

# Health Effects Related to Harmful Algal Bloom Exposure



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# Outline

- ❑ Harmful Algal Bloom (HAB) Surveillance Program Overview
- ❑ HAB Health Impacts
- ❑ Public Health Importance of HAB
- ❑ Case Studies
- ❑ Wisconsin HAB Illness Summary
- ❑ Citizen Involvement

# Wisconsin Division of Public Health (DPH), HAB Surveillance Program



Lake Kegonsa, Dane County, June 2009

- ❑ Established in 2008.
- ❑ Surveillance of health effects related to HAB exposure.
- ❑ Investigates reports of human and animal illnesses.
- ❑ Coordinates water sampling and analysis.
- ❑ Coordinates health advisories with local public health.
- ❑ Education and outreach.

# HAB-Associated Illness Reporting

- ❑ Online case reporting tool on DPH Blue-Green Algae website
- ❑ Direct contact with staff (email, phone)
- ❑ Department of Natural Resources (DNR), local health departments, lake association referrals
- ❑ WI Poison Center



The screenshot shows the Wisconsin Department of Health Services website. The header includes the department's logo and name. A navigation menu lists categories: About DHS, Data & Statistics, Diseases & Conditions, Health Care & Coverage, and Long Term & Support. Below this is a 'Topics A-Z' index with letters A through L. The current page is titled 'Blue-Green Algae' and is part of the 'Swimming Pool and Camps Licensing' section. It features a 'Share This' button and a paragraph explaining that the division collects information about human and animal illnesses related to blue-green algae. A warning states that the department does not provide medical treatment for severe symptoms. The page concludes with the phrase 'When in doubt, stay out!' and an image of a lake with a large, circular, light-colored object floating in the water.

# HAB-Related Illness Complaints in Wisconsin

Health Complaints Overview 2009-2015	
Year	# of Health Complaints
2009	37
2010	27
2011	36
2012	33
2013	13
2014	27
2015	12
<b>Total</b>	<b>185</b>

## HAB-Related Illness Reporting Methods

Reporting Method (2014-2015)	Total Illnesses
Online form	17
Phone	12
Other agency referral	9
Wisconsin Poison Center referral	8
During patient interview	3
<b>Total</b>	<b>49</b>

# Harmful Algal Blooms

- How are people exposed?
  - Swimming
  - Water skiing
  - Boating
  - Wading
  - Using lake water for drinking or irrigation



[www2.epa.gov](http://www2.epa.gov)

- Routes of exposure determine clinical signs/symptoms
  - Ingestion
  - Skin contact
  - Inhalation of toxins or gases
  - Fish consumption

# Skin Contact Symptoms

- ❑ Rash
- ❑ Hives
- ❑ Skin blisters
- ❑ Lesions most common under swimsuits



[www.floridawatercoalition.org](http://www.floridawatercoalition.org)



# Ingestion Symptoms

- ❑ Abdominal pain
- ❑ Diarrhea
- ❑ Vomiting
- ❑ Nausea
- ❑ Numb lips
- ❑ Tingling fingers and toes
- ❑ Dizziness



Lake Chetac , Sawyer County, July 2014

# Inhalation Symptoms

- ❑ Influenza-like illness
- ❑ Runny eye
- ❑ Runny nose
- ❑ Sore throat
- ❑ Asthma-like symptoms



<http://msbonnersinil.blogspot.com/>

# Animals and HABs

- ❑ How are animals exposed?
  - Eating scum material
  - Drinking lake water
  - Licking algae from coat
- ❑ Dogs are common victims.



CDC



[www.organic-center.org](http://www.organic-center.org)

# Symptoms in Animals



<https://aesrd.files.wordpress.com/>

- ❑ Lethargy
- ❑ Vomiting
- ❑ Drooling
- ❑ Diarrhea
- ❑ Difficulty breathing
- ❑ Weakness
- ❑ Seizures

## Public Health Importance

- ❑ Emerging public health problem worldwide.
- ❑ Projected increases in severity and magnitude.
- ❑ Ability to affect large numbers of people when drinking water is involved.
- ❑ Health impacts are still poorly understood.

