

Results of a Zoonotic Disease Prioritization Workshop

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Zoonotic Diseases are a Threat to Health Security

- **60%** of existing human infectious diseases are zoonotic
- **At least 70%** of emerging infectious diseases of humans (including Ebola, HIV, and influenza) have an animal origin
- **5 new human diseases** appear every year. Three are of animal origin.
- **80%** of agents with potential bioterrorist use are zoonotic pathogens



WORKSHOP: Prioritizing Zoonoses using a One Health Approach



Fairbanks, Alaska
March 20-21, 2019

Why Make a Prioritized Zoonotic Disease List?

- **Funding is finite**
- **Personnel are limited**
- **Surveillance, especially across sectors, must be focused**
- **Laboratory tests and equipment cannot cover all diseases**
- **A list of priority diseases may help with funding**

CDC's One Health Zoonotic Disease Prioritization Tool

OPEN ACCESS Freely available online

PLOS ONE

Prioritizing Zoonoses: A Proposed One Health Tool for Collaborative Decision-Making



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Abstract

Emerging and re-emerging zoonotic diseases pose a threat to both humans and animals. This common threat is an opportunity for human and animal health agencies to coordinate across sectors in a more effective response to zoonotic diseases. An initial step in the collaborative process is identification of diseases or pathogens of greatest concern so that limited financial and personnel resources can be effectively focused. Unfortunately, in many countries where zoonotic diseases pose the greatest risk, surveillance information that clearly defines burden of disease is not available. We have created a semi-quantitative tool for prioritizing zoonoses in the absence of comprehensive prevalence data. Our tool requires that human and animal health agency representatives jointly identify criteria (e.g., pandemic potential, human morbidity or mortality, economic impact) that are locally appropriate for defining a disease as being of concern. The outcome of this process is a ranked disease list that both human and animal sectors can support for collaborative surveillance, laboratory capacity enhancement, or other identified activities. The tool is described in a five-step process and its utility is demonstrated for the reader.

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Introduction

The majority of emerging or reemerging infectious diseases originate in animals [1,2], with over 250 zoonoses documented in the literature as newly discovered or rapidly increasing in incidence or geographical range in the past 70 years [3,4]. In addition to the emergence of zoonotic pathogens, an estimated 20% of all human illness and death in the least developed countries are attributable to endemic zoonoses [5]. Globally, the top 13 zoonoses deemed most impactful to poor livestock keepers in developing countries are responsible for an estimated 2.7 million deaths and 2.4 billion cases of human illness each year; the majority of these diseases also have negative effects on livestock production [4]. The global impact of emerging and endemic zoonoses on both human and animal populations make their control and prevention a natural starting point for collaboration between human and animal health sectors. As collaboration efforts move forward, identifying zoonotic disease priorities of jurisdictional importance to governments and institutions becomes critical.

Given the realities of finite fiscal and personnel resources for both public health and animal health institutions in all countries, joint prioritization of zoonoses has the potential to benefit both sectors as efforts are made to conduct efficient and effective surveillance, develop laboratory capacity, target outbreak response, implement disease control strategies, and identify research activities. However, accomplishing the task of prioritization in a

manner that is transparent and useful for all stakeholders can be challenging even in the best of situations; the paucity of quantitative data for decision-making and lack of framework required for multi-sectoral collaboration can significantly impede the process. Taking a collaborative approach to the priority-setting process ensures equal input from stakeholders in both human and animal health sectors, and ideally results in a ranked list of zoonoses that can inform joint efforts in areas of overlapping interest.

Historically recognized methods for prioritization have been adapted by health officials to identify infectious diseases, of both public and animal health importance, for national surveillance and risk-assessment [6–12]; several publications have focused specifically on the prioritization of zoonoses [13–22]. In general, after determining the pathogens to be prioritized, the ranking processes have employed a hybrid of methods to 1) select the criteria used to define the importance of pathogens, 2) apply weights to individual criteria, and 3) to score the pathogens within each criterion. Criteria weights and associated criteria scores are then combined in some manner to produce the final ranked list of pathogens. The various methods used for criteria selection and weighting, and the scoring of pathogens are often described as qualitative, quantitative, or semi-quantitative in nature based on the scoring system used and the type of data required (Table 1).

