



HSC PDHPE NOTES FOR THE HSC EXAMS



**WRITTEN BY A STUDENT WHO
OBTAINED A 94 (BAND 6) SCORE**

Health Priorities in Australia

How are priority issues for Australia's health identified?

Measuring Health Status

Role of epidemiology

Definition

“Epidemiology is the study of disease and illness in groups or populations.”

Collects data from hospital admissions, GPs, health care practitioners, surveys and census information

- **Prevalence** refers to the number of cases of disease that exists in a defined population at a point in time.
- **Incidence** refers to the number of new cases of disease occurring in a defined population over a period.
- **Distribution** the extent of the disease

Epidemiology can tell us:

- Monitor major causes of sickness and death, to identify any emerging inequities (morbidity and mortality)
- Identify areas that need attention, to allow for the intervention to fulfil this
- Determine priority areas for government funding (allocation of resources)
- Monitor use of health facilities and services
- Evaluate the effectiveness of programs
- Evaluates health behaviours and strategies to control and prevent disease

Epidemiology does not:

- Explain why health inequities exist
- Recognise the sociocultural influences on health behaviours
- Provide a holistic approach to health
- Focus on all components or dimensions of health
- Accurately indicate quality of life

Who uses epidemiology?

- Policy developers at all levels of government
- The manufactures of health products
- The providers of health services
- Individual consumers

Measures of epidemiology

What are commonly used on measures of epidemiology?

1. Mortality rates
2. Morbidity
3. Life expectancy
4. Infant mortality

Mortality

- The number of deaths in a group of people or from a disease over a specific time period, usually one year.
- Mortality rates can indicate trends in relation to specific conditions and they can also be age specific.

Infant mortality

- The number of infant deaths in the first year of life (0-1) per 1000 live births.
- This measure is considered to be the most important indicator of the health status of a nation and can also predict adult life expectancy.
 - Neonatal – first 28 days
 - Post-neonatal – remaining year

Morbidity

- Refers to the rates of prevalence and incidence of disease, illness, injury, hospital admissions, doctor visits and disability.
- Can be sourced from
 - hospital admissions, epidemiology and surveying,
- Info on prevalence and incidence on diseases in the population gives us an insight into the nation's health in more detail compared to mortality rates

Life expectancy

- The average number of years an individual is expected to live.
- Increases as medical based knowledge and technology has led to increase
 - Female and male both increasing, although females live longer.

Critical Inquiry.

What has led to this decline in infant mortality?

- improved medical diagnosis and treatment of illness
- improved public sanitation
- health education
- improved support services for parents and newborn babies and children.

Identifying Priority health issues

To identify health priority issues

- **Prevalence** of the **disease**
- **Priority Population** groups
- **Principles** of **Social Justice**
- **Potential** for **change**
- **Cost** for **individual**
- **Cost** for the **community**

Social justice principles

Social justice: promotes inclusiveness of diversity & establishing supportive environments for all. The principles are:

- **Diversity** – all cultural and social groups involved in planning and decisions
- **Rights** – equitable opportunities for all individuals to achieve good health
- **Access** – the availability of health services, information and education
- **Participation** – the empowerment of individuals and communities to be involved in planning and decision making for good health
- **Equity** – fair allocation of resources and entitlements without discrimination
- **Supportive environments** – physical, social, spiritual, economic and political aspects of surroundings

Priority population groups

Priority population groups are those that are most susceptible to particular disease, illness or injury. Australia is characterised by its diversity and multiculturalism. Our population has subgroups of people who have significantly different health statuses. The identification of priority population subgroups with inequitable health status is important for determining health priority areas. There are particular priority population groups that are achieving significantly poorer health outcomes compared to the rest of Australia. For example:

Aboriginal and Tres strait Islander (ATSI)

- have much higher death rates from heart disease, injury, respiratory diseases and diabetes
- ATSI males and females can expect to live 10 years less than the non-ATSI population

Low socioeconomic status (SES)

- have a higher incidence of disease risk factors such as high blood pressure, high cholesterol levels, smoking and lower use of preventative health services;
- Lower oral health is found in people of lower socioeconomic status

When these groups are identified, health disadvantages specific to the group can be determined. These disadvantages can be related to socioeconomic, sociocultural or environmental factors, for standard low SES

Epidemiology provides some statistics on these population groups and allows the government to identify priority population groups that need extra resources in order to remove the gap in health outcomes. It also further advances our knowledge of the sociocultural, socioeconomic and environmental determinants of health.

Priority population groups then become the focus of health promotion initiatives. They receive more funding and health programs get developed to meet their particular needs. For example, the royal flying doctors service that functions in remote areas.

Prevalence of disease

Prevalence is “the number or cases” in a population at a given time. In relation to cancer, prevalence refers to the number of people alive who had been diagnosed with cancer. This is different to incidence, which refers to the number of new cases diagnosed in a specific time period.

The prevalence of a condition is used to determine the number of people affected by the health issue. The higher the prevalence the greater the health issue, which may then be identified as a priority health issue in Australia.

There are many current conditions that are high in prevalence and have become priority health issues. These include:

- Cardiovascular disease – has been a priority health issue for a long time in Australia and will continue to be long into our future.
- Cancers – have been a growing priority in Australia, although the decreased smoking rate is helping

Potential for change and early intervention

As a priority issue is identified, it is vital that there is potential for prevention and early intervention that will make treatment more successful. The easier it is to prevent a disease the more likely a health promotion will have an impact on the burden of the disease and reduce its incidence. If prevention cannot occur, then early intervention is preferable, with higher rates of survival for those diagnosed and treated early for the condition. For example, diseases that have high potentials for being prevented include type II diabetes, hypertension, cardiovascular disease and obesity. These are lifestyle diseases mostly caused by sedentary lifestyles and poor dietary choices. A particular preventative action that has been taken recently is to reduce smoking in order to reduce diseases that are linked to and caused by smoking, such as: COPD, cerebrovascular disease, and lung cancer. In relation to health priorities in Australia, the more potential for prevention and early intervention the more likely the health issue will be made a priority. This is particularly the case if the condition has both potential for prevention and potential for early intervention.

Costs to the individual and the community

In the identification of priority health issues, the costs to the individual and community of the health issue must be examined. Costs to the individual and community come in various forms, such as: expenses, time, independence, and connection with other issues, such as mental health issues.

The costs imposed on individuals by poor health can be extensive and varied. These might include the:

- financial cost of treatment or lost employment and medications
- physical cost of lost mobility or functionality
- emotional suffering caused by chronic pain or depression
- social cost resulting from damaged relationships and family suffering

The combination of premature death and time spent with a disability is referred to as 'burden of disease'. The costs imposed on the community may include 'direct' costs that are borne by the healthcare system or 'indirect' costs that may be borne by the family or other sectors of the community.

- Direct costs
 - might include the financial cost of providing hospital and medical services or the cost of subsidising pharmaceuticals or funding medical research.
- Indirect costs
 - might include the cost of premature death, lost productivity, insurance costs, support services or retraining programs.

What are the priority issues for improving Australia's health?

Groups experiencing health inequities. fix this

Aboriginal and Torres Strait Islander peoples (ATSI)

Nature and extent of the health inequities

ATSI peoples experience the largest gap in health outcomes in Australia. They currently have a life expectancy 10 years lower than other Australians. The ATSI people have higher death rates in each age group and for CVD, endocrine disorders and diabetes than other Australians.

The sociocultural, socioeconomic and environmental determinants

Australia's Health 2014 report states: "Many factors contribute to the gap between Indigenous and non-Indigenous health. Social disadvantage, such as lower education and employment rates, is a factor, as well as higher smoking rates, poor nutrition, physical inactivity and poor access to health services."¹ These determinants interact with each other to produce the gap in health outcomes.

The roles of individuals, communities and governments in addressing health inequities

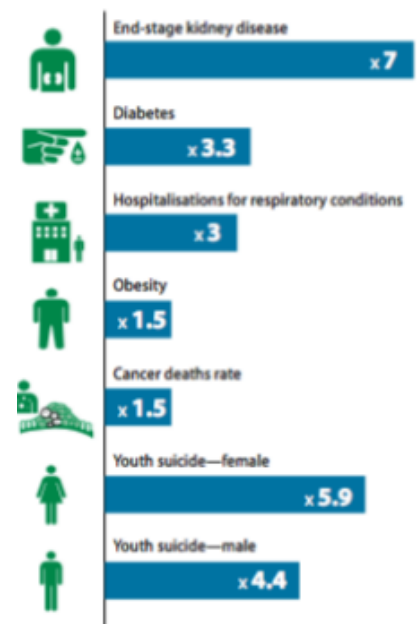
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Socioeconomically disadvantaged peoples (low SES)

The relationship between SES and health is so clear that it has its own term: "the social gradient of health".

The nature and extent of the health inequities

Socioeconomically disadvantaged people have higher rates of chronic disease including: higher death rates from CHD, incidence of lung cancer, more obese, higher mortality rates from all cancer and lower life expectancy.



The sociocultural, socioeconomic and environmental determinants

Socioeconomically disadvantaged people are more likely to take part in risky health behavior, eg) smoking, overweight or obese, Higher rates of drinking, and lower rates of physical activity. Families pass these behaviours on to their children. Socioeconomically disadvantaged people have lower levels of education and income. This affects health as healthy choices are improved if the choice is an informed decision. They also have higher rates of hazardous work types, and unemployment. A lack of shelter and living on the street or in someone else's house affects physical and mental health, as well as bringing a social stigma that will affect social health. There are higher rates of socioeconomically disadvantaged people in rural and remote areas.

The roles of individuals, communities and governments in addressing the health inequities

Individuals can seek to remain in school, or attend university to help individuals make informed choices about their health and health care. Individuals can also choose not to smoke or reduce alcohol intake. Communities can address the health inequities by providing relevant health care and support services. Eg) PCYC, 'Youth of the Streets' Finally the Australian Government's address this inequity by supporting many community programs and providing funding for free or reduced cost health care. E.g.) Medicare & PBS.

