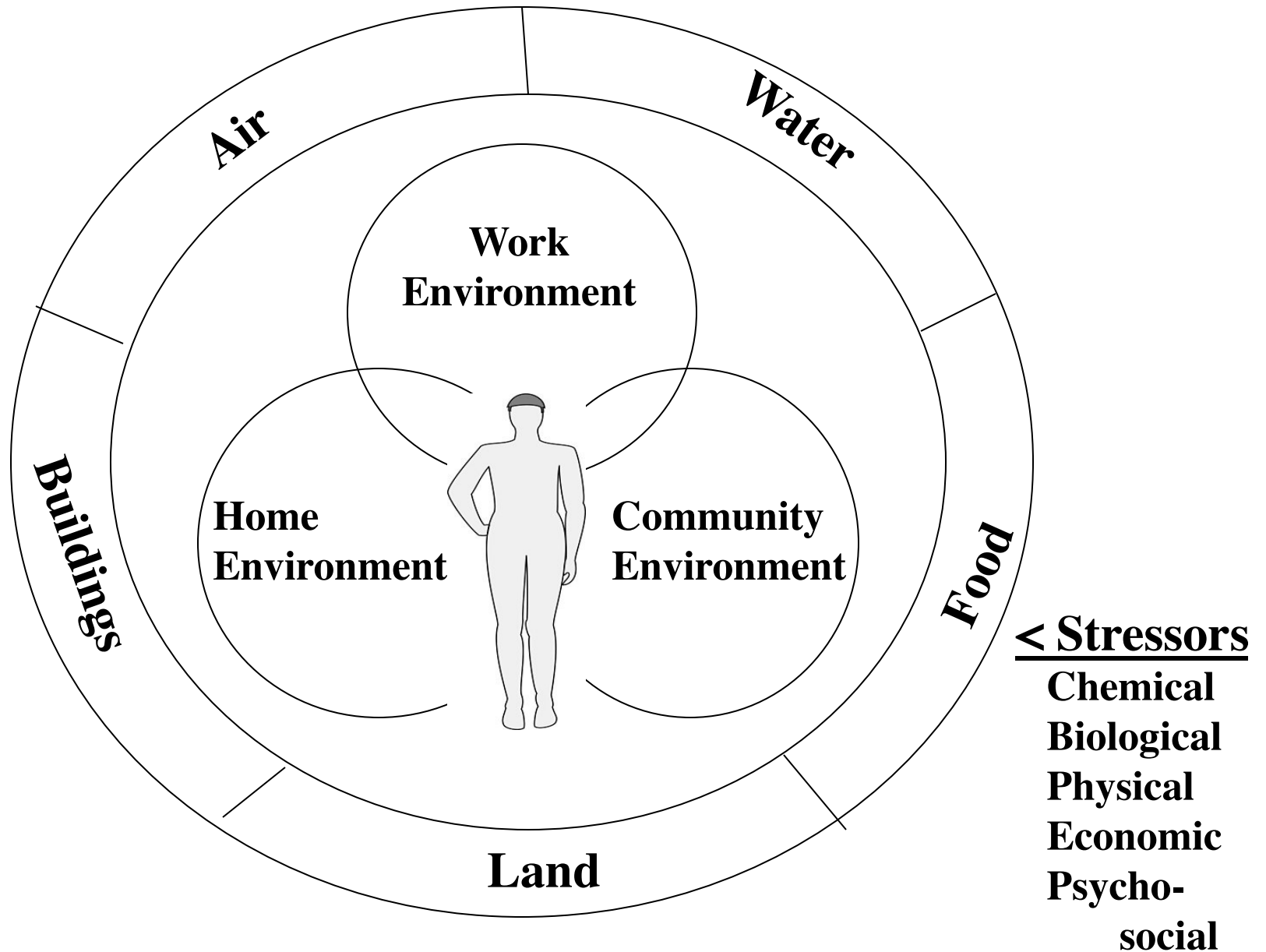


Exploring Environment and Health Connections

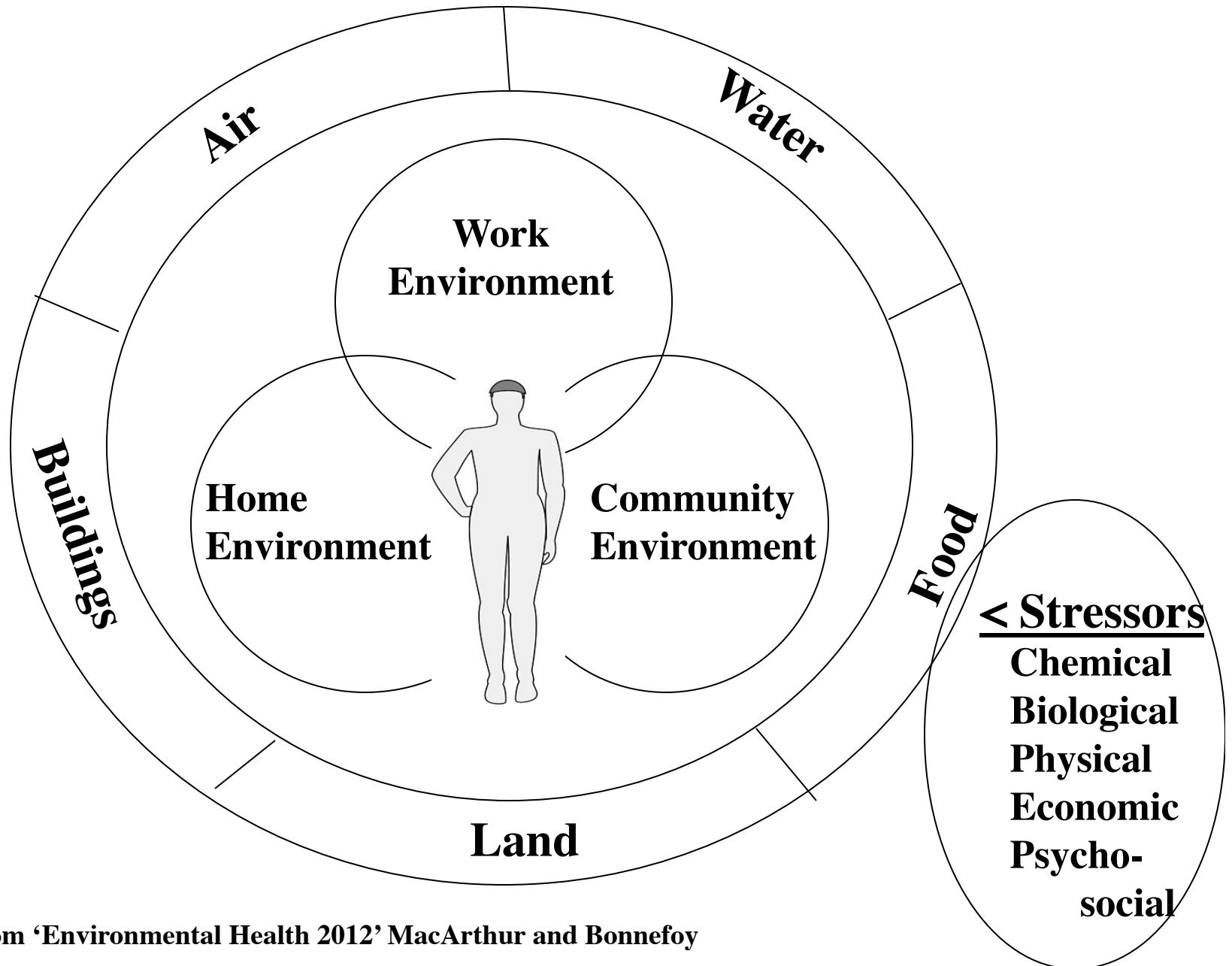
Occupational Health and Safety

Model for Environmental Health Knowledge



Adapted from 'Environmental Health 2012' MacArthur and Bonnefoy

Model for Environmental Health Knowledge



