

The Health Impact of Harmful Algal Blooms

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While conducting field work, environmental health specialists may come across harmful algal blooms (HABs) in recreational areas. In some locations, waterbody managers or the public will alert Environmental Health Departments of a bloom or a potentially related illness at a local waterbody.

Several state and local agencies coordinate to track, and respond to, HABs in California. Reporting suspected HAB-related illnesses will assist the state in assessing the impact of HABs and identifying actions that will help to address HABs statewide. When a HAB incident is reported, a multi-agency coordination effort is triggered, consisting of the following:

- All HAB reports will prompt staff from the California Water Boards to contact the Local Public and Environmental Health Departments to assist with the HAB identification and early response.
- When a potential human or animal HAB-related illness is reported, the Tracking California program at the California Department of Public Health (CDPH) and the Office of Environmental Health Hazard Assessment (OEHHA) will contact the reporting party to collect additional information on the potential illness.
- If the reported illness involves fish or wildlife, OEHHA will inform the California Department of Fish and Wildlife (CDFW) and assist in collecting data.



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Harmful Algal Bloom

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On Public Health, Part 2

From the Committee...

Richard Diaz

Chair, CEHA Publications Committee

Retired, San Diego County Environmental Health

“Health is a state of complete physical, social, mental and environmental well-being and not merely the absence of disease, infirmity, or eco-pathological conditions... . The health of each is essential to the health of the other.”

In the January 2019 issue of The Bulletin, Dr. Amer El-Ahraf described the evolution of the definition of Public Health from the absence of disease in an individual to the inclusion of various determinants, environmental and socioeconomic, impacting the community as a whole. Seeing the Big Picture, to be precise. This definition provides the basis for current approaches to understanding and addressing public health concerns today.

In today’s issue, Dr. El-Ahraf concludes with a “game plan” for public health practitioners, which include EH field specialists.

This approach includes newer proactive steps to accompany long-established reactive ones. You may recall these elements from your formal education and training in environmental and public health.

Seeing the Big Picture is valuable for those members looking forward to advancing their careers in supervision and management.

The Big Picture...for the public’s health.

On Public Health, Part 2

Dr. Amer El-Ahraf



Dr. Amer El-Ahraf

Background

The Ecological Definition of Health was first presented in an “Invitational Paper” by El-Ahraf before President Richard Nixon’s Committee on Health Education in 1972.

It was formulated as the “Philosophical Foundation” for innovation in improving Urban Human Ecology.

The paper dealt with innovative techniques developed by the authors, particularly in citizen participation and public engagement in public health, in the Los Angeles County area of Willowbrook under a contract between the federal government and the Los Angeles County

Department of Health Services.

The Willowbrook Model Neighborhood Program was part of the “Model Cities Program” which, in turn, was the main expression of President Lyndon Johnson’s “War on Poverty” to improve conditions in America’s urban centers after a series of nation-wide unrest--as exemplified by the Watts Riots/Rebellion in the Los Angeles area.

President Nixon’s Committee on Health Education evaluated all Model Cities programs throughout the nation. The Willowbrook Model Neighborhood Program was identified as such an example of success and hence the invitation was extended to El-Ahraf and Don Hanson to explain why their program was successful.

The authors indicated to the Committee that success was based not only on a new approach to public engagement in public health practice, but also, and primarily, on a philosophical foundation of an “Ecological Definition of Health”.

In other terms, a sound program philosophy is a pre-requisite to successful program implementation.

Model Standards for Public Health Practice (after Ryan et al., 2007):

1. Surveillance and assessment of the population’s health and well-being:
 - health needs assessment;
 - health determinants;

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- health surveillance.
- 2. Promoting and protecting the population's health and well-being:
 - plan, monitor and evaluate health promotion strategies;
 - plan, implement, monitor and evaluate prevention and screening programs;
 - protect population health by managing outbreaks, incidents and emergencies.
- 3. Developing quality and risk management within an evaluative culture:
 - assess evidence of effectiveness of health interventions;
 - improve quality through audit and evaluation;
 - manage risk to public's health and well-being.
- 4. Collaborative working for health:
 - develop and sustain cross-sectional working;
 - communicate effectively with the public and others.
- 5. Developing health programs and services and reducing inequalities:
 - develop, implement and evaluate health programs and services;
 - facilitate the reduction of inequalities in health.
- 6. Policy and strategy development and implementation:
 - shape and influence the development of health and social care policy;
 - implement strategies to put policies into effect;
 - assess impact of policies.
- 7. Working with and for communities:
 - involve the public and communities as active partners;
 - empower communities;
 - advocate for communities.
- 8. Strategic leadership for health:
 - develop, sustain and implement a vision and objectives for health;
 - lead teams and individuals to improve health and reduce inequalities.
- 9. Research & Development:
 - appraise, plan and manage research;
 - develop and implement research findings in practice.
- 10. Ethically managing self, people and resources:
 - manage the development and direction of work;
 - develop capacity and capability to improve health;
 - deliver effective services, the aim of which is to improve health.

