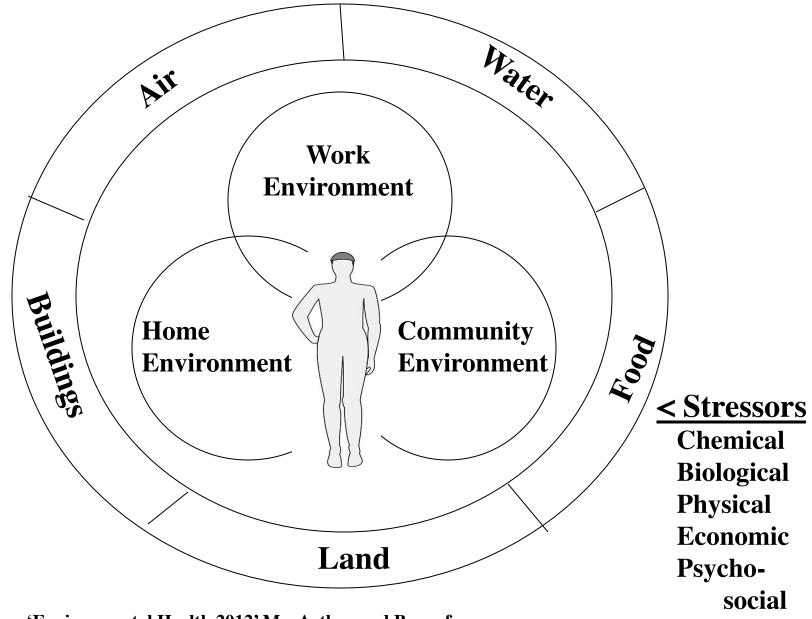
Exploring Environment and Health Connections

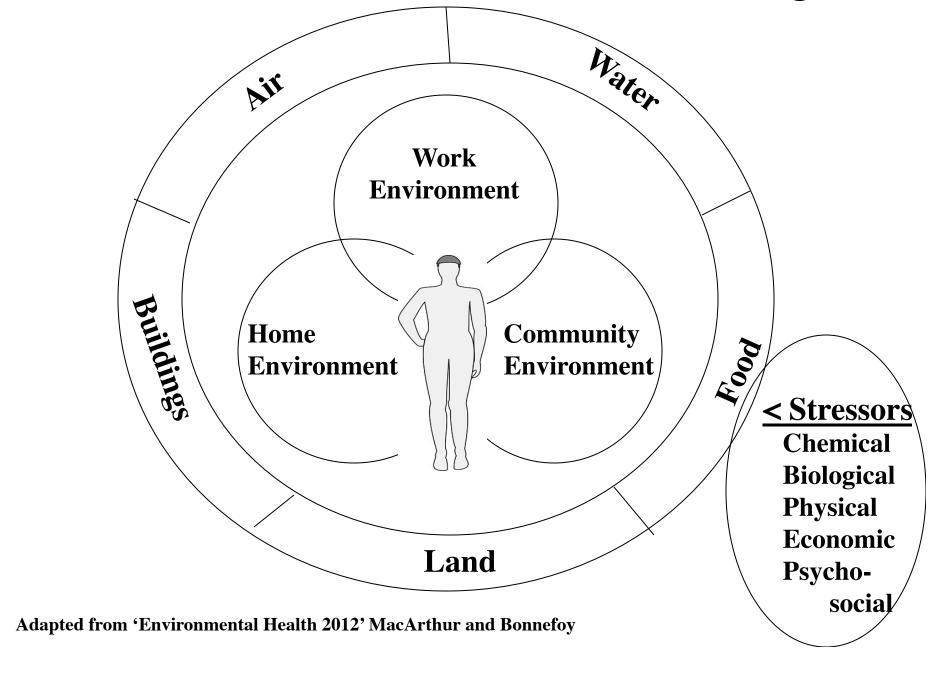
Occupational Health and Safety

Model for Environmental Health Knowledge



Adapted from 'Environmental Health 2012' MacArthur and Bonnefoy

Model for Environmental Health Knowledge



Hazard + Exposure + Host Factors = Risk

Hazard and Exposure Assessment

- Production process
- Frequency of exposures
- Duration of exposures
- Acute or chronic effects
 - Route of entry
 - Mechanism of action
- Adjacent workers
- 'Take home' exposures

Chemical Hazards

- Carbon monoxide
 - Forklifts, gas heaters
 - Oxygen transport; headache, nausea, death
- Metal fumes
 - Metal castings, welding, grinding
 - Lung diseases; cancer
- methyl ethyl ketone
 - Manufacture of plastics; cleaning agent
 - Skin damage; upper respiratory irritation

Biological Hazards

- Methicillin-Resistant Staph Aureus (MRSA)
 - Hospital and Community Acquired
 - Skin infections, systemic infections
- Molds and Fungus
 - Cooling towers
 - Respiratory irritation
- Blood borne infections
 - Health care facilities; emergency response; personal services

Physical Hazards

- Noise
 - Temporary or permanent hearing loss
- Vibration
 - Upper extremity; whole body
- Radiation (ionizing and non-ionizing)
 - X-equipment; welding (UV radiation)
 - Tissue heating; cancer?
- Heat
 - Agriculture; service work
 - Burns; heat stress

Psycho-Social Hazards

Stress

- Headache, absenteeism, ulcers, high blood pressure, 'psychosomatic' complaints
- Reduced productivity

Shift rotations

 Sleep disorders; GI upset; aggravation of chronic diseases; heart disease; cancer?

