FACULTY OF PUBLIC HEALTH MEDICINE

Of the Royal Colleges of Physicians of the United Kingdom

MFPHM DIPLOMA AND PART I EXAMINATION

JUNE 2000

QUESTIONS WITH EXAMINERS' KEY POINTS AND COMMENTS

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

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JUNE 2000 DIPLOMA & PART I MFPHM EXAMINATION KEYPOINTS

PAPER I

QUESTION 1

Describe how, in a named country, you would recognise a suspected waterborne outbreak of cryptosporidiosis. How would you investigate and control this?

KEY POINTS

Should have a surveillance system for Crypto cases, each should be investigated by EHO with standard questionnaire covering risk factors, and water supply should be mapped.
Also should have established liaison with water company, supply addresses of cases so can do own checking, they should report problems with water quality which could herald cyst breakthrough.
Outbreak recognised either by sudden increase in incidence of cases beyond that expected, or by unusual clustering of cases in one water supply zone where drinking unboiled water seems to be the major risk factor for development of Crypto.

Investigation

May start with Incident control team, small group conducting initial 'look' to establish whether or not problem. If establish major problem then Outbreak control team established;
CCDC
Water company scientists and managers
Environment agency
Environmental health officers
Representative of HA or PCG
Representative of hospital trust
GP
Microbiologist
Vet from SVS

Cases - need faecal specimen for exam for oocysts, can be typed as human or animal.
Environment - 10 litre grab samples or filter samples (1000 litres), in association with EHO, EA and WC.
Also need to investigate water supply and treatment - catchment - EA; treatment - water company, unusual turbidity etc.

Can use case/control standard ques to ascertain whether water likely to be vehicle.
If ongoing problem with mains water supply need to issue boil water notice.
Should be able to trace oocysts from animals or sewage to tap of affected patients.
In looking for problem need to allow onset date - incubation period (2-5 days) - transit time through treatment works and through distribution system.

COMMENTS

Most candidates answered this question using a generic framework for ‘outbreak’. This was fine as far as it went, but a substantial number of candidates did not clarify how they would know or suspect that the outbreak was waterborne, such as by mapping cases and attack rates to water distribution zones, or using a case-control study.

Some candidates who did mention a case-control study suggested using controls from another area, and others suggested a cohort study, so there is clearly some confusion over the appropriate epidemiological method for outbreak investigation.

Few candidates mentioned the two Badenoch reports or the Bouchier report, or suggested they knew how water sampling was undertaken. As far as Cryptosporidiosis went, few candidates mentioned relevant detail about the organism or the condition (e.g., incubation period), which could be material in an investigation.

On a positive note, it was encouraging to see that almost all candidates commented on the particular risk posed to the elderly and the immunocompromised.

QUESTION 2

a) Describe the strengths and limitations of data on hospital inpatient activity.
b) Briefly describe <u>three</u> ways in which these data may be used, giving examples where possible of relevance to public health.

KEY POINTS

Dependent on the country and system, but likely to cover most of the following:

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

<u>Strengths</u>
- Data on all admissions are routinely collected and available
- All admissions coded according to the same classification (such as ICD and OPCS in England)

<u>Limitations</u>
- In theory data on all admissions are collected, but in practice, completeness of coding of main diagnosis and intervention may be variable
- Quality of coding of diagnosis and intervention is of concern (done by local coding clerks within hospitals)
- Data provide minimal data for use in case mix adjustment if seeking to examine clinical outcomes
- Data may relate to finished consultant episodes (FCEs) not patient admissions

<u>Uses</u>

i. Monitoring activity [UK specific]
Information of the number of admissions and length of stay by speciality and hospital
ii. Planning health care
Information on age, sex, diagnosis and number of admissions, LOS, and number of procedures over a period of time
iii. Health needs assessment

Examination of population based rates of interventions by district of residence can provide information on levels of care provided e.g. rates of coronary artery by-pass grafting.

iv. Assessing quality and outcomes of care

e.g. mortality rates in hospitals following surgical intervention

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

Clear demonstration of real understanding of inpatient data e.g. points such as:

- Linkage via unique patient identifier theoretically possible
- Limitations relating to variable inclusion of outpatient attendance and lack of linkage to other data sets
- Practical real examples of the use to which data can be used

COMMENTS

Overall this question was well answered. Most candidates understood the question and correctly identified the major strengths and weaknesses of hospital inpatient data. Many candidates appeared to have used these data (or tried to) in real life, and wrote with some feeling about their experiences. Most candidates kept to the point, and only a few wandered off into the wasteland of disease icebergs, and waiting lists.