High levels of preventable chronic disease, injury and mental health problems

Cardiovascular disease (CVD)

<p>Nature</p>	<p>Cardiovascular disease (CVD) is a serious condition, which is caused by the narrowing of blood vessels and arteries, affecting blood flow and the health of the heart. There are various types of CVD. For example:</p> <ul style="list-style-type: none"> – A Stroke (cerebrovascular disease) which is caused by blockages or blood clots forming in the blood vessels of the brain. – Coronary (ischaemic) heart disease, which causes angina and heart attack. – Peripheral Vascular Disease, which is caused by blockages or blood clots forming in the blood vessels of the patient’s limbs. 	
<p>Extent of the problem (trends)</p>	<p>Morbidity increasing and Mortality falling. Due to increased awareness, improved forms of medical and surgical treatment. The leading cause of preventable death in Australia. Leading cause of illness and fatalities in Australia.</p>	
<p>Risk Factors</p> <p>There are two types of risk factors for any disease: non-modifiable factors, which are biological traits beyond the patient’s control, and modifiable factors, which are behaviours or habits the patient can change.</p>	<p>Non-modifiable risk factors which can lead to CVD include:</p> <ul style="list-style-type: none"> – Age and Gender (specifically, females over 65 and males over 40) – Ethnicity (i.e. ATSI) – Family history – Diabetes 	<p>Modifiable risk factors, which patients can address to reduce the chance of developing CVD include:</p> <ul style="list-style-type: none"> – Smoking – High blood pressure – Obesity (bad diet) – Physical inactivity – High stress levels – High cholesterol levels
<p>The Protective Factors:</p>	<p>Protective factors are behaviours or practices people can adopt to maintain good health and reduce the likelihood of conditions like CVD from occurring.</p> <ul style="list-style-type: none"> • Practicing a healthy diet (low in salt, fats and alcohol), • exercising regularly, • managing stress and attending regular check-ups • avoiding exposure to tobacco smoke 	

<p>The sociocultural, socioeconomic and environmental determinants</p>	<p>Sociocultural</p> <ul style="list-style-type: none"> • family history • People from Asian countries → are less prone due to a generally low-fat diet • ATSI people • Media exposure on the effects of smoking on health have led to a reduction in smoking rates & therefore a declining trend for CVD rates <p>Socioeconomic</p> <ul style="list-style-type: none"> • low income (can't afford fruit/veg, limited access to certain health facilities) • low education (poor health choices, less knowledge about how to access and use health services) therefore higher risk, bad health decisions. <p>Environmental:</p> <ul style="list-style-type: none"> • People living in rural and remote areas are more at risk due to less access to health information, services and technology
<p>Group at risk</p>	<ul style="list-style-type: none"> • Smokers • ATSI • Low socioeconomic • Poor diet/obese • Family history

Cancer

<p>Nature of the problem</p>	<ul style="list-style-type: none"> • Cancer refers to cells that have become abnormal and begin to multiply rapidly and cannot be controlled by the body. • Tumours can be both benign (noncancerous) and malignant (cancerous), where malignant tumours contain cells that grow out of control and can invade surrounding tissue, entering blood stream and lymphatic system 		
<p>Extent of problem (trends)</p> <ul style="list-style-type: none"> • Increased prevalence and incidence increasing (increased screening) • Decreased mortality, 	<ul style="list-style-type: none"> • Skin cancer- mortality and morbidity increasing 	<ul style="list-style-type: none"> • Breast cancer – mortality decreasing, morbidity increasing 	<ul style="list-style-type: none"> • Lung cancer – Both overall decreasing • Males decreasing faster than females increasing (both)
<p>Risk Behaviours</p>	<p>Skin</p> <ul style="list-style-type: none"> • Fair skin • Light coloured eyes • High sun exposure 	<p>Breast</p> <ul style="list-style-type: none"> • Family history • Early onset menstruation/late menopause • Obesity • Late first pregnancy 	<p>Lung</p> <ul style="list-style-type: none"> • Smoking • Exposure to carcinogenic chemicals e.g. asbestos
<p>Protective behaviours</p>	<ul style="list-style-type: none"> • Avoid sun exposure • Reduce exposure (hat) 	<ul style="list-style-type: none"> • Self-examination • Regular mammograms • Low fat diet 	<ul style="list-style-type: none"> • Avoid exposure to this carcinogen

<p>Sociocultural, socioeconomic, environmental determinants</p>	<p>Sociocultural</p> <ul style="list-style-type: none"> • Cultural ethnicity (ATSI lung cancer is higher) • Age <p>Socioeconomic</p> <ul style="list-style-type: none"> • Outdoor occupations (higher) • Lower education (higher) <p>Environmental</p> <ul style="list-style-type: none"> • Rural and remote (sun exposure - higher) 	<p>Sociocultural</p> <ul style="list-style-type: none"> • Family history (higher) • Healthy eating habits within family (lower) <p>Socioeconomic</p> <ul style="list-style-type: none"> • Low SES (higher) – income limits health choices • Low education (higher) <p>Environmental</p> <ul style="list-style-type: none"> • Rural and remote (mammogram access) 	<p>Sociocultural</p> <ul style="list-style-type: none"> • Family history (higher) • ATSI’s Smoking <p>Socioeconomic</p> <ul style="list-style-type: none"> • Occupation with related exposure to carcinogens (higher) • Low education (higher) <p>Environmental</p> <ul style="list-style-type: none"> • Rural and remote (smoking rates - higher)
<p>Group at risk</p>	<p>Skin</p> <p>Fair skin Outdoor occupations Excessive sun exposure</p>	<p>Breast</p> <p>Women over 50 Family history Obese women Women who have never given birth Women with early menstruation or late menopause.</p>	<p>Lung</p> <p>Smokers Exposure to carcinogens People over 50</p>

Injury

Nature	An injury is an adverse effect on the body resulting from an event. They include accidents such as: falls, transport accidents, and drowning; as well as intentional events such as: suicide, homicide or assault (known as external causes of injury). Injuries are a significant cause of mortality and morbidity in Australia.
Extent of the problem (trends)	<p>Leading cause of death for children and young adults Mortality and morbidity decreasing</p> <ul style="list-style-type: none"> • A leading cause of death in 1-44 years (47%) • Main cause of premature death (dying without chronic diseases before life expectancy) • Major causes of hospital admissions • Males 2x females • Unintentional injury is decreasing, however intentional injury is increasing • Road traffic deaths have continued to fall • Injuries caused by falls increasing (ageing population)
Risk Factors and protective factors	<p>Falls – major risk factors for falls include being elderly, poor balance or working in a high-risk job, such a building, or roofing, where falls can be more frequent. Some falls can be prevented through the use of harnesses and other WH&S related safety regulations.</p> <p>Transport – risk factors for transport injuries include: speeding, drink driving, and fatigue. Protective factors fort transport injuries include: wearing a seatbelt, going the speed limit, wearing a helmet, and ensuring long road trips are broken up into manageable chunks where fatigue does not become a dangerous factor.</p> <p>Self-harm – risk factors for self-harm include: mental health issues, depression, drug used, unemployment, and powerlessness. Protective factors include the development of resilience, employment, and a positive sense of self.</p> <p>Work – risk factors include: poor attitude to safety, unsafe work behaviours, and working in high risk jobs such as transport, construction or mining. Protective factors include: the use of protective measures, risk assessments, and proper utilisation of WH&S legislation and the WorkCover Authority.</p>
The sociocultural, socioeconomic and environmental determinants	<ul style="list-style-type: none"> • Media exposure • Low income and education can encourage risk taking behaviours, limit safety equipment • Location, rural and remote can influence the use of dangerous machinery to farmers and higher suicide due to less support networks
Group at risk	<ul style="list-style-type: none"> • ATSI • Elderly – likely to fall • Males • Young people • Rural and remote

A growing and Ageing Population

Healthy ageing

Healthy aging is a process that includes various behaviour and choices that affect health, such as regular physical activity, good dietary choices, regular family contact and social activities, as well as resilience to life's circumstances. The goal of healthy aging is to enable the elderly to maintain their health into old age, which allows them to contribute to the workforce longer, and engage in society better. This decreases the use of health services by the elderly. Healthy aging involves people reducing their risk factors for disease, and preventing the progression of the disease after its onset and reducing morbidity and mortality

Increased population living with chronic disease and disability

As Australia's population continues to age, there is an increase in population living with chronic disease and disability. This is because chronic disease and disability are more prevalent in the elderly. Chronic disease is the greatest issue for Australia's health and has a large burden on the population. With rising survival rates from cancers, cardiovascular disease and other major diseases, prevalence of people living with chronic disease and disability is rising and increases the population of the elderly. With an increase in people living with chronic disease and disability, comes an increase in health care expenditure and the need for aged care facilities.

Demand for health services and workforce shortages

Assess the impact of a growing and ageing population on:

The health system and services

There is concern that the ageing population will increase public spending on health and place an unsustainable strain on the health system trying to serve the increasing cliental. The challenges focus on how the health system and its workforce will manage the health needs of the ageing population, particularly the increasing impact of chronic disease. In the last 10 years the number of people living in aged care facilities has risen. Aged care carries a high burden on the health system with all of their residents having chronic disease or illness that increased the demand for health services.

Health service workforce

The increase in aged care facilities also require an increase in workforce training in aged care and issues surrounding chronic diseases and disability. An ageing population requires an adequate health workforce. This relates to not only the number in the workforce, but their distribution and skills as well. Of particular concern is the increased demand for workforce in the aged care sector and specialists. To address this there is a focus on efficient coordination of care and safe use of medication to decrease the demand for health services and workforce shortages. greater interaction between the hospitals and the aged care system will also improve efficiency. The Living Longer, Living Better aged care reform package, aims to address the attraction, retention, remuneration, education, training and career development of aged care workers, in order to address workforce shortages.

Availability of carers and volunteers.

Assess the impact of a growing and ageing population on:

Carers of the elderly

A growing and ageing population, with the increase in chronic disease and disability require an increase in carers and volunteers. A carer is someone who provides assistance in a formal paid or informal unpaid role for someone due to illness, disease or disability. Care for the elderly needs to be varied in its approach in order to meet the demands. Aged care can be provided through community aged care or residential aged care. Care provided often includes daily activities such as bathing, cooking, home upkeep, and administering medications. Most informal unpaid carers are family members, particularly children or a spouse. Many carers come from charities, religious institutions, or the government. Positively 31% of the elderly participate in voluntary work as carers, child minders and volunteers. The elderly provide support for relatives and friends who are aged, sick, or living with a disability. They also provide regular care for their grandchildren aged under 12, with this number rising.

