

# **Exploring Environment and Health Connections**

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ENVH 111  
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## *Exploring Environment and Health Connections* **Course Topics**

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- Climate and health
- Food supply
- Health effects of chemicals
- Technological disasters
- Workplace hazards
- Water quality & waste management
- E-waste
- Bottled water

*Exploring Environment and Health Connections*

## Course Requirements

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- Read article and summarize - weekly
- Find article and summarize - weekly
- Discussion group in-class assignment - weekly
- Group facilitation – one week
- In-class exam
  - Middle of course
  - End of course

## **What is Health?**

(World Health Organization definition)

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- Anatomic integrity
- Ability to perform personally valued family, work, and community roles
- Ability to deal with physical, biologic, and social stress
- A feeling of well-being
- Freedom from risk of disease and untimely death

## **Public Opinion Survey**

### **What do the words “public health” mean to you?**

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- **Less than 4% gave correct answer**
  - health care system
  - universal health care
  - welfare programs
  - health insurance
  - Medicaid and Medicare

## **What is Public Health?**

**A set of efforts organized by society to protect, promote, and restore the people’s health through collective or social action**

- scientific research
- population-based interventions
- education
- regulations and enforcement powers

## The Public Health Infrastructure

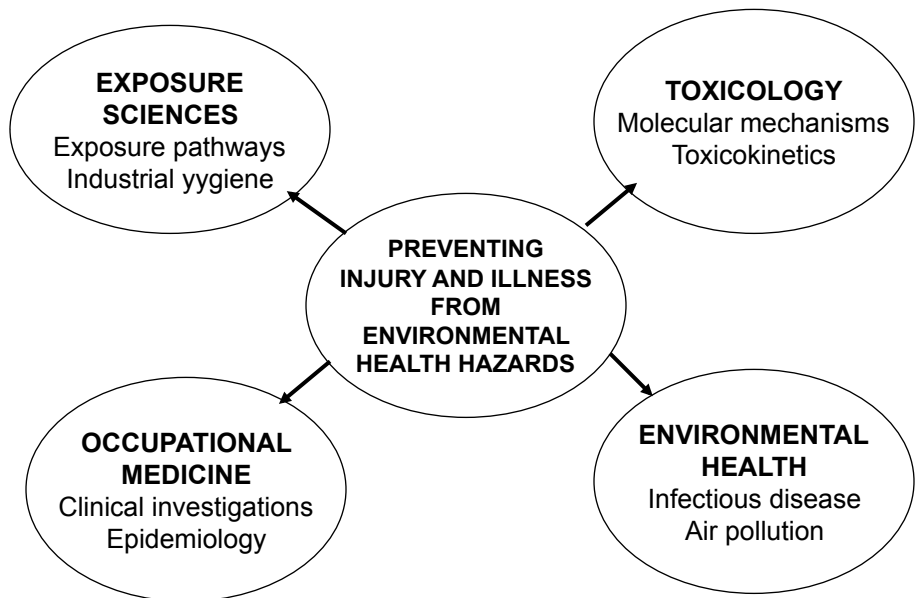


## Key Public Health Services

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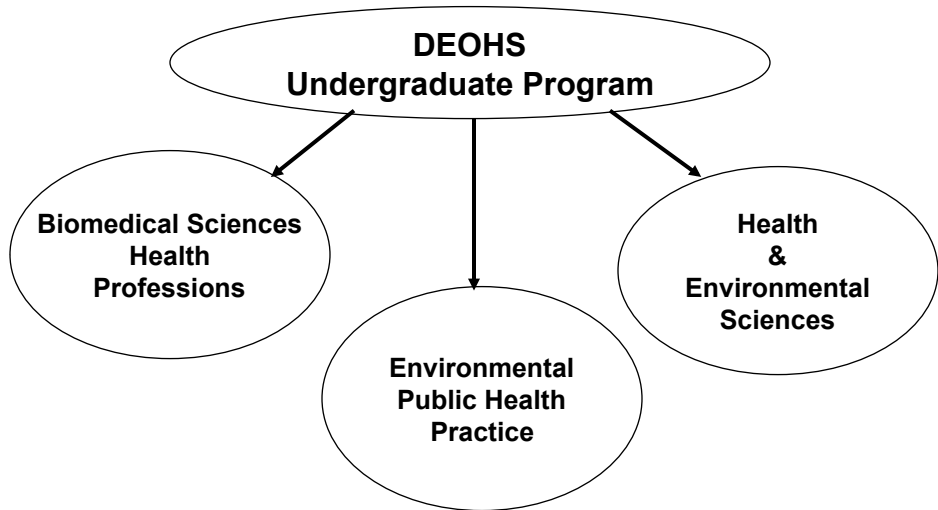
- Ensure safe drinking water
- Ensure that foods are free of contamination
- Protect from toxic exposures
- Prevent spread of communicable and vector-borne diseases
- Prepare for natural disasters
- Respond rapidly to disease outbreaks and natural disasters
- Provide community education to promote healthy lifestyles

