Introduction to Public Health 2
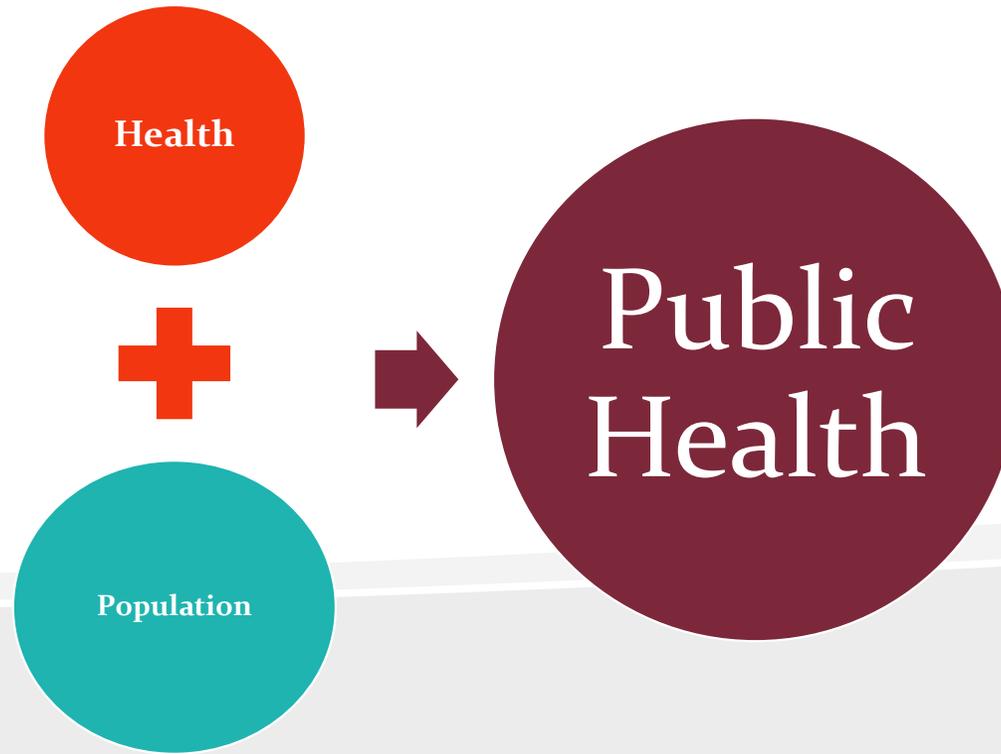
Public Health System & Practice

Dr. Israa Al-Rawashdeh MBBS, MPH, PhD

Faculty of Medicine, Mutah University,
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Recap:

- **Health = complete well-being (WHO).**
- **Dimensions:** Physical, mental, social, emotional, spiritual.
- **Spectrum of Health**
- **Determinants.**
- **Population ≠ Community:** One is shared traits, the other adds connection & belonging.

Health + Population → Public Health

Now: What is Public Health?

Imagine yourself a clinician in your clinic:

▪ You focus on the sick individual in front of you.

▪ You treat those who come to seek help.

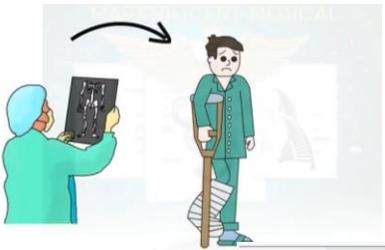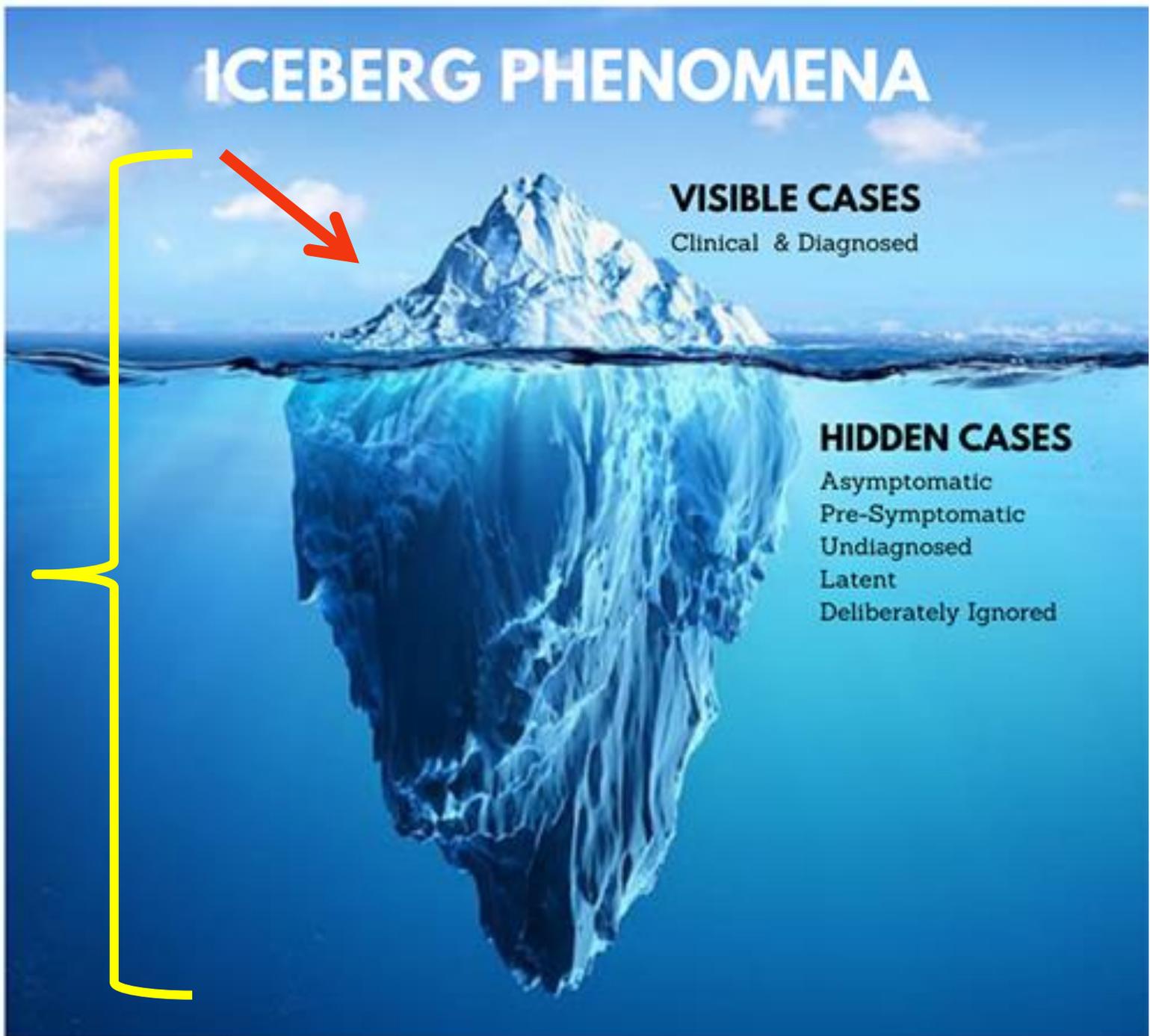▪ You show the same attitude to other patients waiting outside.