# Public Health Challenges

- ❑ Under-reporting of cases.
- ❑ Failure to associate illness with HAB exposure.
- ❑ Challenging to diagnose.
  - Symptoms are non-specific and can mimic many other common illnesses.
  - Many ill individuals do not seek medical attention.
  - Case recognition is low among doctors and veterinarians.
  - There is no clinical diagnostic test to confirm exposure.



# HAB-Related Illness Case Studies

# HAB Case Study 1:

## Lake Kegonsa, Dane County

- ❑ On July 15, 2009, a 31-year-old male awoke at 2 a.m. with nausea, diarrhea and vomiting.
- ❑ Later that day, burn-like lesions developed on lower left arm.
- ❑ The previous evening, he had caught and eaten fish from Lake Kegonsa.



[www.floridawatercoalition.org](http://www.floridawatercoalition.org)



# HAB Case Study 1:

## Lake Kegonsa, Dane County

- Patient reported:
  - Lake water was green and cloudy with a strong manure-like odor.
  - Heavy algal mat present.
  - Left arm was exposed to algal material up to his elbow.
  - While cleaning the fish, he accidentally severed the liver.
- Water sample collected two days later:
  - 2 cyanobacterial species
  - Microcystin-LR present

## HAB Case Study 2: Lake Tomahawk, Oneida County

- ❑ August 14, 2009
- ❑ A 15 lb. rat terrier collapsed 30 minutes after swimming and playing fetch near a beach on Lake Tomahawk.
- ❑ On admission to veterinarian:
  - Comatose
  - Dilated pupils
  - Blue-gray mucous membranes
  - Elevated heart rate



<http://msh.mashoid.netdna-cdn.com>

## HAB Case Study 2: Lake Tomahawk, Oneida County

- ❑ Dog died within 90 minutes of onset.
- ❑ No visible evidence of an algal bloom three days later.
- ❑ Water samples:
  - Two cyanobacterial species present.
  - Concentrations considered low risk for adult humans.
- ❑ Toxin analysis was not conducted.
- ❑ The presumptive cause of death was exposure to blue-green algae.

# HAB Case Study 3:

## Lakes Mendota and Monona, Dane County

- ❑ 25-year-old female went tubing over 4<sup>th</sup> of July weekend, 2009
- ❑ Within one hour, rash on chest and abdomen developed
- ❑ Within 12 hours, severe nasal congestion, earache, sore throat, conjunctivitis, headache, and malaise developed



<http://msbonnersinil.blogspot.com/>

# HAB Case Study 3:

## Lakes Mendota and Monona, Dane County

- ❑ Routine monitoring detected four toxin-producing species of cyanobacteria at four beaches.
- ❑ Samples from Lake Mendota:
  - Several microcystin variants at high risk concentrations
  - Cylindrospermopsin

## Safety Tips

- ❑ Do not swim where water is discolored or where you see foam, scum or algal mats.
- ❑ Do not boat, water ski or jet ski through algal blooms.
- ❑ Do not fish in lakes where algal scum is present.
- ❑ Shower after swimming in lakes, rivers and ponds.
- ❑ Keep pets out of soupy, green water or where you see foam, scum, or mats of algae.
- ❑ If dogs swim in scummy water, rinse them off immediately - do not let them lick the algae off their fur.
- ❑ Respect water-body closures and health advisories.

