MFPHM PART I EXAMINATION

EXAMINERS' KEY POINTS & COMMENTS

JANUARY 1998

N.B: Please note that these are Key Points and not model answers

PAPER I

1. Describe the epidemiology and control measures, in a named country, for **two** of the following three:

   (a) Tuberculosis
   (b) Rubella
   (c) Rotavirus enteritis

Most or all of the following would be required for a pass:

a) Tuberculosis

* Major cause of death and disability in many parts of the world.

* Initial infection often unnoticed (90-95%).

* 5% (or 50% of people with HIV) initial infection progresses to pulmonary TB or extra pulmonary involvement.

* Endogenous reactivation or exogenous re-infection may cause progressive pulmonary TB. Untreated carries 50% 5 year mortality. Appropriate chemotherapy nearly always results in cure.

* Tuberculin skin test with positive reaction of approximately 10mm (however clinical judgement needed).

* Presumptive diagnosis of active disease made by finding acid fast bacilli in sputum.

* A positive sputum smear justifies chemotherapy. Diagnosis confirmed by culture and drug sensitivity determined.

* Industrialised countries sharp decline plateaued in 1980s and then increased where high HIV or immigration of people with higher prevalence. Morbidity rates increase with age and social deprivation.

* Reservoir human. May be other animals eg. cattle.

* Transmission by airborne droplets and unpasturised milk. Risk of infection directly related to degree of exposure.

* Incubation period of between 4-12 weeks for primary lesion.

* Effective chemotherapy eliminates communicability within a few weeks in household settings.

* Children with primary TB generally not infectious. Theoretically risk remains as long as viable tubercle discharged in sputum.

* Prevention and control by case finding and treatment, education, better environment and BCG.

* Isolation (at home unless severe) for pulmonary TB. Not required when sputum negative, not coughing and known to be on adequate chemotherapy.

* Investigates contacts and find source.

c) Rubella

Most or all of the following would be required for a pass:

* Mild febrile disease with diffuse punctate and maculo-papular rash.

* Children usually few or no symptoms. Adults usually mild lasting 1-5 days.

* Importance is ability to produce Congenital Rubella Syndrome. Occurs in up to 90% of infants born to women infected in trimester, 10-20% by 16 week and rare with infection after 20 weeks.

* Fetuses infected early at greatest risk of intrauterine death and congenital malformations of major organ systems.

* Severe and moderate recognisable at birth, mild may take months or years to become apparent.

* Laboratory diagnosis needed to differentiate rubella infection from others. Four fold rise in antibody or rubella specific IgM.

* Occurs world wide and is endemic. In non immunised populations it is primarily disease of children. In immunised populations adolescent and young adults infections more important.

* Reservoir is human.

* Spread by droplets or direct contact.

* Incubation period 14-23 days.

* Infectious 1 week before and at least 4 days after rash, highly infectious. Infant with CRS may shed virus for months.

* Susceptibility general after loss of maternal antibodies. Active immunity by infection (permanently) or immunisation (probably lifelong).

* Prevention and control by education and immunisation

* Prevent contact with non immune pregnant women.

* Investigation of contacts to identify pregnant women.

c) Rotavirus enteritis

* Sporadic or seasonal gastroenteritis of infants and young children. Often severe causing vomiting, fever and watery diarrhoea. Secondary cases in adults may occur and subclinical infection common.

* Identified from stool or rectal swab.

* Very common and important case of hospitalisation of infants. Often though infection may be asymptomatic.

* Reservoir is human

* Transmission by faecal-oral route with possible contact or respiratory spread.

* Incubation period of 24-72 hours.

* Infectious during acute stage of disease and whilst shedding virus. Usually not detectable after eight days. Symptoms last 4-6 days.

* Prevention and control by enteric precautions. School and work exclusion (48-72 hours).

Examiners' Comments

Candidates common failings were:

* failing to say how cases were verified
* failing to consider isolation
* failing to accurately state incubation and infectivity periods
* failing to recognise the paramount importance of congenital rubella syndrome and describe it.

2. You are asked to design a case control study to examine the relationship between the use of mobile telephones and brain cancer. How would you go about selecting cases and what information would you need for your sample size calculations?

Most or all of the following would be required for a pass:

Rare condition, therefore case/control study is appropriate. Need to define the condition (eg. primary brain tumour) and the exposure (eg. 'regular', 'close' proximity to a mobile phone). State whether incident or prevalent cases are to be used (prevalent best for quick results; incident best to avoid selecting only the longest survivors).

Selecting cases:

Potential sources

* Cancer registry; convenient, large and well maintained data, but problems over delays in data incorporation and missing study-relevant data.

* Oncology/neurology specialists' patient databases; high degree of diagnostic accuracy and interested supplier, but may be skewed toward particular types of tumour or severity.

Selection process

Either all cases or a random sample, depending upon numbers, to prevent selection bias. Cases should be verified against explicit criteria by an expert.

Sample size

State desired power and level of significance (eg. '80% and 95% respectively'). State level of clinical significance sought (eg. 'at least a two-fold increase in risk after exposure').

Then sample size will be dictated by:

* frequency of exposure in the control group
* anticipated size of effect.

Additional factors

* if the risk is stratified then the sample must be bigger.
* if the condition is stratified (eg. different types of brain cancer to be studied) then a larger sample required.

Also allow for lost records, non-responders, unconfirmed cases etc. by boosting sample size accordingly.

The following are additional points which might improve the answer to 'good' or 'excellent':

Control sample should be drawn from a similar population (eg. same GP lists). Matching controls to cases reduces anticipated confounding factors, but generally better to allow for these in later analysis. If electro-magnetic radiation is the causative agent, there are many other everyday sources besides mobile 'phones' - difficult to allow for this.

Examiners' Comments

Common problems were:

* poor understanding of case-control study design
* confusing ‘cases’ as those ‘exposed’ rather than ‘diseased’
* poor understanding of power calculations.

3. Write short notes on **one** of the following:

   a) the fetal origins of adult disease (the 'Barker hypothesis')

   OR

   b) the efficacy of nicotine replacement therapy for smoking cessation

Most or all of the following would be required for a pass:

a) The 'Barker hypothesis'

* what it means (the role of factors in fetal or early life on the risk of developing a range of adult chronic diseases)
* evidence from ecological, individual-level (eg. Hertfordshire, Sheffield and Preston cohorts) and animal studies.
* main criticisms: selection bias, confounding by socioeconomic status and lifestyle factors, inconsistencies within and between studies
* inconsistencies with international data

b) Nicotine replacement therapy

* spray and inhaler under modes of delivery of the nicotine
* RCTs on nicotine chewing gums (2 mg and 4mg) and transdermal patch
* both highly efficacious. Evidence of the efficacy of gums related to level of dependence on nicotine. 4 mg gums more effacacious in high dependence individuals. Patches less related to level of dependence
* therefore in high dependence persons, 4mg gums. For less highly dependent smokers, patches are of similar efficacy but more convenience and less instruction needed for use.
* overall could enable about 15% of smokers to quit.

Examiners’ Comments

a) Barkers’ hypothesis:

Generally satisfactory except that many candidates did not mention ecological studies.

b) Nicotine replacement

Very disappointing answers. One had the impression that those who tackled the NRT option did so because they knew nothing about the Barker hypothesis. Very few were aware of the meta-analyses

which demonstrated efficacy of NRT. Many candidates actually thought that there was not evidence for its efficacy.

4. Write short notes on **two** of the following

a) the ecological fallacy
b) the use of 'funnel plots' in systematic reviews
c) methods of controlling for confounding in case control studies.

a) Ecological fallacy

Most or all of the following would be required for a pass:

Ecological fallacy is the bias resulting from drawing inappropriate conclusions about individuals from ecological data; the association observed between variables at the group level does not necessarily represent the association that exists at the individual level.

In ecological or correlational studies, population disease rates are correlated with factor(s) of interest that represent characteristics of entire populations eg. food consumption, health service utilisation; the units of study are populations or groups of people rather than individuals.

The following are additional points which might improve the answer to 'good' or 'excellent':

Reasons for ecological fallacy:

* cannot link exposure with disease in individuals (those with disease may not be those who are exposed)
* data usually collected for other purposes; often proxy measures
* use of average exposure levels may mask more complicated relationships with disease
* inability to control for confounding.

b) Funnel plots in meta-analyses

Most or all of the following would be required for a pass:

* what a meta-analysis is (quantitative synthesis of primary data to yield an overall summary statistic).
* a statement on the role of systematic reviews and meta-analyses. A good example (eg. streptokinase for MI)
* possibility of publication bias (small trials with positive results more likely to be published than negative trials).
* funnel plot: sample size of studies plotted (usually on the vertical axis) against estimates of effect size (horizontal axis). If there is no publication bias, the plot should look like a symmetrical inverted funnel, ie results of smaller studies more widely scattered than those of larger studies.
* useful to detect bias in meta-analyses which may be contradicted later by large trials.