Volunteer organisations

Volunteering is unpaid wilful help given as time, service or skill to a formal organisation. Formal groups include social groups such as sport or recreation groups, religious groups or heritage groups, as well as civic participation, which relates to unions, professional associations or political parties. Volunteers often cook, drive, do housework, visiting, or help the elderly shop. Volunteer organisations include: Anglicare, Alzheimer's Australia NSW, ARV (Anglican Retirement Villages), Your Aged Care at Home Ltd, Independent Community Living Australia, and Nursing on Wheels. Rates of volunteers had increased between 1995 and 2010, but from 2010-2014 the rate of volunteers fell. This falling rate needs to be turned around if Australia is going to appropriately care for the needs of our growing and ageing

What role do health care facilities and services play in achieving better health for all Australians?

Healthcare in Australia

Health services are organised/financed/delivered by both public/private sources. Healthcare in Aust. is dominated by medicine and is generally concerned with diagnosis/treatment/rehabilitation/care of people with illness and injury.

Range and types of health facilities and services

Institutional facilities and services

- Hospitals
 - Provide general and specialised healthcare. Patients in hospitals are classified as public and private according to their choice. Public hospitals are operated and financed by the government, and the healthcare service is free of charge for patients. Private hospitals are owned and operated by individuals and community groups
- Nursing homes
 - provide care and long-term nursing attention for those who are unable to look after themselves, such as the chronically ill, the elderly and people with disabilities. Three types of nursing home; private charitable (Anglicare), private for profit and state government.
- Psychiatric hospitals
 - provide treatment for people with severe mental disorders. They use a system of care that integrates hospital services and community settings

Non-institutional facilities and services

- Medical service
 - These services are provided by doctors, specialists and other health professionals. General practitioners are the most common, some GP's bulk bill, meaning Medicare cover the full cost.
- Health-related services
 - These include other services such as dentistry, optometry, nursing, ambulance services and physiotherapy.
- Pharmaceuticals
 - Drugs are supplied through prescription from doctors or hospitals (PBS) or over the counter from shops or pharmacies. Pharmaceutical Benefit Scheme (PBS) drugs are subsidised by the federal government for people with special needs.

Responsibility for health facilities and services

There are five groups responsible with providing a range of health facilities and services in Australia

Federal Government

The Federal Government is the responsible for the development and implementation of national health policies. They receive and control taxpayer dollars and then distribute the budgeted funds to states, territories and local governments so they can manage their health expenditures.

Medicare and the Pharmaceutical Benefits Scheme are examples of federal government initiatives, along with selected national health and advocate selected programs.

State or Territory Government

State and territory governments receive their funds from the federal government. They use this budget to finance and manage various health and community services, including public hospitals, medical practitioners and family health services. These agencies also devise state health policies, regulate private hospitals and surgeries, and make immunisation programs easily accessible.

Local Government

Local governments must implement and support policies devised by state or territory governments. They are also responsible for regulating any environmental issues, including restaurant hygiene, safety standards, maintaining parks and recreational amenities, along with home care services.

Private sector

Health services in this sector are generally privately owned, funded and controlled by individuals, businesses, charities or religious organisations. However, in some instances, private organisations receive government funding (e.g. Cancer Council). They offer a variety of health services including private hospitals, private surgeries and alternative health services, like dental, optical, physiotherapy and occupational therapy.

Community Groups

Community groups may take on the responsibility of raising awareness for specific issues, promoting health and organising support services. Examples include Diabetes Australia and Alcoholics Anonymous.

Commonwealth Government

- Funding to state/territories
- Medicare
- Pharmaceuticals Benefit Scheme
- Health promotion initiatives
- Worksafe
- Veterans

Local Government

- Personal preventative programs (e.g. immunisations)
- Environmental & hygiene regulations
- Some home care operations and community health centres

State and Territory Governments

- Delivery of health services including administering public acute-care hospitals and psychiatric hospitals
- Legislation and regulations for private hospitals, nursing homes and health professionals
- Management of mental health programs, dental health services, home & community care, family health services, rehabilitation services

Private sector

- Private hospitals
- General practitioners
- Dentists, pharmacists, physios etc
- Private sector, NGOs, eg Cancer Council, Diabetes Australia.

Equity of access to health facilities and services

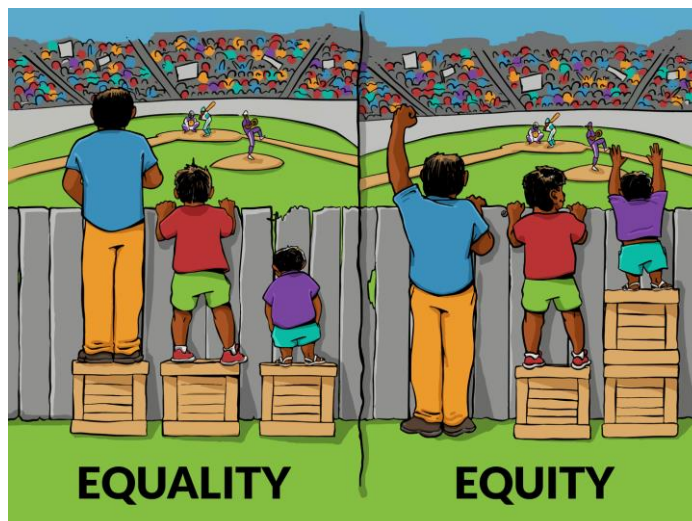
Healthcare systems across the world want to achieve the same goal as equal access to healthcare. Equality in health access of healthcare can be considered from two perspectives

Horizontal equity

Horizontal equity, which refers to equal treatment for comparable needs. One example is Medicare, the national health insurance system, which aims to provide the majority of Australians with equal access to basic healthcare. Another example is the Pharmaceutical Benefits Scheme (PBS), where the service provided by the Australian Government ensures a range of necessary prescription medicines are made available at affordable prices to all Australian residents

Vertical equity

This involves the priority treatment of those groups with increased health needs and reduced access to health facilities and services, such as Aboriginal and Torres Strait Islanders, and people of culturally and linguistically diverse backgrounds. An example of a service addressing the vertically equitable need of geographic disadvantage is the Royal Flying Doctor Service of Australia



Health care expenditure versus expenditure on early intervention and prevention

Health expenditure

Health expenditure is the allocation of funding and other economic resources for the provision and consumption of health services.

There are two types of expenditure.

1. Recurrent expenditure consists of regular ongoing costs
 - i. i.e. salaries and bandages)
2. capital expenditure are infrequent costs
 - i. i.e. buildings and equipment

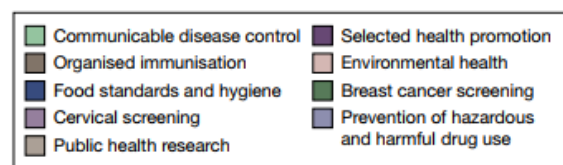
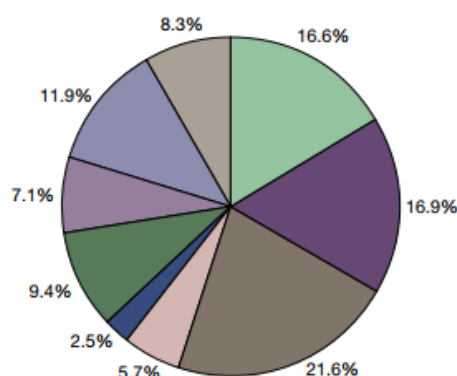
intervention and prevention (public health)

“prevention is better than cure”

in contrast to health expenditure (medication), early intervention and prevention refers to the money spent on intervention during the early stages of the disease or illness, and prevention refers to the money spent on preventing it in the first place (Quitline to prevent lung cancer). This is also ran at federal, state and local levels.

Public/preventive health activities can be programs, campaigns or events. They draw on a large range of methods, such as health education, lifestyle advice, infection control, risk factor monitoring and tax increases to discourage unhealthy lifestyle choices. They also use multiple settings, such as schools, homes, work places, through the media and via general practitioner consultations. Early intervention and prevention strategies are carried out by federal, state or territory and local governments, as well as non-government agencies, such as the Cancer Council and the Heart Foundation

FIGURE 3.6 ▶
Government expenditure on public health activities, 2005–2006



Total funding: \$1476 million

Impact of emerging new treatments and technologies on health care, e.g. cost and access, benefits of early detection

Much of the rise in healthcare costs can be attributed to advances in medical technology. Diagnostic and therapeutic advances, such as new radiological scanners, biological therapeutics, surgical procedures and prostheses, come at a considerable cost. The inclusion of these methods under subsidised healthcare, such as Medicare and the Pharmaceutical Benefits Scheme, have made it's possible for most Australians to afford these new services.

Treatments and technologies have emerged that address the essential needs of access and early detection. Two programs that have been effective in achieving this are cancer screening and childhood vaccinations.

Cancer screening

There are national population screening programs in Australia for breast, cervical and bowel cancers. Their goals are to reduce morbidity and mortality from these cancers through early detection of cancer and pre-cancerous abnormalities and effective follow-up treatment. These programs are:

- BreastScreen Australia—using mammography for screening
- National Cervical Screening Program—using Pap smear tests
- National Bowel Cancer Screening Program—using faecal occult blood tests.

These programs provide screening services that are free to women in the target age group (for breast screening) and to men and women invited to participate in bowel screening, or if they are covered by a Medicare rebate (for cervical screening).

Childhood vaccinations

The National Immunisation Program Schedule covers children's vaccinations for diphtheria, tetanus, whooping cough (pertussis), polio, measles, mumps, rubella, meningococcal type C disease, varicella (chickenpox), hepatitis B, rotavirus and, for females aged 12 years and over, human papillomavirus (HPV). Additionally, for Aboriginal and Torres Strait Islander children living in high-risk areas, hepatitis A is covered.

Health insurance: Medicare and Private

Medicare

Medicare, was established in 1984, and is the primary healthcare system in Australia. The aim of Medicare is to provide all Australians with accessible, affordable and high-quality healthcare. The funds to operate the Medicare system are obtained from income taxes and the Medicare levy, paid according to income level. (Generally, 2% of income). Medicare is based upon three principles:

- universality
- equity
- simplicity

Regardless of what doctors or specialists charge, every Australian is covered for 85 per cent of an amount that is set down by the government as a common (scheduled) fee. Some doctors charge more than the scheduled fee.