Adapted from 'Environmental Health 2012' MacArthur and Bonnefoy

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

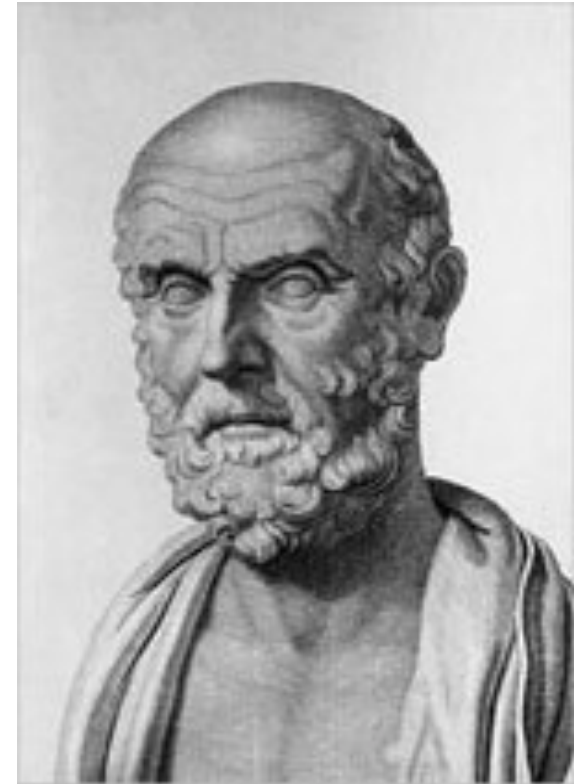
- Noise
 - Temporary or permanent hearing loss
- Vibration
 - Upper extremity; whole body
- Radiation (ionizing and non-ionizing)
