探索

创新

Preventive Medicine

Introduction

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倾听

思考

Outline

- ◆Overview of our course
- ◆Something about you
- ◆Preventive medicine
- ◆Health, Illness, Disease
- ◆Determinants of health
- ◆Preventive strategies

Week	Date(Week 3)	Class	Lectures	Teachers
1	3月7日	3-4	Introduction	Tao Sha
2	3月14日	3-4	Individual preventive strategies and clinical preventive services	Li Jiang
3	3月21日	3-4	Theories for individual behavior change	Zheng Pinpin
4	3月28日	3-4	Discussion on precision prevention	Xiao Qianyi
5	4月4日	3-4	Consultation for smoking cessation	Wang Fan
6	4月11日	3-4	Consultation for diet	Tao Sha
7	4月18日	3-4	Consultation for physical activities	Zheng Pinpin
8	4月25日	3-4	Strategies for early detection of disease	Tao Sha
9	5月2日	3-4	Preventive strategies for population and community health	Zheng Pinpin
10	5月9日	3-4	Environment, health and safety	Li Jiang
11	5月16日	3-4	Hospital and Patient Safety	Li Jiang
12	5月23日	3-4	Reports with groups (Environment, health and safety）	LiJiang
13	5月30日	3-4	Health system	Tao Sha
14	To be confirmed		Health system（field visiting）	Tao Sha
15	6月13日	3-4	Non-communicable disease management	Tao Sha
16	6月20日	3-4	Reports with groups（Health system）	Tao Sha
17	6月25日	13:00-15:00	Examination **(covering the teaching contents from 1st to 9th week**

Introducing yourself

◆ **Name**

◆ Where did you come from

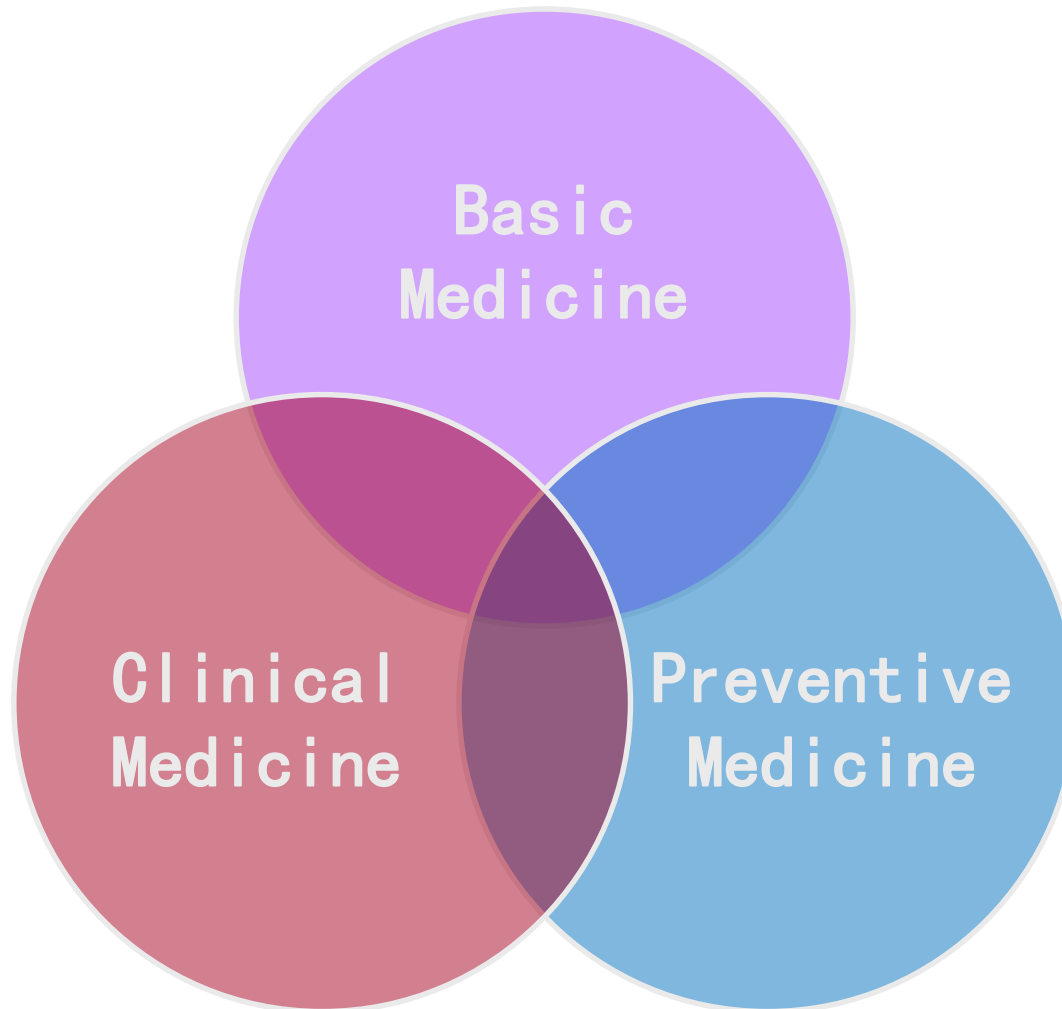◆ Your background and interests

What is Preventive Medicine?

Preventive Medicine is the specialty of medical practice which focuses on the health of individuals and defined populations in order to protect, promote, and maintain health and well-being and prevent disease, disability, and premature death.

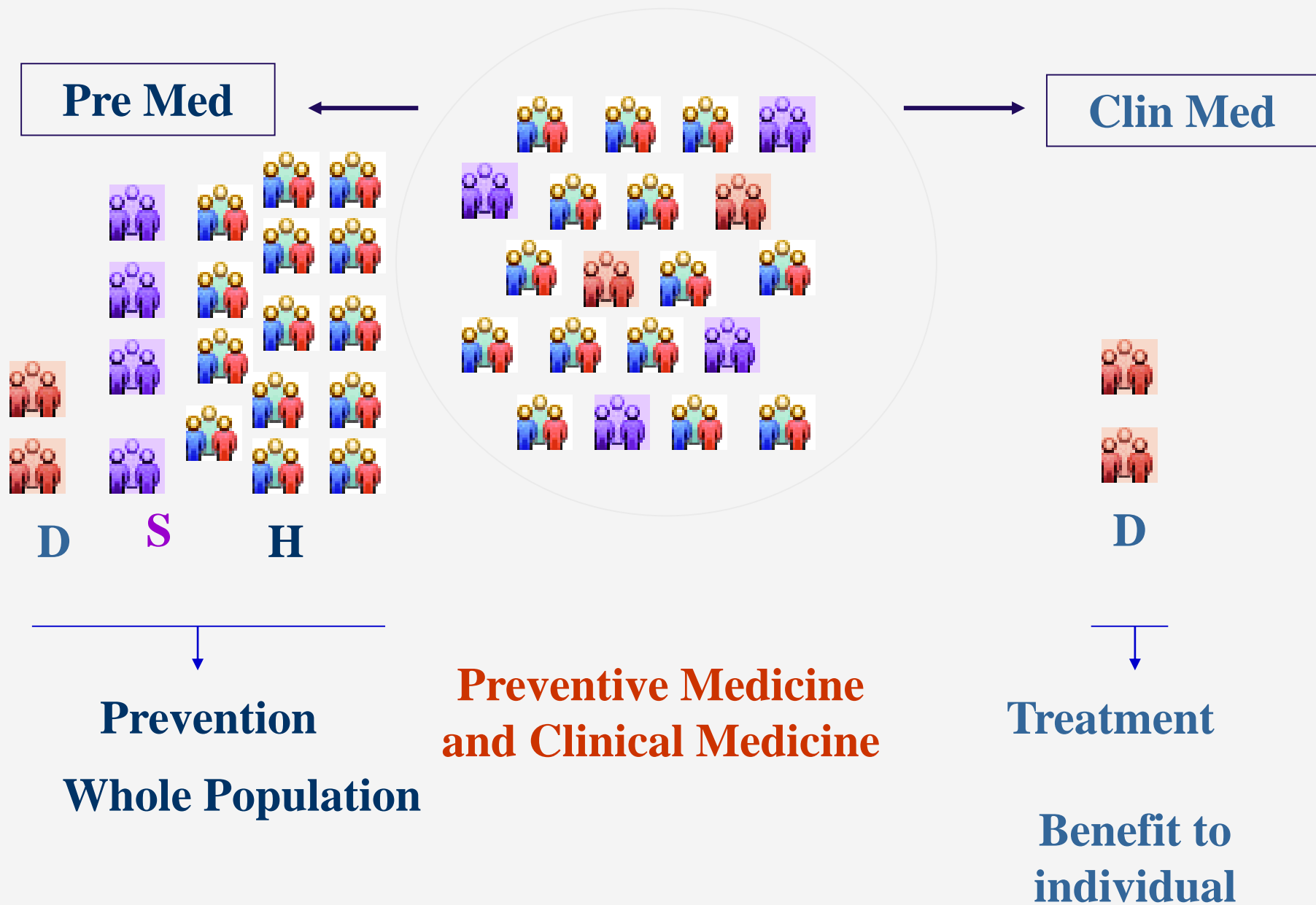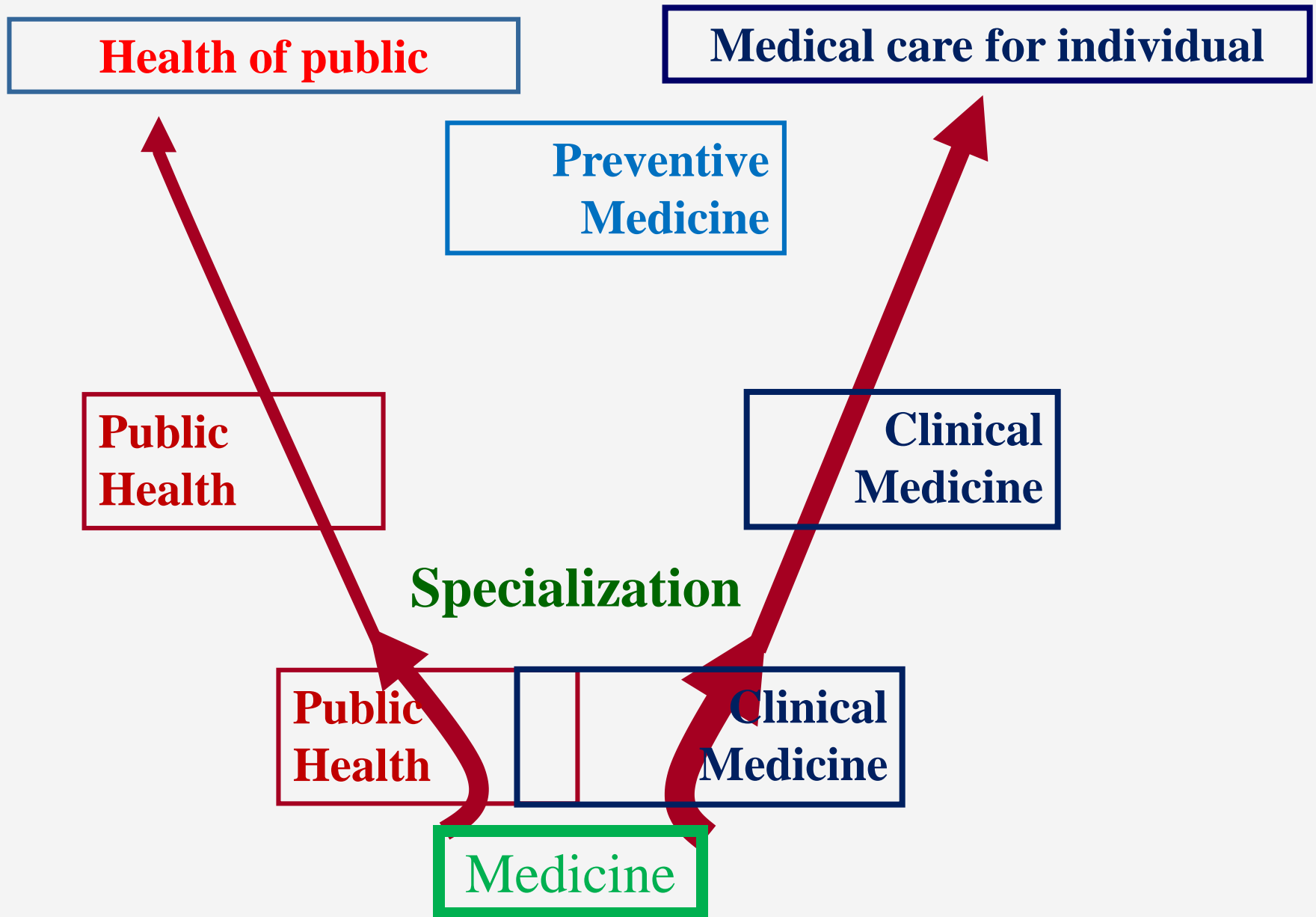From American Association of Preventive Medicine