When asked to give practical clinical illustrations in the context of an examination answer, candidates would be well advised to avoid hackneyed examples (e.g. fractured neck of femur). The core of most examination questions is likely to be immutable, but the examples are an opportunity to show originality of thought, and can raise a candidate from a “good” to an “excellent”.

QUESTION 3

In a certain population, the incidence of a particular infectious disease is 500 per 10,000 total population per year. A point prevalence survey reveals 4 cases in a random sample of 2,000 subjects. Making simple assumptions, calculate the average length of an episode of the disease.

Explain briefly which of your assumptions is likely to have a major effect on the accuracy of your answer.

KEY POINTS

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

- Brief definition or explanation of incidence and point prevalence.
- With an incidence of 5 cases per 100 people per year and a point prevalence of 1 case in 500 people, the average episode length is

  (1/500) / (5/100) = (1/500) * (100/5) = (1/25) of a year, or about 2 weeks.

- This estimate is dependent on the accuracy of the figure (4/2000) assumed for the point prevalence. The survey may not have revealed the true point prevalence, most likely because:
  - The disease may be seasonal, and the survey may not have been carried out at an "average" time of the year (quite likely for many infectious diseases). This could affect the point prevalence either way.
  - Random error: a survey revealing only four cases gives an estimate with a wide confidence interval.

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

- For most infectious diseases which last around 2 weeks, under-reporting is the norm. If the incidence figure is derived from report (routine surveillance) data, and the prevalence from a special study, the differing ascertainment makes it hazardous to combine the figures in a computation.
- If the disease affects mainly a subgroup of the population, such as the elderly or young children (quite likely for an infectious diseases), then the precision of the point prevalence estimate is likely to be even less (since it uses a plain random sample). Age specific incidence rates could alert investigators to this, and a stratified sample would help.
- If the point prevalence is an underestimate, then the answer underestimates the average episode length, and vice versa for an overestimate.

COMMENTS

The answers revealed a lot of muddled thinking about simple epidemiology. Many candidates stated quite unnecessary assumptions. Remarkably many candidates could not apply the simple (and very intuitive) formula **prevalence = incidence x average episode duration** and cope with the fact that the average episode duration would be a mean, which would be quite valid even if there was a lot of variation in the actual episode lengths.

Among the most striking false concepts about the assumptions needed were:
1) the idea that is matters whether the infection has a high death rate or not (death is simply, for this calculation, one of the possible ways an episode might end);
2) the idea that it matters whether the disease has an asymptomatic phase, or whether there are sensitive and specific tests for it (this is simply a matter of the case definition: whatever is taken, it implies the definition of the "episode");
3) that large variations in episode lengths would invalidate the calculation (they may affect its precision, but do not undermine the estimation of the mean).

Unfortunately few candidates combined a) the ability to feel and see clearly the straightforward numerical aspects with b) the real world sense of what key features of the situation would affect the accuracy of the estimate.

QUESTION 4

One of your local Accident and Emergency physicians states that child accidents are more common in one part of your administrative area than another. What types of data are available to investigate this (in a named country of your choice) and what possible explanations could there be for the clinician's observation?

KEY POINTS

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

Data sources:
- Death registrations (small numbers)
- Hospital admissions (should have ICD 'external cause' coded)
- A&E attendance (cause not systematically collected)
- Vehicle accidents (can obtain from police)
- GP data (probably not systematically collected)
- Can compare to national data, e.g. Home Accident Surveillance.

