Health & Safety Lessons From Other Public Health Professions
Techniques and discoveries we may be missing that could help us protect our workers

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Learning Objectives

- Define "public health" and instill an understanding of its importance to the origins of the health & safety professions

- Discuss examples of advances in various public health disciplines that can assist the health & safety professions in achieving stated goals

- Instill an awareness of the professional growth opportunities in the field and highlight key references

Outline

- Part 1: Brief history of public health and its relationship to occupational health & safety

- Part 2: Three examples of public health efforts

- Part 3: Possible personal and professional development opportunities in the field

Typical Educational Backgrounds of H&S Professionals

Public Health

Engineering

Sciences

Other

H&S Career

Retirement
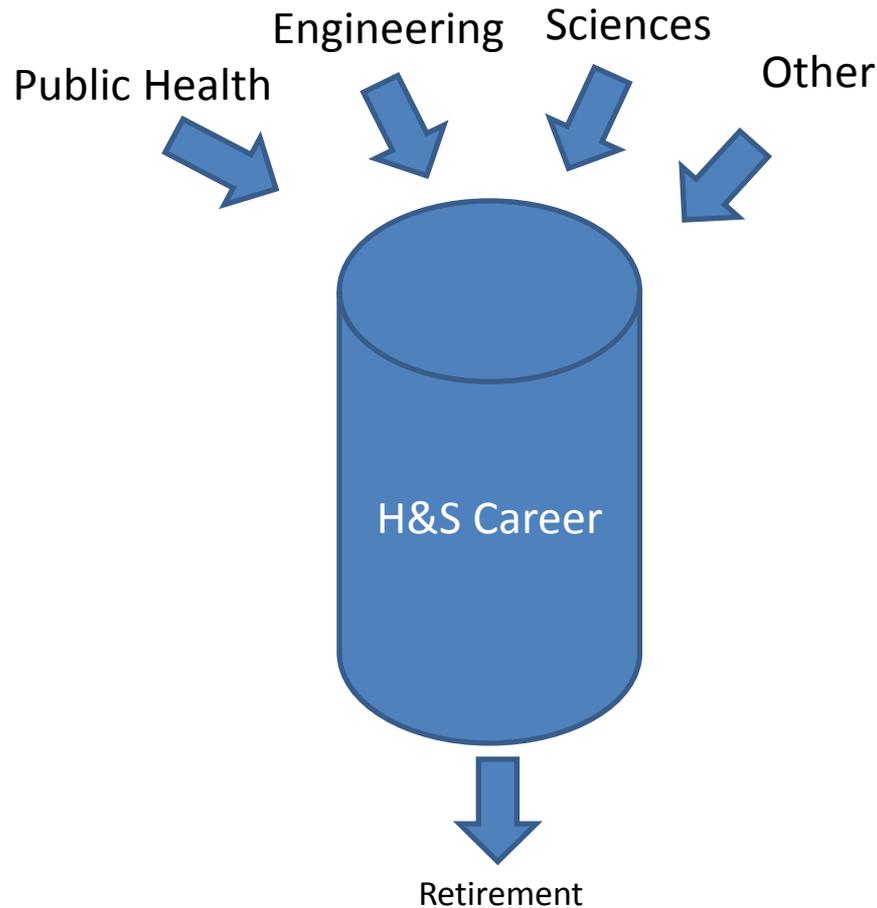
Note:
4,700 colleges and universities in the US. Only 59 accredited Schools of Public Health

Opinion: Perhaps the Biggest Barrier to Understanding "Public Health" is the term "Public"

What image comes to mind when you hear these commonly used terms?

- Public restrooms
- Public housing
- Public schools
- Public transit
- Public assistance
- Public works

- Public property
- Public telephone
- Public access
- Public disgrace
- Public indecency
- Public intoxication

The Parable of the Doctor and Epidemiologist

"The river usually flows lazily through the middle of town, but today it is a torrent carrying human bodies. Some, still alive, are gasping for air and thrashing the water.

Approaching the river to enjoy lunch on its banks, a doctor and an epidemiologist, horrified by what they see, begin to haul people out of the water. There are no signs of violence, but the victim's eyes are glazed, their weak pulses racing.

The doctors cannot keep up with the flow of bodies. They save a few and watch helplessly as others drift beyond them.

Suddenly, the epidemiologist lowers an old man to the ground and starts to run. "What are you doing" yells the doctor. "For God's sake, help me save these people!"

Without stopping, she yells back over her shoulder, "I'm going upstream to find out why they are falling in."

