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COLLEGE OF ENGINEERING & TECHNOLOGY
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DEPARTMENT OF BIOMEDICAL ENGINEERING

VII Semester

OBT357 BIOTECHNOLOGY IN HEALTH CARE

UNIT- I PUBLIC HEALTH

1.1 Definition of Public Health:

"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

1.2 Concept of Public Health:

Public health is distinct from individual medical care. It focuses on:

- Population-Level Approach
  - ✓ Concerned with health issues at the community, national, or global level.
  - ✓ Aims to improve health outcomes for groups rather than individuals.
- Prevention-Oriented
  - ✓ Emphasizes disease prevention and health promotion rather than treatment.
  - ✓ Focuses on early detection, vaccinations, health education, sanitation, and healthy lifestyle promotion.
- Interdisciplinary

- ✓ Combines fields like epidemiology, biostatistics, environmental health, health policy, behavioral sciences, and health education.

➢ Social Determinants of Health

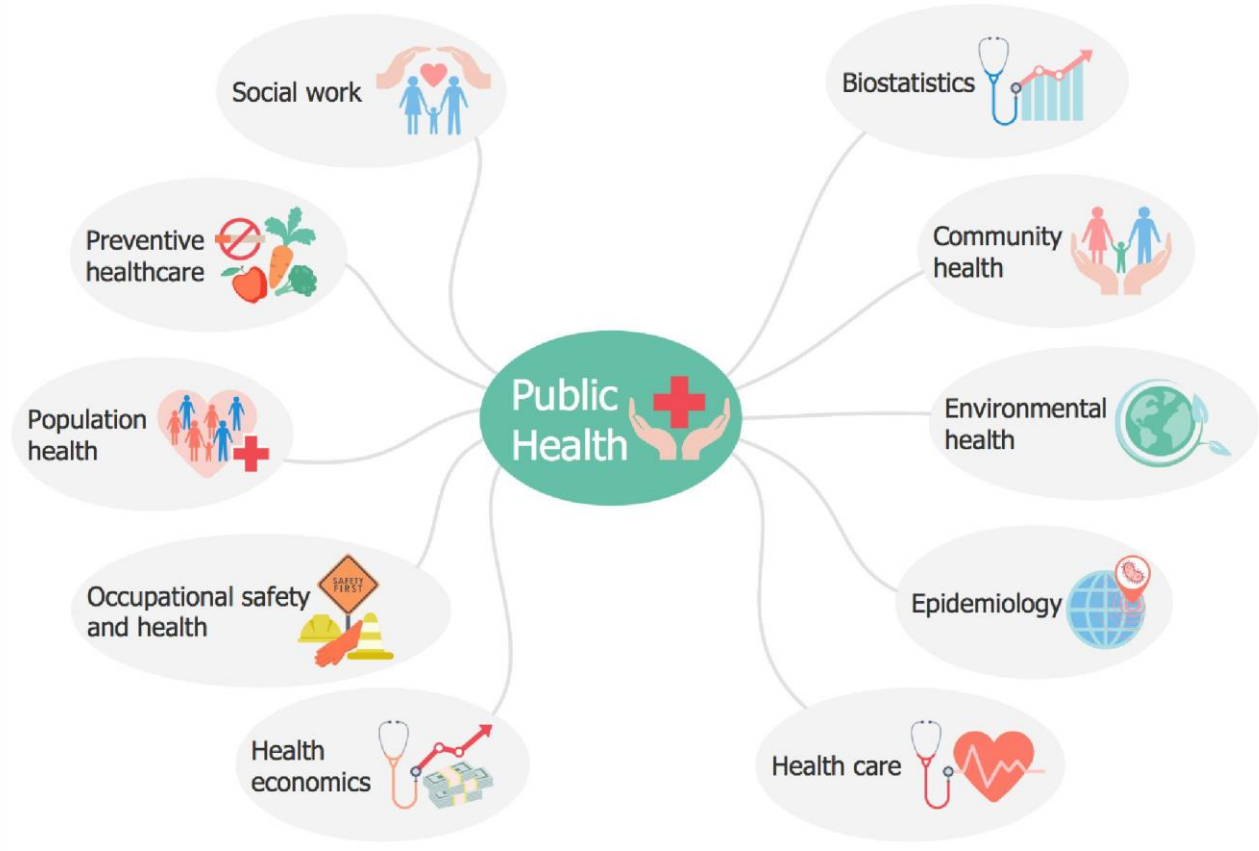
- ✓ Recognizes that health is influenced by economic, social, environmental, and cultural factors.
- ✓ Addresses inequalities in health outcomes due to poverty, education, employment, housing, etc.

