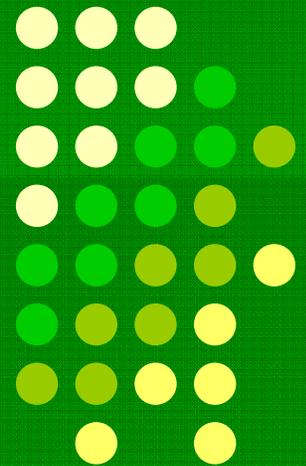


Environmental Health

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Environmental Health definition?

Two definitions are presented below, the first relating to the effects of the environment on health, the second relates to environmental health services

- *Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations.*

- *Environmental health services are those services which implement environmental health policies through monitoring and control activities. They also carry out that role by promoting the improvement of environmental parameters and by encouraging the use of environmentally friendly and healthy technologies and behaviors. They also have a leading role in developing and suggesting new policy areas.*

- **Environmental health** is defined by the World Health Organisation as:
 - Those aspects of human health and disease that are determined by factors in the environment.
- It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health.
- Environmental health as used by the WHO Regional Office for Europe, includes both the direct pathological effects of chemicals, radiation and some biological agents, and the effects (often indirect) on health and wellbeing of the broad physical, psychological, social and aesthetic environment which includes housing, urban development, land use and transport.
- Nutrition, pollution, waste control and public health are related concerns.
- When well-being of a whole population is measured, these become economic and political concerns. Increasingly wellness concerns are affecting fiscal policy and prompting some advocates to call for monetary reform (to end systematic pollution credit, governments actually paying to create human health harms). [WHO]

- The U.S. government identifies the most significant preventable threats to health and establishes national goals to reduce these threats.
- The six major environmental health topics as established in Healthy People 2010 document
 - Outdoor Air Quality,
 - Water Quality,
 - Toxics and Wastes,
 - Healthy Homes and Healthy Communities,
 - Infrastructure and Surveillance, and
 - Global Environmental Health

- Environmental disease is a greater threat to low-income communities of color than other communities as reported from local health, labor, and housing departments since the 1930's, and similar national agencies since the 1960's.
- Low-income communities of color are limited by fewer environmental benefits (e.g., clean air, water, and land) and more environmental threats (e.g., hazardous chemicals and environmental illness).

- Exposures to toxins are greater in low-income communities of color because they are often located in or near polluting industrial areas
- This is especially the case for low income persons, the working class, and people of color whose health may be imperiled by lead in their houses, pollution in their neighborhoods, and hazards in their workplace.

- Low-income communities of color receive less treatment for environmental disease because healthcare resources are limited and environmental health expertise is rare.

- Persons living in these communities are faced on a daily basis to concentrations of
 - fast food restaurants,
 - liquor stores,
 - dry cleaners,
 - gas stations,
 - manufacturing facilities with noxious odors and dust and
 - the resultant large volume of truck traffic and diesel exhaust.

- Mounting evidence suggests that asthma rates are rising and that this disease can be caused or aggravated by air pollution.
- Although ambient air quality has generally improved, these improvements have not reached minority communities in equal proportions.

Asthma

- Asthma is a major public health problem of increasing concern in the United States. From 1980 to 1996, asthma prevalence among children increased by an average of 4.3% per year, from 3.6% to 6.2%.
- Low-income populations, minorities, and children living in inner cities experience disproportionately higher morbidity and mortality due to asthma.

- When environmental health threats are not eliminated, the harm jumps from generation to generation. The end result is that people in low-income communities of color have less healthy surroundings, less education, and less income to support their personal health, and to fight for better healthcare, than people in other communities.

- Existing data demonstrate that children of color are the subgroup of the population most exposed to certain pollutants, including heavy metals (ie. lead), air pollution, and pesticides.
- Children receive greater exposures to environmental pollutants present in air, food, and water because they inhale or ingest more air, food, or water on a body-weight basis than adults do.