The following are additional points which might improve the answer to 'good' or 'excellent':

* example of magnesium and ISIS 4
* apart from visual inspection, statistical tests on funnel asymmetry have been proposed.

c) Methods of controlling for confounding

Most or all of the following would be required for a pass:

At design stage: randomisation, restriction, individual or group matching. At analysis stage: stratification, adjustment, multivariate techniques eg. logistic regression.

* Randomisation - RCT only; can control for unknown as well as known confounders
* Exclusion - simple to do, but loss of generalisability of results
* Matching - practical difficulties, loss of potential subjects, requires matched analysis, can lead to difficulties in analysis
* Stratification - relatively straightforward but if many levels can be difficult to absorb findings: investigator remains in touch with data; small numbers in individual cells may limit scope of analysis.
* Adjustment - summary figure produced, easy to absorb but figure is not 'real' and may mask patterns within data; choice of standard may distort picture, comparisons only possible if same standard used.
* Multivariate techniques - allow simultaneous adjustment of several confounders even with relatively small sample; can be difficult to interpret, investigator and reader distanced from data, require computer to calculate.

The following are additional points which might improve the answer to 'good' or 'excellent':

* Presence of confounding indicated if adjusted estimates of effect differ from the crude estimates.
* Distinguish confounding from effect modification.

Examiners' Comments

Generally fairly well answered.

a) Ecological fallacy.

Candidates responses tended to be rather superficial but the basics were correct.

b) Funnel plots.

Candidates realised that funnel plots are used to detect bias but were not clear as to which bias. Many said that studies should cluster around an odds ratio of one.

c) Controlling for confounding

Most candidates could list the various methods but few showed any awareness of the practicalities.

5. Describe the epidemiology of prostate cancer in relation to screening for the condition.

Most or all of the following would be required for a pass:

A structured reply should relate to either a) the principles of screening, eg. headings from Wilson & Junger 1968 WHO or some later consequent publication, or b) epidemiological headings, eg such headings would include:

* Incidence and mortality
* Natural history
* Tests available
* Diagnostic test
* Treatments for screen detected disease
* Evidence of effectiveness of screening.

Screening:	Specific examination of well individuals to identify an existing illness at a pre-symptomatic stage or to identify susceptibility to a specific disease.
Importance of problem:	Prostate is third commonest cause of cancer death (mortality of 34/100 in males).
Natural history:	Prostate cancer is not clearly understood. Most men with prostate cancer die with, rather than from, the disease. PM studies show that 30% of men over 50 years and over 50% of men over 80 years who have had no symptoms of prostate cancer whilst alive, have histological evidence of cancer at time of death. Majority of prostate cancer appear to be slow growing and may not lead to symptoms or deaths.
Cost effective test:	Three methods of detecting early prostate cancer in asymptomatic patients - digital rectal examination, transrectal ultrasound and serum prostate specific antigen. PSA is the most sensitive. However, studies show that even PSA cannot predict reliably whether a man who has cancer will progress to ill health/death. Annual testing with PSA will detect clinically important cancers and over detect clinically unimportant cancers. There is no test or combination of tests, to provide diagnostic triage of a) those who have quiescent disease which does not require treatment from b) there with early stage aggressive disease which might benefit from treatment c) some later stage aggressive disease who would be best treated. Importantly, there have been no large scale studies of prostate screening.
Effectiveness of treatment:	The main treatment options are - wait and see, radiotherapy and

radical prostatectomy. Each of these have complications (increased anxiety, damage to adjacent organs, impotence, incontinence and death). There is uncertainty about the effects of these treatment options - survival after each one is relatively high and there does not appear to be a significant difference in mortality. No direct evidence to show that those with well and moderately differentiated disease benefit from treatment.

Conclusions: Insufficient evidence to set up a screening programme. It would be important for any programme model to be subjected to RCT. The consumer should show appropriate understanding of both epidemiology and screening.

Examiners' Comments

Many of the answers were superficial and did not demonstrate a depth of understanding greater than an informed clinician. This was surprising, given the importance of screening in general and prostate cancer in particular over recent months. However, most candidates did enough to pass. Most of the successful candidates appeared to have benefited from knowledge of the content of the article on the topic in Effectiveness Matters.

6. Define the major indices of fertility and factors which influence trends in these indices.

Most or all of the following would be required for a pass:

Demonstrate an understanding that fertility rates refer to live births as opposed to "fecundity" which refers to conceptions.

* Crude birth rate

  The number of live births, expressed per 1,000 total population per annum, is the annual crude birth rate. Although often quoted, it is a poor indicator of fertility because included in the denominator are males, children and post-menopausal women.

* General fertility rate

  A better denominator is used in the general fertility rate, which is calculated by expressing the number of live births per annum per 1,000 women in the population of the child-bearing age (by convention this is 15-44 years).

* Age-specific fertility rates

  Because there are differences in levels of fertility amongst women of different ages within the child-bearing years, an even more precise measure of fertility is obtained by calculating the number of births to a specified age group, per annum per 1,000 women of the same age group. For example, the fertility rate for women aged 20-24 years is calculated by taking the number of live births occurring to mothers aged 20-24 years and expressing them per 1,000 women aged between 20 and 24 years.

* Total period fertility rate

  The total period fertility rate is a convenient summary of all the age-specific rates. This rate is the sum of the age-specific fertility rates, in this case expressed as live births per woman of a single age, rather than per 1,000 women. It measures the average number of live-born children per woman which would occur if the current age-specific fertility rates applied over the entire 30 years of the reproductive span. It therefore takes account of differential fertility within the different reproductive age groups, while providing a convenient summary measure in a single figure. It enables comparisons to be made between countries and within the same country over time. The replacement of the British population requires a total period fertility rate of 2.1, not 2.0 as might at first be expected because it is necessary to allow for deaths which occur before the reproductive years are reached.

* Cohort measures of fertility

  All indices of fertility so far described have referred to births at a specific period of time, most often a single year. However, births in any given year occur to a cross-section of women, married at different ages and with differing numbers of previous children. Temporary fluctuations in 'period' indices, may simply reflect the timing of child births within a reproductive lifespan, without any important change in the number of children women will have by the time they have come to the end of their reproductive years.

  A cohort of women is a population of women who were born in a particular year (generation or birth cohort) or married in a particular year (marriage cohort). Studies of fertility, following such cohorts of women, observe the occurrence and timing of births in their reproductive lifetime. The cohort fertility rate (which gives the completed family size for women born around the same time) provides a much more stable basis for commenting on trends and predicting future levels of fertility than do measures based on a specific period of time. The cohort fertility rate has the disadvantage that it cannot properly be calculated until the cohort concerned has passed out of the childbearing years.

Factors that influence trends:

* Economic prosperity level. Employment.
* Marriage/cohab patterns
* Sexual mores and practices
* Contraceptive usage
* Factors affecting physiological reproductive capacity. Infections in inflammatory condition. Sperm count.
* High unintended less of life during early life (neonatal and infant deaths). Provide pressure to
  increase fertility rates to ensure sufficient children survive into adulthood.

Three major factors:

* Contraceptive availability
* Level of affluence
* Working women.

(Termination of pregnancy rates may be indicative of availability of other contraceptive methods or cultural/national preferences (Japan, Russia) and require to be interpreted in these contexts if regarded as influencing fertility).

Examiners' Comments

Poorly answered. There was a lack of basic knowledge about fertility. Most candidates had difficulty in both identifying the key indices and defining them. The second part of the question was covered adequately by most candidates.

This question was in two parts:
a) "define major indices of fertility"
b) define factors which influence trends on these indices.

There was no indication in the question about whether these two components should have equal marking and many candidates gave more emphasis to one part rather than the other. Commonly there was confusion between "fertility" and "fecundity".

7. Outline the contribution of qualitative methods to health services research.

Most or all of the following would be required for a pass:

* The goal of qualitative research is the development of concepts which help us to understand social phenomena in natural rather than experimental settings, giving due emphasis to the meanings, experiences and views of all participants.

