HEALTH AND HUMAN DEVELOPMENT
Trial examination 2010

Suggested answers

SECTION A

Question 1

Students refer in this question to Table 1, comparing burden of disease for different conditions.

a. According to the study design the definition of burden of disease is 'A measure of the impact of diseases and injuries; specifically it measures the gap between current health status and an ideal situation where everyone lives to an old age free of disease and disability. Burden of disease is measured in a unit called the DALY.'

b. Cardiovascular disease contributes to 18.0% of burden of disease, while mental disorders contribute 13.3%.

While the fatal component of the burden of disease from cardiovascular disease is 78% of the total, mortality contributes only 7% to the burden of disease from mental disorders. For mental disorders there would be many more years of healthy life lost due to living with a disability than years of life lost due to premature death.

Question 2

In this question, students consider Table 2, an international comparison of health status.

a. HALE – stands for Health Adjusted Life Expectancy which is 'a measure of burden of disease based on life expectancy at birth, but including an adjustment for time spent in poor health. It is the number of years in full health that a person can expect to live, based on current rates of ill health and mortality.

b. For three marks, students are to show understanding – referring to the data – of Australia's health status and its comparison to two other listed developing countries.

Through their answers students should show that they understand that health status can be measured using health indicators such as those shown in the table. Students should identify both similarities and differences in health status between Australia and the other chosen countries. Students should use data in the table to support their statements.

Australia and the other four countries in the table are all developing countries with a very good health status. Comparative comments could include the following:

- Australia has the second highest life expectancy (82) after Japan (83) and has equal second highest Health Adjusted Life Expectancy (73) after Japan (75).

- Australia's maternal mortality ratio is second best (4 deaths per 100,000 live births) after Sweden (3).

- Australia's infant mortality (5 per 1000 live births) and under 5 mortality (6 per 1000 live births) are equal second poorest after the USA.

Question 3

Nutrient	One major function as a determinant of health
Folate	Required for DNA synthesis and production and maturation of red blood cells. Involved in rapid cell division. Sufficient intake in the early months of pregnancy reduces the risk of neural tube defects in the foetus. Deficiency also leads to anaemia.
Calcium	Hardening mineral in bones. Needed to increase bone density to help to prevent osteoporosis.
Vitamin B12	Required for DNA synthesis and production of red blood cells. A deficiency results in anaemia.
Iodine	Needed for the production of thyroxine, the thyroid hormone which controls metabolic rate.

Question 4

a. Medicare is a universal health care system for all Australians, funded by general taxes and a special Medicare levy. Medicare pays for basic medical and hospital care for all Australians.

b. Students need to correctly identify two of the following values and explain the ways in which Medicare achieves each of the two values:

Effective, appropriate, efficient, responsive, accessible, safe, continuous, capable, sustainable

Sample answer:

Accessible – this is the ability of people to obtain health care at the right place at the right time, irrespective of income, cultural background or physical location.

Efficient – refers to achieving desired outcomes with cost effective use of resources. Some interventions are more cost-effective than others. The management of Medicare should be efficient.

Question 5

a. Food Standards Australia New Zealand (FSANZ) is a government agency. Its main role is to ensure a safe food supply and well informed consumers. For full marks, students should present a brief overview of the organisation's major functions. FSANZ has a number of functions related to:

- Food standards – developing standards on food labeling and composition and on primary production.

- Food surveillance and food recall – monitoring foods and retailers to make sure that food standards are adhered to, and to oversee recall of foods.

- Food labelling – FSANZ determines the information that is required to be included on a food label (including nutritional content and list of ingredients) and what cannot be included (for example any deceptive or misleading health and nutrition claims).

- Food safety – laws are based on the FSANZ food standards codes – foods sold at retail outlets are required to be handled and stored in a safe and hygienic manner.

Students should describe appropriate functions of FSANZ and show how the functions assist in promoting healthy eating. Healthy eating is promoted by providing a safe food supply and by ensuring that consumers are provided with accurate information about the foods they eat, including nutritional content. FSANZ also promotes healthy eating by ensuring that consumers are not misled by deceptive or untrue health or nutrition claims.

b. The Nutrient Reference Values for Australia and New Zealand (NRV) refer to the National Health and Medical Research Council (NHMRC) guide on the amount of nutrients required daily that is considered to be adequate to meet known nutritional needs and prevent deficiency diseases. Their purpose is to provide a guide for governments, health practitioners, food manufacturers and individuals.