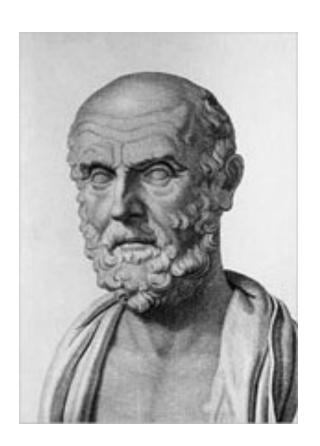
Violence

- Late night retail, mental hospitals
- Verbal abuse, intimidation

Hippocrates 460-377 BC

- Father of Medicine
- Noticed that Lead miners had unique health problems





Paracelsus (1493- 1541)

- A Physician, Astrologist, & Alchemist
- The father of toxicology
- 'dose makes the poison'



Bernadino Ramazzini (1633-1714)

- Treatment for Malaria
- First Text on Occupational Disease
 - De Morbis Artificum Diatriba





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

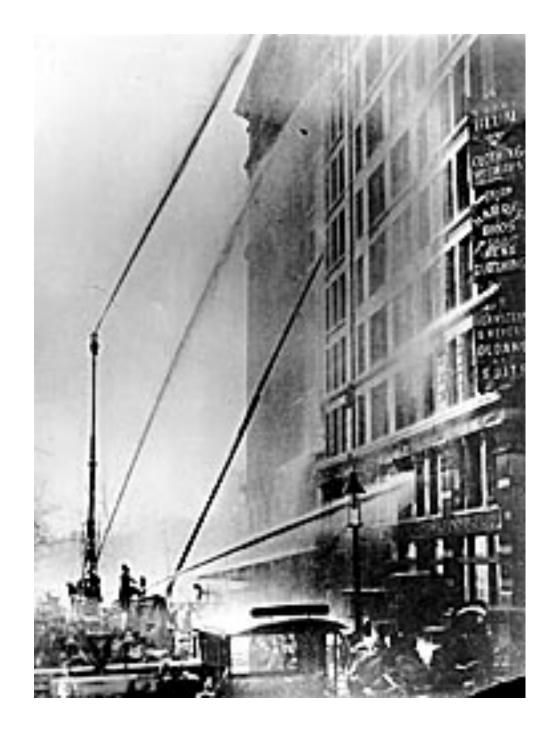
DEATH CALENDAR IN INDUSTRY FOR ALLEGHENY COUNTY

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Each red cross stands for a man killed at work, or for one who died as a direct result of an injury received in the course of his work.

^{*}In the original figure, each X is in red. Reprinted by permission of the Russell Sage Foundation (1).

March 25, 1911
Triangle Shirtwaist
Fire



Asch Building, Lower Manhattan, NYC

One of 790 tower loft buildings constructed in NYC 1900-1910, many with blocked exits; wooden, obstructed, or no fire escapes.





15 year old Window Washer Fatality



Sago Mine, W. VA January 2006 12 died

Crandall Canyon Mine, Utah; August 2007; 9 died

Tesoro Refinery Explosion

- April 2, 2010; WA
- 7 dead
- Labor & Industry investigates
- Chemical SafetyBoard investigates



Employed Civilians in the US

Type of business/activity	<u>Millions</u>
Services	47.2
Trade; retail and wholesale	27.2
Manufacturing	8.6
Finance, insurance, real estate	9.3
Transportation Utilities	8.5
Agriculture, forestry, fishing	3.5
Mining	0.6
Government	<u>5.9</u>
Total	131.5

Avg work week 34.3 hrs; population ~ 308M; ~ 7M private companies

Meaning of Work

- Survival: Wages pay for necessities
- Security: Assurance of stability in society
- Benefits: Insurance, vacation, retirement
- Enjoyment: Many fully enjoy their work
- Social Status: Our rank in society
- Identity: "I am construction worker; a CPA"
- Social contact: Social life provided by work
- Meaning: Fulfillment and importance

My Job Is Killing Me

9,000 disabling injuries per day One every second

150+ deaths each day
One every 9 seconds

16 injury related deaths137 illness related deaths



~80/year in Washington

Occupational Injuries and Illness

- Total Injuries and Illness:
 - 4.8 cases/100 FTE workers
 - Manufacturing, construction, agriculture (includes fisheries and forestry)
 - Doesn't include government employees, selfemployed workers, or small farms

• Illnesses:

- 249,000 total newly diagnosed cases
- 20/10,000 FTE workers
- Manufacturing, agriculture, transportation
- Noise-induced hearing loss, skin disease, asthma