Epidemiologic Understanding of the UN Sustainable Development Goals

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SUSTAINABILITY RESEARCH and PRACTICE SEMINAR

OCTOBER 18, 2023
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Public Health Sciences

Epidemiologic Understanding of the UN Sustainable Development Goals

Wednesday, 12:00 to 12:50 pm in person (255 A/B Sykes Student Union) and in our Zoom room: https://wcupa.zoom.us/j/91259797459, passcode: 194422
Epidemiology

Sustainability
United Nations Sustainable Development Goals (SDGs)
Social and Behavioral Epidemiology
A Model for Psychosocial Factors in Health
(Adapted from Friis)

Adverse physical and social environmental conditions
(poor sanitation, water pollution, poverty, overcrowding, etc.)

- Stress
- Social incongruity
- Person-environment fit
- Stressful life events

Personality factors
- Culture
- Social support
- Lifestyle and behavior

Life and job
- Mental health
- Physical health

INDEPENDENT VARIABLES
MODERATING VARIABLES
DEPENDENT VARIABLES
Adverse Childhood Experiences (ACEs)
ACEs Increase Health Risks

According to the Adverse Childhood Experiences study, the rougher your childhood, the higher your score is likely to be and the higher your risk for various health problems later.

**BEHAVIOR**
- Lack of physical activity
- Smoking
- Alcoholism
- Drug use
- Missed work

**PHYSICAL & MENTAL HEALTH**
- Severe obesity
- Diabetes
- Depression
- Suicide attempts
- STDs

- Heart disease
- Cancer
- Stroke
- COPD
- Broken bones

Source: Centers for Disease Control and Prevention
Credit: Robert Wood Johnson Foundation
Communicable Disease Epidemiology
Chain of Infection

Next Sick Person
(Susceptible Host)
- Babies
- Children
- Elderly
- People with a weakened immune system
- Unimmunized people
- Anyone

Germs
(Agent)
- Bacteria
- Viruses
- Parasites

How Germs Get In
(Portal of Entry)
- Mouth
- Cuts in the skin
- Eyes

Where Germs Live
(Reservoir)
- People
- Animals/Pets (dogs, cats, reptiles)
- Wild animals
- Food
- Soil
- Water

Germs Get Around
(Mode of Transmission)
- Contact (hands, toys, sand)
- Droplets (when you speak, sneeze or cough)

How Germs Get Out
(Portal of Exit)
- Mouth (vomit, saliva)
- Cuts in the skin (blood)
- During diapering and toileting stool

Number of suspected cholera cases reported in Haiti from 2 October to 6 December 2022
Chronic Disease Epidemiology

Figure 2. Crude Mortality Rates for All Causes, Noninfectious Causes, and Infectious Diseases
CDC’s National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)

CHRONIC DISEASES IN AMERICA

6 IN 10 Adults in the US have a chronic disease

4 IN 10 Adults in the US have two or more

THE LEADING CAUSES OF DEATH AND DISABILITY and Leading Drivers of the Nation’s $3.5 Trillion in Annual Health Care Costs

- HEART DISEASE
- CANCER
- CHRONIC LUNG DISEASE
- STROKE
- ALZHEIMER’S DISEASE
- DIABETES
- CHRONIC KIDNEY DISEASE
Figure 4. Age-adjusted death rate for the 10 leading causes of death in 2021: United States, 2020 and 2021

- Cancer: 144.1 (2020), 146.6 (2021)
- Unintentional injuries: 57.6 (2020), 64.7 (2021)
- Stroke: 38.8 (2020), 41.1 (2021)
- Chronic lower respiratory diseases: 36.4 (2020), 34.7 (2021)
- Alzheimer disease: 32.4 (2020), 31.0 (2021)
- Chronic liver disease and cirrhosis: 13.3 (2020), 14.5 (2021)
- Kidney disease: 12.7 (2020), 13.6 (2021)

Notes:
1 Statistically significant increase from 2020 to 2021 (p < 0.05).
2 Statistically significant decrease from 2020 to 2021 (p < 0.05).

NOTES: A total of 3,464,231 resident deaths were registered in the United States in 2021. The 10 leading causes of death accounted for 74.5% of all U.S. deaths in 2021. Causes of death are ranked according to number of deaths. Rankings for 2020 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes and the percentage of total deaths. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db458-tables.pdf#4.

The Social Ecological Model
Environmental Epidemiology

**DOSE**
How much of the hazard a person is exposed to

**PERSONAL TRAITS**
Factors like age, diet, genetics, health status, lifestyle, and sex

**DURATION**
How long a person was exposed

**EXPOSURE ROUTE**
How a person came in contact with the hazard (e.g., breathing, eating, drinking, touching)

**HEALTH EFFECT**
Number of deaths attributable to indoor air pollution in 2017. Image credit Our World in Data.
HOUSEHOLD AIR POLLUTION

Over 3.2 million people a year die prematurely from household air pollution (2019). Household air pollution is mostly created by using kerosene and solid fuels such as wood with polluting stoves, open fires and lamps.

Women and children are the most at risk.

- 23% from stroke
- 32% from ischaemic heart disease
- 19% from chronic obstructive pulmonary disease (COPD)
- 6% from lung cancer
- 21% are due to lower respiratory infections

CLEAN AIR FOR HEALTH #AirPollution
"A growing number of scalable business models are capable of meeting the cooking energy needs of developing markets."

Dymphna van der Lans
CEO, Clean Cooking Alliance
Health Policy and Epidemiology
Health in All Policies

Good health requires policies that actively support health

It requires different sectors working together, for example:

- HEALTH
- TRANSPORT
- HOUSING
- WORK
- NUTRITION
- WATER & SANITATION

To ensure all people have equal opportunities to achieve the highest level of health
Thank You!