* Quantitative and qualitative methods are commonly dichotomised in an unconstructive way. Qualitative research (asking the 'how' and 'why' questions) is often a necessary prelude to quantitative studies (asking the 'how many' questions). The reasoning implicit in qualitative work is inductive (moving from observation to hypothesis) rather than deductive (hypothesis testing). It aims for validity rather than reliability.

* Commonly used methods include participant observation, in-depth interviews, focus groups, and case studies.

* They are an essential component of health services research because they allow access to areas not otherwise amenable such as lay and professional health beliefs.

* High quality research requires high standards of methodological rigour. An increasing acceptance of qualitative methods is being accompanied by increasing critical awareness.

* Qualitative research can be extremely resource intensive (interviews, transcription and data analysis).

8. General practitioner consultation rates can vary extremely widely between different geographical areas. Describe, in a named country, the factors that give rise to high

consultation rates.

Most or all of the following would be required for a pass:

The 'epidemiology' of consultation rates

* A brief description of the variability of consultation rates by place (and if relevant person) in the selected country.

* Highlight the well established link between deprivation and consultation rates.

High consultation due to high levels of need

* A discussion of groups with high levels of need arising from physical illness. These include the elderly, those with identified chronic diseases, younger children etc.

* A brief mention of those with high levels of need arising from mental health problems and the differing patterns of frequency of consultation that arise in different diagnostic groups.

High consultation rates due to differences in patient behaviour

* Candidates should discuss the concept of the iceberg of illness and the fact that 'trigger' for consultation have been described.

* A mention should be made of the generally higher consultation rates amongst females and the postulated reasons for this difference.

* Some mention might be made of 'highly demanding patients' and 'heart sink patients'.

High consultation rates due to differences in GP behaviour

* Candidates should demonstrate awareness of how the 'style' of GP consultation and policies for review and follow-up influence consultation rates.

The following are additional points which might improve the answer to 'good' or 'excellent':

* The difficulty of defining appropriate level for consultation rates
* Attempts at benchmarking
* The problem of matching need to consultation behaviour
* Studies examining patients' expectations and doctors' expectations.

Examiners' Comments

In general this question was answered well. Most candidates covered the necessary ground but there were few exceptional answers. Most answered the answer broadly in terms of need, patient issues and GP issues.

The ‘epidemiology’ of consultation rates was well appreciated but usually described in general rather than specific terms. Most candidates highlighted the key role of deprivation. Some tended to describe the Jarman index as if it explained rather than described this phenomenon.

High consultation due to high levels of need was less well covered. Some candidates failed to mention this at all. High consultation rates due to differences in patient behaviour featured in most answers. There was a disappointing lack of theory in some answers but some did mention the role ‘trigger’ for consultation.

High consultation rates due to differences in GP behaviour was mentioned by almost all candidates but few addressed the issues other than to describe it as one of the factors.

Only a very few candidates addressed the issue of the difficulty in defining appropriate level for consultation rates and attempts at benchmarking.

Paper II Section A

A. Epidemiology

1. Describe recent (over the last 10 years) trends in asthma prevalence and mortality in the developed world and how epidemiological evidence supports possible preventive strategies. Indicate the potential for possible health policy interventions.

Most or all of the following would be required for a pass:

* There are two types of asthma extrinsic and intrinsic.
* Definition " a clinical syndrome characterised by widespread airways obstruction which is reversible spontaneously or with treatment".
* Most reliably diagnosed in surveys by tests of airway responsiveness to histamine or exercise.
* Possible that trends in prevalence may be masked by changes in diagnostic habit.
* Need to ensure consistent criteria are being used. Possibility of diagnostic shift between asthma and other respiratory conditions.

Mortality

* Asthma causes about 1600 deaths per year most of these are in elderly people.
* The total number of asthma deaths has risen over the past two decades. This reflects the growth in numbers of elderly people.
* Number of deaths among persons aged under 65 shows no consistent trend.
* Standardised Mortality Ratios show a social class gradient. SMRs in social classes I and II are less than the national average.

Morbidity

* Estimation of prevalence of asthma requires special surveys.
* It has been estimated that the prevalence of asthma severe enough to require medical supervision in children is 4-6% and about 4% of adults
* Asthma is the commonest cause of long standing illness reported by children in the General Household Survey.
* In children under 10 prevalence of asthma is higher in boys than girls.

* Hospital admissions for asthma have nearly doubled in past decade.
* GP consultations for asthma has more than doubled in past decade.
* Prescriptions for asthma have increase by 75% in past decade.
* These trends may partly reflect changes in diagnostic habit and treatment thresholds but must also reflect change in underlying prevalence.

Small minority of asthma associated with certain occupational exposures (isocyanates, flour wood dust). Control exposure to these substances of workers in relevant industries.

Clear genetic component to asthma. Particularly in children attacks may be triggered by exposure to house dust (mites), pollens (eg oilseed rape), dietary antigens (eg peanuts). May be possible to reduce exposure to some allergens (eg modify home environment). Important to label foods with their constituents to reduce risk of inadvertent exposure. Cigarette smoke important in triggering asthma. Encourage people, especially parents not to smoke or at least not to smoke near children.

Suspicion that atmospheric pollution can trigger asthma in susceptible people. Hospital admissions associated with peaks of pollution with ozone, nitrogen oxides and SO2. Public health implication give public warning of likely pollution peaks and in longer term seek to remove sources of pollution (traffic, domestic heating systems, industry).

Asthma is condition where self management is important. Ensure people with asthma understand own condition, how best to use medications and when to seek medical attention. Improve knowledge and skills of medical profession in treatment asthma.

Examiners' Comments

This question was generally well answered. Most candidates adequately discussed the problems of definition and described the trusts in prevalence. Discussion of evidence for and against different causal hypotheses was less adequate. This limited subsequent discussion of policy opinions. Many candidates mentioned guidelines and other measures to improve treatment of this kind.

2. What evidence is there to implicate passive smoking as a cause of ill health? What is the public health relevance of these findings?

Most or all of the following would be required for a pass:

* Conditions associated with passive smoking
* Lung cancer
* Ischaemic heart disease
* Acute respiratory infection in childhood
* Glue ear in children
* Increased symptoms in people with asthma

Greatest effect of smoking on non-smoker is foetus in utero. This is not usually included in definition of passive smoking.

Expert committees in UK (Froggatt committee), USA (Surgeon General) and Australia have all concluded that passive smoking (exposure to environmental tobacco smoke) is harmful to health.

Study of passive smoking is difficult. Usually based on studies of non smoking spouses or partners of smokers or else children who live in households where adults smoke. Need to control for numerous confounding variables. Also many non smokers may be exposed to environmental smoke in other situations. Exposure to spouses smoking can be validated as indicator of exposure using biological markers (breath CO, urinary coninine)

Many studies show increased risk of lung cancer. Recent meta-analysis by Wald and colleagues based on large number (37) of studies gave relative risk of 1.2 for lifelong non smokers who lived with smoker compared to those living with non smoker. There was dose response effect - risk greater for current smoking partner than ex smoking partner and greater for heavy smoker partner than light smokers partner. This effect is biologically plausible since passive smokers exposed to wide range of known carcinogens.

Also several (5 large and 14 smaller) studies of passive smoking and heart disease. Meta analysis by Wald also shows non smoking partners of smokers have increased risk of ischaemic heart disease with relative risk of 1.3. This is surprisingly high since relative risk of smoker is less than 2. Confounding is probably not the explanation of high relative risk in passive smokers. Might be explained by effect of smoking on platelets as increased aggregation can be shown at very low doses.

Effect of smoking on children respiratory tract shown in many studies. Children living in households where adults smoke have more respiratory symptoms (cough and wheeze) and more middle ear problems than non exposed children.

Smoking is also an important cause of domestic fires. Those living in households with smokers are more likely to suffer death or injury in domestic fires.

Effect of passive smoking is quantitatively much smaller than that of active smoking. It is however very important since tobacco industry can incorrectly argue that smoker knowingly and voluntarily chooses the increased risk to which they are exposed. No such argument can be made for passive smoking. The facts about passive smoking are therefore highly damaging to the industry and should be fully used by public health advocates.

Legislation requires that the workplace should be safe. It has been argued that exposure of workers to smoke in the workplace violates this requirement and the employer is liable for any resulting harm. There have already been cases of workers gaining compensation from employers for being required to work in a smoky workplace environment.

Examiners' Comments

Discussion of the evidence of harm from passive smoking was not very well done. Candidates either considered relatively few of the different types of harm as gave very little detail on the evidence for them. There were many suggestions for policy to reduce smoking but not all candidates identified the fact that passive smokers unlike active smokers are deprived of choice.