Medicine

Target population

♦ Individuals

♦ Defined population: communities

Pre Med

Clin Med

D S H

D

Prevention

Whole Population

Preventive Medicine
and Clinical Medicine

Treatment

Benefit to
individual

How do we know we are health?

What is health?

Can you please make a definition of a car?

♦ Shape?

♦ Function?

What is health

♦ Health is the absence of disease

♦ Health is a state of complete physical, mental, and social well-being (WHO).

♦ Health designates a process of adaption-to changing environments, to growing up and ageing, to healing when damaged, to suffering, and to the peaceful expectation of death. (Ivan Illich).
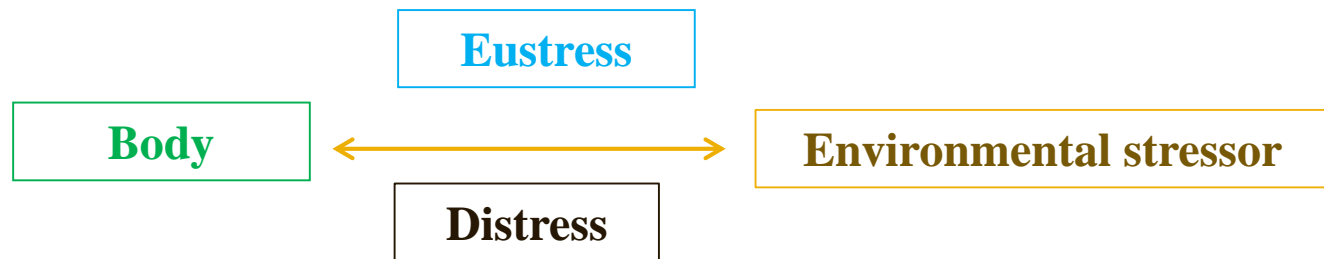
Who is healthy

- ♦ An official due to corrupt on the walk to her execution
- ♦ A monk who has generalized weakness as result of prolonged fasting
- ♦ A farmer who lost a finger in an accident during his boyhood
- ♦ A baby

Healthy	Definition 1	Definition 2	Definition 3
Official	Yes	No	possibly
Monk	Yes	No	Yes
Farmer	No	No	Yes
baby	Yes	Yes	No

Health as successful adaption

♦ **The states of health or disease are the expressions of the success or failure experience by the organism in its efforts to respond adaptively to environmental challenges.** (Dubos R: Man Adapting. 1965)