## Environmental and Occupational Health Sciences



## Bachelor of Science, Environmental Health

### Emphasis Areas



Web site: <http://depts.washington.edu/ehug/>

*Health and the Environment*  
**Something in the Air**

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- **Miasma**
  - New Latin, from Greek: defilement; from *miainein*, to pollute
  - First known use: 1665
  - Miasmata is decomposing matter
- **Vitruvius, 1<sup>st</sup> century Rome**
  - ‘poisonous breath of creatures of the marshes’
  - Health and unhealthy places

*Health and the Environment*  
**Something in the Workplace**

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- **Bernardino Ramazzini**
  - 17<sup>th</sup> century Italian physician
  - “Father” of occupational medicine
- **“Disease of Workers”**
  - Hazards of chemicals and dusts
  - Physician, ask your patient, “What is your occupation?”



## *Health and the Environment* United States in the 19<sup>th</sup> Century

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- **Dr. Benjamin Rush**

- “Disease is the offspring of putrid vegetable and animal exhalation”
- Miasma produced by “filth acted upon by the hot sun in a moist state”



- **Sources of miasma**

- Marshes, spoiled vegetables, canvas from old tents, rotting books and paper
- Unburied human bodies, beached whales, fish entrails, privy wastes

## *Health and the Environment* England in the 19<sup>th</sup> Century

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- **Miasma as a medical theory**

- Causal agent of cholera
- Putrid vapors associated with filth and decay

- **Public health responses**

- Edwin Chadwick: report on sanitation reforms
- Florence Nightingale: care for wounded and dying soldiers in Crimean War
- Design of cities: green spaces; remove waste outside city boundaries

*Health and the Environment*  
England in the 19<sup>th</sup> Century

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- **John Snow and cholera**
  - Linked cholera outbreaks to water sources
  - Stopped use of water contaminated with human waste
- **Rise of the germ theory**
  - Louis Pasteur demonstrates existence of pathogenic organisms
  - Robert Koch isolates the specific organism that causes cholera
  - Anopheles mosquito identified as vector for a protozoan (malaria agent)

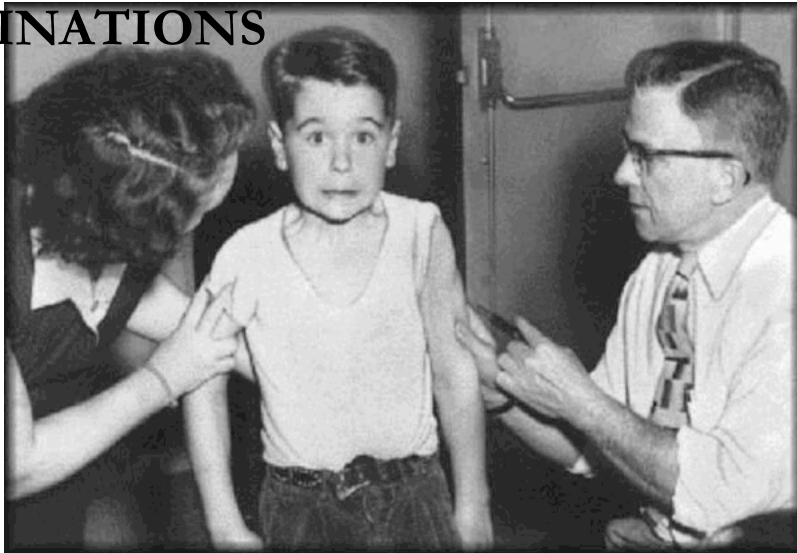
**Ten Great Achievements in  
Public Health**

1900-2000





## VACCINATIONS



**A few moments of discomfort can prevent a lifetime of suffering from the ravages of disease or death. Over 20 diseases can be avoided because of vaccines.**

### Children's Vaccines

<b>Disease</b>	<b>Baseline 20th Century Morbidity</b>	<b>1998 Morbidity</b>
Smallpox	48,000	0
Diphtheria	176,000	1
Pertussis	147,000	6,000
Poliomyelitis	16,000	1*
Measles	503,000	89
Mumps	152,000	606
Rubella	48,000	345
Influenza b	20,000	54