B. Environmental Health & Communicable Disease

3. An increasing proportion of the population now travel overseas for recreation, business and family reasons. What are the public health implications of this travel? How are these implications best addressed?

Most or all of the following would be required for a pass:

* Reasons for increase in international travel.

* At risk groups in the British population

* Global prevalence of infectious and other diseases

* Risk of contracting infection and other diseases in the first, second and third world.

* Preventive measures to include simple precautions, immunisation including malarial prophylaxis.

* Costs and problems with malarial prophylaxis.

* Special immunisation requirements, eg: yellow fever, meningitis.

* Dangers of traffic and swimming accidents whilst on holiday.

* Risks associated with casual unprotected sex.

* Targeted health education/provision of services in primary and specialist care settings and through travel agents. Emphasis on population campaigns as well.

* Issues associated with seeking medical attention outside Great Britain.

The following are additional points which might improve the answer to 'good' or 'excellent':

* Awareness of cost-effective studies

* Risks associated with first generation of immigrants, as many will not have received routine vaccination.

* Drug abuse in many parts of the world.

* Identification of sources of specialised advice.

* Risks associated with unusual travellers, eg. rabies, snake bites in back-pack travellers.

Examiners' Comments

A large number or majority of candidates attempted this question and the answers were rather poor. Many essays had no structure and a few had not read the question well. Considering travel health advice is frequently received in most public health departments it was disappointing to see only a limited understanding amongst specialist registrars. The better responses related to possible action in specific circumstances. There was no demonstration of an understanding of the levels of knowledge amongst travellers and professionals.

4. Discuss the contribution of epidemiology to prevention strategies for chronic hepatitis and liver cancer resulting from Hepatitis B and Hepatitis C infection.

Most or all of the following would be required for a pass:

For each of Hepatitis B and Hepatitis C a description of the epidemiology of the infection with particular reference to:

* incidence/prevalence in time, place and person
* causative organism
* sources/routes of the infection
* communicability, incubation period and immune response to the infection
* acute/chronic disease presentation and diagnosis
* progression to chronic hepatitis and liver cancer.

Description of possible prevention strategies:

* education and training of public and professionals
* behavioural avoidance of risk exposure
* screening of blood and organ donations and at risk groups
* use of infection control precautions
* immunisation of at risk groups/population
* treatment of cases
* contact tracing
* post exposure prophylaxis
* legislation issues (eg. notifiable disease, skin piercing registration).

The following are additional points which might improve the answer to 'good' or 'excellent':

* A structured response relating epidemiological knowledge to specific prevention strategies.
* Evidence of an understanding of the cost/benefit debate around population immunisation and screening programmes
* Need to use and improve the quality of surveillance of infection to assess the impact of prevention interventions.
* Moral and ethical considerations relating to the immunisation of health care workers.

Examiners' Comments

Answered by quite a few candidates. Most candidates answered the question well and demonstrated a goo up-to-date knowledge of the epidemiology of hepatitis B and C infection. Most responses were well structured and related appropriate preventive measures to specific elements of the epidemiology.

C. Health Information

5. In England and Wales information collected around the time of the decennial census enables analysis of mortality by social class (based on occupation). The table presents data from the three most recent decennial publications.

Mortality rates by social class (based on occupation) at three time periods, males (aged 20-64 years), England and Wales.

Rates per 100,000 per year, standardised to the European Standard Population.

Social Class (based on occupation)	All causes combined		
	1970-72	1979-80, 82-83	1991-93
I	500	373	280
II	526	425	300
III (non-manual)	637	522	426
III (manual)	683	580	493
IV	721	639	492
V	897	910	806
England & Wales	624	549	419

[Source : ONS: Health inequalities; 1997]

Comment on the data presented. Identify further analyses from these data sources which you would wish to examine in order to interpret more fully any mortality differences by social class. Indicate potential difficulties with any of the analyses you propose.

Most or all of the following would be required for a pass:

Commentary:

* Marked gradient across social classes within each time period: V/I ratio increases from 1.79 circa 1971in 1970-72, to 2.44 in 1979-80/82-83, to 2.88 in 1991-93.

* In social classes I to IV the mortality rate declines in each time period: in contrast, in social class V the mortality rate rises slightly from 1970-72 to 1979-80/82-83and then falls in 1991-93 to below the level which existed in 1970-72.

* Social class V levels of mortality and secular trends differ markedly from all other social classes.

* Calculation of percentage changes to illustrate above points is desirable.

Further analyses:

Consider:

Other age groups:
* below age 20 - but mention problems of assignment of social class by "head of household".
* above age 64 - but mention problems of assignment of social class to retired people
* age-specific data within 20-64 age group (eg. age-specific mortality ratios).

Females:

* difficulties surrounding assignment of women to social class should be flagged up.

Cause-specific analyses:

* analyses by major causes of death should be proposed (eg. CHD, stroke, cancers, suicide, accidents, etc).

General comments:

Mention should be made of general issues relating to analyses of social class data, such as:

* changing social class classifications over time
* the use of social class based on occupation (other characteristics may be more relevant)
* assignment of social class on the basis of occupation at a single point in time
* the difficulties surrounding the use of occupation as presented on the death certificate whilst occupation is derived from census data.

The following are additional points which might improve the answer to 'good' or 'excellent':

* a well-structured, systematic approach to the question

* evidence of a more detailed understanding of the technical problems which underlie the compilation and use of social class statistics

* mention of use of longitudinal (linked) data to minimise some of the problems.

Examiners' Comments

This should have been an easy question on which to score well, however just over 1/3 of candidates failed this.

Comments on data provided were disappointing in that most candidates did interpret the trend correctly but failed to consolidate their answer with ratios or percentages.

As regards identification of further analyses most candidates gave adequate answers but comments on potential difficulties were pedestrian and sparse, in the main.

Better candidates:
a) answered the question asked
b) organised their information well
c) presented their answers with a clear layout.

Poor legibility in some cases was a problem.

6. It has been suggested in a local newspaper that the occurrence of heart disease in your locality (population 250,000) is much higher than the national average. You have been asked to confirm or refute this suggestion on the basis of readily available data.

   a) Comment on any immediate issues you would wish to resolve

   b) Identify the various sources of data you would use (briefly indicating

their major strengths and limitations) and

c) Indicate any important methodological issues which might arise.

Most or all of the following would be required for a pass:

* comment on the ambiguity of "occurrence" - prevalence, incidence, mortality
* comment on the range of problems which might be encompassed by the term "heart disease" eg. angina, heart failure, heart attacks.
* comment on the need to clarify "higher than the national average" eg. possible small numbers involved.

* data sources
    * mortality statistics [strengths - ready availability, up-to-date; limitations - only identifies fatal cases]
    * hospital and/or GP statistics [strengths - greater coverage of full spectrum of disease; limitations - data may be unavailable locally, particularly for GP data].
    * survey data [strengths - population coverage, good case-definitions; limitations - data may well be unavailable locally].

* methodological issues
    * comparisons (with national or other local data) may be difficult - eg. case definitions, age-standardisation
    * small numbers - aggregate data over several years
    * lack of data - consider if any novel local sources are available.

The following are additional points which might improve the answer to 'good' or 'excellent':

* a well-structured, systematic approach to the question
* demonstration of a thorough understanding of all the key sources of data
* a practical and robust approach to resolving methodological difficulties.

Examiners' Comments

This was a straightforward question and the overall standard achieved was disappointing - almost a third of candidates failed to achieve a pass mark and good/very good answers were rare. A few candidates treated this as a "Paper III" type question and gave inadequate weight to the health information issues. Many candidates produced "standard" responses but failed to give sufficient emphasis to the particular problem/setting which they had been asked to address. The best answers discussed data availability (and any associated problems) with particular respect to information specifically relevant to heart disease and which was likely to be available at local level.

D. Statistical Methods

7. Two pain clinics have compared their results for relief of chronic pain using a 10cm visual analogue scale, on a small sample of patients in each clinic. The scale ranges from 0 (no pain) to 10 (maximum pain). The patients were randomly allocated to clinics and the pain scores after a period of treatment are summarised below and displayed graphically in figure 1.

