Occupational and Environmental Health in the Public Health Model

Boris D. Lushniak, MD, MPH
Rear Admiral, Deputy Surgeon General USPHS

Disclosure of Conflicts of Interest

Boris D. Lushniak, MD, MPH

- I do not have any relevant financial relationships with any commercial interests
- No off-label discussion of drugs or devices
- Work supported by US Government (DHHS, PHS, FDA, CDC/NIOSH)

…to present the public health view

- How does occupational and environmental health fit into the public health model?
Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

The science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals.

– CEA Winslow, 1920

Public Health

Deals with preventive rather than curative aspects of health

Deals with population-level, rather than individual-level health issues
10 Great Public Health Achievements-US 1900-1999

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of water
- Recognition of tobacco as a health hazard

MMWR 1999 Apr 2;48(12):241-3.

Public Health US 2009

- 6.22 infant deaths per 1000 live births (45)
- 78.11 life expectancy in years (49)
- Health care expenditure
  - 17.6 % GDP (1)
  - $2.5 trillion
  - $8160 per person

Causal Pathway of Disease or Disability

- Environment (pre-exposure)
- Hazard/agent
- Behavior/risk factor
- Exposure
- Pre-symptomatic phase
- Apparent disease
- Death
Problem

Surveillance: What is the problem?

Risk Factor Identification: What is the cause?

Intervention Evaluation: What works?

Implementation: How do you do it?

Core Public Health Functions

- Assessment and monitoring of the health of communities and populations at risk
  - identify health problems and priorities - surveillance
- The formulation of public policies
  - designed to solve identified local and national health problems and priorities
- Assure that all populations have access to appropriate and cost-effective care
  - including health promotion and disease prevention services
  - evaluation of the effectiveness of that care
### Public Health Surveillance

- Ongoing, systematic collection, analysis, and interpretation of health-related data
- Essential to the planning, implementation, and evaluation of public health practice
- Closely integrated with the timely dissemination of these data to those responsible for prevention and control

### Uses of Public Health Surveillance

- Estimate magnitude of the problem
- Determine geographic distribution of illness
- Portray the natural history of a disease
- Detect epidemics/define a problem
- Generate hypotheses, stimulate research
- Evaluate control measures
- Monitor changes in infectious agents
- Detect changes in health practices
- Facilitate planning

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Workplace Injuries and Illnesses 2009

- Private industry employment 111,469,100
- Nonfatal injuries and illnesses
  - 3.6 per 100 FTEs private industry
  - 3.3 million cases
  - 1.1 per 100 were cases with days away from work
  - 965,000
- Fatal work injuries
  - 4,340 injuries

www.bls.gov

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Rates of Occupational Skin Diseases by State 2001

- Rate per 10,000 workers
  - A = 7
  - B = 4.7
  - C = 3.8
  - D = 2.6
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Rates of Occupational Skin Diseases
1984-2001 BLS Annual Survey

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Injury | Rescuers (n=279) | Nonrescuer (n=511) | Total (n=790)
--- | --- | --- | ---
Inhalation | 118 (42%) | 268 (52%) | 387 (49%)
Ocular | 108 (19%) | 96 (19%) | 204 (26%)
Sprain or strain | 48 (10%) | 64 (13%) | 110 (14%)
Laceration | 23 (5%) | 57 (12%) | 80 (10%)
Contusion | 54 (11%) | 56 (11%) | 110 (14%)
Fracture | 13 (5%) | 33 (6%) | 46 (6%)
Burn | 6 (2%) | 33 (6%) | 39 (5%)
Closed head | 3 (1%) | 11 (2%) | 14 (2%)
Crush | 3 (1%) | 5 (1%) | 8 (1%)

FIGURE. Percentage of firefighters who used respiratory protection during and following the World Trade Center attacks, by time period and type of respirator — New York City, September 2001

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Data Sources and Methods for Surveillance

- Notifiable diseases
- Laboratory specimens
- Vital records
- Sentinel surveillance
  - Monitoring of key health events through sentinel:
    - Sites, Events, Providers
    - SENSOR
- Registries
- Surveys
- Administrative data systems
- Other data sources

BLS Annual Survey

- National annual survey of about 176,000 employers conducted by US Dept of Labor, Bureau of Labor Statistics (BLS) and State agencies
- Participant employers are selected to be a representative sample of all private industries
- Based upon forms [OSHA-300 logs] which are completed by employers for occupational injuries/illnesses
- More extensive information gathered for only those cases with days away from work
Population-based surveys
- National Health Interview Survey
  - Conducted since 1957
  - 35-40,000 households (75-100,000 individuals)
  - Occupational Health Supplement (OHS) 1988
  - OHS 2010
  - National Health and Nutrition Examination Survey
- Provider-based surveys
  - National Hospital Discharge Survey
  - National Ambulatory Medical Care Survey

National Health Interview Survey
Occupational Health Supplement 2010
- Supplement funded by NIOSH in October 2008
- Addresses a critical need for population-based occupational health surveillance
- Interviews conducted on representative sample of households selected using a multistage cluster sample design
- Info on work history, exposures, asthma, carpal tunnel syndrome, dermatitis

Information Loop of Public Health Surveillance
Core Public Health Functions

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Healthy People
www.healthypeople.gov

- Developed in 1979 by the Department of Health and Human Services
- Science-based, 10 year national objectives
- For promoting health and preventing disease
- Includes a vision, mission, goals, focus areas, criteria, objectives and action plans for achieving the targets