But what about those who never come to the clinic?

Who takes care of them?

- **Clinical medicine** sees only the *tip of the iceberg*,

 but **public health** must address the whole iceberg.
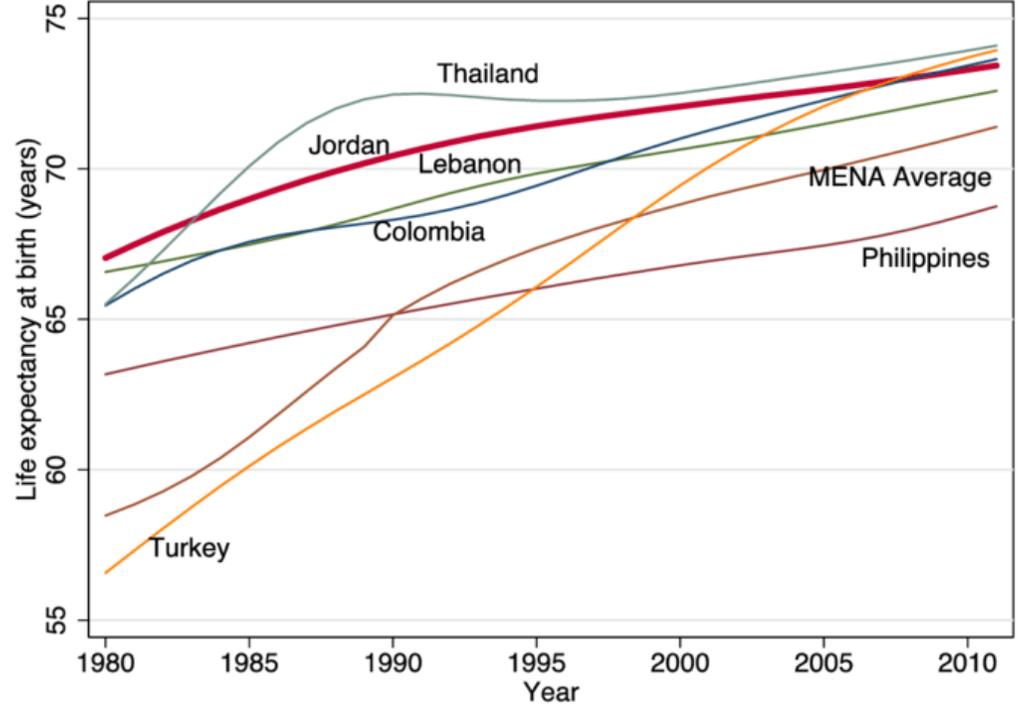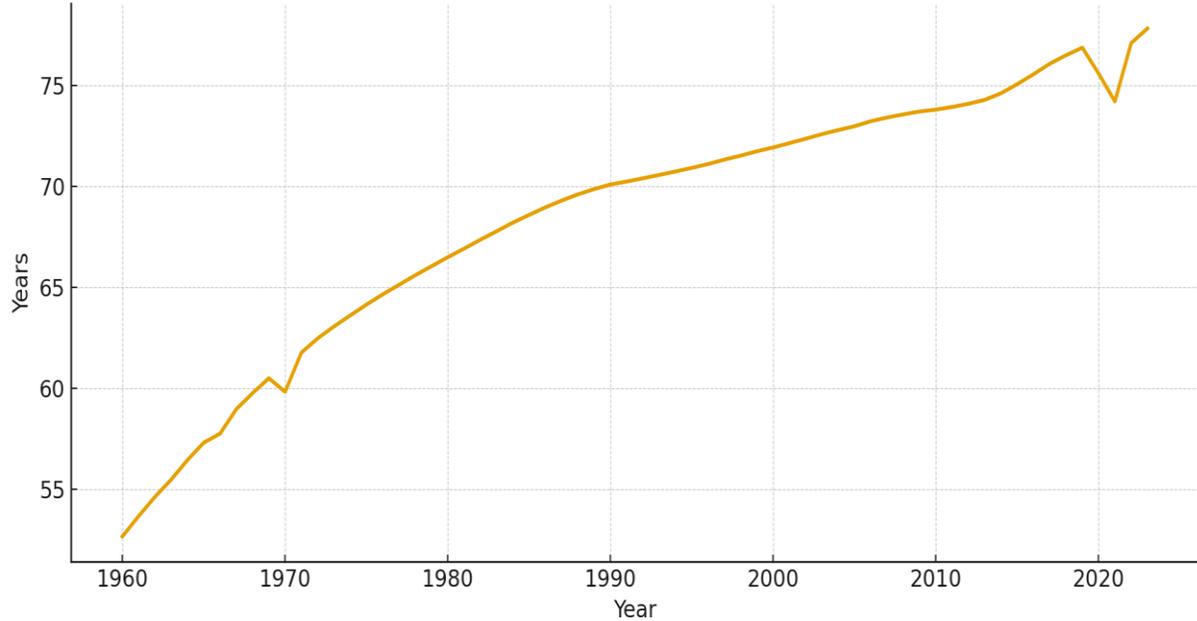
Clinical medicine Vs Public health