Indeed, "it takes a village" to allow for innovation to be born, shared, practiced on a broad basis--- and thus prosper.

Acknowledgments

A tribute is due to the late Walt Wilson, Former Director of Environmental Management, Los Angeles County, and the late Don Hanson, former Director of the Compton Health District, both of whom had the wisdom and vision to grant a high degree of flexibility and support, truly unprecedented in bureaucratic circles, to the authors along with the encouragement and critical support of other colleagues such as Richard Rinaldi, Al Hearne and Adam Rocke, and among others that included Jim Foster, Mr. Price, Larry Kozak, and George Riggs. Additionally, recognition is due to the Chair of the Board of Supervisors as well as Presidents of both the California and National Environmental Health Associations at the time. Most significantly, appreciation is expressed to the children, other citizens, officials and non-official figures as well as representatives of almost all public and private organizations serving Willowbrook at the time that extended support and cooperation.

References

- Carr, S., Unwin, N., & Mulloi, T. P. (2007). *An Introduction to Public Health and Epidemiology* (2nd ed.). New York: Open University Press, McGraw-Hill Education.

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- Staff at CDPH and OEHHA will be available to answer questions regarding HAB-related illnesses.
- Local Health Departments are encouraged to use the [signs and guidance](#) prepared by the [California Cyanobacteria and Harmful Algal Bloom \(CCHAB\) Network](#) for posting public health alerts at water bodies when HABs pose a health threat.

Many HAB-related resources are available on the [CA HABs Portal](#) including [a fact sheet to assist in recognizing HABs](#) by appearance, color, and odor, and answers to [frequently asked questions about HABs \(more resources are included in the Resources section below\)](#). The specialist is requested to report the bloom and any potentially related illness to the statewide centralized database as soon as possible via:

- Online: [Freshwater Bloom Incident Form](#)
- Telephone: 1 (844) 729-6466 (toll free)
- Email: CyanoHAB.Reports@waterboards.ca.gov

In 2018, 190 reports of potential blooms were received, and state and local agencies posted approximately 145 public health alerts at water bodies throughout California. There were 44 reports of potential HAB-related human and animal illnesses in 2018. Following further evaluation of the available environmental- and health-related information, CDPH reported 19 cases to the Centers for Disease Control (CDC) One Health Harmful Algal Bloom System (OHHABS) as [suspected, probable, or confirmed links to HAB exposure](#). These reported cases included 8 human, 4 domestic animal, and 7 fish or wildlife incidents.

Background

The occurrence of HABs appears to be increasing in inland waters of California, including rivers, streams, lakes, reservoirs, and estuaries. This has led to an increase in the public's concern regarding potential health impacts to humans and animals, particularly dogs.

Inland HABs in California are predominantly composed of cyanobacteria, formerly known as blue-green algae.

Cyanobacteria are non-pathogenic photosynthetic bacteria that grow in outdoor water bodies. Cyanobacteria are present in small amounts in most aquatic ecosystems. Under the right environmental conditions, they can grow quickly and form large blooms and mats. These may produce toxins known as cyanotoxins – notably microcystins, cylindrospermopsin, anatoxin-a, and saxitoxin – at concentrations high enough to be harmful to people and animals. Most blooms appear as green mats or scum on the water's surface or as mucilaginous benthic mats along the bottom of rivers. In California, blooms often occur from spring to fall, but can begin earlier or continue year-round in some locations.

Human exposure to cyanobacteria and cyanotoxins most commonly occurs through recreational activities in affected water bodies. People, and especially children, accidentally ingest small amounts of

water when swimming or playing in water. Ingestion of, or skin contact with, contaminated water can result in adverse health impacts. Small children may be exposed to high levels of cyanotoxins through hand-to-mouth behavior around scums, crusts or mats of cyanobacteria HABs. Inhalation of spray or mist coming off water with high cyanotoxin concentrations may also contribute to exposures. Cyanotoxins may



Harmful Algae Bloom



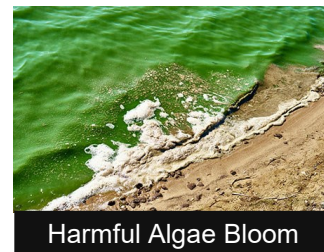
Harmful Algae Bloom

also accumulate in fish and shellfish, although little is known about the likelihood of this occurring during a specific cyanobacterial HAB. It is also possible for people to be exposed to cyanotoxins

through consuming contaminated drinking water or blue-green algae health supplements.