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                    ┌──────────────┐
                    │   Eustress   │
                    └──────────────┘
┌──────────┐                          ┌──────────────────────┐
│   Body   │ ←──────────────────────→ │ Environmental stressor│
└──────────┘                          └──────────────────────┘
            ┌──────────────┐
            │   Distress   │
            └──────────────┘
```

Health as satisfactory functioning

◆Health is the essential foundation that supports and nurtures growth, learning, personal well being, social fulfillment, enrichment of others, economic production, and constructive citizenship.

Health as satisfactory functioning

♦Health is a part of everyday lives, an essential dimension of the quality of life (the opportunity to make choices and to gain satisfaction from living).

♦Health is envisaged as a **resource** which gives people the ability to manage and even to change their surroundings.

Composition of health

Occupational

Intellectual

Spiritual

Physical

Social

Emotional
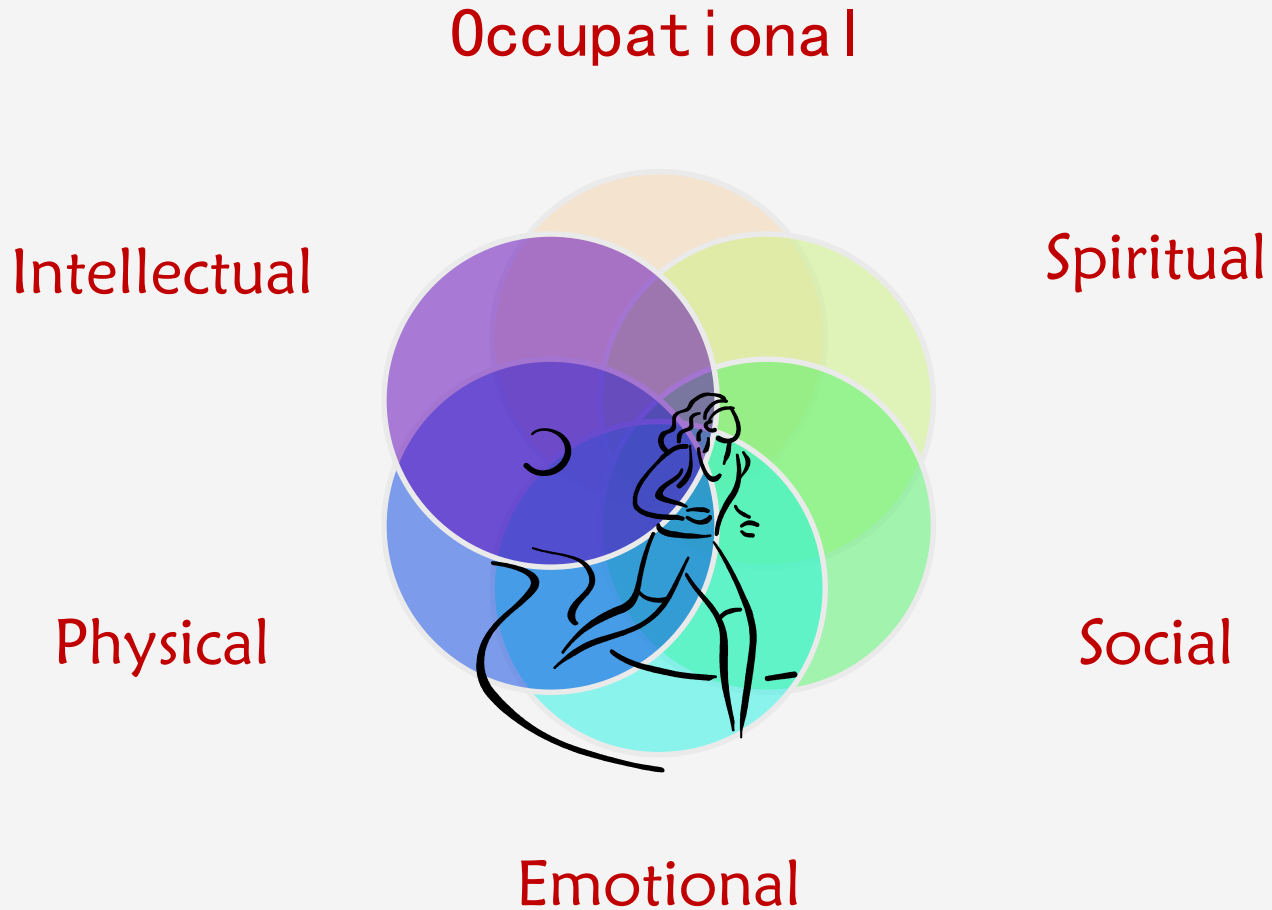
What do we mean by illness?

Disease is diagnosed

♦ Disease implies an entity that we can isolate and eliminate; in many cases, disease are merely collections of symptoms and clinical findings assembled for the convenience of the medical profession and the patient.

Illness is experienced.

♦ Ill ness exists independently of identifiable specific symptoms and signs, and includes the patient's sensation and feelings, disabilities, discomforts attitudes, and the effects of the symptoms on activities and relationships.
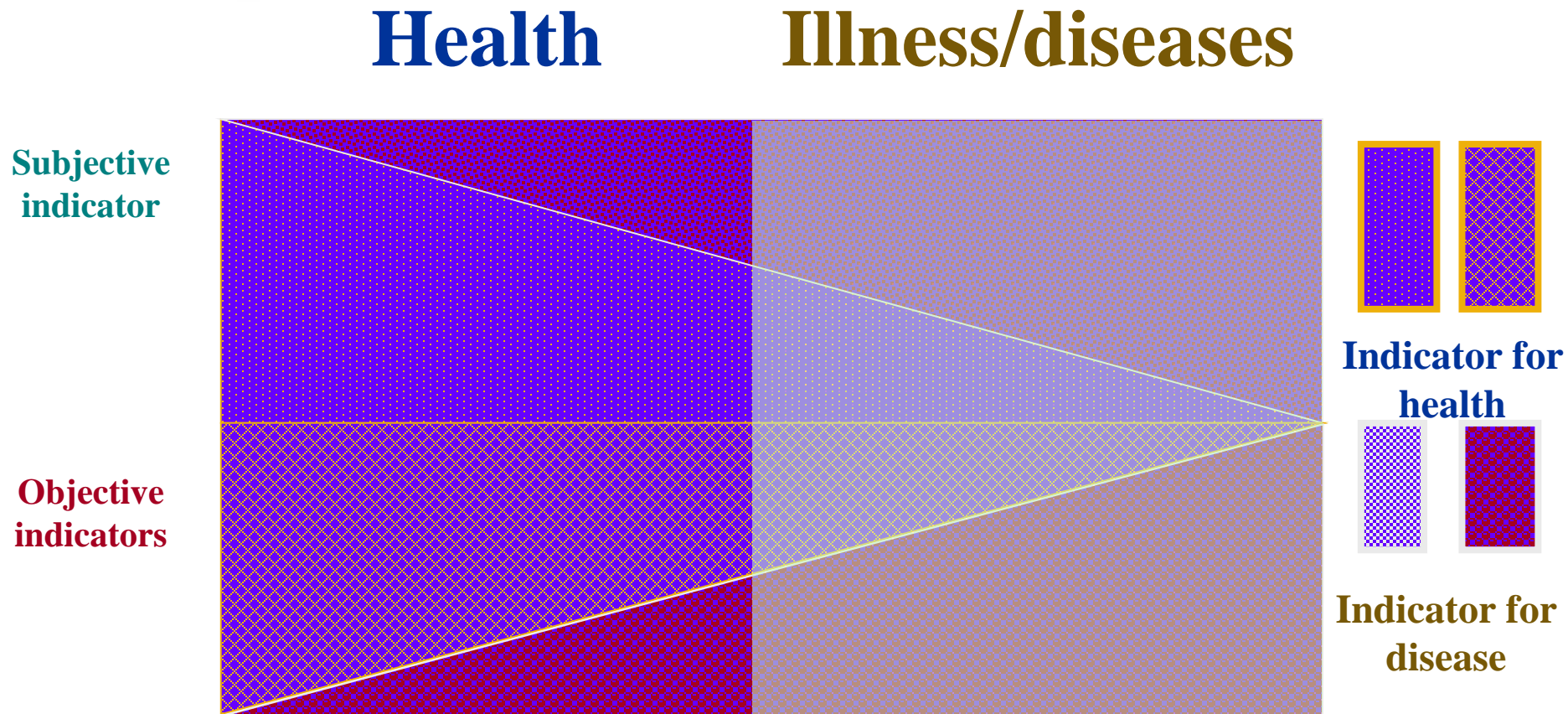
Illness and disease

◆ Acute illness ➡ cause and cure

   Chronic illness ➡ limitation of damage and maximizing the patients potential quality of life

◆ Cultural beliefs have an important influence on perception of illness. Even on modern society.

◆ Doctors need to know about "patient pathways". How do people decide that they are ill and how do they come to seek medical advice.

◆ The nature of the doctor-patient relationship also influence lay and professional perception of illness, and treatment of this.

What determine our health?

♦ **Health determinants are identified as:**