**When in doubt, stay out!**



# Wisconsin HAB-Related Illness Summary

## HAB-Related Illness Symptom Profile

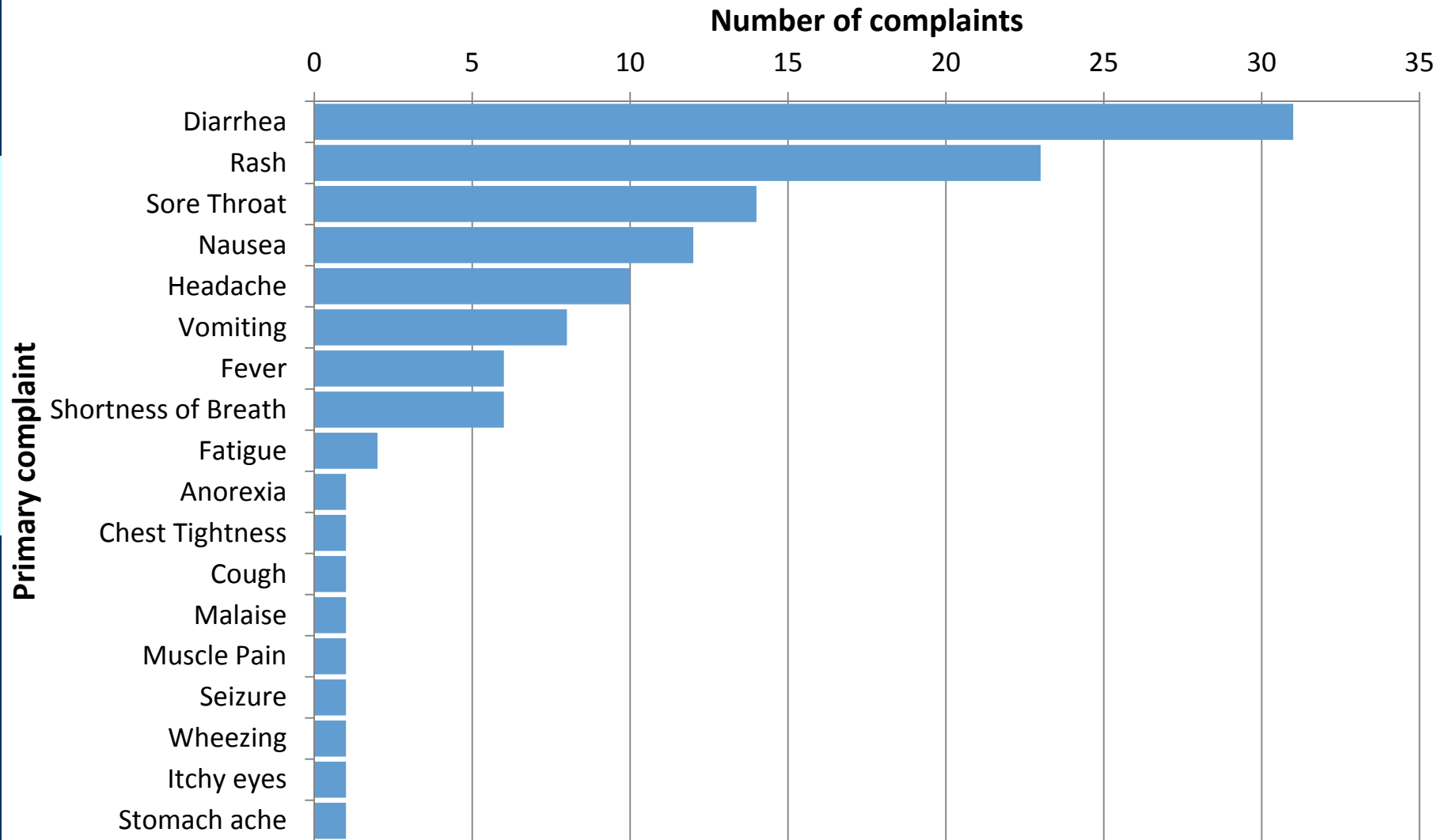
Symptom Profile (2009-2015)*	# of Reports
Gastrointestinal Distress	72
Cold/Flu-like Illness	49
Dermal Rash	39
Respiratory Irritation	32
Neurologic signs**	2

\*Many cases included multiple symptom profiles, thus total number of symptoms exceeds total number of reports.

\*\*Data available for 2014 and 2015 only.