Aspect	Clinical Medicine	Public Health
Focus	Individual patients	Populations & communities
Main task	Diagnosis, treatment, cure	Prevention, promotion, protection
Approach	mainly curative after disease appears or complications occur	mainly preventive (primary, secondary, tertiary)
Evaluation	Recovery of patient on follow-up	Assessment of health programs, Decline in incidence, longer life expectancy
Branches	Internal Medicine, Surgery, Pediatrics, Obstetrics & Gynecology, Psychiatry, etc.	Epidemiology, Biostatistics, Environmental Health, Occupational Health, Health Policy & Management, Social & Behavioral Sciences
Example	Treating TB patient	TB vaccination, screening programs

Life expectancy in Jordan (1960 → 2023)

Improving the health of a population!

Life Expectancy at Birth in Jordan (1960–2023)

How do you think was this achieved?

Definition of Public Health

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

(Winslow, 1920)

Focus: Populations, not just individuals.

Goal:

PREVENTION   **PROTECTION**

PROMOTION

Winslow CEA. The untilled field of public health. Mod Med 1920;2:183–91.

The 3 Ps of Public Health

Protection → controlling hazards, ensuring safe water, sanitation, safe workplaces.

Prevention → immunization, screening, lifestyle modification, laws (seatbelts, no smoking).

Promotion → enabling people to increase control over health (education, empowerment, healthy environments).

- **Example (Jordan):**

- Protection: Food safety monitoring.

- Prevention: National vaccination program.

- Promotion: Awareness campaigns against smoking, encouraging breastfeeding.

