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), **hierarchical** (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).

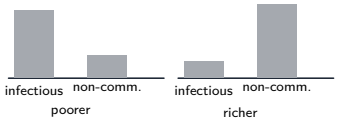
Producing more food

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

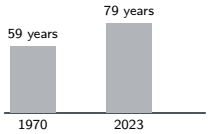
Worked example. Life expectancy $59 \to 79$ years: rise $= 20$ years $= 20 \div 59 \times 100 \approx 34\ \%$.

2 Practice

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

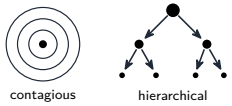


2.2 China's life expectancy rose from about 59 years in 1970 to about 79 years in 2023. Calculate the percentage increase, and give **one** reason for it. [3]

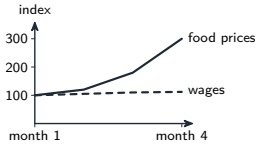


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2.3 Distinguish between **contagious** and **hierarchical** diffusion of a disease. [2]



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]

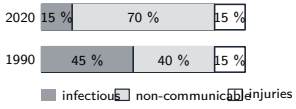


3 Exam-style questions

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]



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 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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