Many doctors 'bulk bill' patients, which means the patient pays nothing and the doctor receives up to 100 per cent (85 per cent in the case of specialists) of the scheduled fee from Medicare. Medicare benefits also cover optometrist services and oral surgery, but not private dentistry, physiotherapy, chiropractic treatment and appliances.

Medicare Safety Net

Once a person has paid about \$447.40 in a calendar year any future benefits increase to 100%.

Pharmaceutical

Under the Pharmaceutical Benefits Scheme (PBS) you pay only part of the cost of most prescription medicines purchased at pharmacies. The rest of the cost is covered by the PBS. If the pharmaceutical is not 'supplied' on the PBS, then private health insurers can choose whether to pay a benefit.

Private Health Insurance

Many people choose to 'top up' their health cover by taking out private health insurance. The extra insurance allows people to cover private hospital and ancillary expenses (such as dental, physiotherapy and chiropractic services) and aids and appliances (such as glasses). It can be expensive is therefore not accessible for all Australians.

Summary of Medicare and Private health care

	Advantages	Disadvantages
Medicare	<ul style="list-style-type: none"> Affordable to whole population Free treatment in public hospital Possibility of bulk billing Free x-ray and pathologist 	<ul style="list-style-type: none"> Compulsory levy even if you don't use it No choice of doctor or hospital Longer waiting time for selective surgery Doesn't cover all services
Private Health Insurance	<ul style="list-style-type: none"> Covers ancillary care (chiro, physio etc.) Private hospitals with doctor of choice May have coverage for travel insurance Shorter waiting times for selective surgeries Reduces burden on public health system 	<ul style="list-style-type: none"> Additional costs on top of Medicare Cannot be accessed by all people People still may need to pay, as insurance may not cover it all

Table 4.2: A comparison of Medicare and private health insurance

	Medicare	Private health insurance
Who pays?	<ul style="list-style-type: none"> • Commonwealth Government • Taxpayers 	<ul style="list-style-type: none"> • Commonwealth Government • Private contributors
How paid for?	<ul style="list-style-type: none"> • Levy or tax linked to salary 	<ul style="list-style-type: none"> • Monthly premiums for various forms of cover
What benefits?	<ul style="list-style-type: none"> • Basic medical services (doctors and specialists) • Choice of general practitioner • Basic hospital services in public hospitals • Specialist health care • Cover for 85 per cent of the scheduled fee for medical services 	<ul style="list-style-type: none"> • Hospital cover <ul style="list-style-type: none"> – hospital services – doctor of choice – hospital of choice – private or public hospital • Ancillary services — for example, dental, optical, chiropractic • Some special benefits — for example, sports equipment • Cover while overseas

Complementary and alternative health care approaches

Reasons for growth of complementary and alternative health products and services

Complementary health products and services are used together with western medicine, while alternative health products and services are used instead of western medicine. Reasons for growth include: increased credibility of many complementary and alternative health services, the growing multiculturalism of Australia, health insurance cover, regulatory bodies and professional associations being made, and Australians seeking a more holistic approach to health

Among popular beliefs by Australians for using complementary and alternative products and services is their:

- compatibility with a holistic view of health
- acceptance by people with diverse cultural backgrounds and influences
- traditional beliefs
- desire to use natural products rather than synthetic ones and an
- acceptance of their validity by the World Health Organization.

Range of products and services available

Some examples of complementary and alternative services include:

- Acupuncture—inserting needles into the skin at points where the flow of energy is thought to be blocked.
- Aromatherapy—the use of oils extracted from plants to alleviate physical and psychological disorders such as sleep disorders, stress, and anxiety.
- Chiropractic—based on the theory that disease and disorders are caused by a misalignment of the bones, especially in the spine, that obstructs nerve functions.

- Homeopathy—a patient is given minute doses of natural substances that in larger doses would produce symptoms of the disease itself.
- Massage—rubbing or kneading the muscles, either for medical or therapeutic purposes or simply as an aid to relaxation.
- Meditation—the concentration of the mind on one thing, in order to aid mental or spiritual development and relaxation.
- Naturopathy—founded on the belief that diet, mental state, exercise, breathing, and other natural factors are central to the origin and treatment of disease.

How to make more informed consumer choices

Though there are many benefits using different types of complementary and alternative medicines, there are also associated risks. Despite widespread access to various treatments and therapies, people often do not have enough information on what to know or check when using complementary and alternative medicines in order to avoid unnecessary harm.

For example, the Chinese herb ‘ma huang’, which contains ephedrine and is used for breathing problems such as asthma, has caused heart attacks and strokes among some people using it as a dietary supplement. Long term use of ‘kava kava’, which is used to relieve anxiety, can cause serious liver damage. And the use of ‘ginkgo’, which stimulates peripheral circulation, can result in bleeding during a surgical procedure.

It is important to make informed decisions when choosing to use alternative healthcare. Before undertaking any service or product, people should research:

- the nature of the product or service
- its credibility, benefits and effectiveness
- qualifications and experience of practitioners
- recommendations from friends, community members and recognised experts or groups such as the World Health Organization.

Consumers need to be aware of people who set up illegal practices. The government has laws in place to protect consumer rights. Individuals are allowed to ask for information about the purchase, complain about false or misleading advertising and ensure that the product or service meets government safety standards.

What actions are needed to address Australia's health priorities?

Health promotion based on the five action areas of the Ottawa Charter

- Developing person skills
- Reorienting health services
- Strengthening community action
- Building health public policy
- Creating supportive environments.

Levels of responsibility for health promotion

Levels of responsibility is shared between all levels of society. Similarly, with health promotion, where; individuals, community, government, non-government organizations, work together for effective health promotion

The federal government

Responsible for providing leadership and coordination. Vital for federal to encourage states to work together to establish health promotion infrastructure. Federal government should interact with international agencies such as WHO and provide the public and the relevant health-promoting agencies with information and systems for achieving the best health outcomes for the population.

State and territory governments

are responsible for delivering the preventive health services that support health promotion, including prioritising health spending, establishing healthy public policy, meeting accountability and public health goals. They need to work cooperatively with different ministries, other levels of government and non-government agencies, as well as communicating closely with communities and the public about health promotion initiatives and programs.

The private sector

has a responsibility to contribute to the overall wellbeing of the population. This can be in conflict with other responsibilities to make profits. The private sector should also work to protect the environment, providing goods, services and working conditions that contribute to achieving healthy outcomes.

Local communities

have a responsibility to their citizens. With limited resources, they need to develop partnerships to provide safe environments and relevant health services to meet public demand. Identifying the specific needs of local groups and addressing the critical determinants of health in the community are the most important tasks in achieving positive health outcomes in the population.

Individuals

must take responsibility for their own health. They can only make informed health decisions if they actively seek accurate health information. Individuals can contribute to the health of the community by supporting their families and friends and by actively participating in community activities that are designed to promote and protect the health of the wider population

The benefits of partnerships in health promotion, e.g. government sector, non- government agencies and the local community

Modern view of health acknowledges that health comes from interactions between a multitude of factors. Effective health solutions are developed by combining health promotion ingenuities with multi-strategy approaches to deal with targeted issues. Forming partnerships between various sectors and agencies can also diversify and improve healthcare programs.

Intersectoral collaboration

Intersectoral collaboration refers to the combined actions of agencies in and outside of the health sector. This type of cooperation can involve non-government agencies, government agencies or an amalgamation of both. Successful intersectoral collaboration requires the input of individuals and communities. Australians who are provided with a chance to contribute to decision making and asset with the design of healthcare initiatives are more likely to accept changes and participate in programs. The NSW Government supports public involvement in the health planning process as health promotion strategies and policies which have been built on foundation of collaboration with the affected community affected will achieve greater involvement and success when introduced.

Community Participation

Social capital is a resource which is created when an individual or community participates in promotional activities generating a collective sense of achievement. When neighbours come together, health professionals back community projects and the government improves the quality of environments and public spaces, social capital is created. Recent research has demonstrated that a high social capital can positively affect public health initiatives.

	Equity	Diversity	Supportive environments
Developing Personal Skills	All people should have equal access to education/skill development. ∴ enabling them to make more informed health decisions. Regardless of SE, SC, E factors (PDHPE mandatory K-10 → teaches kids health behaviours and health literacy)	Personalised programs to cater for people of different ethnicities/ languages / socioeconomic/ geographic (health pamphlets in different languages)	People pass their knowledge, and encourage health behaviours to others (a parent teaching their kids positive health behaviours)
Reorienting Health Services	Health services must address inequities in health (mental health initiatives in rural and remote communities)	Meet needs of everyone in the community (promoting healthy diets to ATSI and rural and remote communities) must be culturally sensitive.	
Strengthening Community Action	Between governments and communities, ensuring everyone has equal access to health resources (health information)	Acknowledging each community is unique in their health needs → members of community should make personalised initiatives (indigenous programs in encouraging non-risk-taking behaviour with alcohol)	Communities need an environment that supports healthy behaviours (bush tracks being maintained in a clean way to encourage people bush walking)

Building Health Public Policy	<p>Ensure all people are treated fairly/equitably (smoking bans in all workplaces → protecting white/blue collar workers) Also increasing access to health services (PBS → making medicine affordable for all Australians)</p>	<p>Account for diversity of population → seek to provide for all Australian groups (close the Gap initiative)</p>	<p>Supportive for health (no hat no play policy is school → promoting sun safety)</p>
Creating supportive environments	<p>Supportive environments to acquire equity (increasing facilities in rural and remote communities)</p>	<p>Environments must cater for all (providing translators in community health centres)</p>	<p>Breaking down barriers to good health, and promoting health behaviours (more parks to encourage physical activity)</p>

How health promotion based on the Ottawa Charter promotes social justice

The Ottawa Charter in Action

It's important to know the purpose and aim of each action area, in order to implement the Ottawa Charter to a specific health issue.

The following section will describe each action area of the Ottawa Charter, and then will give an example, as to how it can be implemented into the National Tobacco Strategy, combatting tobacco consumption. Note that the action areas of the Ottawa Charter can be implemented in a variety of health promotion activities for health issues affecting Australia (e.g. injury from road accidents, alcohol consumption, skin cancer, diabetes, cardiovascular disease, and mental health problems and illnesses). HSC questions on the Ottawa Charter can be multiple choice, or short answer, where they ask you to demonstrate how the Ottawa Charter (or a specific action area) can be used for health promotion.