Evolution of Public Health –

- **Ancient Civilizations**
  - Egyptians: drainage, hygiene.
  - Greeks: linked health to environment & lifestyle (Hippocrates).
  - Romans: aqueducts, sewage, public baths → *first large-scale sanitation*.
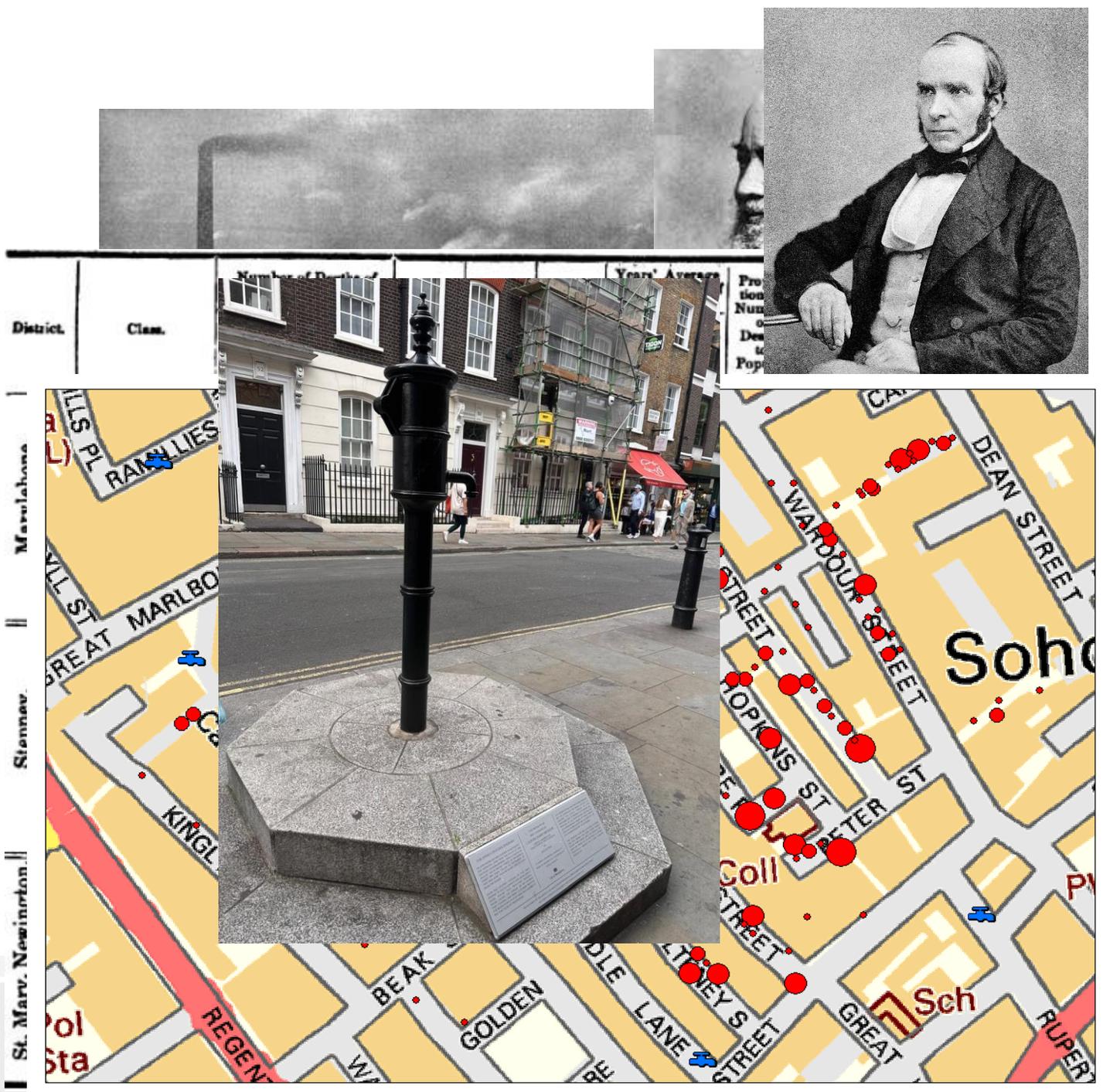
- **Middle Ages**
  - Decline in sanitation, dominance of miasma theory.
  - Black Death (14th C) → quarantine laws (Venice).

- **Industrial Revolution (18th–19th C)**
  - Overcrowding, epidemics (cholera, TB).
  - Chadwick Report (1842) → UK Public Health Act.
  - John Snow (1854) → cholera, Broad Street Pump → *father of epidemiology*.
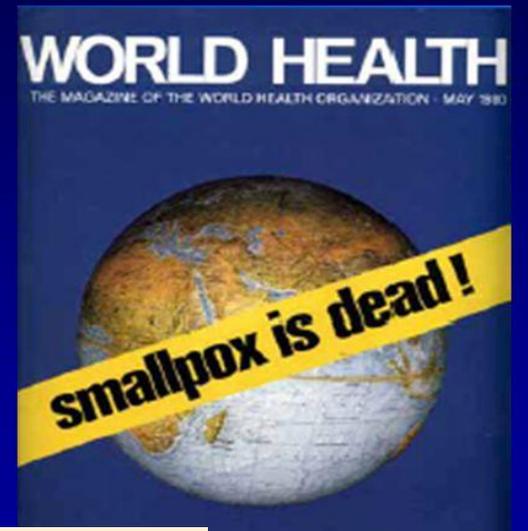
Evolution of Public Health – Milestones

- **Bacteriological Era (late 19th C)**
  - Pasteur → germ theory.
  - Koch → TB, cholera.
  - Vaccines (rabies, anthrax).
- **Early–Mid 20th Century**
  - Winslow definition (1920).
  - Antibiotics, vaccines, WHO (1948).
  - Establishment of health departments.
  - Smallpox eradication.

World Health Organization

- Formed April 7, 1948

- Smallpox eradication
  - Initiated in 1967
  - Last naturally occurring case in 1977
  - Declared dead in 1980

WORLD HEALTH
THE MAGAZINE OF THE WORLD HEALTH ORGANIZATION · MAY 1980

smallpox is dead !

Early public health work focused on the prevention of infectious diseases.

- **Late 20th Century**
  - Shift: infectious → non-communicable diseases (NCDs).
  - Lalonde Report (1974): determinants of health.
  - Alma-Ata (1978): Primary Health Care.
  - Ottawa Charter (1986): health promotion framework.
- **21st Century**
  - Emerging pandemics (SARS, COVID-19).
  - Climate change, antimicrobial resistance.
  - Sustainable Development Goals (2015–2030).
  - Digital health & AI.

THE BURDEN OF CLIMATE CHANGE ON HEALTH IS HUGE

How climate change could impact the world

Warmer water and flooding will increase exposure to diseases in drinking and recreational water

Pollution and pollen seasons will increase, leading to more allergies and asthma

250,000

7million

* resistant to antibiotics, antivirals, antifungals and antiparasitics
Source: Bracing for Superbugs 2023 (UN Environmental Programme)

statista

Evolution of Public Health – Milestones

Ancient	Middle Ages	Industrial Revolution	Bacteriological	Early-Mid 20th	Late 20th	21st
Egyptians Greeks Romans	Plague Quarantine	Chadwick & Snow	Pasteur & Koch	Winslow Antibiotics Vaccines Smallpox eradicated	NCDs PHC	Pandemics SDGs Climate change AI

Characteristics of Modern Public Health

- A new concept of "**Multi-factorial** causation" of diseases.