Students may also include descriptions of some of the categories of values, especially if they use this description to further explain the purpose of the NRVs. Students are not being asked to identify all the values but may include some of the following material:

The NRVs give an indication of nutrient requirements at the individual and population level and are specific to gender and lifespan stage or age group. The NRVs are comprised of six categories of values, including the previously recognised RDI – Recommended Dietary Intake – which is the amount of a nutrient that meets the needs of 97–98% of the population.

Other values included are:

EAR – Estimated Average Requirement

UL – Upper Limit

AI – Adequate Intake

EER – Estimated Energy Requirement

Question 6

a. Obesity refers to the condition of carrying an unhealthy amount of excess fat/weight. It is defined either as having a Body Mass Index (BMI) of greater than 30, or as a waist measurement of greater than 89cm for females or 102cm for males.

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b. Teachers should note that the VCAA has advised an expectation that new teaching on The Australian Dietary Guidelines is expected from 2012 following a 2011 update and will be advising teachers on this through its bulletins. In the meantime, the guidelines remain unchanged and are an examinable part of the study.

Students should note the relationship between obesity and diets high in fat and sugar and low in fibre and water.

They should provide several examples of Dietary Guidelines and show clearly how each one promotes a diet low in fat, low in sugar, high in fibre and in water.

The example that follows provides more information than would be required for 4 marks.

Sample answer:

The Dietary Guidelines for Australian Adults is a set of guidelines for adults to follow – to provide sufficient nutrients for maintenance of body functions and to prevent diet-related diseases/conditions.

The following guidelines help to reduce the energy density (through low fat, low sugar, high dietary fibre, high water content) of the daily food intake of adults, and therefore to help prevent obesity.

Enjoy a wide variety of nutritious foods:

- Eat plenty of vegetables, legumes and fruits – these foods are very low in fat and high in fibre and water content

- Eat plenty of cereals, preferably wholegrain – these foods are very low in fat and high in fibre

- Include lean meat, fish, poultry and/or alternatives – lean (low fat) meats are recommended

- Include milk, yoghurts, cheeses and/or alternatives. Reduced fat varieties should be chosen where possible – low fat varieties are recommended

- Drink plenty of water – this replaces high sugar drinks – soft drinks and fruit juices; also perhaps alcohol.

And take care to:

- Limit saturated fats and moderate total fat intake – reduce fat intake

- Limit your alcohol intake if you choose to drink – alcohol is high in kilojoules

- Consume only moderate amounts of sugars and foods containing added sugars

- Prevent weight gain – be physically active and eat according to your energy needs

- Encourage and support breast feeding – research suggests that breastfed babies are less likely to be overweight

Question 7

Students should describe AusAid and its main aims.

AusAID is the Australian Agency for International Development. It manages the Australian Government's overseas aid program to make sure that it is appropriate.

AusAID aims to reduce poverty in developing countries and improve human development, with a focus on assisting developing countries to achieve Millennium Development Goals.

Students should then provide an example of the work of AusAid and the way in which its programs assist in improvement of global health and sustainable human development.

AusAid provides three main forms of aid – bilateral, multilateral and non-government aid. The aid can be short-term (emergency aid), or long term.

Bilateral aid is aid that is given in a partnership between governments of two countries – Australia and a developing country. It is used for aid for specific projects, education and training programs, community based projects, technological aid, food aid – to improve the health and sustainable human development of people in the specific developing country.

Multilateral aid – aid given by the governments of many countries – distributed through international organisations e.g. United Nations, the World Bank, UNICEF. This aid is used to help developing countries with loans, debt relief, good governance, sound economic policies. Used for emergency relief and large-scale projects e.g. transport infrastructure.

Non-government aid – aid given to NGOs (e.g. World Vision, CARE Australia, Australian Red Cross) who conduct programs that improve health and sustainable human development in tangible and direct ways.