From: Pendergrast, M. Inside the Outbreaks Houghton Mifflin Harcourt 2010

Part 1: Definition of "Public Health"

Public health is the study and practice of managing illness and injuries, and promoting the wellness of *populations* through systematic, population-based solutions

Public health is based on five core disciplines:

1. Biostatistics
2. Epidemiology
3. Occupational and Environmental Health Sciences
4. Management, Policy and Community Health
5. Health Promotion and Behavioral Sciences

Where It All Started: A Brief History

- Prehistoric populations shared the belief that diseases and injuries were caused by malevolent supernatural forces

- Primitive societies designated "shamans" who were specially trained to intervene on a spiritual and physical level

- Likely the first organized approach to disease and injury

Brief History

- Hippocrates (460 - 370 BC):
  - Questioned supernatural causes of disease
  - Questioned the effect of water quality on community health
  - Considered to be the founder of western medicine

Brief History

– Dark Ages (476 - 800 AD)

- Epidemics common

- Up to 2/3 population in European cities died in the first two years

- By 1350 AD, public health initiatives were in place to reduce the spread of the disease

Brief History

- – The Renaissance (1400 -1700)
  - • Rebirth in thinking of the connections between nature and humans
- – Paracelsus (1493-1541)- Father of toxicology
  - • *All things are poison, and nothing is without poison, only the dose permits something not to be poisonous.*
- – Bernardino Ramazzini (1633-1714)
  - • "Diseases of Workers" – seminal work in occupational health

Brief History

- 1700-1800
  - Industrial Revolution
    - Migration to the cities led to overcrowding and poor sanitation
    - Miasma theory
      - poisonous vapor believed to be made up of particles from decomposing material that could cause disease and could be identified by its foul smell
      - Although incorrect, the theory recognized the relation between filth and disease, encouraged cleanliness, and paved the way for public health reform.

Brief History

- ## 1800-1900
  - John Snow (1813-1858)-Father of Epidemiology
    - Traced source of major cholera outbreak to a pump handle on Broad Street in London, England
  - Alice Hamilton (1869-1970)
    - First woman faculty member at Harvard Medical School
    - Pioneer of the study of occupational disease
  - American Public Health Association formed (1872)
    - Oldest and largest association of Public Health professionals in the world

Brief History

- 1900 – present
  - US Public Health Service created (1902)
    - The Marine Hospital Service (established 1798) becomes the Public Health Service.
  - Typhoid Mary (1907)
    - First "healthy carrier" of typhoid identified as a New York City cook; her life in and out of quarantine serves as a case study of public health laws and ethics
  - US Meat Inspection Act (1906)
    - After publication of Upton Sinclair's The Jungle, this act was established to condemn meat unfit for human consumption
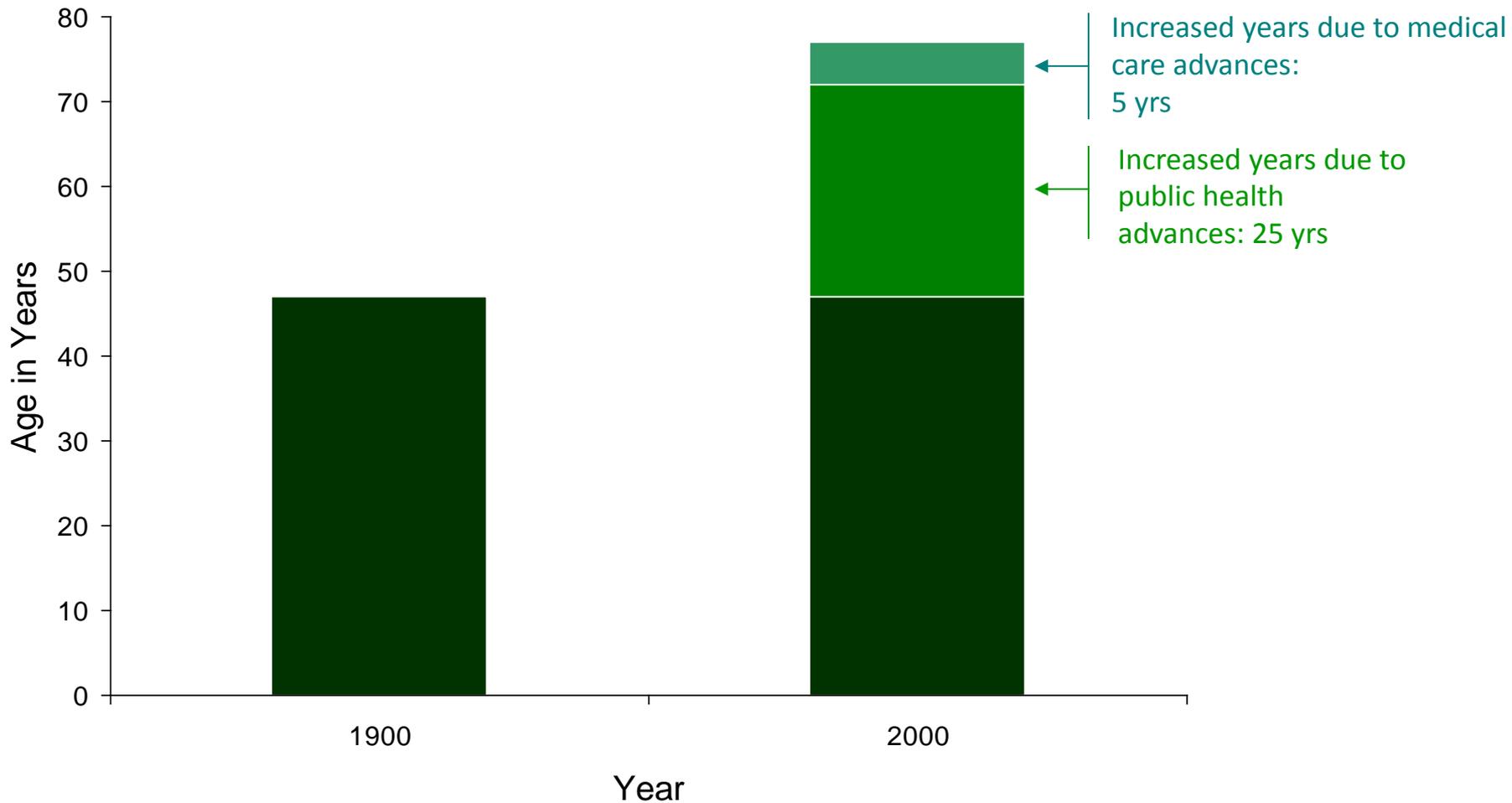
Brief History