- **Luck?** biology and genetic endowment;

- **Choices** personal health practices and coping skills

- **Health services**

- **Physical environments**, employment and working conditions;

- **Social status**: income and social status, social support networks, education;

Determinants of Health

◆ Luck ?

- genetic disease
- different types of inheritance
  - Single gene inheritance
  - Multifactorial inheritance
  - Chromosome abnormalities
  - Mitochondrial inheritance

Determinants of health

◆Luck

◆**Choices**

◆Health care

◆Physical environment

◆Social determinants

Determinants of Health

◆ **Choices**

- **Common risk factors:**
  - are responsible for most of the main chronic diseases
  - these risk factors are modifiable
    - unhealthy diet
    - physical inactivity
    - tobacco use

Determinants of Health

◆ Luck

◆ Choices

◆ **Health care**

◆ Physical environment

◆ Social determinants

What is the contribution of health care to population health, and to health inequalities?

Life expectancy

◆ Heart disease mortality in US

- – fell by more than half 1950 ⟶ 1995

- – Increase in life expectancy ≈3.5 years

- – 1/2– 2/3: Coronary care units, treatment of hypertension, and medical and surgical treatment of coronary artery

◆ Clinical services

- – preventive services and therapeutic intervention

- – 5 – 5.5 years of the 30 years increase life expectancy since 1900

Relief of pain, physical and mental dysfunction

◆ Effective treatment /prevention of hypertension

- Contributes to a fall in the subsequent incidence of non-fatal/fatal heart attack or stroke, and to a resultant fall in months of poorer physical and mental dysfunction

◆ DALY

Iatrogenic Mortality

To Err is Human (Institute of Medicine, 2000)

• 44,000-98,000 deaths each year due to medical error in US hospitals (half medication error, half surgical error)

• Additional 225,000 deaths due to "adverse events" not attributable to medical error.

"Medicine Matters after all: Measuring the benefits of Medical Care…"

(John Bunker, Nuffield Trust Series, UK:2001)

- 75,000-150,000 iatrogenic death per year

- 6-12 month loss in life expectancy

- 4[th] leading cause of death after

Heart disease	725,192
Malignant neoplasms	549,838