Variable	N	Mean	Median	StDev	Min	Max	Q1	Q3	Skew
Clinic A	9	7.985	8.175	1.547	5.487	9.759	6.448	9.302	-0.406
Clinic B	13	5.779	6.729	2.288	1.385	8.508	4.004	7.700	-0.445

Figure 1

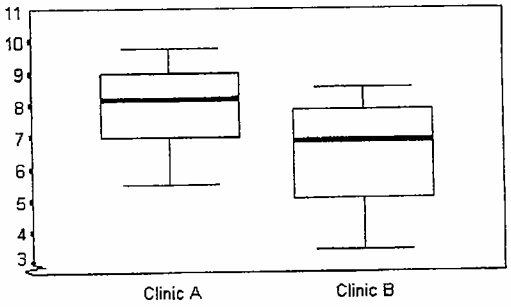
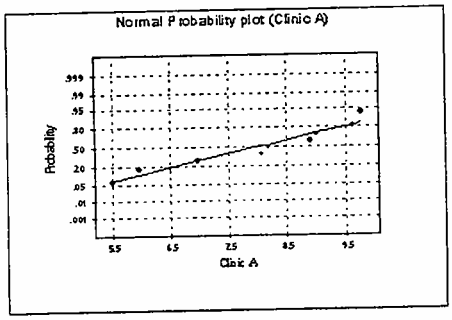
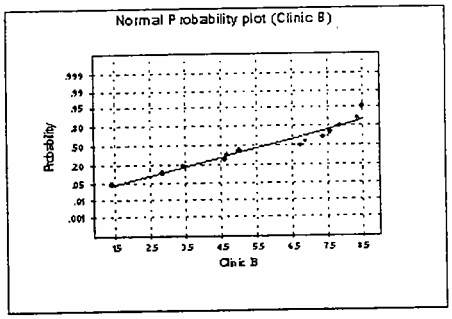


Figure 2





a) What sort of display has been used to illustrate the results in Figure 1? Explain (with the aid of a diagram if you wish) what the components of the display represent and what can be inferred from such displays.

The data were analysed using a two-sample t-test. The difference in means (Clinic A minus Clinic B) was 2.2 (with 95% confidence interval 0.37, 4.04) p = 0.021 using the pooled standard deviation.

b) From the information provided about the study, and the data given and the plots in figure 2. Do think this analysis was justified?

c) What do you conclude from the results? What else might have been done to justify the analysis, and what alternative analysis might have been performed?

Most or all of the following would be required for a pass:

* These are box and whisker plots. The ends of the box are plotted at the upper and lower quartiles, the horizontal line through the box is plotted at the median. The whiskers extend to the maximum and minimum values. The displays indicate symmetry, spread and location of distributions, and some versions indicate the presence of potential outliers (plotted as dots separate from the whiskers).

* The two-sample t-test assumes that the data are randomly drawn from two normal distributions with equal variance but different means. The data show that both sets of results were negatively skewed, with different standard deviations. The sample size is small, so that differences in variance may be the effect of sampling variation. Mathematically the analysis is probably justified but statistically it may not be as the pain relief scale is essentially ordinal.

* There seems conclusive evidence, at least at face value, that clinic A patients have more pain at the end of treatment than Clinic B patients. The assumption of common variances might have been tested by a formal variance homogeneity test and the assumption of normality could have been tested. A transformation to correct the skewness might have been tried. An alternative analysis would be a Mann-Whitney test (same as Wilcoxon Rank-sum test).

The following are additional points which might improve the answer to 'good' or 'excellent':

* Plotting conventions vary between computer packages.

* Small samples are consistent with almost anything. Evidence might have been sought to prove that the scale was approximately interval in nature.

* Checks on baseline comparability, drop-outs (was this intention-to-treat or a per protocol/ treatment actually received analysis?). A permutation test could have been carried out on the original data. A Mann-Whitney test would still have assumed a common parent distribution, and would have returned conclusions with respect to the medians rather than the means.

* Assumption of normality tested by procedures based on how close the normal plot is to a straight line (eg. Shapiro-Wilk test on the correlation coefficient).

Key words: Box & whisker plot, Exploratory data analysis (EDA), t-test, Mann-Whitney test, intention-to-treat.

Examiners' Comments

Only a few candidates attempted this question but the answers were generally satisfactory. Section a) really required an indication what can in general be obtained from such plots, rather than what was specifically displayed.

Very few noted noted that the ends of the boxes did not correspond to the upper and lower quartiles given in the numeric summary. This is probably because SPSS actually seems to display the upper

and lower hinges rather than the quartiles; the interval between the hinges is rather less than that between the upper and lower quartiles but the difference is trivial except for small samples - which these were!

(Note: With n data points the Upper Quartile is the $3(n+1)/4^{th}$ value while the Upper Hinge is the (3n+1)/4th value. The Lower Quartile and Lower Hinge are the $(n+1)/4^{th}$ and the $(n+3)/4^{th}$ values respectively).

Mistakes by candidates were that the ends of the whiskers indicated upper and lower 95% confidence limits, and that the centre indicated the mean. Neither does the size of the box indicate the sample size. One reason the range isn't a suitable measure of spread as it does tend to increase with sample size - because a larger sample is more likely to include outliers; the interquartiles range is used because it is more resistant to this effect.

Points which were generally not picked up were that the scale was ordinal, and that assumptions on the form of distributions can be tested. Also, some candidates mentioned the log transformation, which is definitely not what is called for.

8. A retrospective analysis of in-patient deaths following admission for acute myocardial infarction in Nottingham from 1982-1992 included the following results. (BMJ 1997;**315**:159-164). Using 1982 as the reference year, the crude odds ratio for such mortality in 1992 was 1.38 (95% confidence interval 1.10, 1.73). Women and older patients were observed to have a worse prognosis, and after adjustment for age and sex in a logistic regression model this odds ratio was 1.02 (95% confidence interval 0.81, 1.29).

   (a) Give brief definitions of the terms "odds ratio", "95% confidence interval" and "logistic regression", and explain why these were used in this study.

   (b) What do you infer from the findings, and what might explain them? Which data underlying the results given above would be helpful in interpreting them?

Most or all of the following would be required for a pass:

* The odds of dying in any particular year is obtained from the ratio of the number of deaths to the number of survivors. The odds ratio is obtained by dividing the odds in 1992 by the odds in 1982. It may be interpreted as an approximate relative risk and was used to represent the proportional change in mortality over the intervening 10 years. A 95% confidence interval in the long run contains the true odds ratio on 95% of such instances (from a Bayesian standpoint, with 95% probability). It was used to portray the levels of imprecision in the estimates of the odds ratios. Logistic regression is a technique which controls for potential confounding effects, used here in order to adjust for any changes in the age-sex composition of the in-patient population.

* Before adjustment for age and sex, the odds ratio suggests a nearly 40% higher mortality in 1992 compared with 1982, which is statistically significant given that the confidence interval does not include one. Adjusting for age and sex reduces the odds ratio practically to the null value (unity), and it is no longer statistically significant. The most likely

explanation is that there were higher proportions of women and older patients in 1992 compared with 1982, since these are the groups with higher mortality rates in this context. The data which would be useful at the two time points are the age-sex distributions and the age and sex-specific mortality rates.

The following are additional points which might improve the answer to 'good' or 'excellent':

* The odds ratio approximates more closely to the relative risk for rarer outcomes. The confidence intervals are interval estimates of the odds ratios. Logistic regression is a technique for modelling odds ratios, allowing full flexibility for representing confounders in various ways (discrete or continuous), and also for considering interactions/effect-modification. Less flexible alternatives include Mantel-Haenszel techniques on mortality data stratified by for example age and sex, and standardisation.

* Before adjustment, even the lower confidence limit indicates a large increase in mortality (10%). After adjustment, differences larger than a 20% reduction and a 30% increase can be ruled out - this is still quite wide. Inspection of the age and sex-specific rates would indicate whether the finding of no change in mortality rates overall (from the adjusted odds ratio) is replicated across all sub-groups.

Key Words: Odds ratio, confidence interval, logistic regression, age and sex-specific mortality rates.

Examiners' Comments

Generally reasonably well answered, though there was some confusion about which groups were being compared I the odds ratio for in-patient mortality - these were 1992 versus 1982, not for example admitted versus not admitted. Other mistaken assumptions included that the study was a case-control study (it wasn't) and that the risks of death could not be determined (given the data, they could be). Many still gave too much technical detail about multiple logistic regression, at the cost of clarity regarding the central point that the adjusted OR takes account of any differences between the two years in terms of age-sex case-mix; some candidates simply noted what was in the question, namely that age and sex are related to mortality. Some also gave excessive/tangential details (given that the section is statistical methods) about how the results could have come about, but some made valid points about the importance of knowing the absolute number of admissions, and information about trends between the two time points. Few appreciated the alternatives of Mantel-Haenszel or standardisation, and the importance of considering age-sex specific rates.