- 1900 – present
  - First School of Public Health established in US (1913)
    - Johns Hopkins University
  - CDC (1946)
    - Originally the Communicable Disease Center, early efforts focused on malaria control
  - WHO (1948)
    - The directing and coordinating authority for health within the United Nations
  - OSHA and EPA (1970)
    - Established to address the growing public demand for safer workplaces, cleaner water, air and land

The Significance of Public Health in America:

64% Increase in Average Life Expectancy Over 100 Year Period

Increased years due to medical care advances: 5 yrs

Increased years due to public health advances: 25 yrs

Modern Milestones in Public Health

- Vaccinations
- Motor-vehicle safety
- Safer workplaces
- Control of infectious disease
- Decline in deaths from coronary heart diseases and stroke

- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

The 10 Essential Public Health Services

1. Monitor health status to identify community health problems.

   - *What's going on in my population? How healthy are we?*

2. Diagnose and investigate health problems and health hazards in the community.

   - *Are we ready to respond to health problems or threats in my population?*

3. Inform, educate, and empower people about health issues.

   - *How well do we keep all segments of our population informed about health issues?*

4. Mobilize community partnerships to identify and solve health problems.

   - *How well do we really get people engaged in local health issues?*

The 10 Essential Public Health Services

5. Develop policies and plans that support individual and community health efforts.

   - What local policies in both government and the private sector promote health in my population? How effective are we in setting local health policies?

6. Enforce laws and regulations that protect health and ensure safety.

   - When we enforce health regulations, are we technically competent, fair and effective?

7. Link people to needed personal health services and assure the provision of healthcare when otherwise unavailable.

   - Are people in my population receiving the medical care they need?

The 10 Essential Public Health Services

8. Assure a competent public health and personal health care workforce.

   - Do we have a competent public health staff? How can we be sure that our staff is current?

9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services.

   - Are we doing any good? Are we doing things right? Are we doing the right things?

10. Research for new insights and innovative solutions to health problems.

   - Are we discovering and using new ways to get the job done?