Question 8

Students are to fill in the table to show the five WHO mortality strata, filling in the details below that appear in bold typeface.

Mortality strata	Child mortality	Adult mortality
A	**Very low**	**Low**
B	**Low**	**Low**
C	**Low**	**High**
D	**High**	**High**
E	**High**	**Very high**

SECTION B

Question 1

a. VicHealth is the Victorian Health Promotion Foundation. Its main role in promoting health is through providing grants to fund health promotion programs developed by non-government agencies, local governments and community organisations. It also funds research in the area of health promotion.

VicHealth sets priorities on a three-yearly basis. Key priorities include: reducing harm from alcohol and smoking; encouraging physical activity and healthy eating; and enhancing mental health and wellbeing.

Some examples of programs funded by VicHealth are:

- The QUIT program – to reduce the harm caused by cigarette smoking

- The Food for All program – to reduce food insecurity – to reduce the barriers that make it difficult for people to have access to food for healthy eating.

b. According to the study design the social model of health is 'A conceptual framework within which improvements in health and wellbeing are achieved by directing effort towards addressing the social, economic and environmental determinants of health. The model is based on the understanding that in order for health gains to occur, social, economic and environmental determinants must be addressed'.

c. i. This question addresses the presented case study information on the Food for All program. Students should show understanding of the social model of health – that it addresses the social, economic and environmental determinants of health. They should provide examples of this in the Food for All program. Students should also identify some of the relevant key principles of the social model of health – and use these to evaluate the Food for All program.

Sample answer:

The Food for All program reflects the social model of health in that it addresses the social, economic and environmental determinants of health – related to food insecurity.

The Food for All program addresses the following four of the five key principles of the social model of health.

- Addressing the broader determinants of health – the Food for All program does this by ensuring that those living in poor quality housing have access to food storage and cooking facilities and by improving transport options for those without a car.

- Intersectorial collaboration – the Food for All program encourages local government authorities to improve integrated planning of those things that influence access to food, such as transport, housing, economic development and land use.

- Addressing inequity – Funding was open to local government authorities with 20 per cent or more of their population living in disadvantaged neighbourhoods.

- Empowering communities and individuals – actions include improving food and cooking knowledge among disadvantaged groups.

c. ii. Students should identify three different potential health outcomes of the program and briefly show the way in which the health outcome may result from the program.

Examples of potential health outcomes:

- Physical health: Reduction in overweight and obesity – provision of a variety of foods, particularly fruit and vegetables.

- Physical health: Reduction in diabetes mellitus and cardiovascular disease – due to reduction in overweight

- Mental health: Reduction in anxiety that results from food insecurity.

Question 2

a. The glycaemic index (GI) of a food is a ranking of foods based on the time taken for individuals to reach peak blood glucose level. Foods are ranked from 0 to 100 where 100 is equivalent to the score for pure glucose. The higher the ranking, the faster the blood glucose is released into the blood.

b. Low GI foods are broken down slowly – the release of glucose into the blood after a meal is gradual.

c. Name of National Health Priority Area – Diabetes mellitus

Role of low GI foods: Low GI foods cause a gradual release of glucose into the blood. This means that the amount of insulin required to be released from the pancreas is lower than if there is a rapid release of glucose into the blood. The body's cells do not become insulin-resistant. Impaired glucose regulation is less likely to develop. Therefore diabetes mellitus is less likely to develop.

Question 3

This question relates to Figure 1, a graph showing proportion of people aged 18 years and over reporting selected health risk factors and long-term conditions, by socioeconomic status, 2004–2005 (per cent).

a. Determinants of health are factors that raise or lower the level of health in a population or individual. They help to explain or predict trends in health and why some groups have better or worse health than others.

b. Biological determinant: Overweight/obesity

Behavioural determinants (any three of):
- Risky/high-risk alcohol use
- current daily smoker
- low/no daily intake of fruit
- sedentary/low exercise level.

c. Those in the lowest SES group have a higher proportion of people over 18 who report each of the long-term conditions than do those in the highest SES group (although the two groups have equal reporting of cancers). For example, 18 per cent of those in the lower SES group have arthritis compared to 12 per cent of those in the higher SES group.