**MOTOR  
VEHICLE  
SAFETY**



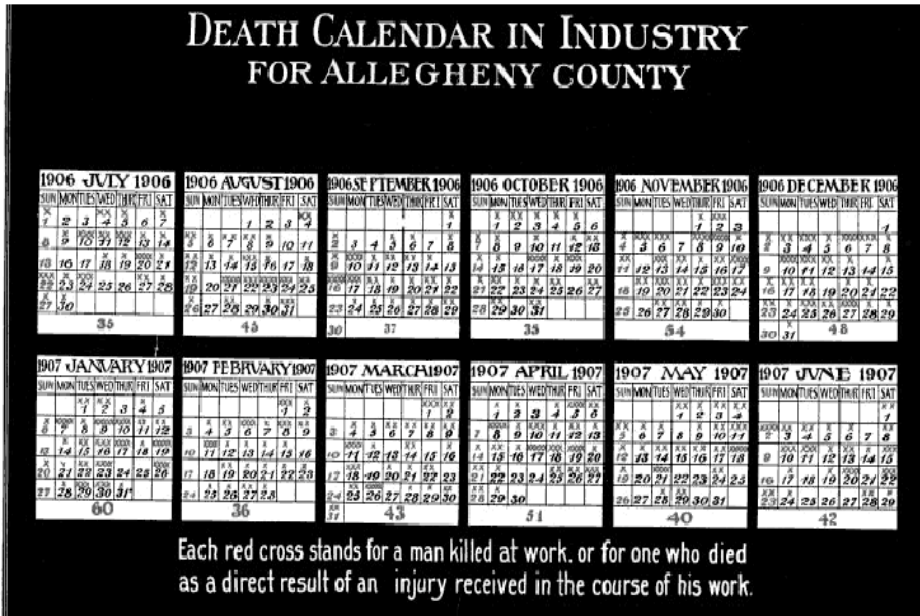
**The invention of the automobile created both a wonderful new means of transportation and a deadly new public health threat.**

**SAFER  
WORKPLACES**



**In the coal mining industry, improvements in workers' environmental health and safety have resulted in lower rates of fatal injury.**

FIGURE 1. Number of work-related deaths, by day — Allegheny County, Pennsylvania, July 1906–June 1907\*



\*In the original figure, each X is in red.  
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## CONTROL OF INFECTIOUS DISEASES



The 1918 influenza pandemic taught us the importance of disease surveillance using molecular epidemiology to identify new strains of organisms.

## **HEART DISEASE & STROKE**



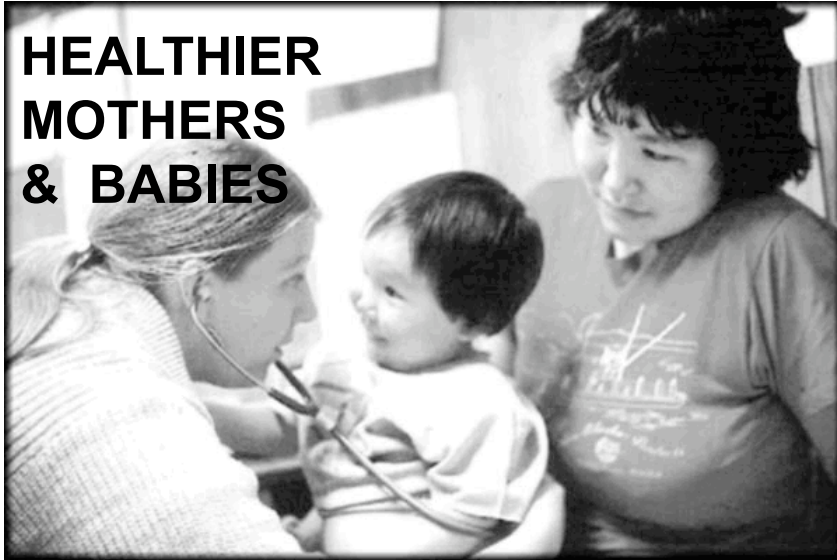
**Studies in the 1960s found that reducing behavioral risk factors would reduce the incidence of CVD.**