- Multidisciplinary (epidemiology, sociology, law, economics, environmental sciences).

- Multisectoral (health, education, agriculture, transport, media).

- Evidence-based (epidemiology, surveillance, digital health).

- Social justice: targeting vulnerable groups.

- Globalization: pandemics, SDGs, climate.

Levels of Prevention	**Target population:**
Primordial: <u>prevent risk factors</u> before they emerge (e.g., banning trans fats, urban planning with walkable cities).	**Entire population** (before risk factors appear) → children
Primary: <u>prevent disease onset</u> (helmets, education, immunization, sanitation).	**Susceptible individuals** (healthy but at risk)
Secondary: <u>early detection</u> (screening for hypertension, Pap smear, mammography, blood sugar testing).	**At-risk or asymptomatic individuals** with early, undiagnosed disease
Tertiary: <u>limit complications</u> (rehab after stroke, dialysis in CKD).	**Patients with established disease** to minimize disability and improve quality of life

Public Health System

- **Definition:** The network of organizations, resources, and actions that work together to improve population health.

- **Core components:**
  - Public sector (MoH, Royal Medical Services).
  - Private providers (clinics, labs, hospitals).
  - NGOs, civil society.
  - International partners (WHO, UNICEF).
  - Communities (mosques, municipalities).

- PH system is not = Ministry of Health, it is broader.

Public health approach

Public Health Approach

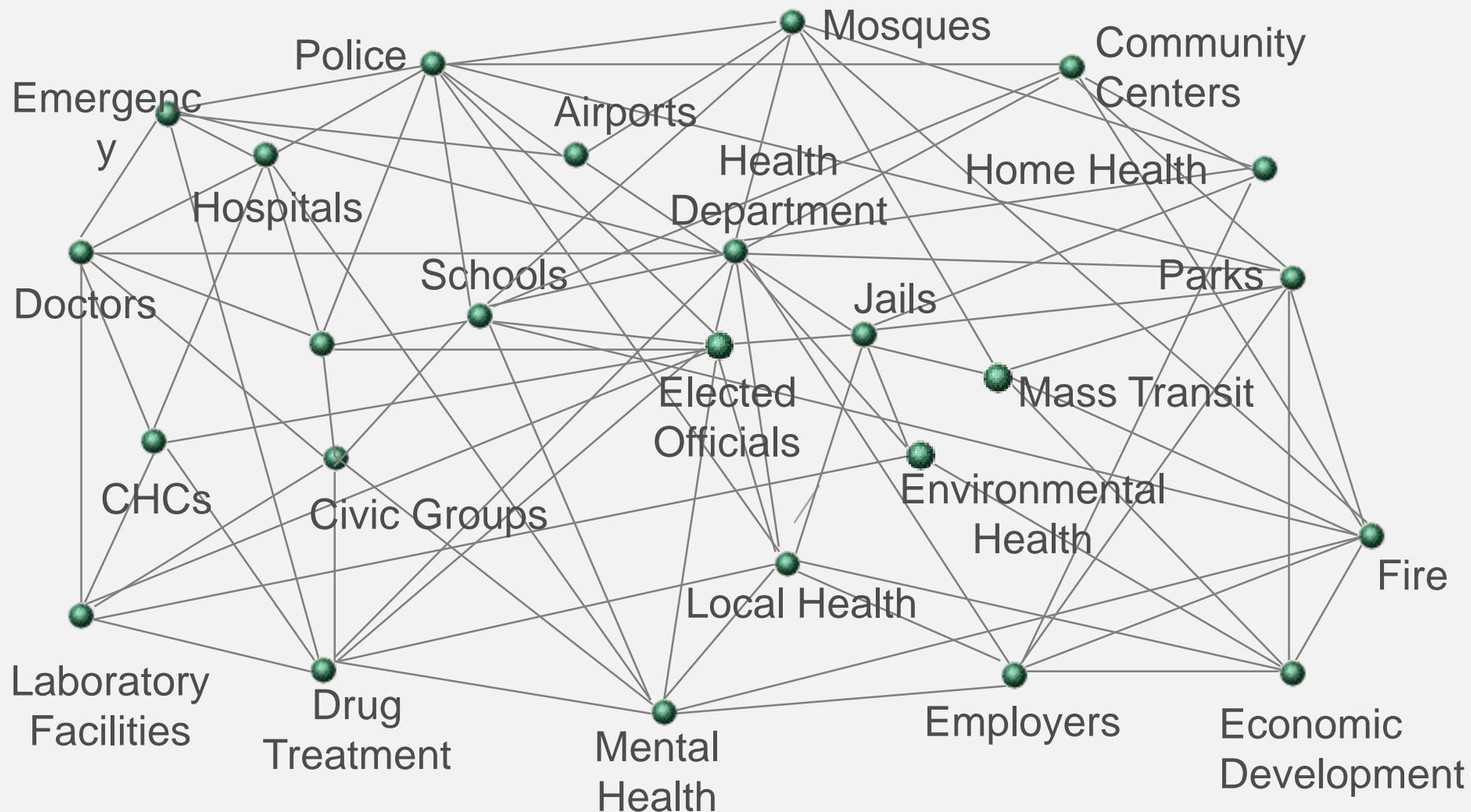| **What is the problem?**	**What is the cause?**	**What works & for whom?**	**How do you do it?**
Define the problem	Identify risk & protective factors	Develop & test prevention strategies	Ensure widespread adoption
Surveillance	*Research causes/factors*	*Design Implement Evaluate*	*Promote & scale up effective programs & policies*

Problem ⟶ **Response**

A Public Health System Is Complex

Three Core Functions of Public Health

Assessment

Systematic collection, analysis, and dissemination of information on the health of the community.