(Those in the lowest SES group also have a higher proportion of people over 18 who report each of the selected health risk factors (all except risky alcohol use) than do those in the highest SES group: note that these risk factors are not measures of health status, so should not be the main response by the student.)

d. Students are to provide three reasons for cardiovascular health being included as a NHPA, using statistics to support their answer. Students should include three clear reasons, supported by at least one statistic. The following information could be included:
- CVD is the second leading cause of burden of disease in Australia (closely following cancers).
- CVD is the leading cause of premature death in Australia.
- About 3.5 million Australians reported having a chronic circulatory system condition in 2005.
- CVD is one of the leading causes of morbidity/disability in Australia.
- Direct and indirect costs of CVD are very high.
- Direct costs are estimated to be approximately 11–12 per cent of healthcare expenditure.
- Much of the burden of disease from CVD is largely preventable.
- There are interventions that are known to be able to reduce the burden of disease from CVD.

e. Students should clearly explain the role of three of the following determinants as a risk or preventative factors for cardiovascular diseases:

- Overweight/obesity: increases blood cholesterol levels; increases blood pressure; puts added strain on the heart – all of these increase the risk of cardiovascular disease

- Smoking: increases blood cholesterol levels

- Sedentary/low exercise level: increases the risk of overweight/obesity; physical activity decreases blood cholesterol levels and blood pressure

- Risky/high-risk alcohol use: is a risk factor for high blood pressure and obesity

- Low/no daily intake of fruit: fruits and vegetables contain negligible fat, are relatively low in energy density and are high in dietary fibre. This means that they are protective factors for overweight/obesity and cardiovascular disease.

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f. Direct costs of cardiovascular disease to the individual are those incurred due to diagnosis and treatment of the condition. Some examples of direct costs to the individual are: costs of visits to the doctor for diagnosis and treatment; costs related to hospitalisation due to a heart attack; ambulance costs; medication to treat angina, reduce blood pressure or reduce blood cholesterol.

Students should identify one cost and link it specifically to cardiovascular disease.

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g. Indirect costs to the community are those costs incurred that are not directly related to diagnosis or treatment. Some examples are: lost productivity if a worker works less efficiently due to illness; payment of sick leave – due to time off work for hospitalisation.

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h. This question asks for identification and description of one NGO health promotion program addressing cardiovascular health in Australia. There are a number of programs that students could choose to describe. The programs must be developed/implemented by an NGO e.g. the Heart Foundation or Nutrition Australia. Some examples are:

- The Heart Foundation's Tick

- The Heart Foundation's Healthy Heart Week

- Nutrition Australia's Nutrition Week

- Nutrition Australia – Healthy Living Pyramid

Sample answer:

The Heart Foundation's Tick – developed by the Australian Heart Foundation.

The Heart Foundation Tick is a symbol showing a red tick in a circle. The Heart Foundation gives permission to food manufacturers to display the 'Tick' on their food product if it meets the Heart Foundation's criteria. The criteria include high dietary fibre, low fat, low saturated fat, low salt compared to other foods of a similar type. The food manufacturer pays for the testing of their food product and an annual licence fee for the right to display the 'Tick'.

The Tick program also awards 'Ticks' to fresh foods in supermarkets, healthy menus and menu items in restaurants. There is an informative website.

The program's objective is to encourage food manufacturers to produce healthier foods, and to provide consumers with a simple way of making healthy choices easy choices. The ultimate aim is to reduce the burden of disease due to cardiovascular disease in Australia.

Diets high in fat, saturated fat and salt and low in fibre are major risk factors for cardiovascular disease.

Question 4

This question considers Table 3, which shows selected Human Development Report data.

a. The Human Development Index is a measurement of human development. It provides a single statistic which can be used as a reference for both social and economic development. It combines data on three aspects of a country's average achievement – in health (measured using life expectancy), knowledge (measured using adult literacy and children's school enrolment rate data) and standard of living (measured using GDP – Gross Domestic Product). The Human Development Index uses a scale from 0 to 1.

b. Life expectancy: 'An indication of how long a person can expect to live – it is the number of years of life remaining to a person at a particular age if death rates do not change' (AIHW, 2008).

c. This response must refer to comparative data in the table. Students would need to show that they understand that the health status of a country can be measured by looking at health indicators such as life expectancy, HALE (and percentage of children who are underweight).