Cerebrovascular dis.	167,366

Fig. 6.1. Age-standardized death rates from tuberculosis in England and Wales, 1840–1968

Source: McKeown. 1976. Reproduced by kind permission of the publisher.

WHO 92341
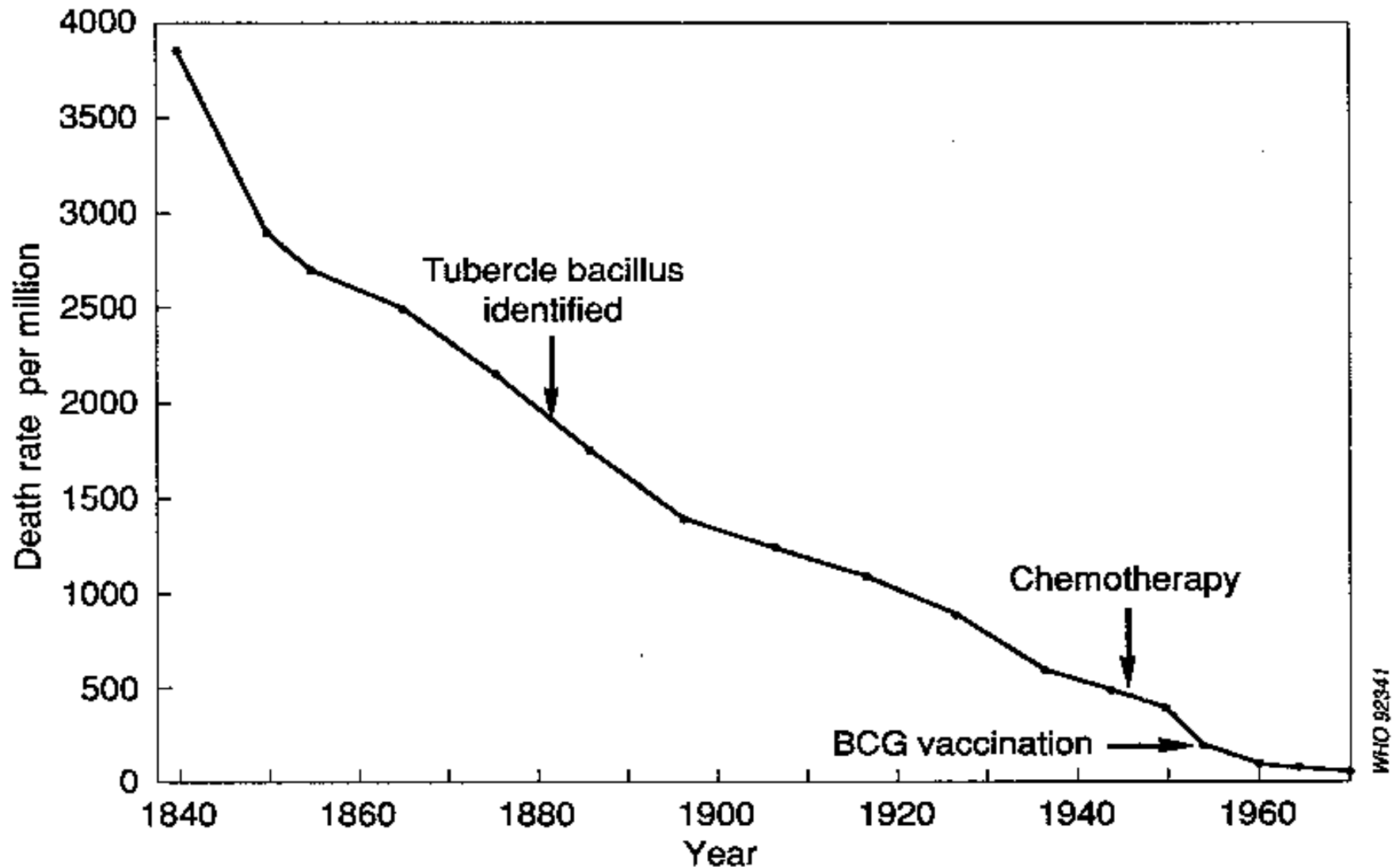
nores 8.14. Measles: death rates of children under 15: England and Wales.

1. Haldane, J. B. S., *Science and Life* (London: Pemberton, 1968), p. 65.

The Contribution of Primary Care Systems to Health Outcomes within OECD countries, 1970-1998

Pooled, cross-sectional, time series analysis of PHC system characteristics in 18 OECD countries using fixed effects regression

The Contribution of Primary Care Systems to Health Outcomes within OECD countries, 1970-1998

◆ Strong primary care system and practice characteristics such as geographic regulation, coordination, and community orientation were associated with improved population health.

◆ Strength of a country's PHC system was inversely associated with all-cause mortality and morality from asthma, pneumonia, cardiovascular disease ($p < 0.05$), even after control for per capita GDP, total physicians per capita, percent elderly.

◆ Despite health reform efforts, few OECD countries have improved essential features of their primary care systems as assessed by the scale used here.

Determinants of Health

◆ Luck (incl. genetic inheritance)

◆ Choices

◆ Health care

◆ Physical environment

◆ Social determinants

Physical environment

♦ safe water and clean air

♦ healthy workplaces

♦ safe houses, communities and roads all contribute to good health

♦ employment and working conditions - people in employment are healthier, particularly those who have more control over their working conditions

Physical environment transport

♦ Accidents between motor vehicles, bicycles and pedestrians (particularly children and young people)

♦ Pollution from burning fossil fuels

♦ Noise from transportation

♦ Psychosocial effects such as severance of communities by large roads and the restriction of children's movement

♦ Climate change due to CO_2 emission

♦ Improved physical activity from cycling or walking

♦ Increased access to employment, shops and support services

♦ Recreational uses of road spaces

♦ Contributes to economic development