Paper II Section B

E. Disease Prevention & Health Promotion

1. What should be the elements of strategies to improve the nutrition of young people?

Most or all of the following would be required for a pass:

* A brief discussion of the nutritional requirements of young people.

* a discussion of dietary related conditions originating in childhood.

* a knowledge of studies of what young people are actually eating and the related factors.

* the role of school meals in the diet and in nutritional education.

* the role of health education in promoting diet and establishing healthy lifestyles.

The following are additional points which might improve the answer to 'good' or 'excellent':

* knowledge of the legislative background around school meals, national nutritional guidelines,
and the recent "School Meals Campaign".

* 'Health of the Young Nation' report.

Examiners' Comments

Most candidates gave a reasonable overview of strategies required and related them to young people. Several approaches were used to addressing the question. In general there was an over-emphasis by candidates in trying to explain the process of strategy. Few candidates explained the particular nutritional requirements of children. The importance of nutrition on growth and development and risk of deficiency diseases were under-emphasised. Texts read often in relation to the adult population.

The best answers described the needs of young people and demonstrated how health education can work in their particular settings. Also the importance of nutrition and nutritional requirements, and looked broadly at how young people might be influenced.

2. Describe the role of community development in health promotion and disease prevention programmes.

Most or all of the following would be required for a pass:

* A description of the main determinants of health - general socio-economic, cultural and environmental conditions, social and community networks and individual lifestyle factors

* An understanding of how these determinants relate to variations in health status.

* A description of community development approaches.

* Specific links between changes associated with community development and health promotion/disease prevention programmes - eg. child development, screening, diet.

The following are additional points which might improve the answer to 'good' or 'excellent':

* An understanding of how to implement community development.

* Broad and holistic view of health, with an understanding of the variety of perceptions of key health issues.

Examiners' Comments

Candidates gave examples of community development, but could have made more explicit an understanding of the main determinants of health and how these relate to variations in health status.

F. Medical Sociology & Health Psychology

3. The sociologist, Eliot Friedson, argued in 1970 that 'autonomy' was a key marker of medicine as a true profession; to what extent do you think this statement is still true?

Most or all of the following would be required for a pass:

* Describe what Friedson meant by autonomy - the professional should be self-directing in his/her work.

* Describe other criteria by which occupational groups may be seen as 'professions' and why this is important (self-regulating, own governing body etc) and important because it creates a situation of professional power and self-accountability for that group.

* Describe changes which have happened with the introduction of managerialism in the health services

* Comment on the effect the changes may have had upon all professional groups; local examples quite appropriate here

Examiners' Comments

The answer relating to autonomy (relating the work of Friedson) and the professions was answered reasonably well by most students. The weakness lay in students not defining (and perhaps not understanding) clearly the meaning of autonomy and hence understanding it as a characteristic of the individual, rather than of the profession. However, the majority of answers noted the ways in which professional autonomy was eroded by the introduction of general management and buy greater consumer power. Students who recognised that the essential features of autonomy were not eroded (eg. entry into the profession, control over practice) were awarded more marks.

4. What are the benefits and disadvantages of using standard tests for measuring the psychological health of a population?

Most or all of the following would be required for a pass:

* Numerous scales relating to psychological wellbeing, especially those aimed at detecting common psychiatric disorders such as depression/anxiety.

* Special scales have been developed for certain groups, eg. the elderly, those only with depression (Beck Depression Inventory) etc.

* Easy to administer

* They can be administered to small and large samples if population norms exist (eg. Hospital Anxiety and Depression Scale (HAD), General Health Questionnaire (GHQ).

* Certain well-known tests have high reliability and validity, which may decrease with lesser known and used tests.

* The person is ill then the scores may be affected

* A certain test may not always apply to some groups, eg. GHQ and maternity patients (here because too many questions concern sleep and related issues which 'the condition' distorts)

* Tests tend to measure and identify a condition but do not 'explain' it

* More work on reliability and validity with specific populations is needed for many tests.

Examiners' Comments

Only a few candidates attempted this topic and while all wrote a reasonable essay, it turned out to be a difficult choice. Students were expected to give illustrations of different forms of scales in their answer, and to illustrate their strengths and weaknesses. Students were also expected to indicate how those working in the field of public health may psychological tests.

G. Social Policy & Health Economics

5. Describe the process for allocating resources in a health care system with which you are familiar. Critically appraise the method used.

Most or all of the following would be required for a pass:

* Recognition that there are different levels of allocating eg. between districts and within districts
* Some historical perspective of RAWP or an analogous system
* Description of the basic elements of the formula eg. age weights, SMR, social variables, market forces factor (in England).
* Critical discussion on the main issues which have dominated debate mentioning several of:

    * debate about age weights
    * use of SMR as a proxy for morbidity
    * size of populations and reliability of formula
    * use of data from decennial census
    * weighting of different components
    * use of regression methods to approximate need.

The following are additional points which might improve the answer to 'good' or 'excellent':

Two or more of the following:

* knowledge of local approaches to sub-district allocation
* understanding of the criticism over the implementation of York
* recognition that the method of movement of districts to target is as important as the target itself
* discussion of the underlying assumption that equity of inputs is an appropriate model
* differences within the UK
* knowledge of new review which is to take place

Examiners' Comments

This question aimed to assess candidates' knowledge of the resource allocation process in a health care system with which they were familiar. It was answered by a majority of the candidates. There were some very good answers. In re-drafting the question following comments from examiners from Hong Kong the emphasis on allocation to commissioners of health care had been lost leaving some ambiguity, with a significant number of candidates focusing their answer on the process of allocating resources to specific providers of care with a discussion on rationing. Knowledge of the resource allocation process within the UK NHA, but which Districts and Health Boards receive their annual budgets, was often out of date, though many of the arguments rehearsed about the deficiencies of the RAWP formula can be applied to the current resource allocation formulae. Few candidates explained how resources are allocated to GPs. Given the ambiguity of the question a range of different approaches led to pass marks being awarded.

6. What do you understand by the term advocacy? Explain the place of advocacy in public health practice illustrating your answer with examples.

Most or all of the following would be required for a pass:

* Offered definition of advocacy which recognises that the term can be used in two broad ways:

    * representation and speaking out for the needs of groups or individuals who may have a limited voice in society, eg the disabled, mentally ill, those with a learning disability, and

    * speaking out for a cause which is of public health importance eg. lobbying for cessation of tobacco advertising.

* Explanation, with appropriate examples, of public health practitioners adopting both of these practices.

* Use of annual reports, public meetings of the health authority, work with the local media, to promote public health action.

* Recognition that public health physicians (PHPs) can operate at different levels, from national
to local eg. working in partnership with a national voluntary organisation to advocate changes in legislation around childhood accidents vs playing an advocate role for people with learning disabilities on a local planning group.

The following are additional points which might improve the answer to 'good' or 'excellent':

* Recognition that a great deal of advocacy for public health is carried out by people who are not public health doctors.

* Discussion of the independence of public health doctors operating at national or regional level and of local PHPs in relation to their employment as civil servants or employed by health authorities and the impact this can have on their ability to advocate.

* At least one high quality example of the impact made by advocacy

* Knowledge of the work of specialist advocacy projects working with disempowered groups.

Examiners' Comments

This question sought to explore candidates' views and knowledge of the role of the Public Health professional as advocate. Most candidates distinguished between examples in which the PHP was acting as advocate for an individual and their needs, examples were the HPHP took on the role of speaking up for the disadvantaged, and a broader role as an advocate for health in general. The were some useful examples of media advocacy. Strong answers explored the tension between advocacy and empowerment, with the risk of advocacy tending towards paternalism if this is not recognised. The importance of an independent voice in public health practice was stressed, if PHPs were to be free to act as advocates. In general this was well answered with a high average mark and no failures.

H. Organisation & Management of Health Care

7. Drawing on your knowledge of management theory, describe the process of managing change, using a specific health care issue as an example.

Most or all of the following would be required for a pass:

* identifying the need for change
* identifying the levers for change and barriers to change
* generating support for change
* maintaining the change.

The following are additional points which might improve the answer to 'good' or 'excellent':

* The answer will be grounded in relevant management theory and use the example in a

realistic and practical fashion.

8. The improvement of health requires better collaboration between organisations that influence health. In a named country of your choice, describe the barriers to effective partnerships between organisations and ways to overcome these.

Most or all of the following would be required for a pass:

* Description of barriers:

  - cultural
  - structural
  - resource

* Description of mechanisms to overcome barriers, eg:

  - leadership
  - incentives
  - legitimation of joint working
  - joint appointments
  - creation of umbrella organisations.