Developing personal skills

This action area focuses on the individual and aims to empower them, so that they are equipped with the necessary skills (e.g. decision making, problem solving) to become autonomous in making good decisions about their health. This is done by providing individuals with information which can influence their behaviour and attitude towards their health. Through this, people can have greater control over their health.

Example for National Tobacco Strategy:

The development of personal skills allows individuals to make better choices about their health. For instance, in providing individuals with information about the health consequences of tobacco smoking, such as lung cancer and other respiratory system related diseases, keeps them informed and will dissuade them from participating in this activity. This will turn empower and increase autonomy among individuals, allowing them to develop better health habits that will prevent them from smoking tobacco and suffering its long term health effects.

Building healthy public policy

The government is responsible for addressing this action area of the Ottawa Charter. In this, they are responsible for developing, introducing, and implementing policies and legislation that prompt and support the entire population in making good choices regarding their health.

Example for National Tobacco Strategy:

The government's implementation of legislation aids in the building of healthy public policy. With regards to the issue of tobacco smoking, the government's introduction of plain packaging where the brand of tobacco cannot be displayed on the boxes and all cigarettes must come in an olive green box makes cigarettes less attractive to purchase. Packets also have graphic images of the effects of tobacco smoking to discourage the activity. This has been done to encourage people to make better health choices, and to reduce the prevalence of tobacco smoking and its health consequences.

Strengthening community action

This action area encourages communities to work together to address health issues and empowers individuals to participate in health promotion initiatives that will provide them with useful information and enhance life skills such as planning and problem solving.

Example for National Tobacco Strategy:

The action area of strengthening community action is heavily linked to the other areas of health promotion in accordance to the Ottawa charter. Through this action area, there are many health promotion campaigns such as at the Quitnow, which is a government initiative that runs nationwide to help people become aware of the consequences of smoking. Additionally, they assist people with quitting through 'Quitline' which is an over-the-phone helpline designed to empower people and encourage them to make better choices about their health and reduce the incidence of respiratory illnesses.

Creating supportive environments

This action area is aimed at modifying people's work places and recreation areas to create an environment that supports and encourages people to make better choices about their health.

Example for National Tobacco Strategy:

Creating supportive environments that encourage the maintenance of good health habits contributes to effective health promotion. In the case of reducing the prevalence of respiratory diseases that may be a result of tobacco smoking, work and leisure places are becoming predominantly 'non-smoking' areas. This restricts the number of locations in which people can smoke, and will also convey the message that it is not as socially acceptable to smoke nowadays, thus contributing to the pressure to quit. This effectively reduces the overall health issues related to tobacco smoking.

Reorienting health services

The reorientation of health services aims to change the role and responsibility of health services by going beyond curative services, and participating in health promotion. This way, people have greater opportunities to be exposed to and access health promotion.

Example for National Tobacco Strategy:

In reorienting health services, resources and funding are partially redirected towards health promotion. This is being done to ensure that health institutions go beyond curing people with existing medical conditions that may have been a result of smoking tobacco, and prevent people from smoking in the first place. Clinics can play a role in promoting services such as Quitnow, a government initiative. Similarly, general practitioners may also participate by preventing people from beginning to smoke, by informing them about the long-term effects of smoking. The reformation of the health sector brings about significant improvement in health promotion.

CLOSE THE GAP (2008)

The aim of this health promotion initiative was to close the health and life expectancy gap between indigenous and non indigenous Australians. There is currently a 17 year life expectancy gap between these two groups, which is devastating. There are serious concerns about the health inequities experienced by the indigenous population, the main causes being inadequate access to health services, low levels of education and overcrowded or poor living conditions.

Developing Personal Skills

Improves the education levels and services available and provides indigenous mothers with access to early learning support services.

Reorienting Health Services

Investments have been made in primary health care to ensure that there is a balance between prevention, promotion and curative services. These services also promote access to health services which provide education to improve the quality of lifestyles choices.

Strengthening Community Action

The program makes sure that primary health services are delivered with cultural sensitivity. It also empowers Aboriginal and Torres Strait Islanders to become active members of the community and participate in the planning of health at a local and community level.

Building Healthy Public Policy

A national Indigenous Representative Body has been established and targets have been set to show improvements in health equality. Funding has also been supplied to provide skilled labourers and workforces to counter the challenges of improving the quality of remote indigenous education and communities.

Create Supportive Environments

For health professionals to deliver quality care they need to be adequately trained and ideally indigenous, so that they understand they cultural and social challenges faced by the ATSI community. Extra teachers and educators have also been trained and sent to remote areas to improve levels of education.

In addition, training indigenous people to work in frontline services such as police can booster the profile and the relationship of indigenous people with local authorities.

Argue the benefits of health promotion based on:

Individuals, communities and governments working in partnership

The most successful health promotion campaigns in Australia provide us with outstanding examples of how individuals, communities and governments have worked in partnership to produce greatly improved health outcomes for the population. Following are a few examples of successful partnerships and how they have worked to accomplish their achievements.

BreastScreen Australia

The BreastScreen Australia Program is a free screening program that aims to maximise the early detection of breast cancer. The program targets women aged 50–69 years as these are the years of higher risk from breast cancer and optimum benefit from screening. However, women of 40–49 years and over 70 years of age are also eligible to attend. The program operates in over 500 fixed, relocatable and mobile locations.

The state and territory governments have primary responsibility for the implementation of the program at their local level. The Australian Government provides overall coordination of policy formulation, national data collection, quality control, monitoring and evaluation, with the AIHW publishing an annual monitoring report.

Health departments and the Cancer Council in all states and territories advertise and promote 'Breast screen' services. General practitioners, as well as organisations and local community groups help promote the use of the service to women in the targeted group. In NSW, the Cancer Institute provides ongoing scientific research, while local governments provide sites and access. As a result of these collaborative programs, breast cancer mortality has declined from 62 deaths per 100 000 women aged 50–69 years in 1996, to 52 deaths per 100 000 in 2005.



FIGURE 4.3 ▲
BreastScreen
Australia logo

Cervical screening

The National Cervical Screen Program (NCSP) provides free Pap smear tests for all women aged 18–70 years. In combination with free pap smear tests a program of immunisation for young women and school-aged girls against the human papilloma virus (HPV) has also been initiated.

The Australian Government is responsible for the National Immunisation Framework. The NCSP is jointly funded by federal and state governments and coordinated by the Cancer Institute. General practitioners play an important primary role by recommending regular Pap tests to their patients. This influences many patients in making the decision to have a regular Pap test. (Media agencies are also employed to design and deliver advertising campaigns to promote Pap testing.)

Gynaecologists advise and assist the program in the development of evidence-based strategies that will facilitate effective clinical management of women. All results from laboratories are reported to service providers and the pap test register according to guidelines established by the NHMRC.

Schools are involved as sites for education and the delivery of the HPV vaccine, while families, mothers in particular, support their daughters to use these preventative services as recommended.

Since the introduction of a national screening program in 1991, cancer of the cervix has dropped from the 8th to the 18th most common cancer among Australian women. The use of pap smear tests has reduced death rates from cervical cancer by 52% in the last decade. The introduction of the HPV vaccine will protect women from the strains of HPV that cause approximately 70% of all cervical cancer.



▲ FIGURE 4.4
NCSP logo



The five action areas of the Ottawa Charter

Just as partnerships in health promotion improve health outcomes for the population, its effectiveness is enhanced when it is based on the five action areas of the Ottawa Charter. The following two statements from the Ottawa Charter give a better understanding about what the ‘action areas’ are designed to do.

When the five ‘action areas’ are incorporated in the design of a health promotion strategy they integrate quite naturally to produce a collaborative intersectoral approach that can address a wide range of health determinants and inequities on a variety of different levels.

The ‘action areas’ that are applied to address heart disease might include the following suite of responses in a multi-strategy approach:

- Developing personal skills (DPS)
 - This could include strategies for courses in time management, yoga or other stress management techniques and PDHPE lessons that educate students about nutrition and exercise.
- Reorienting health services (RHS)

This could include strategies for screening programs to identify risk factors such as obesity and hypertension; free check-ups for people in higher risk categories such as males over 45 years old; and training for doctors to identify high-risk patients.

- Strengthening community action (SCA)
 - This could include strategies such as healthy canteens in schools, breakfast exercise groups in local communities or community obesity forums.
- Building healthy public policy (BHPP)
 - This could include strategies such as no GST applied to fresh fruit and vegetables or high taxes on tobacco and alcohol.
- Creating supportive environments (CSE)
 - This could include strategies for smoke-free zones, workplaces that reduce exposure to tobacco smoke and programs such as 'Quit' that provide social support to smokers who are trying to give up.

Many of Australia's most successful health promotion campaigns have applied the Ottawa Charter action areas, influencing many of the determinants that contribute to the problem and putting pressure on influential people and agencies to take action.

The Immunise Australia Program coordinated the Measles Immunisation Program in the late 1990s. The summarised case study below demonstrates how the action areas were applied to produce a highly effective national health promotion program.



HSC PDHPE NOTES FOR THE HSC EXAMS

“IMPROVING PERFORMANCE”



**WRITTEN BY A STUDENT WHO
OBTAINED A 94 (BAND 6) SCORE**

Improving Performance

How do athletes train for improved performance?

Aerobic Training

Aerobic training is training that focuses on developing the cardiovascular and aerobic energy system.

Continuous/uniform

Sustained, low intensity, steady rate, aerobic energy system, CV endurance – jogging, swimming, cycling

Often elite athletes will perform high intensity continuous training, where they train just below the lactate inflection point or lactate threshold. This allows for greater physiological adaptations to occur as a result of the training.