➢ Community Participation

- ✓ Involves engaging communities in identifying health issues and implementing solutions.

➢ Policy and Systems-Based Approach

- ✓ Works with government and organizations to develop policies, regulations, and systems that protect and promote health.



Example: 1: Tobacco Control Policies (COTPA, 2003)

It prohibits tobacco advertising, promotion, and sponsorship, restricts smoking in public places, and regulates the sale of tobacco products to minors. COTPA also mandates pictorial health warnings on tobacco product packaging.

Example: 2:. Ayushman Bharat Scheme (2018)

Pradhan Mantri Jan Arogya Yojana (PM-JAY): Offers up to ₹5 lakh per family per year for secondary and tertiary hospitalization to over 500 million beneficiaries, targeting below-poverty-line (BPL) households

Health and Wellness Centres (HWCs): Aims to establish 1.5 lakh HWCs to provide comprehensive primary healthcare, including preventive and promotive services like screening for non-communicable diseases (NCDs) and maternal health. Over 1.7 lakh HWCs have been established as of 2025.

1.3 Core Functions of Public Health:

Core Function	Key Activities
Assessment	❖ Monitor health status ❖ Diagnose and investigate health problems
Policy Development	❖ Inform, educate, and empower ❖ Mobilize community partnerships ❖ Develop policies
Assurance	❖ Enforce health regulations ❖ Link people to needed health services ❖ Assure competent health workforce ❖ Evaluate health services

1.4 Examples of Public Health Activities:

Area	Example Activities
Infectious Disease Control	Immunization programs, pandemic control
Environmental Health	Clean drinking water, sanitation
Health Promotion	Anti-smoking campaigns, nutrition education
Chronic Disease Prevention	Diabetes and heart disease prevention programs
Emergency Preparedness	Disaster response planning, outbreak investigation
Maternal and Child Health	Prenatal care, child immunization

1.5 Public health systems: are commonly defined as "all public, private, and voluntary entities that contribute to the delivery of essential public health services within a jurisdiction." This concept ensures that all entities' contributions to the health and well-being of the community or state are recognized in assessing the provision of public health services.

The public health system includes;

- Public health agencies at state and local levels
- Healthcare providers
- Public safety agencies
- Human service and charity organizations
- Education and youth development organizations
- Recreation and arts-related organizations
- Economic and philanthropic organizations
- Environmental agencies and organizations

The 10 Essential Public Health Services describe the public health activities that all communities should undertake:

1. Monitor health status to identify and solve community health problems
2. Diagnose and investigate health problems and health hazards in the community
3. Inform, educate, and empower people about health issues
4. Mobilize community partnerships and action to identify and solve health problems
5. Develop policies and plans that support individual and community health efforts
6. Enforce laws and regulations that protect health and ensure safety
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable
8. Assure competent public and personal health care workforce
9. Evaluate effectiveness, accessibility, and quality of personal and population
10. Research for new insights and innovative solutions to health problems.

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1.6 Challenges in Public Health

- Emerging infectious diseases (e.g., COVID-19)
- Non-communicable diseases (e.g., diabetes, hypertension)
- Environmental degradation
- Urbanization
- Health inequities
- Mental health issues
- Antimicrobial resistance
- Climate change

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