♦ Vector borne diseases

Determinants of Health

◆Luck (incl. genetic inheritance)

◆Choices

◆Health care

◆Physical environment

◆Social determinants

Case Study 1

The experience of Eastern Europe

- Countries such as Poland, Hungary, Bulgaria, and Russia experienced steady improvements in life expectancy after World War II.

- In Russia life expectancy has fallen from 65 years in 1987 to 59 years in 1993.

Case Study 2

Economic growth and prosperity

Japan

• Between 1965 and 1990 it leaped ahead of all other industrialized countries despite increased dietary fat and increased smoking rates.

• Life expectancy was 63.6 years for males and 67.8 years for females in 1955

• By 1991 it had increased to 76.1 for males and 82.1 years for females.

Health ecological model

健康生态学模型

Cause analysis for James

- ◆ Why did James come to see doctor?
- ◆ Because his leg suffered from infection。
- ◆ Why was his leg infected?
- ◆ Because his leg was wound but not be treated immediately.
- ◆ Why was his leg wound?
- ◆ Because he played on a green area with his dog near his residence area, then incised by a tile when his leg stepped into a hole.
- ◆ Why did he play on this risk green area?
- ◆ Because his apartment is very limited, and no public garden there for playing.
- ◆ Why did his family live there?
- ◆ Because of high price of housing in other pla   rent an apartment with good condition.
- ◆ Why were his parents unable to offer such a
- ◆ Because his father was unemployed, and his
- ◆ Why was his father unemployed?
- ◆ Because he obtained low level of educatio   jobs with high-tech.
- ◆ why...?
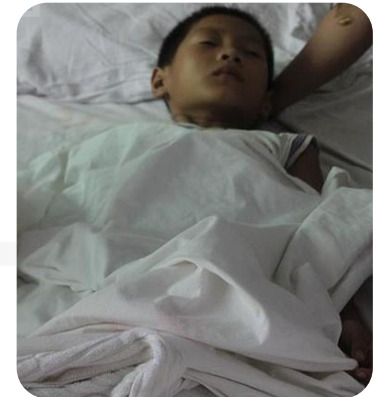
Mechanisms and causes of disease

Deficient of Vin D in diet

Ergosterol in skin

D Vitamins

Osteomalacia

Some Muslim women in the puberty avoid public observation

Spending most time indoor and wearing clothing cover all body

Pear-shaped pelvis

Pregnancy disorder

Natural History of Disease

Health → Asymptomatic → Disease → Recovery / Death

Window of Opportunity

Predisease Stage   **Latent (hidden) Stage**   **Symptomatic Stage**
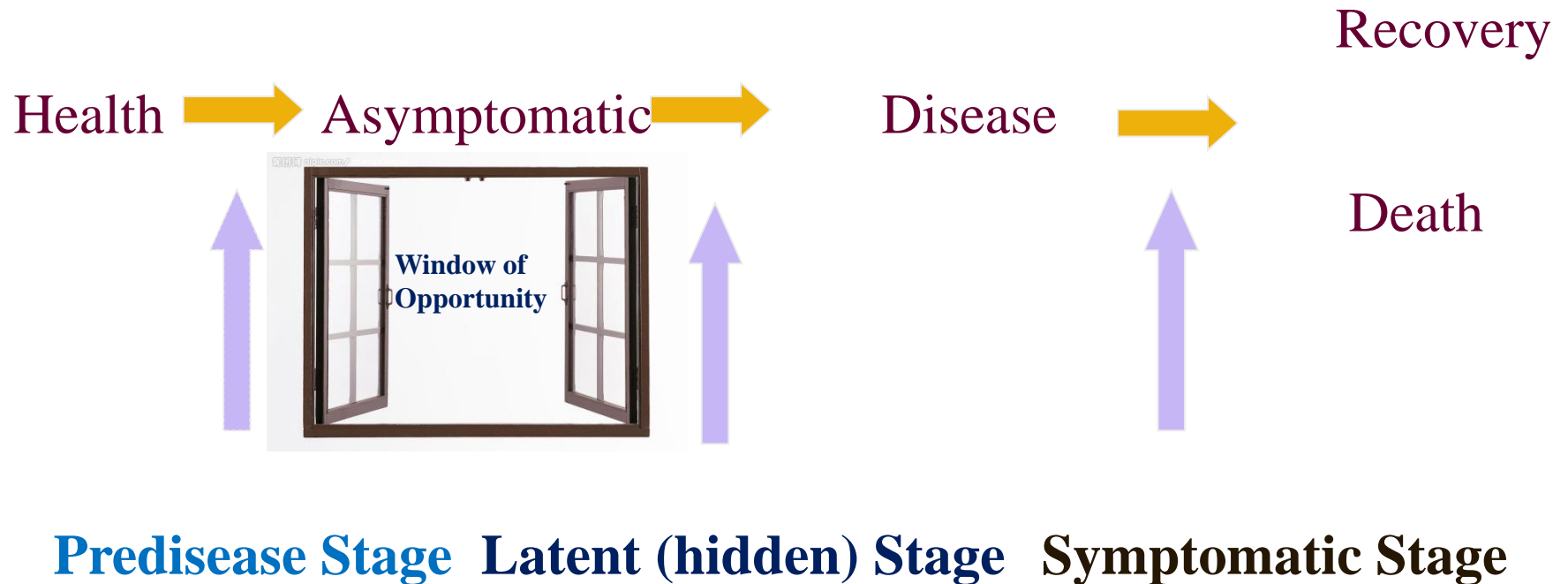
Levels of Prevention
(Leavell levels)

Recovery

Health → Asymptomatic → Disease →

Death

Primary prevention