This type of aerobic training **improves** an athlete's

- oxygen uptake/capacity
- stroke volume
- lower resting heart rate

Is used in repetitious movements over long periods of time. E.g. marathon and cycling

INTENSITY	ENERGY SYSTEM	EFFECTS	DURATION	EVENT
50–60% of maximum heart rate or 20 to 36% of VO_2 Max Very easy pace	aerobic	metabolises fat	60 minutes plus	joggers and ultra-distance runners
60–70% of maximum heart rate or 36 to 52% of VO_2 Max Slightly faster pace	aerobic	burns glycogen and fat; improves cardiovascular system—capillarisation	45–90 minutes	marathon runners
70–80% of maximum heart rate or 52 to 68% of VO_2 Max 10 km pace	aerobic	improves cardiovascular system—capillarisation—glycogen burning	30–45 minutes	10 km and marathon runners
80–90% of maximum heart rate or 68 to 83% of VO_2 Max 5 km pace	lactic/aerobic	improves cardiovascular system—capillarisation—glycogen burning—lactate tolerance and removal	10–20 minutes	5 km to marathon
90–100% of maximum heart rate or 83 to 99% of VO_2 Max 800/1500 m pace	anaerobic/lactic	improves glycogen burning—lactate tolerance and removal	1–5 minutes	800 m to 5 km

Fartlek

Continuous with varying higher intensity intervals. is **beneficial** in sports using more than one energy system as rugby

As a result of fartlek, the body will have **improved**

- Lactate threshold
- VO_2 max

Long Interval

Long interval involves using long periods of higher workloads followed by shorter recovery. Hence Rapidly improves:

- aerobic conditioning
- endurance.

E.g. running, cycling, swimming. Long workouts (2-5 min) at challenging speed, with shorter rests (up to 2 min)

Flexibility Training

Flexibility training aims to maximise range of motion (ROM) and the stability of the muscles by performing exercises. This subsequently reduces the risk of injury and improves blood flow.

Static

Static flexibility training refers to the use of static, isometric stretches used to increase a joint's ROM.

Static stretching **works by:**

- turning off the stretch reflex, which causes muscular contraction when a muscle is lengthened at speed. This then allows the muscle to be stretched or lengthened. Repeated and frequent exposure to muscular lengthening causes the body to adapt, by increasing the muscle length.
- Increasing the joint ROM by stretching ligaments and tendons around the joint. The stretching of ligaments helps increase the elastic properties of the tissue, allowing for greater range of motion.

A good ROM and flexibility helps **to improve** performance by

- preventing injury
- allowing more fluid and coordinated movements
- improves biomechanical efficiency
- delaying onset muscle soreness (DOMS) – by removing lactic acid build up

Dynamic

Dynamic stretching is stretching with continual movement through the joint range of motion.

Dynamic stretching **works by**

- slow purposeful movements that move throughout a joints full range of motion. Movements are tailored to mimic those involved in sports performance and should involve a balanced approach to stretching (stretching matched muscles/groups e.g. hamstrings and quads in rugby).

Benefits include **improved:**

- Improved performance before activities requiring power, strength or speed.
- endurance
- coordination
- balance
- biomechanical efficiency, and
- speed of contraction

Ballistic

Ballistic stretching involves stretching past the natural range of motion by using the body's momentum.

Generally ballistic stretching is not recommended for the everyday person looking to get fit or healthy. Although it has better results at increasing flexibility, it can be dangerous if not performed properly and is usually reserved for elite athletes.

Benefits include

- increased joint ROM
- increased tendon elasticity (reduces tendon rupture)

It is often done in sports requiring eccentric contractions followed by concentric contractions as ballistic stretching best replicates this movement. Such sports include: basketball

What are the Planning considerations for improving performance?

Planning considerations for performance is vital to ensure that the athlete's training and competition requirements are adequately catered for throughout the short-term or long-term training cycles, to effectively improve performance.

Initial planning considerations

Performance and fitness needs

The performance needs will be sport and athlete specific and will vary based on level of competition & expectation.

For example: Olympic marathon runner (comp priorities, training analysis) differ to amateur

Schedule of events/competitions

Planning is important as it ensures that the athletes peak when they need to be. It is important that athletes are not under or over trained leading into competition, as this will decrease performance as well increased onset fatigue

For example, NRL teams plan to have athletes peak during the least few games of the season, for the finals

Climate and season

Athletes who are competing in another country, or in an environment they are not used to, will need to conduct training in simulated conditions to acclimatise their bodies.

For example, Olympic skiers will train overseas for months prior to adapt/acclimatise to the different conditions.

Elite and amateur comparison

Planning consideration	Elite	Amateur
Performance and fitness needs	More in-depth analysis /program design as higher requirements of performance and fitness	More general level of analyses due to lower fitness and performance needs
Schedule of events/commotions	More competitions/events meaning more planning with peaking/tapering	Less competition/events, less requirements for peaking /tapering
Climate and season	May need to acclimatise especially if travelling internationally.	Only needs to consider local weather and season

Planning a training year (periodisation)

The term periodisation is used to describe the process of dividing the training year into manageable phases and sub-phases, which are smaller in nature. This technique makes it easier to plan for important events in the competition season and ensure that athletes peak at the right time.

Phases of competition (pre-season, in-season and off-season)

The following phases are called *macrocycles*

Pre-season/preparatory phase

pre-season phase is to develop physically, increase resilience to injury and address weaknesses. Can be divided into:

- Basic conditioning – emphasizes the development of general physical performance capacities;
 - aerobic fitness
 - muscular endurance
 - strength
 - mental skills
 - all at low to medium intensity
- Specific conditioning – increased intensity and specialized training
 - technical & tactical skills
 - more sport specific & mental skills
 - all at an increased intensity

In-season/competition phase

The competition phase is more focuses on strategy, tactics and refining skills, whilst maintaining fitness. The training load is decreased however the training intensity is increased.

A key element of this stage is specificity; athletes need to adapt training to their specific needs at that time. They also need to consider tapering to ensure that they peak at the right time of year. And tapering

For example, a basketball team will development set play execution while maintaining anaerobic fitness and skills

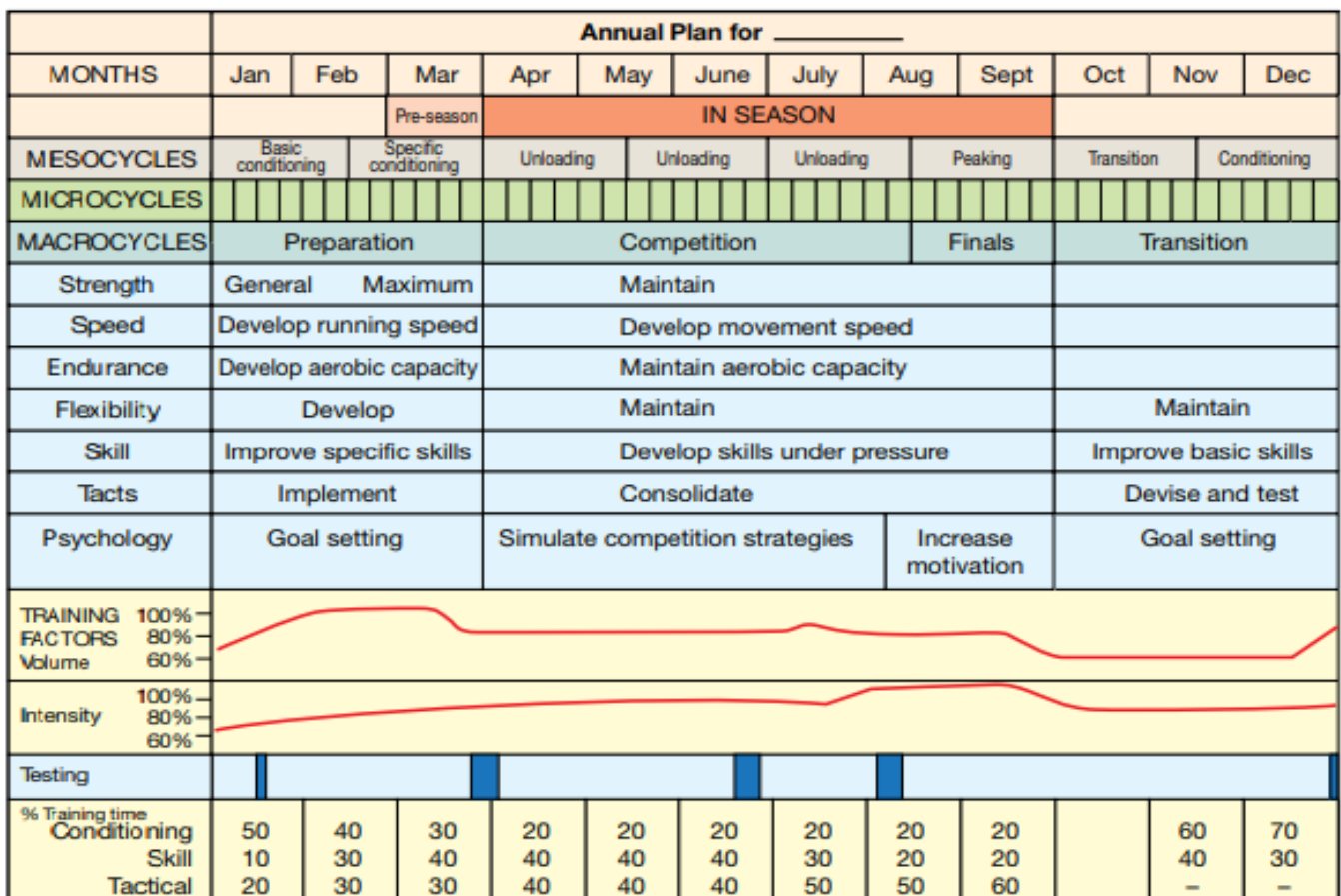
Off-season/transition phase

Recover from physiological & psychological stress – maintain endurance, control body weight, work on weakness, evaluate results

For example, light aerobic exercise and massage after a football season.

Sub-phases (macro and microcycles)

- Macrocycles (preparatory, competition, and transition phases) these are broken down into *mesocycles*
- Mesocycles (about 6 weeks each, basic & specific conditioning) are broken down into *microcycles*
- Microcycles (7-10 days, fine tuning, intensity, frequency, duration & sequencing) Feature Article p 282



Peaking

Peaking is the absolute best condition, physically, emotionally & mentally

- excellent health and mentally alter
- good recovery rate
- function synergism (everything working together)
- optimal technical & tactical preparation
- superior neuromuscular coordination
- self-confidence and motivation

To peak, training levels increase until 2 weeks prior to event, then taper (to allow recovery), reduce volume, maintain high intensity.

When peaking athletes show a variety of physiological and psychological indicators.

