# 3.6 Option: Food and health

Name: _____ Class: _____ Date: _____ **Total: 30 marks**

**KEY WORDS** food security • famine • obesity • epidemiological transition • non-communicable disease

## Objective

Build the skills to answer Paper 1 questions on the **food and health** option: food security and famine, undernutrition and **obesity**, the **epidemiological transition**, how diseases spread, managing diseases such as malaria, and strategies to increase food production.

**You must be able to:**

- explain why famine can happen when food is available (Sen)
- explain the epidemiological transition with data
- distinguish types of disease diffusion
- evaluate strategies to reduce a disease such as malaria
- evaluate strategies to increase food production

## 1 Key knowledge and worked examples

### Food and famine

**Food security**: all people can get enough safe and healthy food at all times. A **famine** often happens not because there is no food but because people cannot afford or reach it. Amartya Sen: in the Bengal famine of 1943 food was available, but prices rose far faster than the wages of the poor; about 2 to 3 million people died.

Both problems exist at once: **undernutrition** (too little food or too few nutrients) and **obesity** (about 1 in 8 people in the world were obese in 2022, WHO).

### Health and disease

- **Epidemiological transition**: as countries develop, deaths from **infectious diseases** (diarrhoea, tuberculosis) fall, people live longer, and **non-communicable diseases** (heart disease, cancer, diabetes) become the main causes of death. China's life expectancy rose from about 59 years (1970) to about 79 years (2023).
- **Diffusion** of disease: **contagious** (spreads to nearby people, like ripples), **hier-**



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**archical** (spreads down from large cities to smaller places), **relocation** (carried by a person to a new place).

- **Malaria** kills about 600,000 people a year, mostly young children in Africa (WHO). It is spread by *Anopheles* mosquitoes. Strategies: insecticide-treated bed nets, indoor spraying, draining standing water, quick testing and treatment, and vaccines (first recommended by WHO in 2021).

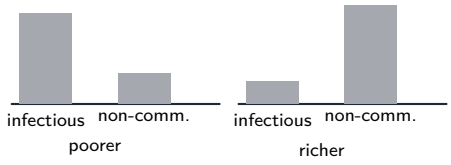
### Producing more food

| strategy | benefit | limit |
|---|---|---|
| Green Revolution seeds, fertilizer, irrigation | much higher yields | water, fertilizer and debt for small farmers |
| genetically modified crops, e.g. Bt cotton in India | less pesticide, higher yields | seed cost; public concern |
| irrigation | grows food in dry places | falling groundwater, salty soils |
| aquaculture (fish farming) | protein without catching wild fish | pollution, disease, mangrove loss |

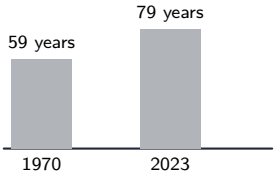
**Worked example.** Life expectancy 59 → 79 years: rise = 20 years = $20 \div 59 \times 100 \approx 34$ %.

## 2 Practice

**2.1** Define the **epidemiological transition**. [2]



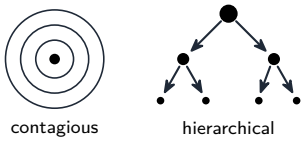

**2.2** China's life expectancy rose from about 59 years in 1970 to about 79 years in 2023. Calculate the percentage increase, and give **one** reason for it. [3]



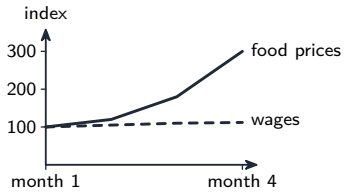


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**2.3** Distinguish between **contagious** and **hierarchical** diffusion of a disease. [2]




**2.4** Explain why a famine can happen even when there is enough food in a country. [3]




**2.5** Explain **two** strategies used to reduce deaths from malaria. [4]

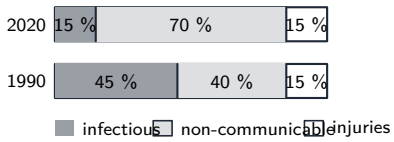



## 3 Exam-style questions

**3.1** *(Paper 1 style.)* The graph shows causes of death in a middle-income country (illustrative data).

(a) Describe the changes in causes of death from 1990 to 2020. Use data. [2]

(b) Explain **two** reasons why deaths from non-communicable diseases have increased. [4]






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**3.2** Evaluate the strategies used to increase food production. [10]



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## Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

**2.1**

the change in the main causes of death as a country develops: from infectious diseases to non-communicable diseases such as heart disease and cancer, while life expectancy rises

**2.2**

$\frac{79-59}{59} \times 100 \approx$ **34** %; any one: clean water and sanitation / vaccines / better health care / more and better food

**2.3**

contagious: the disease spreads from person to person to nearby places, like ripples; hierarchical: it spreads down an urban hierarchy, from large cities to smaller towns, often along transport links

**2.4**

food may be available, but poor people cannot afford it if prices rise faster than their wages (access); e.g. Sen on the Bengal famine of 1943; food may not reach people because of poor roads, conflict or hoarding

**2.5**

any two, explained: insecticide-treated bed nets stop mosquitoes biting at night and kill them; indoor spraying with insecticide kills mosquitoes resting in homes; draining standing water removes places where mosquitoes breed; quick testing and medicine cure people before they become seriously ill; vaccines for young children lower severe illness and deaths

**3.1**

(a) infectious diseases fell from 45 % to 15 % of deaths; non-communicable diseases rose from 40 % to 70 %, while injuries stayed at 15 %

(b) any two, explained: people live longer, and heart disease and cancer are more common in old age; diets with more sugar, fat and processed food raise obesity and diabetes; less physical work in cities, more cars; smoking and air pollution; fewer people die young of infectious diseases, so a larger share of deaths come from NCDs

**3.2**

Mark with the markbands: [9-10] focused on the command term, detailed and accurate knowledge, well-developed explanation, specific named examples (places, dates, numbers), balanced evaluation and a supported conclusion; [7-8] mostly focused, good knowledge and examples, some evaluation; [5-6] relevant knowledge and examples, explanation partly developed, little evaluation; [3-4] general knowledge, few examples, mostly description; [1-2] little that is relevant. Points that may be included: Green Revolution: high-yield seeds, fertilizer and irrigation raised grain output faster than population from



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the 1960s; but it needed much water and fertilizer, causing falling water tables and polluted rivers; richer farmers gained most; poor farmers often went into debt; GM crops: Bt cotton in India is widely grown, uses less pesticide and gives higher yields; but seeds are costly and some consumers and countries oppose GM food; irrigation lets dry areas grow food, but can make soils salty; aquaculture gives protein, but can pollute water and destroy mangroves; producing more food does not end hunger if people cannot afford it (Sen); conclusion: these strategies have greatly raised food production, but they are sustainable only if they protect water and soil and help poor farmers too


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