration Projects</td>
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<td>23</td>
<td>Objective 3.1 Initiate and support ‘One Health Challenges’</td>
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<td>Support Rabies Challenge Day</td>
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<td>25</td>
<td>‘One Health Challenge Day 1’</td>
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<td>‘One Health Challenges’ Day 2</td>
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<td>Objective 3.2 Improve Integrated Medical Education</td>
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<td>Goal 4: Extend the One Health Initiative to the international community</td>
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</table>
6. Organizational and Management

The National Commission will have a staff of three (3), including a Director, a junior staff member, and an administrative assistant. Recruitment of the Director is a key element to success of the Initiative. A One Health Steering Committee, to be established and comprised of selected members from the AVMA One Health Initiative Task Force and leaders from other health professional associations that have endorsed the concept of One Health (AMA, ASM, etc.), will identify, recruit and select a visionary individual to serve as Director. Recruitment will depend on having a commitment of funding. The Director will in turn recruit other staff for the Commission.

The Director will have an advanced degree (MD, DVM, PhD) and at least 10 years experience in a field relevant to One Health, such as public health, preventive medicine in public or private practice, education, health policy, or research. He/she will have demonstrable passion and vision for the goals and objectives of One Health. Essential attributes will include exceptional ability to articulate and explain complex issues to both sophisticated and lay audiences, to enlist the support of others to his/her view, and to organize and manage the efforts of peers to achieve results. He/she will have a strong network within academia, government, international health or other relevant fields.

7. Budget

A budget of $2,978,682 is requested to fund the Initiative for a period of 3 years. The majority of the budget is for salaries and benefits (45%), contracts (30%) and travel (22%).

(Endnotes)
1 Kahn LH, Kaplan B, Steele JH. Confronting zoonoses through closer collaboration between medicine and veterinary medicine (as ‘one medicine’). Vet Ital 2007;43:5-19.
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7 Kahn LH, Kaplan B, Monath TM, Steele JH. Teaching ‘One Medicine, One Health’. Am J Med, 2008;121:169-170
9 Cardiff RD, Ward JM, Barthold SW. ‘One medicine-one pathology’: are veterinary and human pathology prepared? Lab Invest 2008;8:18-26
10 One medicine approach hinges on local leadership and participation. JAVMA 2007;232:817-819