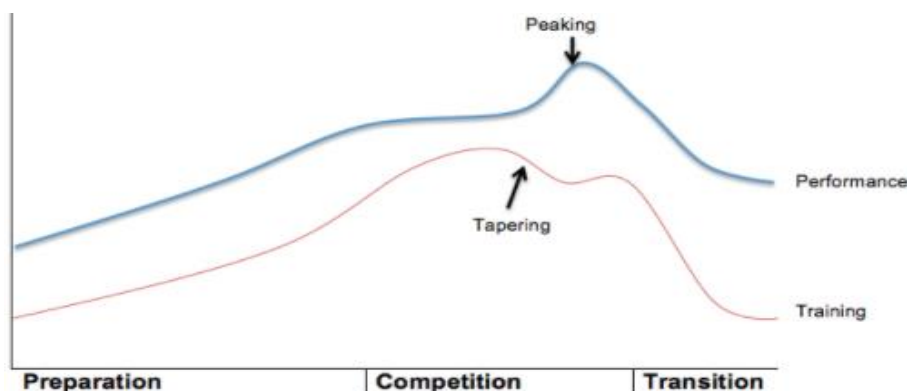
For example, an Olympic athlete will want to peak at the Olympics, not national or local competition

Tapering

The gradual reduction of training prior to competition to allow for peak performance to allow for recovery from training both physically and mentally, rebuilding muscle tissue and renewing energy stores.

different taper periods for different athlete. E.g. sprinter -fast twitch (3 days), marathon -slow twitch (3 weeks)

- Balance – Recovery versus loss of fitness
- Endurance & strength (longer), speed & agility (shorter)
- Reduces 'heavy legs' from overtraining



Sport-specific sub-phases (fitness components, skill requirements)

Mesocycles are often targeted to specific requirements of the sport. For example, a marathon runner will have a specific focus on cardiovascular endurance as it is sport specific.

The main emphasis of the phase is developing performance capacities and new technique levels to match the improved fitness components from the conditioning phase. Improving technical and tactical elements should be a focus of this subphase to prepare an athlete for competition.

Elements to be considered when designing training

A training session should be designed with a goal in mind, e.g. speed, agility, tactics etc. a session with insufficient planning will lead to unsatisfactory results.

Health and safety considerations

Health and safety = coaching priority. Athletes should be free of injury / illness when training to prevent worsening. A quality training session is planned and organised to prevent unnecessary injury, and is equipped with an effective:

- Appropriate warm-up & stretching time
- Appropriate protective clothing & equipment
- regular rest intervals, especially in hot conditions
- Setting & enforcing safety rules
- Assessed climatic and environment controls
- using safe equipment and playing surfaces

Providing an overview of the session to athletes (goal-specific)

An overview at the beginning of the training session, discusses the objectives and plan of the session. During this overview coaches may give an evaluation of past performance and address specific issues. This prepares athletes mentally for what is expected.

Warm up and cool down

An adequate warm up will improve the athletes level of performance and accelerate the recovery process required before they train or compete again.

Warm up

Warm up prepares athletes for the rigours and strains of training, whilst also incorporates specific drills to stimulate neuromuscular action that will be used in games or events. E.g. running and passing
Can include dynamic stretching as it

- Enhances coordination and motor ability
- Mentally prepares
- Involves continuous movement, therefor maintaining muscular warmth

Cool down

Cool down may involve a few minutes of slow static stretches to:

- Accelerate recovery time
- returning it to resting levels
- rid of bodily waste (lactic acid)
- delaying onset muscle fatigue

Skill instruction and practice

Depending on the level of the team/athlete, coaches may utilise verbal instruction, demonstration or video displays to teach skills.

While some exercises are easy to complete, others may need to be broken down into sub-routines to simplify the process and then allow the athletes to combine these to master the skill. This allows the correct development of the skills.

For example: a tennis serve can be broken into the toss, then the serve. Then components can be added such as top spin

Another skill session should include a revision of previously learnt skills and the acquisition of new skills. It is important to use a variety in attempt to simulate game-based activities.

Conditioning

Important to target specific fitness components to enhance fitness components and energy systems that are specific
Sports conditioning and fitness training causes adaptive body stress, the athletes undergo an amount of stress or overload to increase physical capabilities.

This occurs mostly in the pre-season.

Evaluation

Good coaching includes evaluating the session. Allows for the effectiveness and feedback on the session. And if the goals were achieved.

This allows the athletes to arise any queries or opinions on parts of the session.

FIGURE 2.5 ▶
Sample training session for a time allocation of 90 minutes



Planning to avoid overtraining

Athletes must place their body under adaptive stress to increase their physical capabilities. However excessive stress loads are a sign of over training or “burning out.” Can be classified as:

- *Movement coordination:* (cramp, inhibitions, insecurity, disturbances in rhythm & flow, lack of concentration, reduced power of correction)
- *Condition:* (diminished endurance, strength, speed, readiness for action, fear of comp, avoiding difficult situations, increased recovery time, confusion in comp)
- *Psychological:* irritability, obstinacy, defiance, quarrelsome, avoids contact with coach, over sensitivity to criticism, poor incentive, anxiety, depression, insecurity

Amount and intensity of training

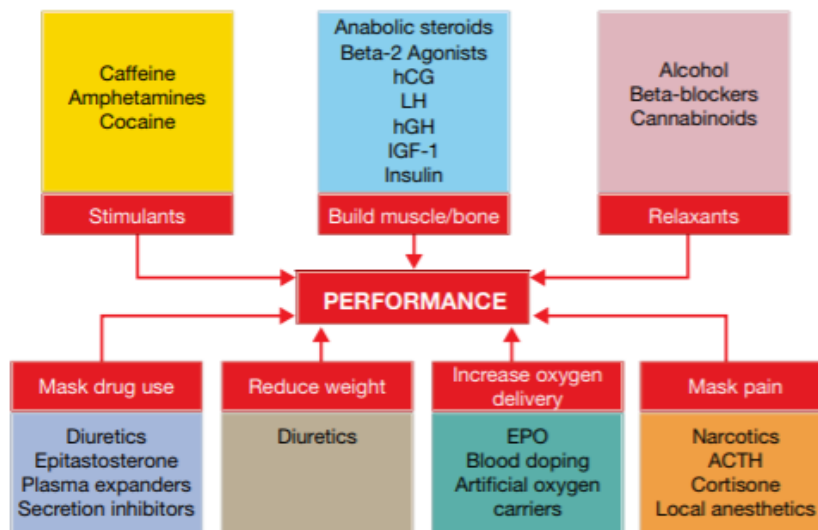
Training factors that cause over-training:

- Recovery is neglected
- Inappropriate increase in frequency or density
- Demands increased too quickly
- Too rapid increase in load after injury/illness
- Too much loading of max & sub-max intensity
- Too high intensity of duration loadings
- Excessive technical schooling without enough recovery
- Excessive comps (max demands)
- Excessive bias of training methods

Physiological considerations	Psychological consideration
<ul style="list-style-type: none"> • Fatigue & discomfort at start of season = normal • Must monitor athlete's physiological responses • Elevated RHR • Frequent minor infections, colds, flus • Increased minor injuries • Chronic muscle soreness/ joint pain • Exhaustion • Lethargy • Weight /appetite loss • Insatiable thirst/dehydration • Intolerance to exercise • Decreased performance • Delayed recovery 	<ul style="list-style-type: none"> • Fatigue, tiredness, drained, no energy • Can't concentrate • Apathy • Irritability • Anxiety • Depression • Headaches • Insomnia • Can't relax

What ethical issues are related to improving performance

Use of drugs



Using artificial substances or ergogenic aids is called doping. Doping is unethical as the IOC gives reasons:

- the health threat of performance-enhancing drugs
- the equality of opportunity of the athletes
- the exemplary effect of 'clean' (doping-free) sports in the public
- the illegal use in the general community

There may be several reasons for athletes to use performance-enhancing drugs. They may want to:

- build mass and strength of muscles and/or bones
- increase delivery of oxygen to exercising tissues
- mask pain
- stimulate the body
- relax
- reduce weight
- hide use of other drugs

Factors why athletes misuse drugs:

- the drug: effects of the drug, physical dependence and availability
- the person: dissatisfaction with performance or progress, easily influenced by others, self ego
- the environment: pressure to win from coach

The dangers of performance enhancing drug use

e.g. physical effects, loss of reputation, sponsorship and income

Using drugs to enhance performance may seem appealing to athletes in the short-term, however, there are long term consequences and repercussions, which will affect the athlete regardless of whether they are caught

- **physical effects**
 - The use of illicit substances can lead to a number of serious physical and mental health issues including cancer, heart problems, stress anxiety and depression.
- **loss of reputation**
 - A positive result in a drug test of an elite player often hits the media very quickly and is wide spread. An athlete may have spent a long time building a reputation, not just as a physically dominant athlete, but also off the field as many elite athletes are now held up as role models.
 - They will be labelled a liar, a cheat, and many other things as their career spirals downward. This loss of reputation will affect other aspects of their life as well.
 - Lance Armstrong has lost his stellar reputation because it was later revealed that he had been cheating.
- **Loss of sponsorship and income**
 - Elite athlete's often have sponsorship with leading brands in the industry. These sponsors can often bring in large amounts of income for the athlete and for some are what allows them to continue as a professional athlete.
 - When an athlete loses their reputation and begins to be seen negatively in the media, many companies who sponsor the athlete will stop their sponsorship, and often will fine the athlete for the effect the media has on their brand.
 - Many sponsorship deals have clauses that relate to negative media exposure and the use of drugs, allowing them to remove their sponsorship quickly when an athlete is caught cheating

For strength (human growth hormone, anabolic steroids)

Human Growth Hormone

Human growth hormone (HGH) is naturally produced by the body in the pituitary gland and stimulates the synthesis of proteins that form bone and muscle tissue, decrease fat and increase testosterone.

Athletes requiring muscle size may supplement HGH, as the increase in muscular tissue may assist with events that require power and short bursts of explosive strength, such as weight lifting or rugby.

The side effects of using human growth hormone include:

- overgrowth of hands, feet and face (acromegaly) because of the increased muscle and bone development in these parts
- enlarged internal organs, especially heart, kidneys, tongue and liver
- heart problems.

Anabolic Steroids

A steroid is a chemical substance derived from cholesterol. Anabolic steroids build muscle and bone mass primarily by stimulating the muscle and bone cells to make new protein.