But Be Careful About Some Common Public Health Misconceptions

- In public health, it is necessary for the EVIDENCE to lead the way to decision making rather than relying on assumptions

- Consider these common assumptions:
  - Lengthening prison sentences serves as a deterrent to crime
  - The distribution of clean needles promotes IV drug use
  - Discussions with kids about sex leads to increased sexual activity

Part 2: Three Public Health Examples

1. Broken Windows Theory

2. Haddon's Ten Countermeasures

3. Guinea worm eradication

1. Broken Windows Theory

- Theory founded in the discipline of criminology, focused on norm setting and signaling effect
  - Monitoring of urban environments: preventing small crimes creates an atmosphere of order and lawfulness
- Experiment: 2 abandoned cars, one in Bronx, NY and the other in Palo Alto, CA
  - The car in NY was stripped immediately. The car in CA remained untouched. Then the researchers broke the windshield, and then car was stripped
- The strategy of addressing minor crimes had some initial success
- But the technique led to "stop and frisk" resulting in societal backlash
- Possible lessons for the application of "behavioral based safety" techniques?

2. Haddon's 10 Countermeasures

- In 1966 Dr. William Haddon, appointed by President Johnson, created the National Highway Traffic Safety Administration

- He was instrumental in setting federal safety standards for motor vehicles, motorcyclist helmet laws, and drunk driving legislation

- In 1970, he published his hallmark work: "On escape of tigers: an ecological note"

Haddon's 10 Countermeasures

1. Prevent the initial marshalling of the form of energy
2. Reduce the amount of energy marshalled
3. Prevent the release of the energy
4. Modify the rate of spatial distribution of release of energy from its source
5. Separate in space or time the energy being released from the susceptible structure

6. Separate the energy being released from the susceptible structure by interposition of a material barrier
7. Modify the contact surface, subsurface, or basic structure which can be impacted
8. Strengthen the structure which might be damaged by the energy transfer
9. Move rapidly in detection and evaluation of damage and to counter its continuation and extension
10. Address all measures which fall between the emergency period following the damaging energy exchange and the final stabilization of the process

Are we availing ourselves of all these techniques to protect our workers?

3. Guinea Worm Eradication

- Guinea worm is set to become only the second human disease in history to be eradicated (what is the other one?)
- The first to be eradicated without the use of a vaccine or medicine
- In 1986 there were an estimated 3,500,000 cases worldwide. In 2016 there were 25
- Parasitic infection caused by the ingestion of water containing a nematode *Dracunculius medinensis*
- Once ingested, the worm grows to over a meter in length and then emerges through the skin via painful lesions
- To seek relief from the burning sensation of the emergent worm many infected persons go to water sources, which is where the worm releases its eggs and completes the reproductive cycle
- Removal of the worm is a painful process where the parasite is wrapped on a stick or gauze over a period of weeks to extract it from the body. Secondary infections often occur.

How Did They Achieve Such Success Amongst the Poorest and Most Neglected Populations on the Planet?

- Researched the life cycle of the parasite

- Developed community-based interventions centered on education and behavior modification with local tribes

- Engaged local leadership

- Designed simple and inexpensive water filtration systems

- Self policing to keep infected persons out of water sources

Can these same strategies be used to reduce workplace injuries and deaths?

Summarizing Part 2

- There is some amazing work going on in other public health fields that we can learn from:

  - Broken windows: behavioral based safety is great but perhaps can be pushed too far

  - Haddon's 10 countermeasures provide a playbook for how we can address current and emergent issues

  - Guinea worm eradication demonstrates how success can be achieved, even in difficult circumstances

  - *And there's many more such efforts we can learn from not listed here!*

Part 3: Possible Professional Development Opportunities

- Public health certificate programs
  - Typically 5 courses covering the breadth of public health basics
  - https://sph.uth.edu/academics/graduate-certificate-programs/public-health-certificate/
    - At UT SPH, upon completion of the certificate program (which can be done on-line or live), the credits accrued can count if one wishes to then pursue a maters degree

- Masters and doctoral academic programs
  - MS or MPH
  - PhD or DrPH

- Certification in Public Health (CPH)
  - https://www.nbphe.org/

US Public Health Service

- One of the nation's seven uniformed services

- Aligned under the Department of Health and Human Services

- Leadership by the Surgeon General

- Commissioned officer ranks, privileges, and benefits are similar to the US Navy

- 12 professional categories including Environmental Health Officer

Summary

- The origins of the health & safety professions reside within the core of public health

- As various public health specialties have evolved, cross – communication has been impacted

- Yet valuable lessons can be learned and applied from other public health professions that can help us collective achieve our goal of keeping workers safe and healthy

- Professional growth opportunities also exist within the field

Final Thought from the US PHS That Captures the Essence of Public Health

"There is no task more noble than working to protect the safety and health of persons whose names you will never know"

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