At sufficiently high concentrations, most cyanotoxins are either neurotoxins or liver/kidney toxins. Exposure to cyanobacteria and cyanotoxins may also result in symptoms of rash, inflammation of mucous membranes, and flu-like symptoms. The following symptoms may occur in people within approximately 48 hours of exposure:

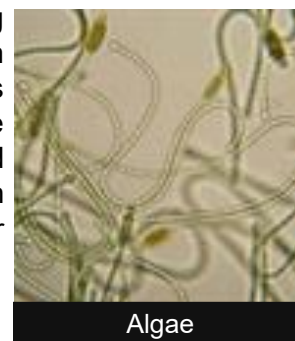
- sore throat or congestion;
- coughing, wheezing, or difficulty breathing;
- red, or itchy skin, or a rash;
- skin blisters or hives;
- ear ache or irritated eyes;
- diarrhea or vomiting;
- agitation;
- headache; and/or,
- abdominal pain.



If people show symptoms of cyanotoxin exposure after contact with water or with scums or mats of algae, they should receive immediate medical attention. Additional resources are available from the [Centers for Disease Control and Prevention](#) (CDC), and by contacting the California Poison Control Center (1-800-222-1222).

Pets, livestock and other animals have been sickened or have died following exposure to cyanobacterial blooms. Animals can have high levels of exposure from drinking scummy water, eating algal material or licking algae stuck in their coats after swimming. Wildlife have died after consuming other organisms that have accumulated cyanotoxins. There have been some instances when pets and livestock have been sickened or have died from ingesting blue-green algal health supplements. Signs reported with cyanotoxin exposure in pets, livestock and other animals include:

- vomiting, diarrhea;
- lethargy, depression, anorexia;
- jaundice, abdominal tenderness;
- dark urine, tarry stools;
- loss of coordination, seizures, paralysis, respiratory arrest;
- liver or kidney failure; and/or,
- death.



If animals show symptoms of cyanotoxin exposure after contact with water, or with scums or mats of algae, they should receive immediate veterinary medical attention. Additional resources are available from the [CDC](#), and by contacting the American Society for the Prevention of Cruelty to Animals, Animal Poison Control Center (888-426-4435; there is a \$65 consultation fee).

Additional Resources and Contacts

Several important informational resources on HABs and HAB-related illnesses are available through the CA HABs Portal, including:

- potential impacts to [human health](#), [domestic animals](#), and [fish and wildlife](#);
- [healthy water habits](#) to protect people and pets;
- a [dog owners fact sheet](#);
- a [veterinarian fact sheet](#) that provides technical information on assessing exposure history, evaluating

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- HDA Public Health Skills Audit (2001).
- https://www.webarchive.org.uk/wayback/archive/20140616160122/http://nice.org.uk/aboutnice/whoweare/aboutthehda/hdapublications/hda_publications.jsp?o=191

REHS — September 2019 Stats

Active REHS's: 2,749

Eligible Trainee Candidates: 1,964

New REHS's in 2019: 139

Retired REHS's: 792

Suspended for Nonpayment: 327

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clinical signs, pursuing diagnosis and confirmatory testing, and patient management in potential HAB-related animal illnesses;

- a [HABs animal safety poster](#) from the CDC;
- a detailed [visual guide to observing blooms](#);
- [resources for mitigating HABs](#).

These resources focus on inland HABs occurring in freshwater, estuarine and lagoon environments. For information on HABs in coastal marine areas and marine biotoxins in seafood, refer to CDPH's [Marine Biotoxin Monitoring Program](#), OEHHA's [FAQs about domoic acid in seafood](#), and [CalHABMAP](#).

Please contact us with any questions or comments.

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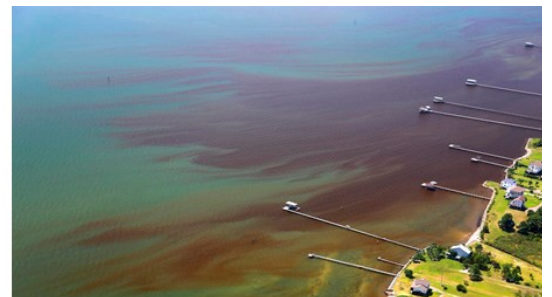
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