Secondary Prevention

Tertiary Prevention

Leavell: HR, Clark EG: Preventive Medicine for Doctor in His Community, 3rd edition. New York: McGwaw-Hill Book Company, 1965)
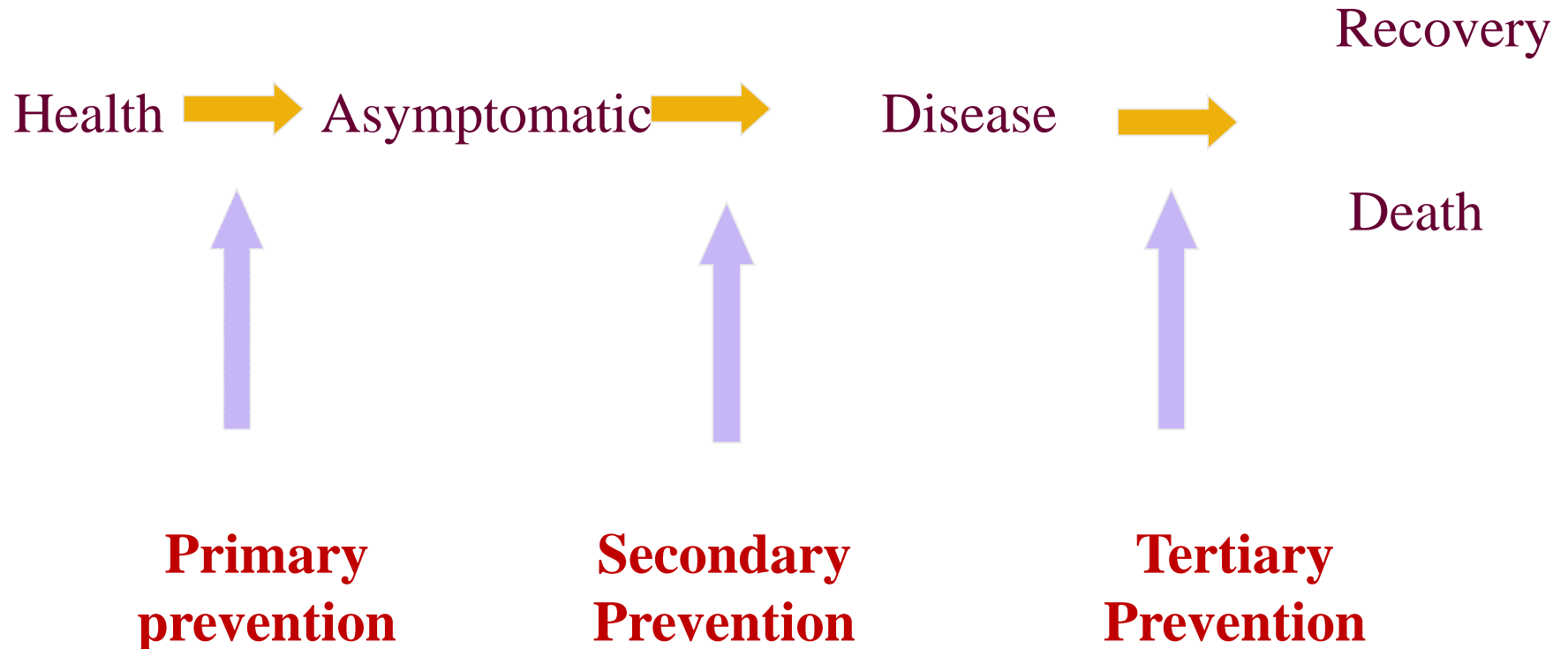
Primary prevention (examples?)

♦ Primary prevention aims at keeping a disease from ever beginning or a trauma from ever occurring.

PUBLIC HEALTH PERSPECTIVE
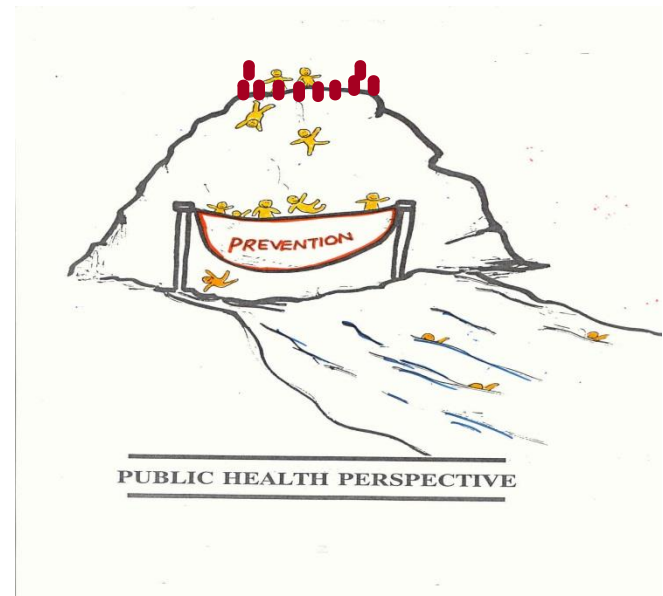
♦ Secondary prevention involves the early detection and early intervention against disease before it develops fully.

THE MEDICAL MODEL OF HEALTH
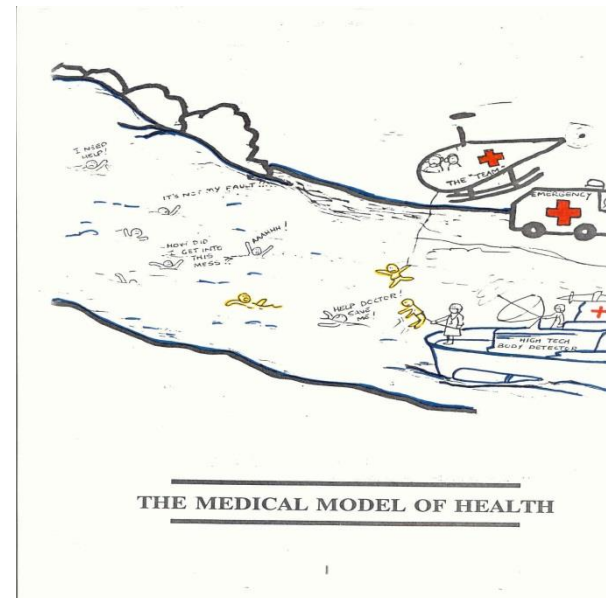
Tertiary prevention *(examples?)*

♦ **Tertiary prevention takes place after a disease or injury has occurred. It seeks not only to prevent deterioration and complication from a disease or injury, but also to rehabilitate and return the patient to as full physical, mental and social function as possible.**

SELF-MANAGEMENT
SELF-HELP
MUTUAL AID
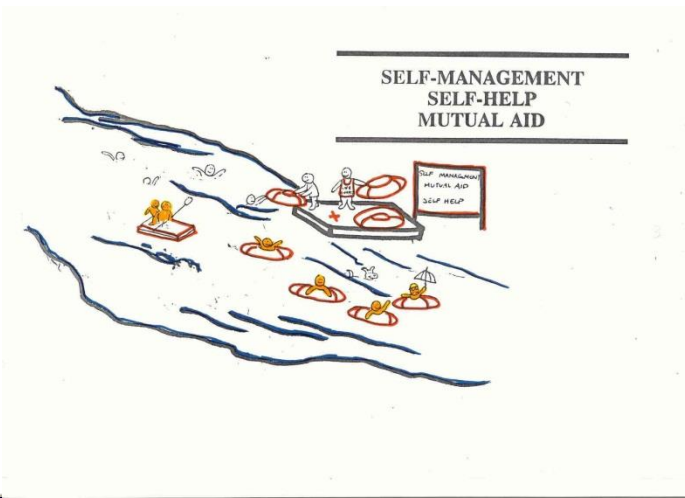
Modified Version of Leavell's Level of Prevention

| Stage of disease	Level of Prevention	Appropriate Response
Predisease		
No known risk factors	Primary prevention	Health promotion (e.g. encourage healthy changes in lifestyle, nutrition, and environment)
Disease susceptibility	Primary prevention	Specific protection (e.g. recommend nutritional supplements, immunizations, and occupational and automobile safety measures)
Latent Disease	Secondary prevention	
Symptomatic Disease		
Initial care	Tertiary prevention	Disability limitation (e.g. institute medical or surgical treatment to limit damage from the disease and institute primary prevention measures)
Subsequent care	Tertiary prevention	Rehabilitation (e.g. identify and teach methods to reduce physical and social disability)

Strategies of preventions

◆ <u>high-risk strategy of prevention</u>

◆ <u>population strategy of prevention</u>

Prevalence of DM, 18+
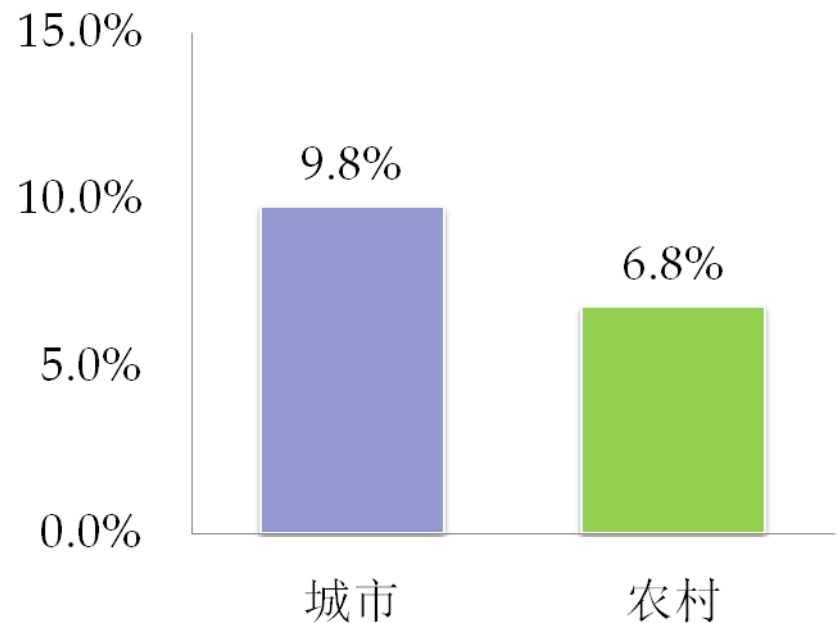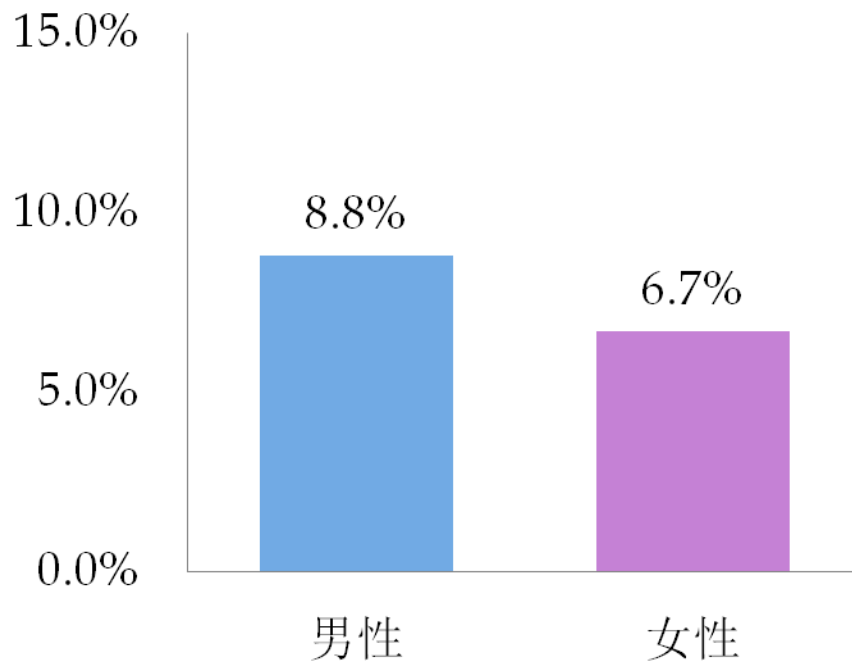
♦ Total9.7%，Male10.2%，Female9.0%

♦ Urban12.3%，Rural8.4%
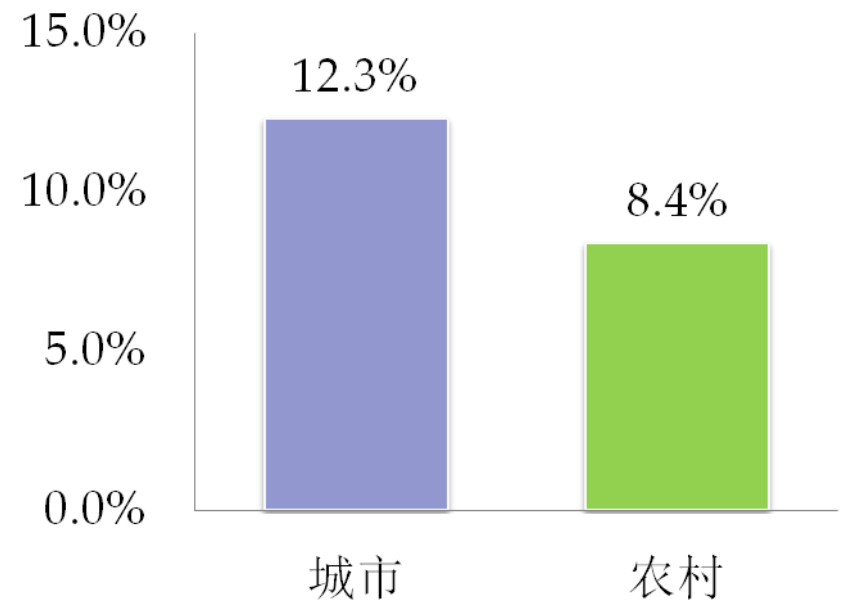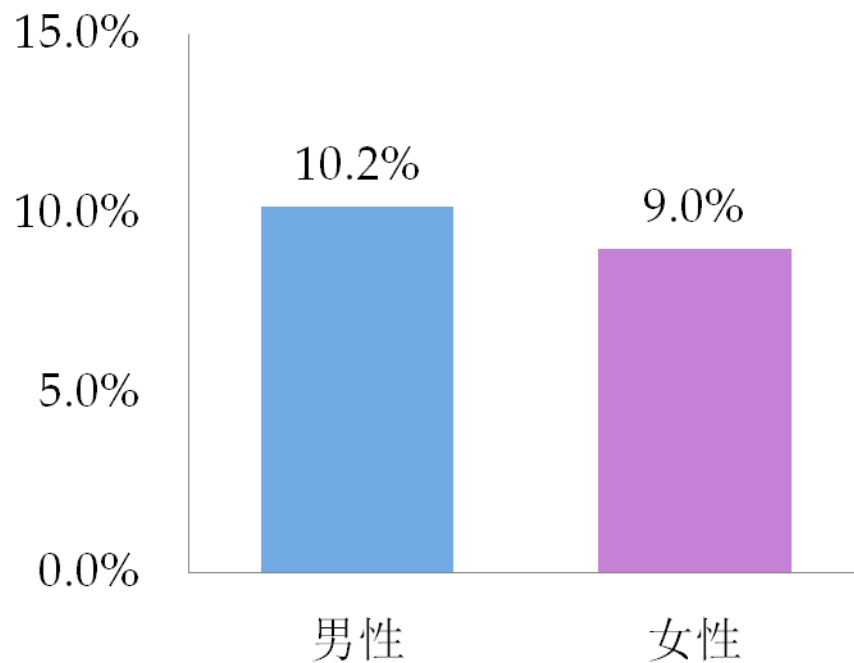
Prevalence of DM, 18-59

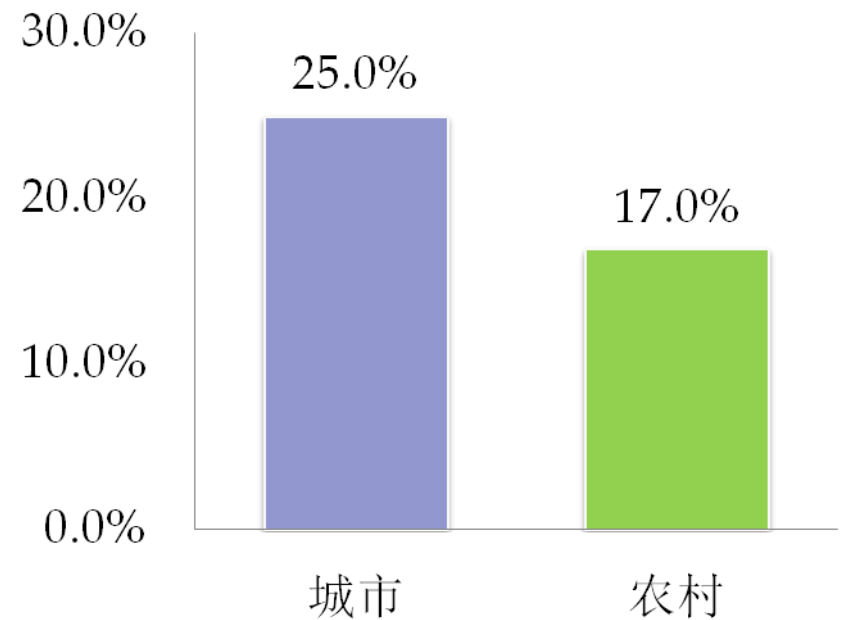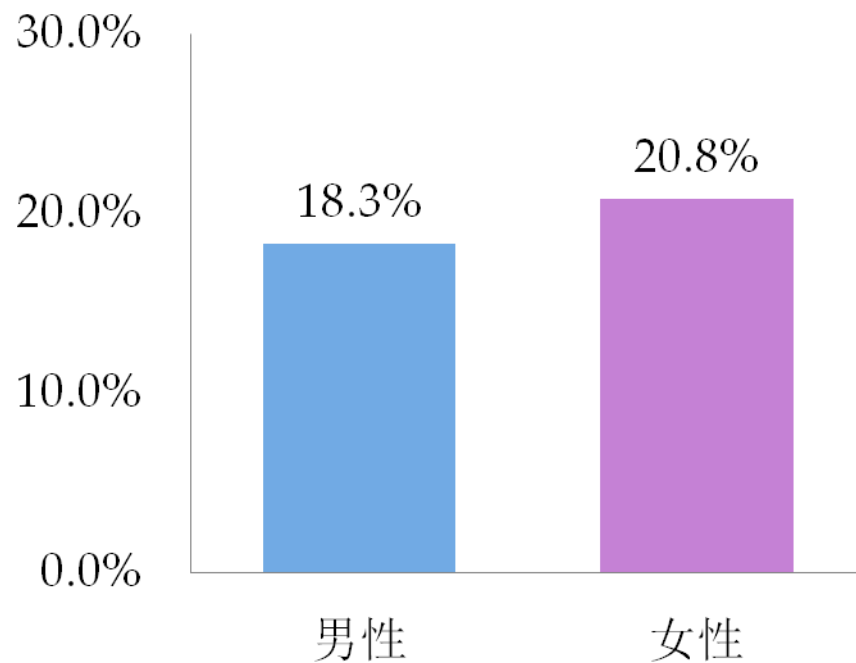♦ Total7.8%，M8.8%，F6.7%