 - X-equipment; welding (UV radiation)
 - Tissue heating; cancer?
- Heat
 - Agriculture; service work
 - Burns; heat stress

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)

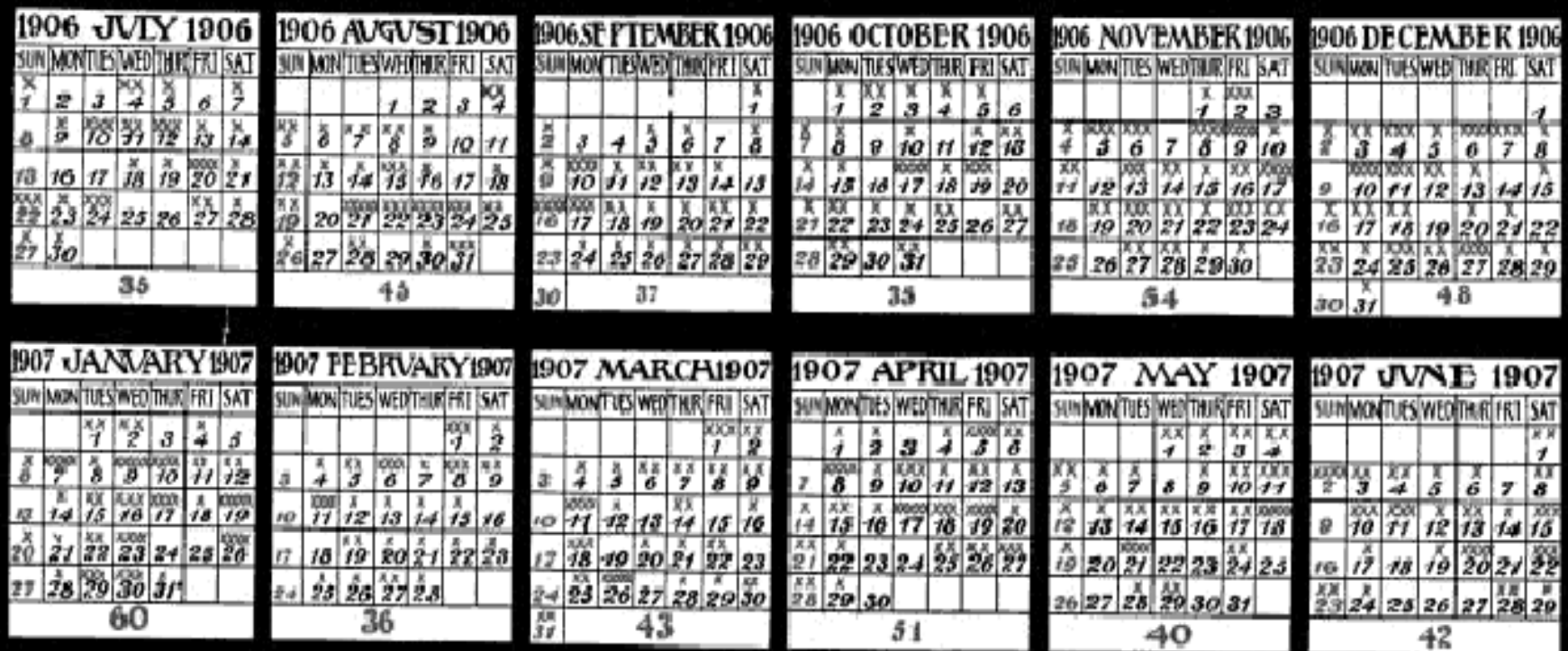
- Treatment for Malaria
- First Text on Occupational Disease
 - *De Morbis Artificum Diatriba*





