

ISDS One Health Surveillance (OHS) Case Study

CASE STUDY TITLE

One Health Harmful Algal Bloom-related Illness Surveillance

PROJECT/ACTIVITY TITLE

Health surveillance for harmful algal blooms and related illnesses in animals and people

CONTACT INFORMATION

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WHAT DOMAIN(S) DO YOU WORK IN?

Human health

Animal health

Environmental health

OHS AREA(S) OF FOCUS ADDRESSED BY CASE STUDY

Cross-Agency Communication and Collaboration

Training and Resources

Technologies and Methodologies

Other: _____

PROBLEM DESCRIPTION (150 word maximum)

Summarize the problem/situation that was addressed with a OHS approach.

Cyanobacteria and marine algae are ubiquitous in the earth's freshwaters and oceans. Under the right circumstances, these organisms can proliferate, causing harmful algal blooms (HABs) which may produce toxins that threaten human and animal health as well as local and regional ecology. Animals may play in, swim in, or drink from ponds and lakes that have extensive blooms, even if the water bodies smell or look unpleasant to people; the first warning that a toxin-producing HAB exists may come from the death of a pet dog or livestock. People may also play in waters that contain HABs if they are not aware of the potential hazard. Despite reports of human health effects and cases of animal poisonings from HABs or HAB produced toxins, the clinical course and public health effects of these adverse health events have not been well-characterized in the U.S.

ACTION TAKEN (500 word maximum)

Describe how the problem was addressed and how the action taken was measured. Please include a description of the collaborators and the data sources used.

CDC provided resources to 11 states from 2007-2012 to develop capacity to respond to HABs and related illnesses using a One Health reporting approach. States reported environmental events, human illnesses, and animal illnesses to the Harmful Algal Bloom-related Illness Surveillance System (HABISS) through 2011. The 11 funded and an additional 4 non-funded states entered over 4,500 reports describing HAB events that occurred from 2007 to 2011. Environmental data were included in 4,225 reports, human health data in 584 reports, and animal data in 175 reports before it was defunded at the end of 2012.

In 2013, CDC received funding from the Great Lakes Restoration Initiative, as well as internal resources, to restart One Health surveillance for HABs using an existing website platform for CDC's electronic National Outbreak Reporting System (NORS). NORS is a reporting system used by U.S states and territories to voluntarily report human outbreaks of waterborne, foodborne, and enteric illness. HAB-related illness reports will be received in the electronic One Health Harmful Algal Bloom System (OHHABS), which will be

accessible to states and territories via NORS. OHHABS has characteristics unique to its One Health focus, in particular, allowing states to report and link human case data, animal case data, and environmental data to characterize an event.

CDC collaborated across multiple programs to develop OHHABS during 2014 and 2015, including three National Centers with responsibility for waterborne disease prevention, outbreak surveillance, and environmental health (NCEZID, NCIRD, and NCEH). Federal agencies, including EPA, USGS, FDA, and NOAA, former HABISS states, and Great Lakes states participated in the OHHABS working group to revise HABISS questions and update case definitions where appropriate. OHHABS is currently in beta-testing in anticipation of its launch in spring 2016.

FACILITATORS AND BARRIERS (100 words max each)

Please list and describe any factors that contributed positively to this project/activity.

The expertise and partnerships that supported HABISS provided critical information for the development of OHHABS. Project activities were further facilitated by leveraging the existing NORS IT expertise and partnerships with state NORS administrative users. Funding provided from the Great Lakes Restoration Initiative supported OHHABS development and critical partnerships with Federal agencies, including EPA, USGS, FDA, and NOAA. An OHHABS coordinator was hired in May 2015 to oversee training development and the OHHABS launch.

Please list and describe any factors that were a challenge or barrier to overcome.

To continue One Health reporting following the termination of the HABISS cooperative agreement, it was necessary to identify a suitable technological platform. Integration with NORS required revisions to existing forms and case definitions. Questions that collected personally-identifiable information were revised or removed to meet NORS security standards. Due to the lapse in surveillance activity, approval is needed from the Office of Management and Budget. Outside of the funded work at CDC, the OHHABS working group was a voluntary effort by state and federal agencies. CDC did not have a full-time OHHABS coordinator until May, 2015.

LESSONS LEARNED (250 word maximum)

Please describe any lessons learned or best practices identified by this project/activity.

Summary:

1. HAB related health surveillance requires a multidisciplinary One Health approach at all levels of government.
2. Environmental monitoring for HABS contributes important information for exposure assessment, clinical diagnosis, and One Health case reporting. Environmental data provide information for pets and other animals about the presence of toxins (exposure to a HAB rather than just an algal bloom) and toxicity of the HAB.
3. Conducting One Health surveillance contributes to illness prevention in animals and people and will assist in closing the gaps in health-based guidelines for HAB toxins in drinking and recreational waters.
4. Multidisciplinary collaboration creates the partnerships needed for future capacity building (e.g., clinical tests development for HAB related exposures and effects).
5. Health communications, including education and outreach to health care providers, veterinarians, and the general public, is an important component of the public health response to HABs.

Best practices:

1. Identify and involve all stakeholders early in the process, including IT developers. Solicit input often.
2. IT development is iterative. Do not wait for a system to be perfect. Develop, evaluate, improve, repeat.
2. Identify existing resources and expertise that can be leveraged to expedite the work or improve its quality.
3. Create data collection tools based on public health needs and priorities. Be cognizant of partner/stakeholder capacity.

ADDITIONAL COMMENTS (75 words max)

Summarize the problem/situation that was addressed with a OHS approach.

NORS: <http://www.cdc.gov/NORS>

Hilborn ED, Roberts VR, Backer L, et al. Algal Bloom–Associated Disease Outbreaks Among Users of Freshwater Lakes — United States, 2009–2010. *MMWR Morb Mortal Wkly Rep.* 2014;63(1):11-15.

Trevino-Garrison I, DeMent J, Ahmed FS et al. Human Illnesses and Animal Deaths Associated with Freshwater Harmful Algal Blooms—Kansas. *Toxins (Basel)* 2015 February; 7(2): 353–366. Published online 2015 January 30. doi: 10.3390/toxins7020353 PMID: PMC4344628

Backer LC, Manassaram-Baptiste D, LePrell R, Bolton B. 2015. Cyanobacteria and Algae Booms and Public Health: Data from the Harmful Algal Bloom-related Illness Surveillance System (HABISS). *Toxins*, 7, 1048-1064. doi:10.3390/toxins7041048