Students should show that they understand that the health status of Australia is the highest (with a life expectancy of 81.4 and HALE of 75 years) compared to that of Malawi with the lowest health status (with a life expectancy of 52.4 and a HALE of 44 years). The health status of the five countries in the table would be ranked as follows – from best to worst: Australia, China, Cambodia, Kenya, Malawi.

d. A person who is literate has better employment prospects and a greater potential to earn a higher income. With that higher income the person can purchase food, clean water, essential medicines, which all add to the life expectancy.

Educated/literate women have greater power – greater control over their lives. They are less likely to be forced into early marriages, having many children, starting at an early age. They will have greater knowledge of family planning. This would lead to a greater life expectancy for the women and for their children.

Question 5

a. This question relates to information presented in a breakout box about programs run by World Vision to increase access to safe water and sanitation.

The two identified Millennium Development Goals that the program in this case study may help to address could be any two of the following:

- Reduce child mortality

- Improve maternal health

- Combat HIV/IDS, malaria and other diseases

- Ensure environmental sustainability.

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b. Students should clearly show the link between the chosen Millennium Development Goal and the safe water and sanitation programs described.

Examples

Reduce child mortality: By providing safe water and sanitation, the program reduces the incidence of water-borne diseases, including diarrhoea – which are key causes of death in young children in many developing countries. Some diseases include cholera, typhoid and dysentery. The incidence of malaria is also reduced as the program reduces the areas of stagnant water which is the breeding ground for the mosquito that carries the malaria parasite.

Improve maternal health: By providing safe water and sanitation, the program reduces the incidence of water-borne diseases, including diarrhoea – which are key causes of death in many developing countries. Diarrhoea leads to malnutrition which weakens the pregnant woman's health status. Some diseases include cholera, typhoid and dysentery. The incidence of malaria is also reduced as the program reduces the areas of stagnant water which is the breeding ground for the anopheles mosquito that carries the malaria parasite.

Combat HIV/AIDS, malaria and other diseases: By providing appropriate water storage and water piping infrastructure, the program is reducing the areas of stagnant water that are the breeding ground for the mosquito that carries the malaria parasite. By providing safe water and sanitation, the program reduces the incidence of water-borne diseases, including diarrhoea.

Ensure environmental sustainability: The program helps to reduce the proportion of people without sustainable access to safe drinking water and sanitation (one of the targets for this MDG). By protecting natural springs the program is helping to reverse the loss of environmental resources in the country.

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c. Students should identify three elements that would assist the sustainability of the program and use examples from the excerpt to show that these elements have been included in the World Vision programs described. The study design identifies the elements of appropriateness, affordability and equity.

Sample answer:

Appropriateness

There is extensive community consultation and involvement in the planning and ongoing implementation of these programs – this will ensure that the program is more likely to be appropriate and culturally sensitive.

Affordability

Members of the community are trained in the correct use of this equipment – this means that they can do the work themselves and will not have to pay for others to do their work for them. World Vision pays for the infrastructure.

Equity

This program benefits women and girls in particular as it is the women and girls who have to walk for hours every day to collect water that often isn't even clean. Girls and women are the ones who do the majority of work in developing countries.

Question 6

This question relates to areas of United Nations action, particularly the ways in which social and economic development contribute to global health and sustainable development.

Sample answer:

The social model of health is based on the understanding that substantial health gains cannot be made unless a person's basic needs are met. These basic needs include peace, shelter, education, food, income, a stable ecosystem, sustainable resources and social justice and equity.

By improving social and economic development, people's basic needs are more likely to be met, therefore providing a basis for health gains.

Social and economic development:

- is vital for reducing/eradicating poverty, which in turn is central to achieving global peace.