Outstanding answer would also be able to articulate at macro and micro levels all these points within the context of management theory.

Paper III (UK)

Section A

1. The Chief Executive of your Health Commission has instigated a Primary Care Development Fund, for which bids are now being invited from practices in your District. It is stipulated that bids must contain evidence to justify expenditure on the proposed development, and must include an evaluation of the proposed development. One practice bids for funds for a minor illness nurse, and gives the attached paper "Establishing a minor illness nurse in a busy general practice" (Marsh GN, Dawes ML, BMJ 1995;**310**:778-780) as evidence to support their bid.

   i) Write a critical appraisal of the paper summarising the evidence devised to justify expenditure.

   ii) Give clear suggestions to the practice as to how an evaluation of a similar service might be undertaken, bearing in mind that the costs of the evaluation would have to be kept under £10,000.

   (Each part of the question carries equal marks)

Most or all of the following would be required for a pass:

Critical appraisal

* Descriptive study of the introduction of a minor illness nurse into a group practice. The description of the practice is adequate. The process of referral to the minor illness nurse is described in a reasonable amount of detail. Detail is provided of the reasons for consultation (as assessed by the nurse). The process of training is described only as "sitting in surgeries with the duty doctor in the practice for three half days a week over a week over about a year".

* We are told that all patients requesting an urgent same day appointment were referred first to the nurse, but that if either patient or nurse was unhappy with the diagnosis or treatment after the consultation, the duty doctor was consulted. We are also told that if patients demurred in any way they were given an appointment with the doctor. There is no indication in the results, however, of the number of patients who refused the initial consultation with the nurse, although there is a reference in the discussion to "about 90%" accepting the consultation.

* We are then told that the nurse did 696 face to face consultations, 602 of which she did without recourse to a doctor. In the remainder the patient was seen by a doctor or the case discussed over the telephone. Whether this was the decision of the nurse, or because of the insistence of the patient, is not stated.

* No assessment of patient outcome is made over and above reconsultation rate with the practice concerned. The authors state only that the "fact that almost 80% of patients did not return for a further consultation about that episode of illness suggests that the treatment was effective". This is at best a crude measure of patient outcome, or of patient satisfaction with the service offered. It takes no account of those who might choose to use alternative sources of primary care supply, such as accident and emergency departments, because of their dissatisfaction with the service offered, or of those who suffer a disease experience that is less than optimum but who do not return because their disease is self limiting.

* Despite the fact that one of the explicit aims of the introduction of the minor illness nurse was to reduce doctor workload, this was not measured at any stage of the study. It is stated that "Because we kept no record of doctors' extra hours before and during the study we are unable to say who much the duty doctor's workload fell. We presume, however, that some of the 12 or so patients seen each day by the nurse must have had an effect on the doctor's evening surgery….". This is a dangerous presumption: provision of a new service often creates new demand.

* The generalisability of the service to other practices is presumed, but the authors do not consider whether the nurse used in this study is typical of other practice nurses, who are the group most likely to take on this role.

* There is little evidence in this paper to justify expenditure on a new service without an element of evaluation being built into that new service.

Advice for practice on evaluation

Candidates should demonstrate a pragmatic awareness of what can be achieved on a small budget: ie, although a randomised controlled trial involving multiple practices would be the ideal, with measurement of several outcome variables including patient outcomes and quality of practitioner (doctor or nurse)/patient interaction, this is unlikely to be achievable on the small sums available from a typical Primary Care Development Fund. There are, however, several improvements which could have been made to the study being considered here:

* Measurement of the effect of the intervention of workload is essential, and at a simple level would involve no more than a count of the number of patients seen by each practice doctor for a period of time before and after the introduction of the nurse, in addition to data on the workload of the nurse herself. Additional data might be collected on reason for consultation. Any increase in demand generated by the new service should be quantified.

* Again, the measurement of patient outcome needs to be incorporated into any evaluation, but should be kept simple. A descriptive study of patient satisfaction with the nurse service could be accomplished easily using a postal questionnaire one to two weeks after consultation. The questionnaire could also ask about use of alternative sources of primary care.

* The estimated costs of the evaluation should be included in the practice bid.

Examiners' Comments

See below.

2. You are working in a District Health Authority in a large urban conurbation with a high proportion of first and second generation Afro Caribbean families. One-off funding has been given by a local businessman to fund a health promotion project for this group. Your health authority has been asked to consider taking over the funding at the end of the project. Your Director of Public Health returns from a meeting with your Chief Executive at which the attached paper was produced to support a decision not to take on the funding for the project. (Chaturvedi N, Jarrett J, Morrish N, Keen H, Fuller J. "Differences in mortality and morbidity in African Caribbean and European People with non-insulin dependent diabetes mellitus: results of 20 year follow up of a London cohort of a multinational study". BMJ 1996;**313**:848-52).

   i) Write a critical appraisal of the article.

   ii) Based upon your critical appraisal, write a paper for your chief executive setting out arguments for and against your health authority picking up the costs aimed specifically at ethnic minorities in your district.

   (Each part of the question carries equal marks)

Examiners' Comments

It is disappointing to have to repeat advice given to candidates in previous examiners' comments. Once again, most candidates failing either of the two questions in section 3a did so because of omission, rather than error. The structure of answers was disappointing.

This January's paper gave a perfect example. Candidate's should realise that their papers, before being passed to the examiner, are divested of the front sheet giving their name, and the number of the question that they answered. This is replaced with another sheet, giving a candidate number, and the number of the appropriate question. In January, for whatever reason (probably the large amount of work needing to be done in a short period of time) the number of the question was not marked on this sheet, necessitating the examiner having to deduce, from the answer, which question was being answered. In many cases, this was simply not possible until three or four pages into the answer! Candidates failing often gave no summary of either method or results of the paper they were criticising. An example of taken from one answer serves to illustrate:

'The study design was appropriate to answer the question posed"

But what was the question posed, and what was the study design?!

Also, it is rare to find a published paper which does not have some positive features, but many candidates fail to give a balanced view. Candidates should try to imagine that they are producing a review for a senior colleague (their Director of Public Health, for example) who does not have time to read the relevant paper but who needs to be able to talk about it knowledgeably at, say, a public meeting. Their colleague will need to have a balanced view of what the paper is about, and its worth in terms of evidence, rather than a diatribe describing only its defects in terms of epidemiological minutiae. Both examiners hopes that by the next sitting both those entering this examination and, perhaps more importantly, those preparing candidates for the examination, will have taken notice of these comments.

Section B

3. The next annual public health report for your locality is to be devoted to the prevention of accidental injury in people aged over 65. Write a briefing paper for the working party compiling the report, outlining the objectives of the report, the priority issues in this topic, and the types and sources of information available. Indicate how the report should be used to promote reductions in the current accidental injury patterns in this age group.

Most or all of the following would be required for a pass:

Objectives of the report

* Raise the profile of the problem
* Discuss possible causes and affects
* Suggest some possible solutions

Priorities Issues

* Extent of mortality and morbidity

* Demand on resources
* Patient factors:

Causes/associated factors

* increased age
* drugs
* muscle weakness
* unstable gate
* posture of hypertension
* decreased visual actuity
* physical environment (internal and external)

Effects

* injuries
* avoidable hospitalisations
* increased morbidity and morality
* fear of falling
* anxiety under pressure
* decreased confidence
* increased disability

Information available

* Hospital admission and discharge figures
* GPs programmes for screening the elderly
* Social Services Department
* A & E Department

Use of report

* To inform health authorities, trusts, independent contractors, local authorities, voluntary organisations and police.

* As a basis for opening discussions with all interested parties

* Possibility of opening up local fora and initiating local partnerships to tackle the problems.

Examiners' Comments

Range of marks 2-8. Answered Fairly well but few candidates covered the section of 'patient factors' well; particularly the effects of falls. Also poor discussions of prioritisation.

4. Your health authority has been approached by a pharmaceutical company wishing to market a

"managed care" programme in your district. Write a background paper on managed care for

your Executive Board.

Most or all of the following would be required for a pass:

* "Managed care" is a generic term describing any health care system that integrates the financing and the delivery of health care.

* Pressures to control costs has driven this programme in the United States: discuss the effectiveness of this.

* What factors might contribute to the decrease in costs, for example, more favourable enrolees to health plans.

* Characteristics of "managed care"

    * limited choice of physician providers
    * controlled access to secondary care
    * selective contracting
    * financial incentives
    * quality management
    * utilisation management.

* Examples of Managed Care in the NHS.