Explanation could be:
- Chance (is the difference statistically significant?)
- Bias (served by 2 Units with different policies?)
- Confounding (age structure of population?)
- True

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

- Ambulance service, fire service, poisons unit or coroner may hold records
- District may be included in national surveys, e.g. HASS, LASS or RoSPA in UK
- Need standard case-definition
- Difference may reflect service provision, e.g. availability of GPs. Could construct a proxy measure of severity, e.g. fractures.
- If difference in under 5 year olds, may reflect less safe home conditions.
- If difference in over 5's, may reflect less safe traffic or playing conditions.
- May be social class difference between areas

COMMENTS

This question was generally well answered, although a number of candidates had problems with:
1) using epidemiological terms e.g. bias and confounding
2) accepting that clinician's observation may be true and so not mentioning why one area could have a higher rate
3) suggesting the use of a case-definition or measure of severity
4) commenting on how helpful each suggested data source might be (some were of pretty marginal use)
5) addressing the questions asked rather than writing short notes on childhood accidents (N.B. the marks were split 50:50 between the two questions posed)

QUESTION 5

People over the age of 60 who have presented with their first low-trauma fracture or vertebral collapse are at risk of further fracture. What interventions would reduce the risk of further fracture for patients in this age group?

KEY POINTS

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

- Note: this is *not* about primary prevention in people under the age of 60, e.g. peri-menopausal women. It is principally about detection and reduction of osteoporosis and prevention of falls.
- **Osteoporosis**

- liaise with Orthopaedic Departments, Accident and Emergency Departments and other clinical specialties where such people would first come to attention so that protocols for further assessment and intervention are initiated.
- establish high risk groups for osteoporosis on basis of history (e.g. oestrogen deficiency from late menarche or early menopause, prolonged amenorrhoea from any cause, high-dose steroid therapy, prolonged immobility or inactivity, nutritional risks such as veganism, low body mass index, smoking or alcohol abuse, endocrine disorders such as hypogonadism or hypoparathyroidism) – note two items from this list would suffice for a pass.
- establish whether osteoporosis is present or not (if facilities for bone densitometry are restricted, prioritise those with highest risk histories)
- reduce ameliorable risk factors
- adjust lifestyle where possible, especially exercise (which improves balance and muscle tone as well as bone strength)
- treat with diet supplements, vitamin D and calcium as clinically indicated
- offer treatment with bisphophonates and/or Hormone Replacement Therapy as clinically indicated
- follow-up for compliance and consider further bone density scans in those on active treatment

- **Prevention or Mitigation of Falls**

- make home and external environment as safe as possible ("joined up" approach by relevant organisations – home visit may well pay dividends)
- individually-tailored interventions to reduce risk of falls, e.g. reduce psychotropic medication
- mitigate effects of falls, e.g. use of hip protectors (specially padded undergarments)

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

- lack of precision in measurement of osteoporosis
- WHO definition of osteoporosis is "bone mineral density 2.5 standard deviations or more below the young adult mean"
- lack of clear evidence of precise role of drugs used in treatment of osteoporosis, including dose and duration
- problems with low compliance
- controversy over population screening for osteoporosis

COMMENTS

Examiner 1 A few excellent submissions shone out from the others, but in general this question was barely adequately dealt with and around 40% failed. Osteoporosis and falls in the elderly are a major public health issue, and strategies for their prevention ought to be part of the knowledge of any candidate, from any disciplinary background or any country.

Good answers had a clear structure and covered the key points. Some mentioned the need for a process to pick up the population at risk in orthopaedic clinics or Accident & Emergency departments, the role of comprehensive rehabilitation, and the links with National strategic priorities such as "accidents" in the UK.

Unsatisfactory answers were those which contained a lot of redundant information on primary prevention, neglected to mention the home and social environment and forgot the role of agencies other than the community health services. Some answers were just generally deficient in content. No marks were deducted for failing to have clinical knowledge about specific drug treatments, but all candidates were expected to be aware that clinical management of osteoporosis was part of the answer.

Examiner 2 Most candidates knew a lot about the epidemiology and management of osteoporosis. However this knowledge was frequently 'regurgitated' without applying it to the problem posed - secondary prevention. The role of hospital based departments (A&E, orthopaedics) were generally overlooked. Thinking through the 'care pathway' would have helped candidates to focus on the opportunities for reducing risk of future fracture. Too much time and energy was invested displaying irrelevant facts, often up to three pages!

QUESTION 6

You have been given nine months in which to compile guidelines for the management of a chronic disease, for use in the catchment area of your local hospital. These will be aimed primarily at the primary care setting but will including referral arrangements to secondary care. It is a disease for which you personally have relatively little knowledge and no well-established national guidelines exist. Describe how you would go about this task (in a named country).