Published descriptions of infectious disease prioritization processes vary by the number of pathogens ranked, the number of criteria chosen and the methods used for ranking criteria and

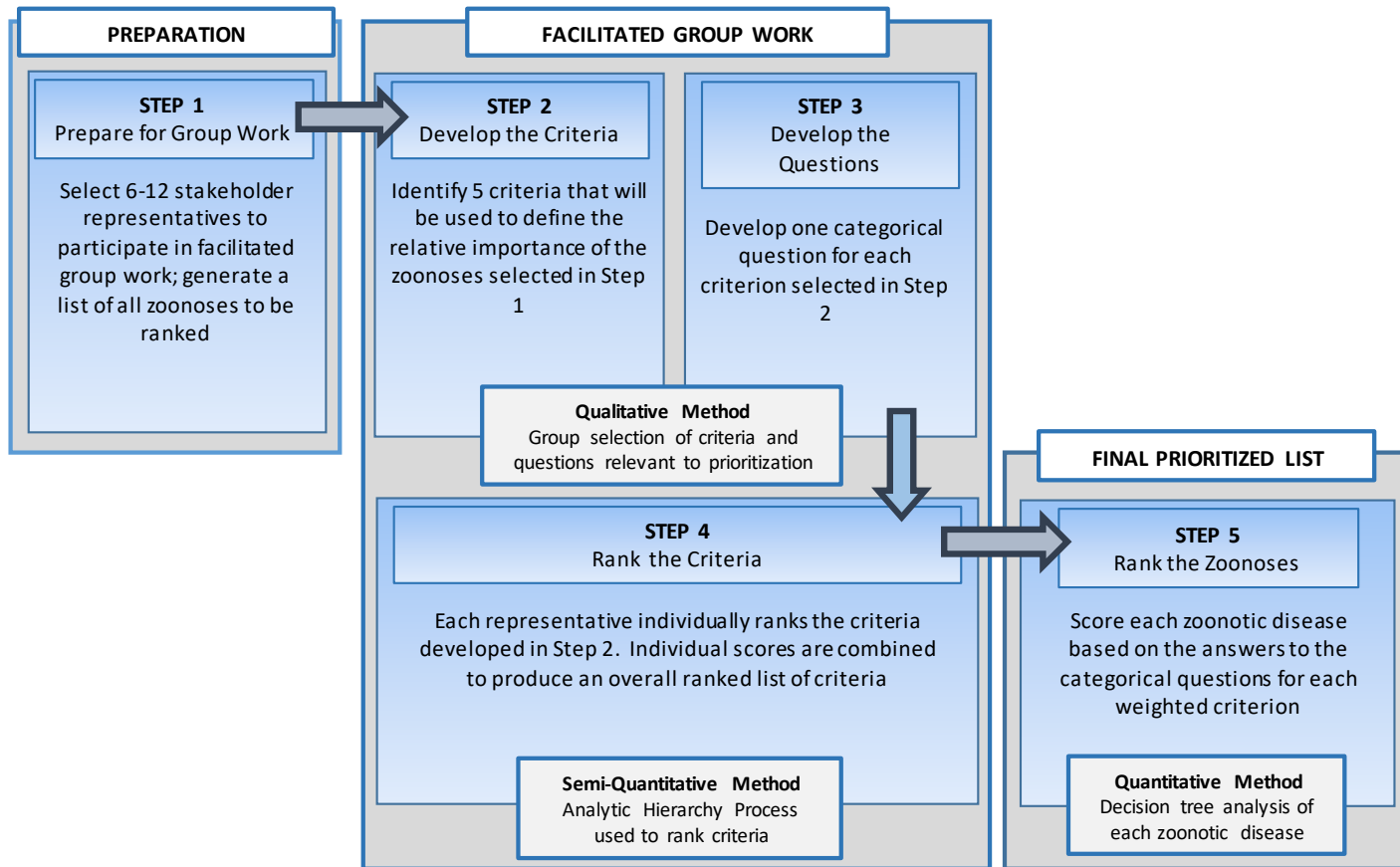
- Rist, Arriola, Rubin
- PLOS One October 2014

OHZDP Workshops (n=22)
2014 – 2018

■ Completed



Overview of 5-Step Prioritization Process



Goal of the Alaska Zoonotic Disease Prioritization Process

**To use a multisectoral, One Health approach
to prioritize endemic and emerging zoonotic diseases
of greatest concern in Alaska
that should be jointly addressed by sectors responsible for
human, animal, and environmental health**



Zoonotic Diseases

Alaska's Initial List of 35 Zoonotic Diseases for Prioritization

Bacteria
Anthrax
Brucellosis
Campylobacteriosis
E. coli
Glanders
Leptospirosis
Listeriosis
Lyme Disease
Melioidosis
Plague
Psittacosis
Q-fever
Salmonellosis
Shigella
Tularemia

Bacteria (cont.)
Vibriosis
Yersiniosis
Zoonotic Tuberculosis

Viruses
Hantavirus Pulmonary Syndrome
Rabies
SARS
West Nile Virus
Zoonotic Influenzas (Avian and Swine)

Parasites
Cryptosporidiosis
Cysticercosis
Cyclosporiasis
Diphyllobothriasis
Echinococcosis
Giardiasis
Metorchiasis
Trichinosis

Prions
Bovine Spongiform Encephalopathy
Chronic Wasting Disease*

Fungi
Cryptococcus gattii

Other
Paralytic Shellfish Poisoning (PSP)