* The contribution of commercial involvement including possible fragmentation of general medical services (GMS); effect of 'for profit' status: use of patient base data and confidentiality issues.

Examiners' Comments

Very poorly answered. Confusion between 'ordinary' contracts, disease management protocols and guidelines and 'managed care' despite articles recently the BMJ and JPHM.

Paper III (Hong Kong)

Section A

1. The Hospital Authority has received a letter from the Hong Kong Nursing Association which indicates that back pain is a major cause of morbidity among Hong Kong nurses. The Association has requested that the Hospital Authority investigates this problem, the formulating of policies for the near future. You are leading a Working Group to investigate this problem.

    a) Write a critical appraisal on the paper by Smedley J, Egger P, Cooper C, Coggon D. "Prospective cohort study of predictors of incident low back pain in nurses". Br Med J; 1997;**314**:1211-1290.

b) Describe the main problems you will encounter in conducting a randomised controlled trial to study whether ergoeconomic intervention is beneficial in preventing low back pain in nurses.

(Each part of the question carries equal marks).

Most or all of the following would be required for a pass:

Critical appraisal

* Cohort study design suitable for research question and avoidance of bias
* Study sample representative of nurses
* Sample size calculation not shown
* Nurses who had back pain in preceding 1 month excluded - rationale unclear and this may be unnecessary.
* Response rate low, only 66% at follow up.
* As nurses know of risk factors for LBP, reporting bias is very likely - this has not been overcome by study design.

Main problems:

* Nurses will complain about reallocation, as nurses who will remain on manual duties will feel that this is unfair.
* Once reallocation is implemented, reversion may not be feasible.
* Due to the shortage of nurses, reallocation is impractical, even for a short period.

Examiners' Comments for Question 1 & 2

Some candidates did not adopt a systematic approach to critical appraisal.

Some candidates did not refer specifically to the paper concerned on the critical appraisal.

2. Stroke is a major cause of mortality and morbidity among the elderly population in Hong Kong. The Health and Welfare Branch is reviewing alternative forms of rehabilitation for these conditions. You are a member of the working group for this task.

a) Write a critical appraisal on the paper by Dennis M, O'Rourke S, Slattery J, Staniforth T, Warlow C. "Evaluation of a stroke family care worker: results of a randomised controlled trial". Br Med J 1997;**314**:1059-1138.

b) Write a paper for your working group on the implications of this study for your review.

(Each part of the question carries equal marks).

Most or all of the following would be required for a pass:

Critical appraisal

* Study design appropriate to objectives. A RCT was the ideal design to evaluate an intervention.
* Study sample from a well organised stroke unit, not representative of stroke patients eg. in Hong Kong.
* Sample size - may have been too small to demonstrate effect. Sample size calculation not demonstrated.
* Outcome measurements - a large number of 'scales' used. Exact outcomes uncertain. Validity uncertain.
* Person who evaluated outcomes not really blinded to 'intervention'.
* Exact intervention not defined.

Main problems:

* Study results not valid for Hong Kong
* Very different interventions are needed in a RCT for Hong Kong
* Many problems on rehabilitation of stroke patients exist. These cannot be tackled by a sole worker.
* Baseline care very divergent, difficult to standardise
* Difficulty in selecting measures of 'satisfaction' in Hong Kong Chinese
* Big problem with external validity even if trial results are positive.

Examiners' Comments

See question 1 above.

Section B

3. The Government has proposed the implementation of a programme of converting lightweight diesel powered road vehicles (DRV) to conventional gasoline engines with catalytic converters (the "Diesel-Petrol (D-P) Switch") or to Liquid Propane Gas (LPG). The transport industry has opposed the proposals on economic grounds. The LegCo panel on health issues has asked the Department of Health to explain the evidence for the potential benefits to community health from this intervention. Write a briefing paper for the Director of Health to support her discussion with the LegCo panel.

Most or all of the following would be required for a pass:

* Describe the current problems with air quality pollutants and sources of pollution in Hong Kong. The principal source of participants is now considered to be diesel road vehicles (DRV).

* A description of the nature of participants, total and respirable.

* The air quality objectives (AQO) in Hong Kong continue to be exceeded with high levels of particulates and also NO

* A review of the epidemiological evidence on acute and chronic health effects: pollution episodes in other countries have been shown to be associated with excess risks for hospital admissions for asthma, COPD, coronary heart disease and stroke.

  Pollution episodes are associated with increased daily mortality reflecting either "excess deaths" or "harvesting".

* The need for local evidence: The Government Environmental Protection Department has requested new studies on morbidity and mortality associated with pollution episodes.

* The volume of vehicular traffic continues to increase and a different approach to transportation policy is needed. This is unlikely to come about soon. In the meantime, urgent efforts are needed to reduce or eliminate vehicular emissions. LPG is one potentially useful step; another would be electrically powered vehicles.

  The transport lobby's vested interested (and opposition to the proposals) is linked to the widespread (and widely publicised) availability of smuggled diesel fuel; the cost of engine conversions (and LPG including taxation).

The following are additional points which might improve the answer to 'good' or 'excellent':

The introduction of low sulphur content industrial fuel in Hong Kong in 1990 was associated with a decrease in the difference in prevalence of respiratory symptoms (cough, phlegm and wheeze) in primary school children living in polluted and unpolluted districts respectively.

Data on AQO's and pollution levels.

The estimated additional health impact (eg. excess mortality) associated with increasing increments of pollution (eg. per $10\mu g/m^3$ of specific pollutants).

Seasonal patterns of pollution in Hong Kong; ie cyclical pattern of high respirable suspended particulates (RSP) levels in winter months and lower levels in summer months.

Problems of research methods, such as modelling annual mortality patterns in the region where deaths are strongly associated with temperature variation (high death rates with low temperature/high RSP and vice versa) and interpretation of research findings.

4. An epidemiologist has studied the pattern of hepatitis A in Hong Kong and cautioned the Director of Health in writing that an outbreak of hepatitis A is likely to occur within the next few years. The letter also urged the Director to take appropriate means to prevent it.

   As a public health consultant responsible for communicable diseases control, prepare a memorandum to advise the Director of Health. Your memorandum should include a review

of the disease pattern, whether you agree with the epidemiologist about the possibility of an outbreak and your recommendations for further action.

Most or all of the following would be required for a pass:

* Review of Hepatitis A (HA) pattern in Hong Kong

  A brief description of the virus, route of transmission and the clinical features of the disease.

  With special reference to the different presentation in young children (no or mild symptoms) and older children and adults (more severe symptoms).

  Epidemiology of HA in Hong Kong - notification data, previous outbreaks, secular trend.

* Situation in neighbouring places (mainland China), Asia and other parts of the world.

* Prevalence of HA antibody in Hong Kong - more younger adults (especially below age 40) are becoming non-immune.

* Sanitation, food hygiene and risks due to travelling.

* Discussion on the vaccines efficacy and costs.

* Review of control measures.

* Potential problems - especially from imported food (shell-fish), local habit of eating raw food

  and in travellers. High level of travel to neighbouring endemic areas.

* A discussion on whether the candidates agrees or not with the epidemiologist, with arguments for or against.

* Recommendations for further action.

  * A working group to examine the situation and issues about control.

  * Composition of inter-departmental working group - specialists in hepatitis A, clinicians, professionals involved in food hygiene, epidemiologist, experts from overseas.

  * Inviting the epidemiologist to present his/her view and to join working group.

  * Special measures which would be useful and controversial.

    Eg. Vaccination policy - efficacy, who to be vaccinated? Who should pay? willingness to pay?

    Food control measures - new regulations? stricter enforcements.

Control of good handlers.

The following are additional points which might improve the answer to 'good' or 'excellent':

* Highlight the urgency of the matter.

* The need for a better system of surveillance of disease and immunity status.

* Discuss the economic considerations and cost-effectiveness of vaccinations, and more detail on issues related to "willingness to pay".

* How the media should be handled.

* Liaison with World Health Organisation (WHO), US Centre for Diseases Control.

Examiners' Comments

Fairly well understood topic but scant attention paid to recommendations; no mention of WHO/CDCs. Little understanding of urgency or otherwise of topic.

In general, this question was answered adequately. The epidemiology of the disease was well-known and was described quite adequately. However, the pattern of immunity and the different presentations (more serious symptoms in the older age group when first infected) was not thoroughly examined with reference to the available data locally. A few candidates did not specifically address the issue raised by the epidemiologist and just gave general answers to the prevention of the disease. The discussion and about the controversy about vaccination was somewhat brief for most candidates.