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DEPARTMENT OF BIOMEDICAL ENGINEERING

VII Semester

OBT357 BIOTECHNOLOGY IN HEALTH CARE

UNIT- I PUBLIC HEALTH

1.8 Burden of Disease

- The **Burden of Disease** refers to the **impact of health problems on a population**, measured by indicators such as **mortality, morbidity, and financial cost**. It helps policymakers understand the relative importance of different diseases and prioritize healthcare resources.

Key Concepts:

Term	Description
Morbidity	Illness or disability caused by a disease.
Mortality	Deaths caused by a disease.
DALY (Disability-Adjusted Life Year)	A combined measure of premature death and disability. 1 DALY = 1 lost year of healthy life.
YLL (Years of Life Lost)	Years lost due to early death.
YLD (Years Lived with Disability)	Years lived in less than ideal health.

Burden of Disease Can Be Measured By:

1. **DALYs (Disability-Adjusted Life Years)**
   = YLL (due to premature death) + YLD (due to disability)

2. **QALYs (Quality-Adjusted Life Years)**
    - Adjusts years of life by quality of health (used more in economic evaluations)

Global Burden of Disease (GBD) Study:

- A comprehensive regional and global assessment of mortality and disability from major diseases, injuries, and risk factors.
- Conducted by the **Institute for Health Metrics and Evaluation (IHME)**.
- Helps compare the burden across countries, age groups, and time.

Why It Matters:

- Guides **public health policy** and **resource allocation**.
- Helps in **setting priorities** for health interventions.
- Supports **monitoring and evaluation** of health programs.

The **Burden of Disease** is a comprehensive concept in public health that quantifies the impact of a health problem on a given population. It goes beyond simply counting deaths or cases of illness to provide a more holistic measure of the loss of health.

Features of the Burden of Disease:

1. **Measuring Impact:** It assesses the overall impact of diseases, injuries, and risk factors in terms of **mortality** (deaths) and **morbidity** (illness, disability, poor health).
2. **The "Gap" Concept:** It's often conceptualized as the **"gap" between a population's current health status and an ideal health status**, where everyone lives to old age free from disease and disability.
3. **Comprehensive Assessment:** Unlike traditional measures that might focus only on specific diseases or only on mortality, burden of disease analysis aims to provide a **single, comparable metric** that integrates both fatal and non-fatal outcomes.

4. **Key Metric: Disability-Adjusted Life Years (DALYs):** The most widely used summary measure for quantifying the burden of disease is the **Disability-Adjusted Life Year (DALY)**. One DALY represents one lost year of healthy life. It is calculated by summing two components:
    - **Years of Life Lost (YLL):** The years of potential life lost due to premature mortality (i.e., death before a standard life expectancy).
    - **Years Lived with Disability (YLD):** The years lived with a disability or ill-health, weighted by the severity of the disability.

    Example: A person dying at age 40 from a preventable disease loses many YLL. A person living with a severe chronic condition like paralysis for 20 years might have a high YLD, even if they live to an old age. DALYs combine these to give a complete picture.

5. **Other Related Measures:**
    - **Quality-Adjusted Life Years (QALYs):** While similar to DALYs in combining quantity and quality of life, QALYs are more commonly used in cost-effectiveness analyses of specific health interventions. One QALY represents one year of life lived in perfect health.
6. **Purpose and Utility in Public Health:** Measuring the burden of disease is crucial for:
    - **Prioritizing Health Issues:** Helps identify which diseases, injuries, and risk factors cause the greatest health loss in a population, guiding resource allocation and policy development.
    - **Informing Policy and Planning:** Provides evidence for developing public health policies, planning healthcare services, and designing prevention programs.
    - **Tracking Trends:** Allows for comparison of health status over time, between different regions, and across various demographic groups.
    - **Evaluating Interventions:** Helps assess the effectiveness of public health interventions and healthcare programs by measuring their impact on reducing the burden of specific conditions.

- **Highlighting Disparities:** Can reveal health inequalities by showing how the burden of disease is distributed among different socioeconomic, ethnic, or geographic groups.

The **Global Burden of Disease (GBD) Study**, led by the Institute for Health Metrics and Evaluation (IHME) in collaboration with WHO and other partners, is the most comprehensive ongoing effort to quantify health loss across the world. It provides detailed estimates for hundreds of diseases, injuries, and risk factors by age, sex, and region.

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