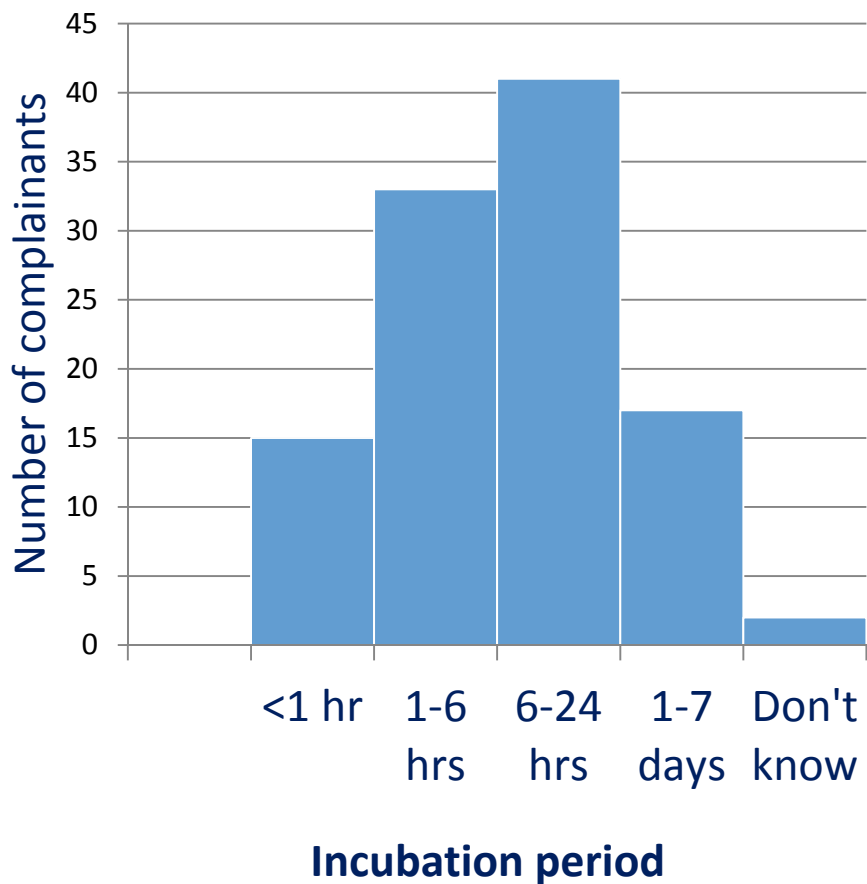


# Frequency of Reported Primary Human and Animal Health Complaints, Wisconsin, 2009-2013 (n=121)

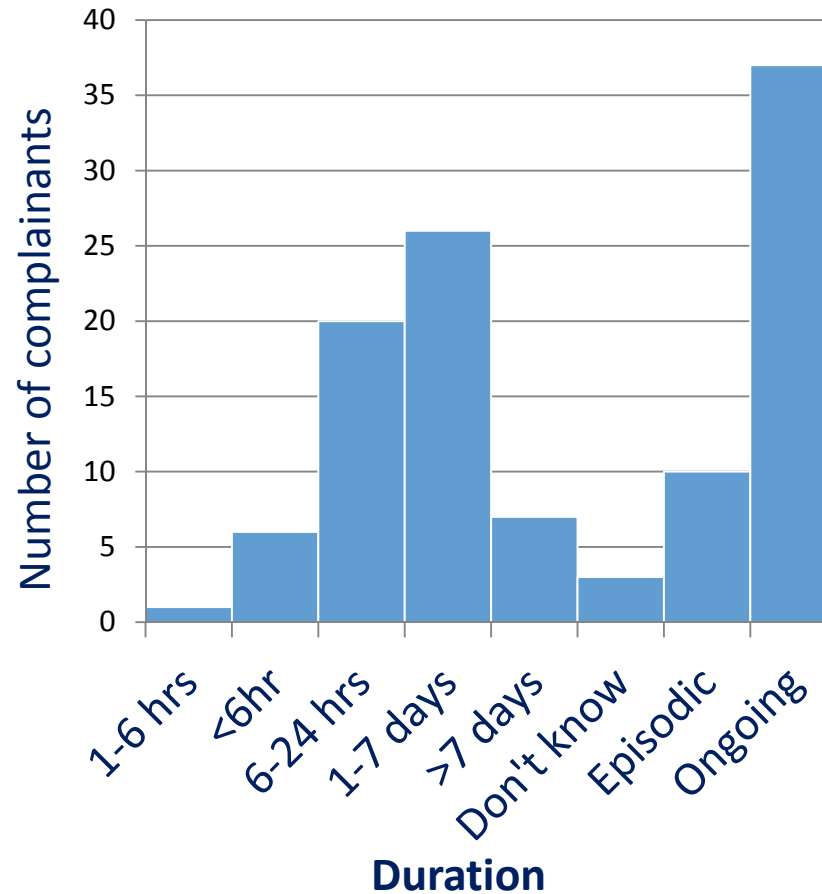


# HAB-Related Illness in Wisconsin

## Incubation Period of Primary Health Complaint, 2009-2013 (n=108)



## Duration of Primary Health Complaint, 2009-2013 (n=110)



## How Can I Help?

- ❑ Become familiar with the signs and symptoms and water conditions.
- ❑ Educate others.
- ❑ Report suspected illnesses.
- ❑ Encourage others to report suspected illnesses.
- ❑ Report obvious blooms to your local health department.

# Contact Information

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Wisconsin Division of Public Health

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**TO REPORT A HAB-RELATED ILLNESS:**

By phone: (608) 266-1120

Online:

<https://www.dhs.wisconsin.gov/water/bg-algae/index.htm>

**Animal Safety Alert**  
**BLUE-GREEN ALGAE BLOOMS**  
When in doubt, it's best to keep out!

**What is a blue-green algae bloom?**  
Cyanobacteria, sometimes called blue-green algae, are microscopic organisms found naturally in all types of water.  
• Blue-green algae grow quickly, or bloom, when the water is warm, stagnant, and full of nutrients.  
• Algae blooms usually occur during the summer and fall. However, they can occur anytime during the year.  
• When a bloom occurs, scum might float on the water's surface.  
• Blooms come in different colors, from green to blue to red or brown.  
• As the blooms die off, you may smell an odor like rotting plants.

**What is a toxic bloom?**  
Sometimes, blue-green algae produce toxins.  
• The toxins can be present in the algae or in the water.  