KEY POINTS

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

- “Scope” the project by reading about it and talking to people who know about it.
- Alert relevant interest groups that you are embarking on this piece of work.
- Convene a group starting with people you believe will be relevant, but at a minimum representatives from primary and secondary health care and patient or carer representatives.
- At the first meeting agree the task, the membership of the group, the chair (which need not be yourself), the roles of each member, the timetable (“who, what, when?”), and the basic format.
- An established checklist such as the St George’s instrument (Clouzeau and Littlejohns) should be used
- Conduct a literature search (may be shared by members of the group, but agree a search and appraisal strategy)
- Make sure that any personal interests, especially financial, are declared.
- List the membership in any final document
- Put a date for review on the document

- Make sure that every recommendation or assertion is backed by the source of evidence and category of evidence (e.g. A, B, C category or I – V)
- Agree a strategy for launch, dissemination and audit/evaluation
- Ensure that relevant authorities and organisations have seen and approved them (and preferably will actively promote them)

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

- Mention of literature on what helps/impedes uptake of local guidelines
- Mention of parallel activities (e.g. educational activities, roadshows, practice visits, newsletters) that can increase engagement
- Make available in variety of formats, e.g. booklet, laminated summary, electronic, plus patient version of guidelines.
- Engage clinical governance leads (or equivalent) from primary care and hospitals.

COMMENTS

Examiner 1 In general this question was well answered and around 80% of candidates passed it.

Additional points of interest were:

- Reference to current and future resources, i.e. with a view to making the guidelines realistic, and therefore co-opting the necessary management expertise (not just patient and clinical expertise) onto the guidelines group.
- The idea of offering the guidelines for publication once they were launched since the question said there were no guidelines in existence.
- Spelling out the project timetable and key milestones.
- Algorithms and patient pathways.
- Involving the independent (private and charitable) health care sectors.
- No marks were deducted for scepticism over the value and success of guidelines in general, but marks were added where the process included steps to show the relevance and gain acceptance amongst the local population and local health economy.

Poor responses included those with redundant introductory material or which failed to answer the question. Several were very weak on search and appraisal strategies for the clinical evidence. A substantial minority mistakenly interpreted this as a question about epidemiological needs assessment, and not as a project management and change-initiation exercise.

Examiner 2 Generally well-structured and adequate answers. Many candidates missed the opportunity to 'shine' on this relatively straightforward question. Common omissions were use of a 'checklist' for guideline development, recognising the literature may extend beyond that contained on bibliographic database, ensuring the 'neutrality' of task group members and categorising evidence. When discussing guideline development & dissemination, few candidates referred to the existing literature on factors which help guideline uptake.

QUESTION 7

Your local water company has agreed to add fluoride to the public water supply. Numerous interest groups and individuals express their opposition to this. Describe psychological and sociological factors which might contribute to differences in risk perception. Write brief bullet points on how these factors could be used to influence your risk communication strategy.

KEY POINTS

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

- People tend to overestimate uncommon risks and underestimate common risks (Lichtenstein, Fischoff)
- Some characteristics of risk are associated with increased perception of risk, e.g. involuntary exposure, uncertainty about effects, effects delayed in time, infrequent but catastrophic events etc. (Royal Society Study Group, DoH). DoH guidance calls these "fright factors"
- Media triggers identified by DoH report
- Degree to which risk is considered unknown or "dread" also important (psychometric approaches)
- Social class and gender differences in ranking/views of hazards, but effects variable
- Framing of risk assessment/risk information known to be important, both in affecting assessment of risk, and in affecting expert assessment of risk
- Expert assessment of risk is culture bound as well – true objectivity difficult or impossible – professionals need to accept that lay judgements may differ
- Assessment of risk is not the same as acceptance of risk – even where assessment is agreed, does not inevitably follow that people will be prepared to accept a risk
- Follows that, in relation to risk communication, important to:
- Accept that total agreement on risk is unlikely or impossible
- Acknowledge that the process is two-way, and may need to enter a risk dialogue
- Trust is important – once lost, hard to regain
- May need to accept that assessment is different from acceptance of risk
- Important to listen to opposing views to ensure that framing off risk communication is appropriate
- DOH guidance argues for clear strategy, developed in advance, with clarity on how to handle professional disagreement

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

- Availability heuristic affects overall perception of risk
- Cultural differences in risk perception, both between countries, and between groups with different cultural orientations in the same country (e.g. work by Dake, Douglas and Wildavsky)
- Anthropologists argue that risk is a political tool used in power struggles

COMMENTS

Candidates frequently wasted several minutes writing a great deal of general information about fluoridation, and the epidemiology of dental caries, and did not appreciate that the question was about risk perception and communication until quite late. Some candidates included a good definition of risk perception.