Athletes use anabolic steroids because they increase muscle strength by encouraging new muscle growth. Anabolic steroids are similar in structure to the male sex hormone, testosterone, so they enhance male reproductive and secondary sex characteristics (testicle development, hair growth, thickening of the vocal cords). They allow the athlete to train harder and longer at any given period, and are commonly used in strength and power events.

However, they have many harmful side effects, such as:

- increased risk of liver disease/CVD's (hypertension)
- acne
- male and female infertility
- shrinking testicles
- disturbed menstrual cycles
- aggression and mood swings
- stimulate hair growth

For aerobic performance (EPO)

Erythropoietin (EPO) is a naturally occurring protein hormone that is secreted by the kidneys when oxygen concentration is low. EPO stimulates the bone marrow stem cells to make red blood cells, which increase the delivery of oxygen to the kidney.

Endurance athletes, use EPO to increase oxygen absorption, reduce fatigue and improve endurance by increasing the rate of red cell production. It is also believed that EPO increases the metabolism and the healing process of muscles because the extra red cells carry more oxygen and nutrients.

In someone who already has normal levels of red blood cells, the use of EPO can lead to increased thickening (or viscosity) of the blood causing clotting, thrombosis, heart attack and stroke

Blood doping

Blood doping refers to methods of increasing the oxygen-carrying capacity of blood in order to boost aerobic performance. This is typically accomplished by withdrawing blood, isolating the oxygen-carrying red blood cells in a solution, and then re-transfusing the cells prior to competition, thereby increasing the body's supply of red blood cells. Blood doping is used in endurance sports such as cycling, distance running and cross-country skiing. Blood doping mimics the effects of EPO.

To mask other drugs (diuretics, alcohol)

There are three (3) reasons an athlete may use diuretics: appearance, weight class, and masking other drug use. Diuretics cause the body to remove water from blood and excrete it as urine. This dilutes urine and makes positive detection of drugs such as anabolic steroids less likely.

Diuretics

Diuretics are used to increase the amount of fluid moving and passing through the body. They are commonly used by athletes to mask the use of performance enhancing drugs or to lose weight quickly. Athletes who compete in sports that require them to perform at a certain weight level such as boxing, weight lifting or horse riding (jockey) may use diuretics to control their weight. As a masking agent, diuretics dilute the urine making it difficult for testers to detect the use of other substances.

Side effects include:

- dehydration and headaches
- heart and kidney disease
- poor coordination and dizziness
- fatigue
- chest pain
- depression
- electrolyte imbalance

Alcohol

Alcohol is a diuretic and a depressant. Its effects on the body vary by body size, previous exposure, amount consumed etc. Alcohol has been used by athletes to mask other drugs and is banned in some sports because of its diuretic effect. Has side effects including the above as well as:

The dangers associated with alcohol use include those above plus:

- nausea, vomiting
- slowed nervous system leading to delayed reaction time, lack of coordination, dizziness etc
- blurred vision
- loss of consciousness

Benefit and limitations of drug testing

Drug tests are not about trying to catch cheating athletes, although it will do this. It is about promoting fair play and making sport safe for the athlete.

Benefits:

- creating a deterrent for athletes who may consider to use drugs to cheat in sport
- promoting drug-free sport that incorporates fair play
- promoting safety in sport
- promoting equity in sport
- rewarding athletes for their ability, training and efforts
- protects athletes reputations

Limitations:

The use of drug testing in sport does have limitations in its use, which some people use to debate its place in sport, but this is not justified. Limitations include:

- not all drugs can be tested for. New drugs get created frequently, and until they are created tests cannot be developed for them.
- testing exposes the athlete (nudity) before the tester
- new prohibited lists are developed each year, which athletes need to know and follow as they are currently held responsible.
- testing is expensive.

Effective drug testing programs are difficult and extremely costly to maintain. One reason is that new performance-enhancing drugs are constantly being developed. These drugs are usually produced in secret and are specifically designed to avoid detection by current testing methods. Some performance-enhancing drugs are more difficult to detect than others. Elevated levels of EPO, for instance, do not remain in the blood for long, making it particularly hard to test for.

The Australian Sports Anti-Doping Authority (ASADA) is the primary anti-doping authority in Australia. Although there is limited statistical evidence on how widespread doping is, athletes and coaches stress that most competitors do not take drugs. Nonetheless, drug testing is becoming an increasingly integral part of sports competitions. As new performance-enhancing drugs are developed, new tests are developed to detect these drugs, and the struggle to keep sports clean continues indefinitely.

- Difficult, extremely costly
- New drugs are constantly being developed in secret to avoid detection, then new tests are developed
 - Testing is also reactive, meaning that it is one step behind in terms of the drugs being used. Additional performance-enhancing drugs and techniques are constantly being created and it is difficult for testing agencies to predict and keep up with new developments. As a result, organisations must conduct steady research and find innovative ways to identify newly created drugs to ensure they can test for all substances.
- Elevated levels of EPO do not remain long in the blood - hard to test.
- Testosterone & EPO (naturally present in the body) means that if an athlete has an abnormally high level due to certain physiological factors, the athlete may test positive even though no illegal drug was used.
- ASADA - primary anti-doping authority in Australia (urine or blood test). Strict protocols apply (notification, sample collection & paperwork).
- Athletes <18 yrs must be accompanied by a parent/guardian in test.
- Drug testing is becoming an increasingly integral part of sports comps.

See PDHPE.net for right hand side of the syllabus

Use of technology

Sport is undergoing a global technological revolution. What needs to be questioned is whether these changes impacting on sport in a positive way? Or are the talents, perseverance, hard work and human ability of athletes and coaches being replaced by technology and money?

Training innovation e.g. lactate threshold testing, biomechanical analysis

- New training innovations develop every year, (outdated quickly)
- Most linked to computer technology.
- Improve power, distance and accuracy, & prevent injury or aid in rehabilitation.
- AIS Department of Applied Research - research is cutting-edge, and designed to give Australian athletes the best chance at international success, and so is not made available.

Examples of innovative training aids:

- clothing, compression garments -improve aero dynamics, buoyancy, absorption and water resistance
- simulated competition environments—stationary cycling with computerised video simulation of competition terrain or altitude tents

Lactate thresholds testing

Lactate threshold testing is a training innovation that seeks to identify an athlete's lactate inflection point (the point when lactate begins to accumulate in the blood). This test provides a lactate threshold heart rate and training pace. Lactate threshold testing helps the athlete to set training zones that are more accurate and beneficial, providing better results, particularly in aerobic sports where the athlete wants to be as close as possible to the lactate inflection point without crossing into the anaerobic training zone. However, lactate threshold testing also helps in anaerobic training to ensure training is forcing the body to deal with lactate overload and recover from it.

- Measures lactate levels during training by taking a drop of blood at [fingertip](#), to accurately determine heart rate training zones and recovery.
- The blood lactate [level increases with exercise](#) intensity and shows clearly the transition from aerobic to anaerobic activity.
- Good training accomplishes fine tuning/optimal balance

Biochemical analysis

All biomechanical evaluations should be completed with two goals in mind: improve performance and reduce the chance of injury. For example kicking, diving and golf swing mechanics can be compared to normative data in order to pinpoint flaws in the motion; and so performance improvements can then be based on scientific evidence.

- Improve Performance Comparing mechanical movements to normative data to pinpoint flaws in the motion, subsequently improving performance. E.g. kicking, diving and golf swing mechanics (Dartfish).
- Reduce chance of injury - prevention of injuries & rehab (Data on joint stresses, knowledge of joint mechanics and the magnitudes and rates of joint loads).

Ethics and training innovation

Many of the training innovations are expensive and can only be accessed by athletes or clubs who can afford the testing and equipment. This can create an unfair playing field, particularly when competition is between countries, where one country has access and the other does not (e.g. American female football players playing the female team from the Congo). The ethical considerations revolve around equity of access and money, more than safety.

Equipment advances e.g. swimsuits, golf ball

Many equipment advances in sports have caused increases in sports performance that are not due to the athlete's ability, but due to equipment advances. Equipment advances are specific to sports where the equipment is used. Equipment advances can be in clothing, protective equipment, general equipment, or technological equipment. The use of advanced materials in sports equipment presents some ethical questions and how behaviour is enhanced by allowing the use of advanced materials. But where should the line be drawn or should there be no restrictions? To maintain an 'even playing field', how much money is spent on these technological advancements and who can afford them?

Swimsuit

The introduction and development of a new, technologically advanced swimsuit caused great controversy in 2008. The Speedo LZR swimsuit was seen as a contributing factor to every world record that was broken throughout that year. Its sleek, hydrodynamic design allowed for minimal drag and resistance, increasing speed, whilst the corset-like fit helped wearers to maintain the best possible posture and style when swimming.

Characteristics:

- constructed water repellent material reducing drag by 5% and increasing efficiency compared to older, slower swimsuits.
- tighter, corset-like midsection reported to reduce fatigue at the end of races and improve body shape.
- seamless, consisting of special panels of the repellent material further reducing drag.

Golf ball

- Size and weight is regulated (≤ 45.93 grams and diameter ≥ 42.67 mm)
- Manufacturers vary materials, size, patterns & depth of dimples on the surface
- Eg Dimpled golf balls - about half the drag as smooth golf balls, (main source of drag is not friction but the movement of air around a golf ball). Dimples allow air to flow in a turbulent pattern around the golf ball, and this pattern has been found to be optimal for flight through the air.
- Analysts use computers to model how the air flows around a ball in flight
- Eg Callaway Golf replaced traditional dimples with a hexagonal dimple pattern on their golf balls, (claim - further reduces drag for longer, more efficient ball flight)
- In addition, they offer core constructions with two, three or four layers designed to minimise spin and offer distance control.
- Costly - creating an unfair platform for competition

Although not as controversial as the Speedo LZR Swimsuit, the design of the golf ball designed has progressed to increase the distance, spin or feel. Manufacturers are now able to manipulate the size and amount of dimples on the golf ball to produce these different effects. This slight change in design affects turbulent air-flow around the ball, which manipulates how the ball travels through the air.

Elite golfers are skilled athletes who will carefully purchase equipment based on quality and the style of their game. The development of improved designs for golf balls means that golfers can now easily choose the style of ball best suited to the particular course or purpose.