• Swallowing water with algae that are producing toxins can cause serious illness.

**Health and Safety Tips for Pets and Livestock:**

1. Do not let your pet, or livestock graze, eat, drink, or swim in water where you see blue-green algae blooms, foam, or scum on the surface.
2. If your animal gets in water with a bloom, immediately wash it off with clean water. Do not let the animal lick algae off of its fur.
3. Call a veterinarian if your animal shows any of these symptoms of blue-green algae poisoning: loss of energy, loss of appetite, vomiting, diarrhea and bloating, swelling of the belly, diarrhea, lethargy, excessive drooling, tremors, and seizures, or any unexplained sickness that occurs within a day or so after being in contact with water.

**You can help protect your pets and livestock from blue-green algae blooms by taking the following actions:**

- Visit <http://www.wisconsin.gov/hab> to learn more about blue-green algae.
- Know what a bloom looks like and avoid contact.
- Keep pets and livestock away from the water if you see signs of blue-green algae.
- Call your veterinarian if your animals are sick.
- Call your state or local health department to report pets or livestock made sick by blue-green algae.

**To report a blue-green algae bloom or a related health event:**

- Call the Centers for Disease Control and Prevention, National Center for Environmental Health's Harmful Algal Blooms program (HABs) at 800-526-0944.
- Call your local or state health department.

**You cannot tell if a bloom is toxic just by looking at it!**

Centers for Disease Control and Prevention  
National Center for Environmental Health