Participating Organizations

- State of Alaska
 - Division of Public Health
 - Department of Environmental Conservation
 - Dept of Fish and Game
- Alaska Native Tribal Health Consortium
- Aleutian Pribilof Islands Association
- North Slope Borough
- University of Alaska
- US Federal Agencies
 - CDC
 - USDA
 - US Dept of Interior
 - National Parks Service, USGS
 - Arctic Research Commission
 - NOAA

5 Criteria

- **Clinical Outcome**
 - Case fatality ratio
 - Number of animal species affected
 - Impact on reproduction, fitness
- **Prevalence and modes of transmission**
 - Has it occurred in Alaska?
 - One mode or many modes of transmission?
- **Food Safety/Security, Social or Economic Effects**
- **Response Capacity**
- **Climate Change**

Priority Zoonotic Diseases for Alaska

- Amnesic Shellfish Poisoning / Paralytic Shellfish Poisoning
- Zoonotic Influenza
- Rabies
- Cryptosporidiosis / Giardiasis
- Toxoplasmosis
- Brucellosis
- Q fever

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Priority Zoonoses United States

- Zoonotic Influenza
- Salmonellosis
- West Nile Virus
- Plague
- Emerging Coronaviruses (SARS, MERS)
- Rabies
- Brucellosis
- Lyme Disease

Next Steps

- Multisectoral, One Health Collaboration
- Surveillance
- Laboratory
- Preparedness and Outbreak Response
- Workforce

- Alaska Report being reviewed by participants and will be made available on CDC One Health website

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 - Invite Canadian and Russian partners to involve common One Health and zoonotic disease issues

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- Develop a One Health contact list (listserv) that could be used for communication and important information to connect people
 - This listserv could be used as a bulletin board to identify who to contact for various needs
 - Need to identify who would maintain this listserv

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- Share case definitions for the priority zoonotic diseases between human and animal health sectors

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- Develop community-based hunter networks
- Develop a document that elaborates the network of laboratory capacity within the state

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- Enhance messaging during the response phase of a zoonotic disease event that utilizes a One Health approach

Next Steps

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 - Develop capacity of these assets to address various topics

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- Develop messaging for priority zoonotic diseases that are tailored to the groups receiving the information

Landscape Reviews

For each of the top listed zoonoses

- Apply the same criterion to:
- Animals, the Environment & Humans
 - Background/Stats - ex. case def
 - Identification - how it's identified/diagnosed
 - Lab testing – who what how where when
 - Surveillance
 - Response

Thank You!





ONE HEALTH ZOOONOTIC DISEASE PRIORITIZATION PROCESS OVERVIEW

Goals of the One Health Zoonotic Disease Prioritization Process

- ▶ To use a multisectoral, One Health approach to
 1. Prioritize zoonotic diseases of greatest concern
 2. Develop next steps and action plans to address the priority zoonotic diseases in collaboration with One Health partners

OHZDP Workshop Process

BEFORE THE WORKSHOP

Prepare and Plan for the Workshop

- Contact the CDC One Health Office at least 3 months before scheduling a workshop.
- Identify Core Planning Team and obtain financial resources to accommodate for workshop logistics, venue, materials, travel, and translation.
- Identify workshop participants (facilitators, voting members, advisors) from human, animal, and environmental health sectors and other related partners.
- Generate an initial list of zoonotic diseases to be considered for prioritization using reportable disease lists, literature, and input from all represented One Health sectors.
- Conduct a literature review on the initial list of zoonotic diseases by reviewing publications, reports, grey literature, etc.

DURING THE WORKSHOP

Develop Criteria

- 5 criteria will be used to prioritize the list of zoonotic diseases; criteria are locally appropriate and address the needs of each unique location.

Develop Questions

- 1 categorical question will be developed to measure each criteria.

Rank Criteria

- Each voting member will rank criteria in their preferred order, allowing each sector to address their sector's priorities and needs. Individual rankings are combined to produce a combined ranked list of criteria.

Prioritize Zoonotic Diseases

- Score each zoonotic disease by answering the categorical questions for each weighted criterion and entering this data into the OHZDP Tool.
- The ranked zoonotic disease list from the OHZDP Tool is used to facilitate discussion among the participants to finalize the priority zoonotic disease list.

Discuss Next Steps and Action Plans for Multisectoral, One Health Engagement

- Discuss next steps and action plans for identifying areas for One Health engagement for prevention and control of the prioritized zoonotic diseases.



AFTER THE WORKSHOP

- Stakeholders advocate and implement recommended next steps and action plans to implement a One Health approach for the priority zoonotic diseases.

OHZDP Workshop Outcomes

- A list of priority zoonotic diseases of greatest concern agreed upon by all represented One Health sectors
- Recommendations for next steps and action plans for multisectoral, One Health engagement to address the priority zoonotic diseases
- Understanding of the roles and responsibilities of all represented One Health sectors
- The creation or strengthening of multisectoral, One Health coordination mechanisms and networks
- A report highlighting the outcomes of the workshop to help advocate for One Health priorities

www.cdc.gov/onehealth/global-activities/prioritization.html