- Jordan NCD STEPs Survey (risk factors surveillance).
- COVID-19 case tracking.
- Cancer registry.

Policy Development

Use of scientific knowledge to create strategies, regulations, and laws that protect and improve health.

- Jordan's Tobacco Control Law (ban on indoor smoking).
- National Road Safety Strategy.
- Food fortification policy (iodized salt, vitamin D in dairy).

Assurance

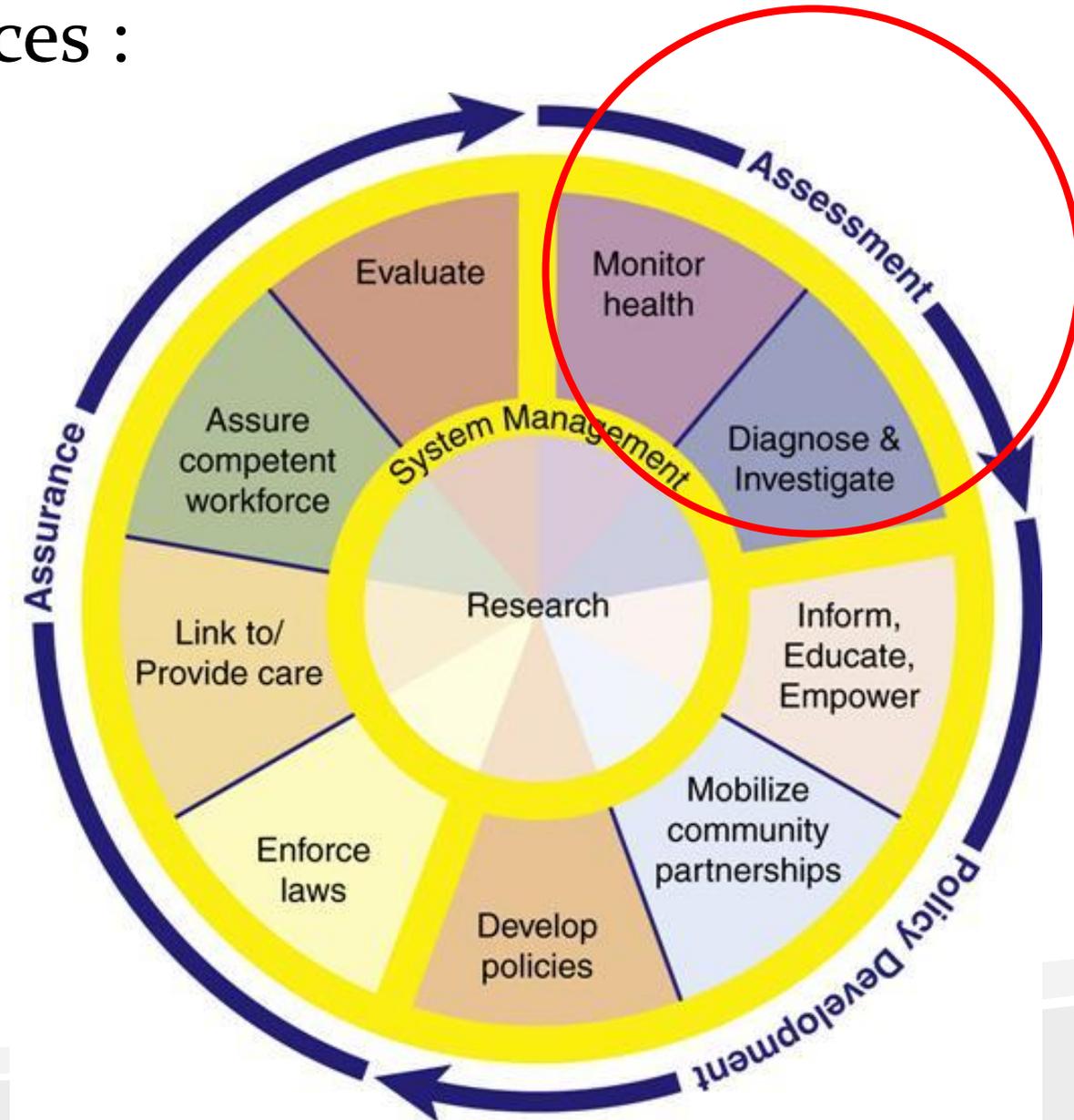Ensuring that essential public health services are provided to all people.

- Expanding primary health care in rural Jordan.
- Availability of essential medicines.
- Quality standards for hospitals.

Institute of Medicine. The future of public health. Washington, DC: National Academies Press; 1988.

The 10 Essential Public Health Services :

- Assessment:

1. Monitor health status: Collect data to know the health problems in the population. Example: Jordan STEPwise survey for NCD risk factors.