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

DEATH CALENDAR IN INDUSTRY FOR ALLEGHENY COUNTY



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.





Location where carriage fell

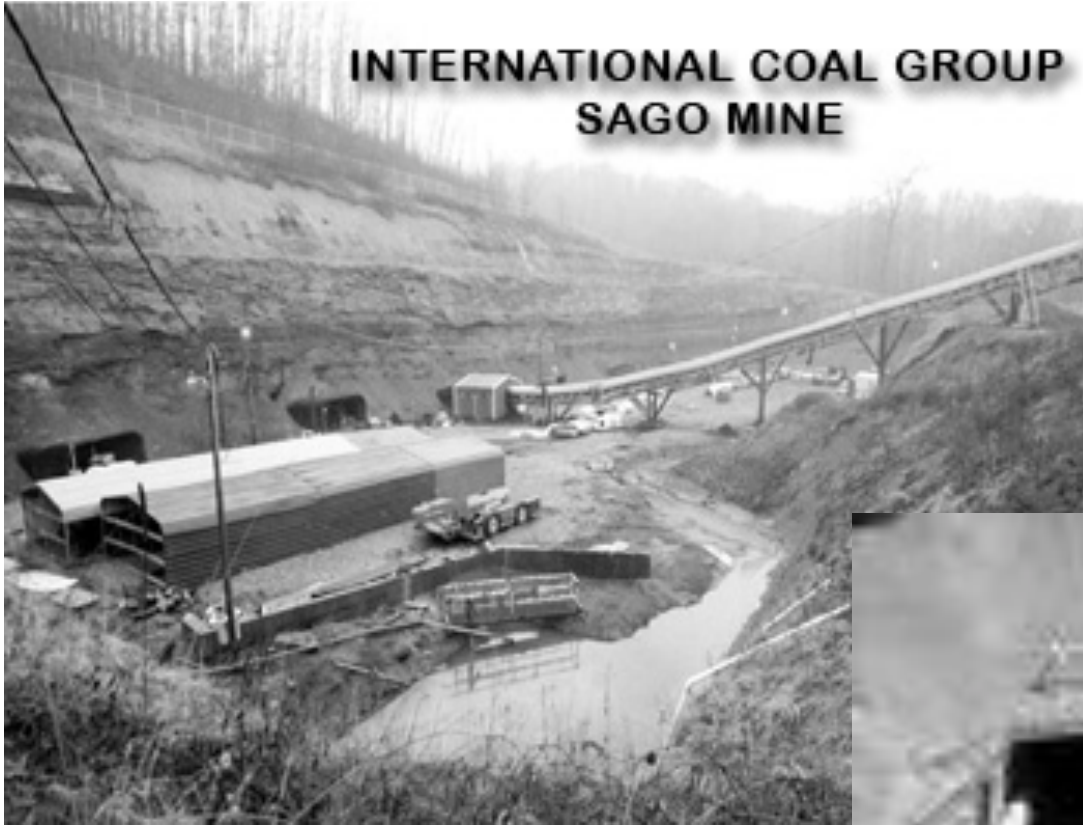


15 year old Window Washer Fatality



**INTERNATIONAL COAL GROUP
SAGO MINE**

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 Safety Board investigates



Employed Civilians in the US

<u>Type of business/activity</u>	<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
<u>Government</u>	<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 deaths
137 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, self-employed 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