- encourages full employment which increases income to pay for food, shelter, education

- improves housing conditions

- provides a more sustainable food supply – reduces food insecurity

- provides sustainable development as it empowers individuals and communities through improved education and training

- provides a more stable government – through providing assistance with governance, finance and debt management.

Question 7

For this question students may choose to discuss either malaria or HIV/AIDS.

a. Students focus their response on a particular existing program, explaining why it is needed, implementation strategies and elements that ensure sustainability.

Malaria

Students could choose from a number of programs. For example:

- The Global Malaria Action Plan

- The President's Malaria Initiative

- Student Leaders Against Malaria.

Sample response for malaria

Note: this is a generalised response; students should focus their discussion on a particular program.

Reasons why the program is needed: Half of the world's population is at risk of infection with the malarial parasite. The majority of cases of malaria infection are in developing countries. Malaria causes approximately 1 million deaths annually. This disease also leads to sickness which affects a person's capacity to work, children's education and the productivity of adults – therefore malaria reinforces poverty.

Strategies used in this program: Strategies for combating malaria will have all or some of the following three components – control, elimination and research. Control involves reducing the stagnant water where the mosquitoes that carry the malaria parasite breed. Distribution of insecticide treated mosquito nets is another key strategy to prevent infection. Other strategies include education of people in ways to prevent and treat malaria and improving access to appropriate medications for treatment of malaria.

Elements of the program that will ensure sustainability of the program: Anti-malaria programs aim to help to empower individuals and communities through education in prevention and treatment methods. They often target women (including pregnant women) and children. It is affordable, and therefore accessible, as the insecticide treated mosquito nets can be provided very cheaply or free of charge (distributed at antenatal clinics). Programs that are equitable will be delivered to communities in remote areas as well as less isolated communities.

HIV/AIDS

Students could choose from a number of programs. For example:

- UNAIDS (Joint Programme on HIV?AIDS)

- The US President's Emergency Plan for AIDS relief (PEPFAR)

- AusAID's HIV/AIDS Asia Regional Program

Sample response for HIV/AIDS

Reasons why the program is needed:

(**Note:** Where possible, the student would tailor the discussion to the region in which the chosen program is operating. For example, the following paragraph is slanted towards the African situation.)

The number of people living with HIV is estimated to be about 33 to 34 million. The majority (two thirds) are in sub-Saharan Africa. Women and girls and poor people are most vulnerable. Impacts of HIV/AIDS are wide ranging – social stigma, physical health problems and premature death, orphaned children, children caring for infected parents, loss of income, loss of cultural traditions. The impacts are felt at all levels – individuals, families, communities and countries.

Strategies used in this program: HIV/AIDS programs are aimed at prevention, treatment and/or care. Education on methods of transmission and on prevention is a vital component. Programs to destigmatise HIV/AIDS are very important. Increasing the availability of condoms works in some communities, although there is much resistance on the part of men to use condoms. Programs also improve access to drugs which are vital for slowing down the progression from HIV infection to full blown AIDS.

Elements of the program that will ensure sustainability of the program: The most sustainable HIV/AIDS programs help to empower individuals and communities through education in prevention and treatment methods. Such programs will aim to be affordable, and therefore accessible, by providing drugs at a low cost. Programs that are equitable will be delivered to all communities including those in more remote areas.

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b. Describe the ways in which the prevention and treatment of malaria **or** HIV/AIDS would contribute to sustainable human development.

Sample response for malaria

Malaria kills 1 million people per year. It also leads to sickness which affects children's education and therefore their future employment prospects.

Malaria affects the productivity of adults – therefore malaria reinforces poverty.

Tourism in malaria infected areas is also affected as people are less likely to travel to these areas.

Therefore prevention and treatment of malaria will improve employment prospects, productivity, economic development though tourism, and it will reduce poverty.

Sample response for HIV/AIDS

HIV/AIDS kills over 2 million people per year. This reduces the human capital of a country.

Children are orphaned or become carers for their HIV infected parents. This means that children do not attend school and therefore their future employment prospects are lower.

HIV/AIDS affects the productivity of adults – therefore HIV/AIDS reinforces poverty.

Therefore prevention and treatment of HIV/AIDS will improve employment prospects and productivity, therefore reducing poverty.