2. Diagnose & investigate health problems : Detect outbreaks and respond quickly. Example: COVID-19 testing, outbreak investigation of food poisoning.
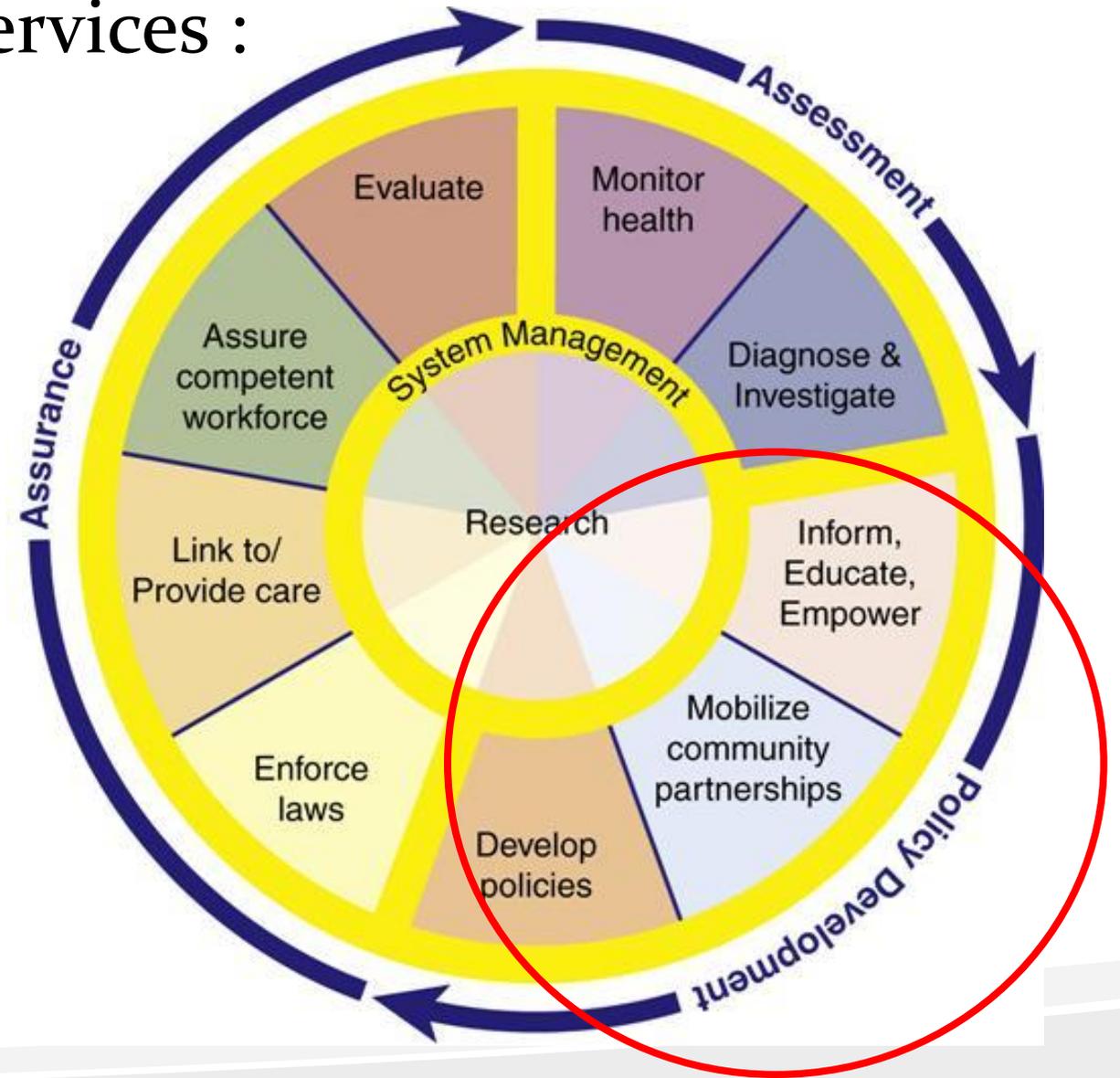
The 10 Essential Public Health Services :

- Policy Development:

1. Inform, educate, and empower people. : Raise awareness, change behavior. Example: Campaigns on smoking hazards or breast cancer awareness month.

2. Mobilize community partnerships : Work with schools, NGOs, municipalities, and private sector. Example: Joint campaigns with NGOs to promote healthy lifestyles.