## **SAFER & HEALTHIER FOODS**



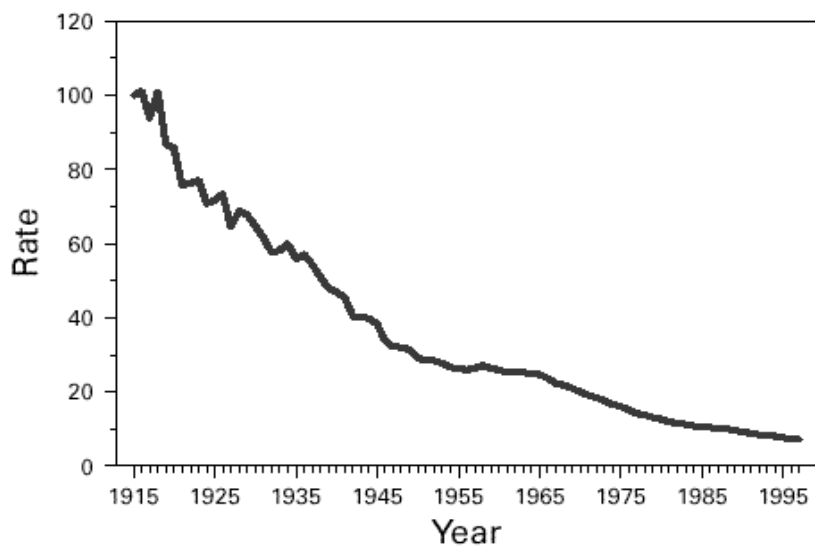
**Populations with diets rich in fruits and vegetables have a significantly lower risk of many types of cancer and decreased risk of cardiovascular disease.**

## HEALTHIER MOTHERS & BABIES



Improved care for women of childbearing age during preconception, pregnancy, delivery, and postpartum

Infant mortality rate,\* by year — United States, 1915–1997



\*Per 1000 live births.



## FAMILY PLANNING



In the early 1900s, distribution of information regarding contraception was generally illegal.

## FLUORIDATION OF DRINKING WATER



Thanks to water fluoridation and other health advances, we are retaining most of our teeth throughout our lifetime.

## **Tooth Decay: how bad was it?**

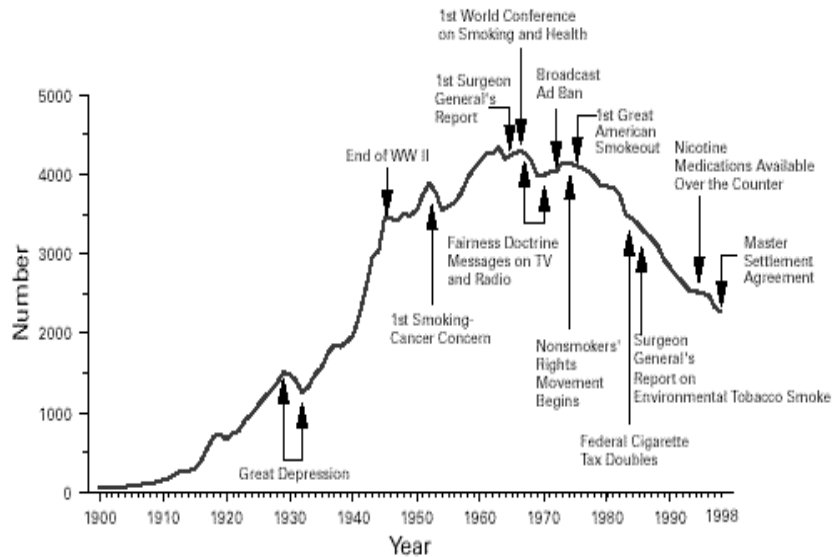
- Minimum standard for military service in World War I and World War II
  - Six opposing teeth
- Fluoridation reduced dental caries 50-70% in children in the 1940's

## **TOBACCO USE**



**Smoking has gone from being an accepted norm to being recognized as the #1 preventable cause of death and disability in the U.S.**

### Annual adult per capita cigarette consumption and major smoking and health events — United States, 1900–1998



Sources: United States Department of Agriculture; 1986 Surgeon General's Report.

## *Challenges for Environmental Public Health* Loss of Public Support

- Many Americans view public health as a government handout for impoverished people
- Government public health budgets dropped 25% between 1981 and 1993
- Budgets between 1994 and 1998 increased, but mostly for provision of medical care
- Current budget cuts at the state and local levels affect public health disproportionately



*Challenges to Public Health*  
**Biology of Aging Program**  
National Institutes of Health

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- **Overall objective**
  - elucidate the biochemical, genetic and physiological mechanisms of aging in humans and animal models
- **Ultimate goal**
  - develop molecular interventions to reduce and/or delay age-related degenerative processes in humans

*Challenges to Public Health*  
**Medicalization**

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“People are going to come in to their doctors with computerized medical records, genetic blueprints embedded on small plastic strips, like credit cards.”

-- Dr. Allen Roses, Vice-President of  
Glaxo Wellcome

## *Challenges to Public Health* Medicalization

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In the New Medicine genomic innovations will lead to individualized preventive medicine.

“A sort of public health, if you will.”

-- Randall Tobias, former CEO of Eli Lilly Pharmaceutical

## *Public Health and Sustainability* A New Partnership?

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- Blend of science, practice, and advocacy
- Common focus on prevention
- Alteration of basic values and community norms through risk communication
- Community-based actions to achieve broad social goals