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Toxicogenomics

- **AIM OF THE CURRENT RESEARCH PROGRAM ON TOXICOGENOMICS (Gene – Environment Interaction)**
- Improved understandings of the factors that contribute to environmental exposure.
- Better understandings of differences and similarities in the biology of human versus rodent models to validate the extrapolation of human risk assessment.
- Development of high throughput, more informative testing strategies to assess toxicity of environmental xenobiotics.
- To elucidate the mechanism, pathway and metabolic network involved in the development of toxicity induced chemical/physical/biological factors to which human are exposed.
- To establish good biomarkers of early molecular alteration that leads to toxicity and chronic diseases, resulting from environmental exposure.
- The early detection of such interaction involving gene, gene products and environmental factors could lead to detection and development of effective prevention strategies and elucidation of mechanism of pathogenesis (analysis of gene and protein expression arrays) by single cell organism / in vitro tissue culture system.
- System biology approach for monitoring dynamic changes in the activity and quantity of molecular constituents of cell and tissue of animals with known genetic background (teratogenic effect).

National Library of Medicine

- The Toxicology and Environmental Health Information Program (TEHIP) evolved from the Toxicology Information Program (TIP) that was established in 1967 at the National Library of Medicine (NLM) in response to recommendations made in the 1966 report "Handling of Toxicological Information," prepared by the President's Science Advisory Committee. The TIP objectives were to: (1) create automated toxicology data banks, and (2) provide toxicology information and data services. In the mid-1990's, the mission of TIP was expanded to include environmental health. TEHIP, by creating, organizing, and disseminating toxicology and environmental health information, now serves as a premier information portal for resources in these subject areas.
- TEHIP maintains a comprehensive toxicology and environmental health web site that includes access to resources produced by TEHIP and by other government agencies and organizations. This web site includes links to databases, bibliographies, tutorials, and other scientific and consumer-oriented resources. TEHIP also is responsible for the Toxicology Data Network (TOXNET®), an integrated system of toxicology and environmental health databases that are available free of charge on the web. The following databases are available for searching via TOXNET:
 - Environmental Health resources

Health & Safety

Information on Household

Products

- What's under your kitchen sink, in your garage, in your bathroom, and on the shelves in your laundry room? near the CD player?
- Learn more about what's in these products, about potential health effects, and about safety and handling.

Hazardous Substances Databank (HSDB)

- HSDB is a toxicology data file on the National Library of Medicine's (NLM) Toxicology Data Network (TOXNET®). It focuses on the toxicology of potentially hazardous chemicals. It is enhanced with information on human exposure, industrial hygiene, emergency handling procedures, environmental fate, regulatory requirements, and related areas. All data are referenced and derived from a core set of books, government documents, technical reports and selected primary journal literature. HSDB is peer-reviewed by the Scientific Review Panel (SRP), a committee of experts in the major subject areas within the data bank's scope. HSDB is organized into individual chemical records, and contains over 4700 such records.

HSDB continued

- Human Health Effects
- Emergency Medical Treatment
- Animal Toxicity Studies
- Metabolism/Pharmacokinetics
- Pharmacology
- Environmental Fate/Exposure
- Chemical/Physical Properties
- Chemical Safety & Handling
- Occupational Exposure Standards
- Manufacturing/Use Information
- Laboratory Methods
- Special References
- Synonyms and Identifiers
- Administrative Information

Toxmap

- Is a web site from the National Library of Medicine (NLM) that uses maps of the United States to show the amount and location of toxic chemicals released into the environment. Data is derived from the EPA's Toxics Release Inventory ([TRI](#)), which provides information on the releases of toxic chemicals into the environment as reported annually by industrial facilities around the United States.
- TOXMAP helps users create nationwide or local area maps showing where chemicals are released into the air, water, and ground. It also identifies the releasing facilities, color-codes release amounts for a single year, and provides multi-year chemical release trends, starting with 1987. Users can search the system by chemical name, chemical name fragment, and/or location (such as city, state, or zip code).

What is in my neighborhood?