3. Develop policies and plans: Use evidence to create strategies and laws. Example: National strategy for NCD prevention, tobacco control policy.
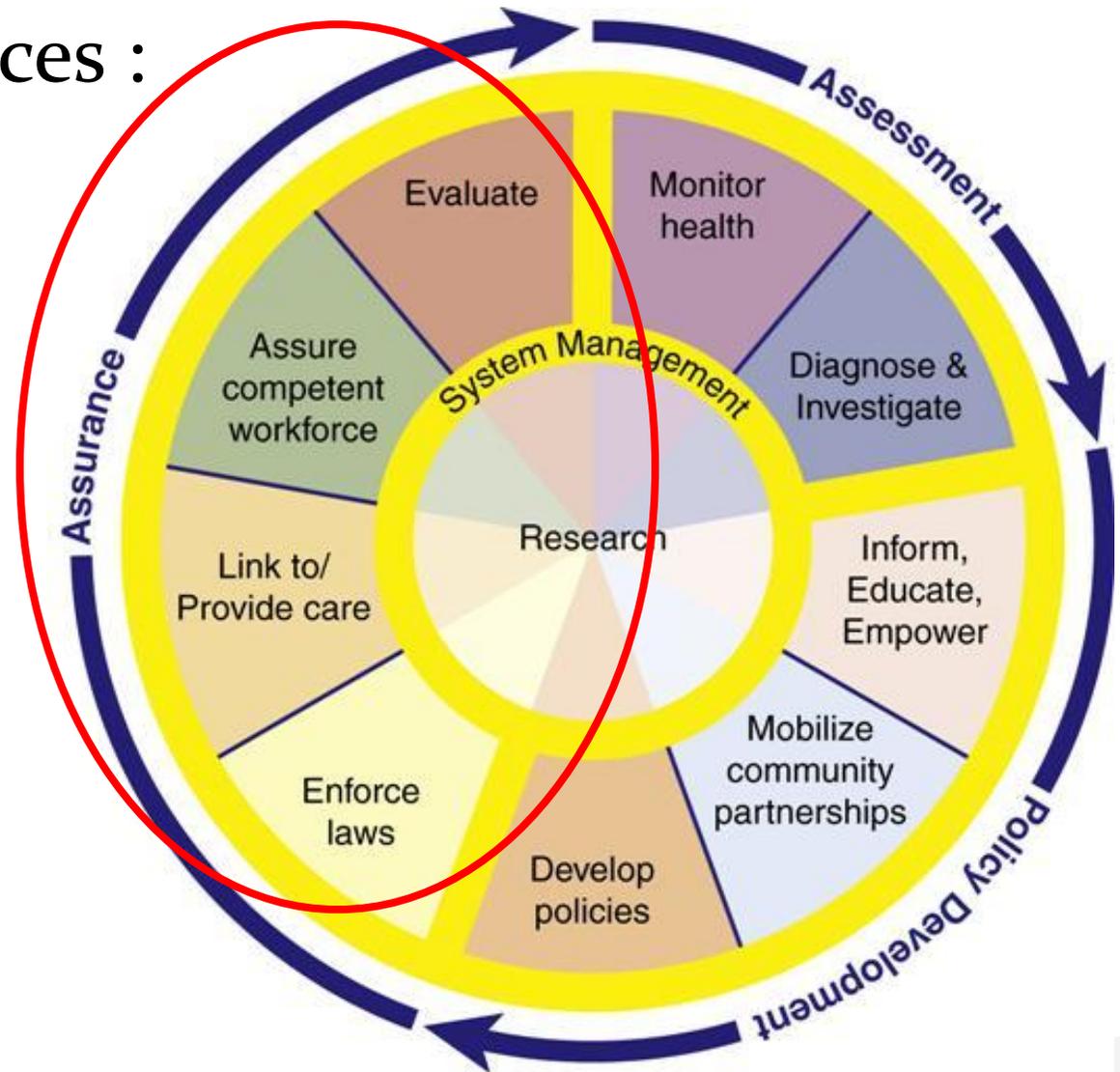
The 10 Essential Public Health Services :

- Assurance

1. Enforce laws and regulations Make sure health-related laws are applied. Example: No-smoking enforcement in public places, food safety inspections.

2. Link people to needed services / assure access: Ensure everyone can reach health care. Example: Expanding primary care in rural areas, mobile clinics for refugees.

3. Assure a competent workforce: Train and maintain qualified health workers. Example: Continuous medical education for doctors and nurses.

4. Evaluate effectiveness, accessibility, quality: Assess if programs and services are working. Example: Monitoring vaccination coverage and patient satisfaction surveys.

O Across All Functions: Research and innovate new solutions Meaning: Generate new knowledge and adapt technology. Example: Using mobile apps for contact tracing in pandemics.

The great 10 public health achievements (**classic list**)

1. 💉 **Vaccination → eradication of smallpox, ↓ polio & measles**

2. 🏭 **Safer workplaces → ↓ occupational injuries.**

3. 🚗 **Motor vehicle safety → seatbelts, safer roads.**

4. 🦠 **Control of infectious diseases → sanitation, antibiotics, vaccines.**

5. 👩‍🍼 **Healthier mothers and babies → improved prenatal, neonatal care, reduced maternal mortality**

6. ♥ **Decline in deaths from coronary heart disease and stroke → via risk factor control (smoking, blood pressure, cholesterol)**

7. 🍞 **Safer and healthier foods → food safety regulation, fortification, pasteurization**

8. 👨‍👩‍👧 **Family planning → giving people ability to control reproduction, reduce maternal risk**

9. 💧 **Fluoridation of water → reducing dental caries in populations**

10. 🚭 **Recognition of tobacco hazard → public awareness, laws against smoking, taxes**

CDC, 1999

Which of these achievements do you think had the biggest impact in Jordan?

10 GREAT PUBLIC HEALTH ACHIEVEMENTS

Control of Infectious Diseases

Family Planning

Healthier Mothers & Babies

Motor Vehicle Safety

Tobacco as a Health Hazard

Declines in Deaths from Heart Disease & Stroke

Fluoridation of Drinking Water

Immunizations

Safer & Healthier Foods

Workplace Safety

Cancer screening
Improved Preparedness and Response to Global Health Threats.

THANK YOU