♦ Urban9.8%，Rural6.8%

Prevalence of DM, 60+:
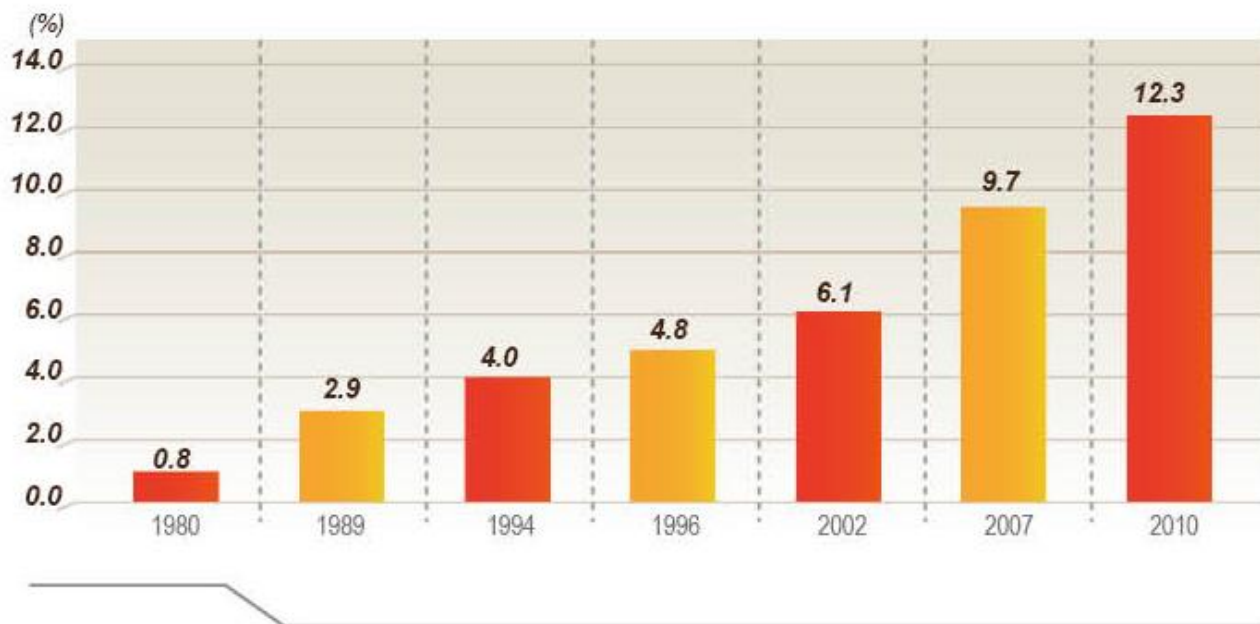
◆Total**19.6%，M18.3%，F20.8%**

◆Urban**25.0%，Rural17.0%**

Epidemiological Trend of DM

来源：全国成人糖尿病流行病
学调查；中国居民营养与健康
调查；中国成人行为危险因素
监测

注：1980-2002 为大城市；2007 为经济发达地区；2010 年为城市。
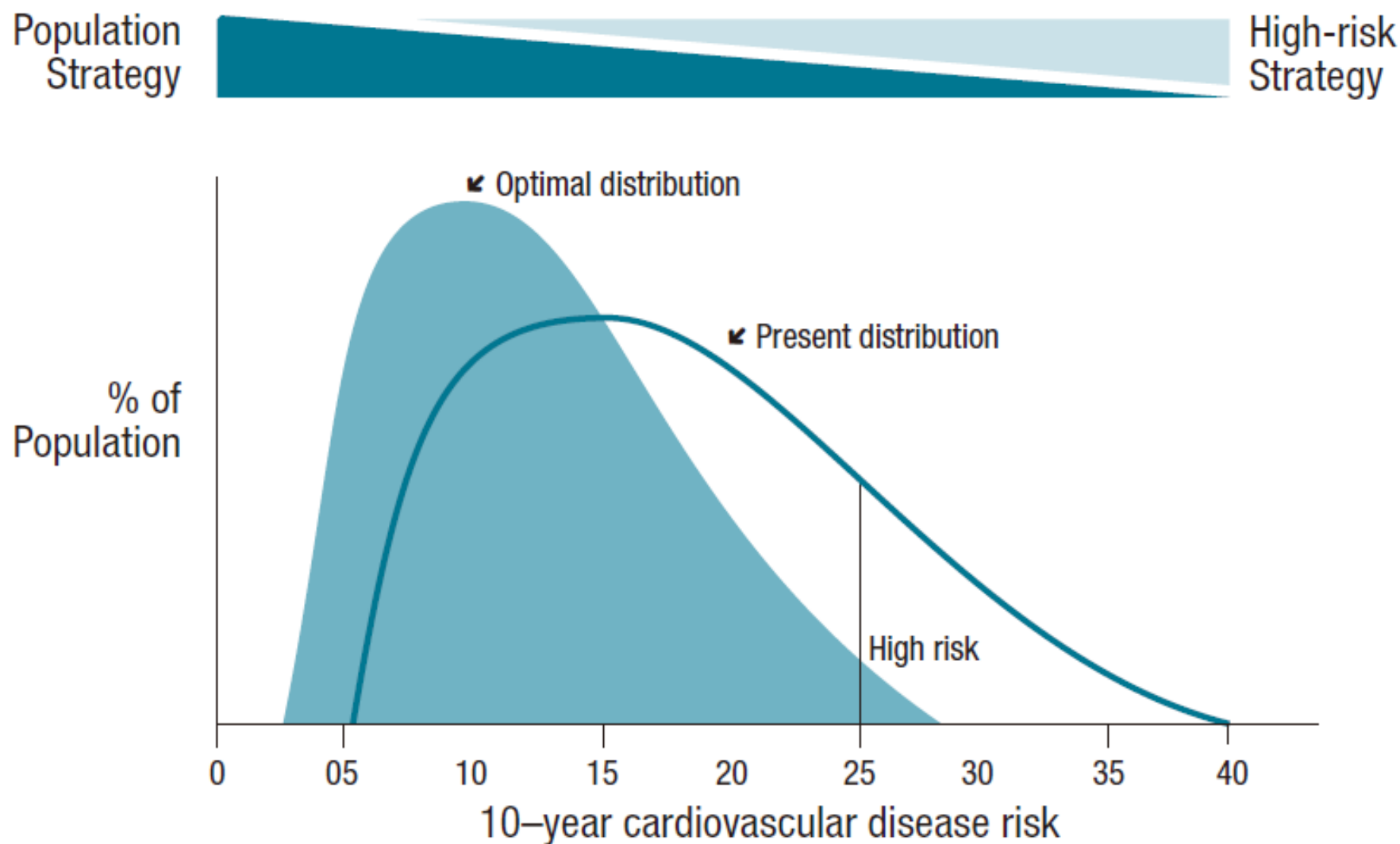
图4 ➤ 中国 18 岁及以上人群糖尿病患病率

Argument
A team/B team

♦ **What strategies is better, <u>high-risk strategy of prevention, or population strategy of prevention</u> ?**

Figure 3 Population-wide and high-risk strategies complimentary and synergetic (9)
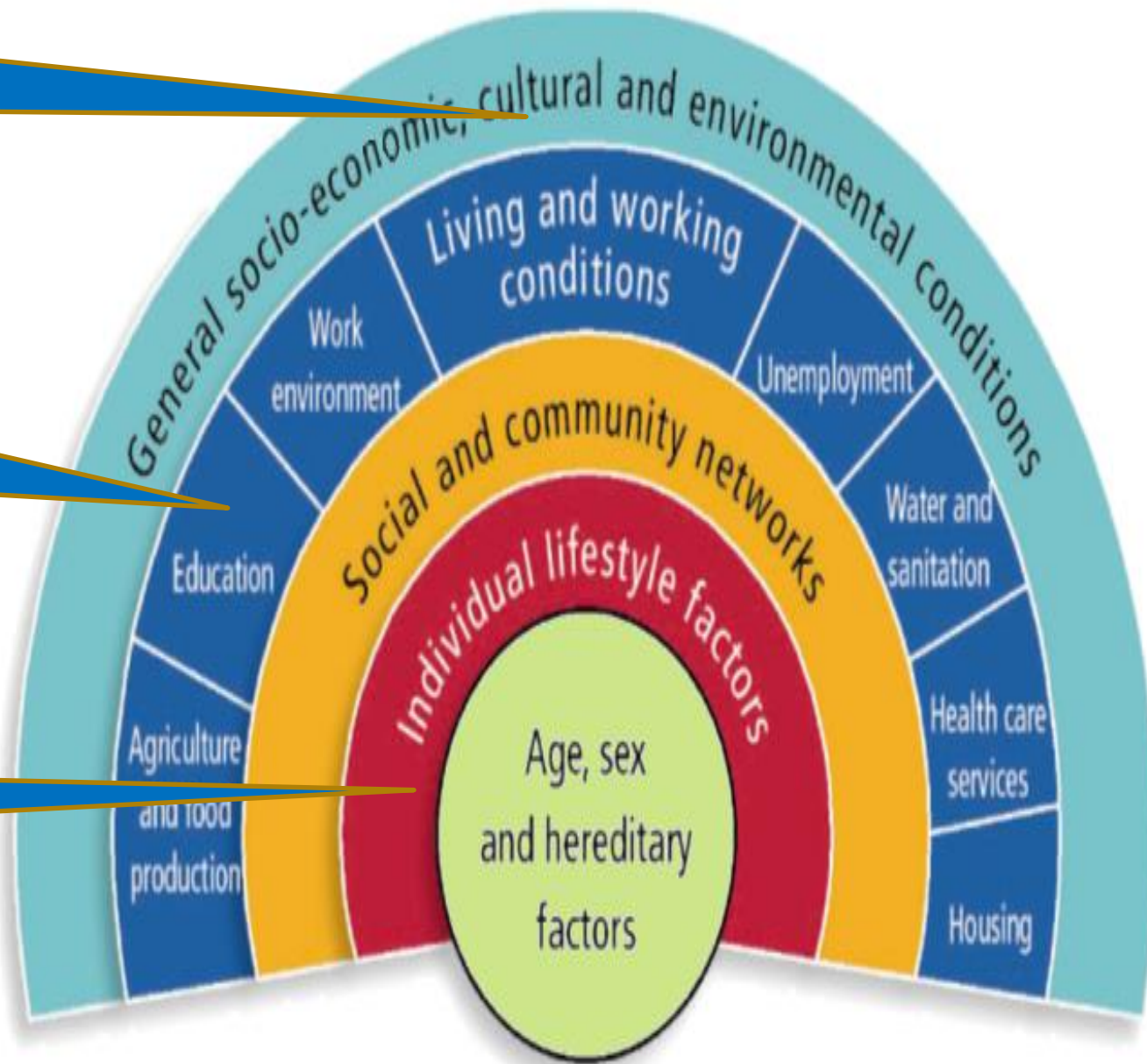
Health system

Com./Pop. Health

Clinical Prevntition

Stat. + Epi.

General socio-economic, cultural and environmental conditions

Living and working conditions

Work environment

Unemployment

Social and community networks

Education

Individual lifestyle factors

Water and sanitation

Agriculture and food production

Age, sex and hereditary factors

Health care services

Housing

Summary1

♦ Preventive medicine seeks to enhance the lives of patients by helping them promote their own health and prevent specitic disease or diagnose them early.

♦ Preventive medicine also tries to apply the concepts and techniques of health promotion and disease prevention to the organizatio and practice of medicine (clinical preventive services)

Summary 2

♦ **Health is an elusive concept, but there is general agreement that it means much more than the absence of disease.**

♦ **It is a positive concept that includes the ability to adapt to stress and the ability to function in society.**

♦ **Illness is experienced but disease is diagnosed.**

Summary 3

♦ The three levels of prevention define the various strategies that are available to practitioners to promote health and prevent disease, impairment, and disability at various stages of the natural disease history.

♦ The three levels are primary prevention, secondary prevention and tertiary prevention

Prevention strategies

D

PreD

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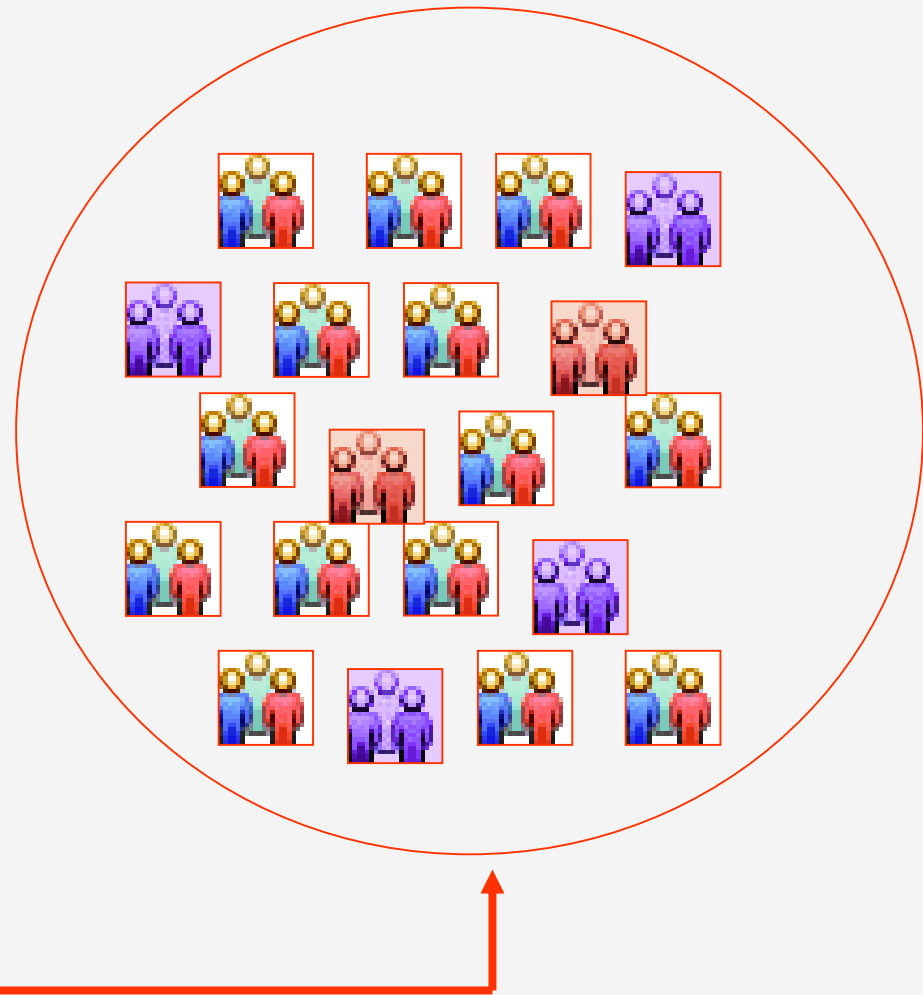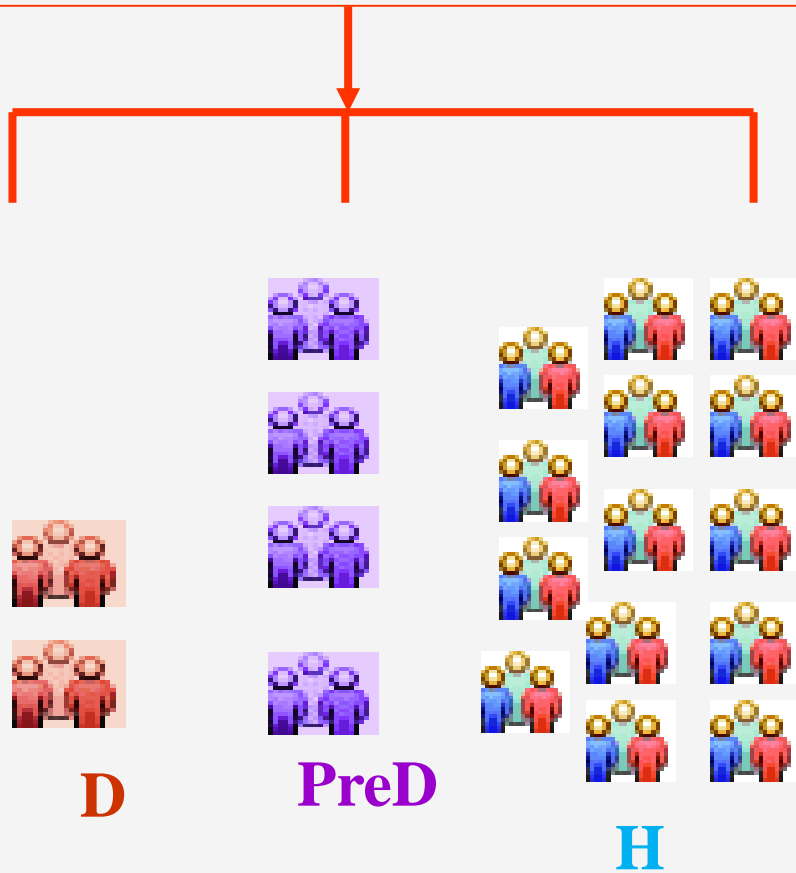
Grading

- ♦ Oral Presentation (Environment and health, Health care system)　　　　40%
- ♦ Report(field visiting)　　　　10%
- ♦ Final Exam　　　　50%