Healthy People 2020

- Launched Dec 2010
- 600 objectives, 1300 measures
- Each objective has a reliable data source, a baseline measure, and a target for specific improvements

www.healthypeople.gov/HP2020

Healthy People 2020
Occupational Safety and Health

- Reduce deaths from work-related injuries
  - Target: 3.6 deaths per 100,000 (10%)
  - Mining, construction, transportation, agriculture
- Reduce nonfatal work-related injuries
  - Target: 3.8 per 100 (10%)
- Reduce injury and illness from overexertion or repetitive motion
  - Target: 26.64 cases per 10,000 (10%)

www.healthypeople.gov/HP2020
Healthy People 2020
Occupational Safety and Health

- Reduce pneumoconiosis deaths
  - Target: 2187 deaths (10%)
- Reduce deaths from work-related homicides
  - Target: 565 deaths (10%)
- Reduce work-related assaults
  - Target: 7.6 per 10,000 (10%)
- Reduce persons with elevated blood lead
  - Target: 20.2 per 100,000 (10%)

Healthy People 2020
Occupational Safety and Health

- Reduce occupational skin diseases or disorders
  - Target: 4 per 10,000 (10%)
- Reduce new cases of work-related, noise-induced hearing loss
  - Target: 2 per 10,000 (10%)
- (Developmental) Increase the proportion of employees who have access to workplace programs that prevent or reduce employee stress

Healthy People 2020
Environmental Health

- Outdoor air quality
  - Reduce the number of days the Air Quality Index exceeds 100
  - Increase use of alternative modes of transportation for work
  - Reduce air toxic emissions

www.healthypeople.gov/HP2020
Healthy People 2020
Environmental Health

- Water quality
  - Increase proportion of persons receiving water that meets regulations of Safe Drinking Water Act
  - Reduce waterborne disease outbreaks
  - Reduce domestic water withdrawals with respect to use and conservation
  - Increase days that beaches are open and safe for swimming work


Healthy People 2020
Environmental Health

- Toxics and waste
  - Reduce blood lead levels in children
  - Minimize the risks posed by hazardous sites
  - Reduce pesticide exposure that result in a visit to a health care facility
  - Reduce the amount of toxic pollutants released
  - Increase recycling of municipal solid waste


Healthy People 2020
Environmental Health

- Healthy homes and healthy communities
  - Reduce indoor allergen levels
  - Increase number of homes with radon mitigation systems
  - Increase new homes with radon-reducing features
  - Increase schools with healthy and safe physical school environments
  - (Developmental) pre-1978 housing tested for lead
  - Reduce homes found to have lead-based paint or related hazards
  - Reduce housing units with moderate or severe physical problems

Healthy People 2020
Environmental Health

- Infrastructure and surveillance
  - Reduce exposure to selected chemicals as measured by blood and urine concentrations
  - Arsenic, cadmium, lead, mercury, chlordane, DDT
  - Beta-HCH, parathions, chlorpyrifos, phenoxybenzoic acid, PCBs, dioxins
  - Bisphenol A, perchlorate, phthalate, BDE
- Global environmental health
  - Reduce global burden of disease due to poor water quality, sanitation and insufficient hygiene

Healthy People 2020
Implementation Framework

- MAP-IT
  - Mobilize -- partnerships
  - Assess -- needs and assets
  - Plan -- clear objectives and concrete steps
  - Implement -- workplan, POC, communication plan
  - Track -- evaluate and track progress
- Using Healthy People to make the case for funding

National Occupational Research Agenda

- Unveiled by NIOSH April 1996
- Input from 500 organizations / individuals
- Provide a national framework to guide occupational safety and health research
  - Need to target research due to fiscal constraints and changing workplaces / workforce
- Provide mechanism to promote interaction among the public and private sectors
NORA 2nd Decade 2006

- Sectors approach to define and meet high priority needs
- Sector Councils
  - Agriculture, forestry, and fishing
  - Construction
  - Healthcare and social assistance
  - Manufacturing
  - Mining
  - Services
  - Transportation, warehousing, and utilities
  - Wholesale and retail trade
- Set goals, develop strategies, encourage partnerships, promote practices

The National Prevention Council
(National Prevention, Health Promotion, and Public Health Council)

Role/Responsibility:
Prioritize and align prevention efforts across the federal government and the nation

Composition:
- Chaired by the Surgeon General
- Council members: 17 federal departments
- Advisory Group: up to 25 non-federal members

http://www.healthcare.gov

Council Members

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<tr>
<th>Bureau of Indian Affairs</th>
<th>Department of Labor</th>
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<td>Corporation for National and Community Service</td>
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**National Prevention Council: Charge**

- Develop the National Prevention and Health Promotion Strategy (National Prevention Strategy)
- Provide ongoing leadership and coordination of federal prevention and health promotion efforts
- Produce an Annual Status Report on the National Prevention Strategy progress

**National Prevention Strategy**

Provide Recommendations and Action Items
- Align and target federal prevention and health promotion efforts
- Align with existing national efforts, such as:
  - Healthy People 2020
  - National Quality Strategy
  - First Lady’s “Let’s Move!” campaign
  - America’s Great Outdoor Initiative

**Approach**

Work across sectors
- Catalyze public and private partnerships:
  - Federal, state, tribal, local, and territorial
  - Private, non-profit, faith, community, labor
- Focus on where people live, learn, work, pray and play
  - Community, schools, worksite, institutions, etc.
- Eliminate disparities
Working together to improve the health and quality of life for individuals, families, and communities by moving the nation from a focus on sickness and disease to one based on prevention and wellness.

Increase the number of Americans who are healthy at every stage of life.

1. Healthy and Safe Community Environments
2. Clinical and Community Preventive Services
3. Empowered People
4. Eliminate Health Disparities
Targeted Priorities

- Tobacco Free Living
- Preventing Drug Abuse & Excessive Alcohol Use
- Healthy Eating
- Active Living
- Injury and Violence Free Living
- Reproductive and Sexual Health
- Mental and Emotional Well-Being

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