Environmental Health Scientists

- Environmental Health Specialists are concerned with the environmental quality of a community and the health and safety of the workers in that community. They are responsible for enforcing local, state, and federal regulations that pertain to the sanitation of food and water, handling of hazardous and infectious wastes, and cleanliness and safety of housing and institutional environments.
- Environmental health scientists apply biological, chemical, and public health principles to control, eliminate, ameliorate, and/or prevent environmental health hazards and are concerned with identifying and controlling the factors in the natural environment (air, water, land) that affect health.

Environmental Health Specialist

- Environmental health specialists may specialize in milk and dairy production, food protection, sewage disposal, pesticide management, air and water pollution, hazardous waste disposal, occupational health, and wildlife health/management.
- They may also be in charge of collecting and analyzing samples to determine if a hazard to public health exists. Environmental health specialists need to be comfortable with computers and other high tech devices because they may be called upon to prepare and calibrate the equipment used to collect and analyze the samples.

- Another major function of these specialists is to consult with and advise physicians and other medical personnel about potential community environmental health hazards.

- These professionals need to possess good oral and written communication skills because they may have to conduct, analyze, and dispense epidemiologic data regarding disease outbreaks within a community. Individuals must also have good analytical and problem solving skills, work well with other people, and have a commitment to creating a safe environment.
- There are shortages in public health for qualified researchers in chemistry, toxicology, occupational health, environmental epidemiology, and environmental engineering.

Work Environment:

- Environmental health specialists may work in state, county, or local health departments, hospitals, private businesses, wildlife parks, and environmental enforcement agencies. They are often employed as educators, consultants, and/or interpreters.

High School Preparation:

Students interested in becoming an environmental health specialist should take high school courses in algebra, geometry, trigonometry, calculus, biology, chemistry, physics, English, literature, computer skills, and health occupations/medical professions education.

College Requirements:

- Individuals interested in environmental health must have a high school diploma or the equivalent. Most environmental health specialists earn a bachelor's degree in environmental health, but some have a degree in a related field such as biological/chemical sciences or environmental engineering. Career opportunities can be greatly advanced by earning a master's or doctoral degree in this specialty. Optional certification may be obtained through the National Environmental Health Association.
- Students interested in environmental health should contact schools for information on admission and course of study.

Career Outlook:

- Employment opportunities for environmental health specialists are expected to grow between 10% - 20% through the year 2012. Because the majority of environmental health specialists are employed by local, state, and federal agencies, job security is usually relatively high. With an increasing amount of environmental protection legislation being passed, demand for these health professionals should increase steadily well into the 21st century. Demand should also increase due to individuals retiring or leaving the profession for other reasons.

Employment Opportunities:

- ■ Industrial Hygiene
- ■ Food Protection and Safety
- ■ Hazardous and Solid Waste
- ■ Environmental Engineering
- ■ Water Quality and Protection
- ■ Air Quality
- ■ Environmental Health Sanitarian/
- ■ Natural Resources
- ■ Environmental Health Protection
- ■ Toxicology
- ■ Laboratory Technician
- ■ Soil Science/Land Conservation
- ■ Radiation Protection

Hands on - Basic Searches

- <http://pubmed.gov>
- Do cell phones cause brain cancer? Review related articles for the first record that you retrieve.
- <http://hpd.nlm.nih.gov>
- How can I find information about specific brands of laundry bleaches, including their manufacturing information, ingredients, and health effects?
- What household products are associated with asthma?
- How can I do a quick search to find information on glue?
- What household products contain chromium?

HSDB

Search Problems: <http://toxnet.nlm.nih.gov>

- What are the occupational risks of working at a nail salon?
- Evaluate the hazards associated with a fire involving *acrylonitrile*.
- What chemicals does DOW Chemical manufacture?
- What chemicals have been found in fish in the Mississippi River?
- Does *nitrobenzene* have any effect on sperm?
- What are some chemicals used in dry cleaning and what are their human health effects?
- What is a therapeutic use for the herb spearmint?

Questions??

Thank You

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