Some candidates had clearly read material on communication of risks in public health, including the DoH report, but others answered using basic health psychology models, including the Health Belief Model. This was sometimes done well, but in many cases these models were not clearly related to the topic of the question. Many people had difficulty relating individual behavioural models to a population perspective.

The second part of the question tended to be done poorly (and in a few cases not at all). Few recognised the need for an open, honest, participatory dialogue, and most relied on provision of information and a mass media campaign using a classic deficit model.

Those candidates who had read the relevant literature and understood it did extremely well in this question.

QUESTION 8

Three hospitals which provide in-vitro fertilisation (IVF) have published the following pregnancy rates and financial charges for couples who meet defined eligibility criteria, within a maximum of three treatment cycles each (same charge applies whether success occurs at first, second or third cycle).

IVF Hospital	Pregnancy rate	Charge
A	30%	£1,500
B	40%	£1,700
C	50%	£2,500

1. **Which hospital is most cost-effective?**
2. **Success has been defined in terms of pregnancy rates: cite some of the drawbacks of this as an outcome measure and suggest a more appropriate indicator of outcome.**
3. **List seven factors, other than cost-effectiveness, against which the hospitals could be judged before a decision is taken to purchase their service.**

KEY POINTS

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

1. Hospital B – see explanation – lowest cost per success

IVF Hospital	Pregnancy rate	Charge	Cost-effectiveness (Cost per success)
A	30%	£1,500	£1,500x100/30 = £5,000
B	40%	£1,700	£1,700x100/40 = £4,250
C	50%	£2,500	£2,500x100/50 = £5,000

2. Pregnancy per se is not a good outcome measure because not all pregnancies proceed to term, congenital abnormalities might arise, there may be multiple pregnancies or there may be pre-term delivery (with its associated social and clinical problems). A better indicator of success would be

the percentage of couples taking home a live, healthy singleton baby or twins. (Variations on this theme are acceptable).

3. Seven examples from this list (not an exhaustive list):
Geographical proximity,
Timeliness – short waiting list is especially important if "biological clock" is ticking
Quality of service in terms of patient experience – ambience, convenience, courtesy
Whether the unit contributes to teaching and/or research – "positive externality"
Long-term financial viability
"Fit" with other strategic developments such as obstetrics and neonatal paediatrics
Absence of negative (adverse) outcomes – safety record, low level of complaints
Stability of outcomes (have they a long track record of success and improvement?)
Turnover (are percentages quoted on large volumes or small ones) – high turnover generally a sign of a thriving unit and robust outcomes, all else being equal
Is it in the private or public sector (political considerations plus "externalities" above)

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

- Mention of "externalities"

Mention of biological clock being a factor specific to this area of service.

COMMENTS

This question was answered better than question 7. Most candidates understood the concept of cost-effectiveness and made the correct calculations. A few had trouble with the arithmetic, and came to the wrong conclusion.

A high proportion of candidates could appreciate the difference between a pregnancy rate and live birth rate, and suggested this as an appropriate outcome. Relatively few candidates mentioned the risk of multiple pregnancies and congenital abnormalities. Good candidates understood the importance of case-mix.

Many candidates gave long lists for part c) without any indication that they understood the terms they listed. Few candidates thought of throughput of the unit. A sizeable minority of candidates spent a lot of time discussing local priority setting, while the question implies that a decision has been made to purchase, and the decision is simply from where to purchase these services. This was the weakest section of many answers and gave the impression that most candidates had not yet been involved in this type of decision.

JUNE 2000 DIPLOMA & PART I MFPHM EXAMINATION KEYPOINTS

PAPER IIA

SECTION A
QUESTION 1

Discuss the benefits and risks of screening for colorectal cancer.

KEY POINTS

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

- **Criteria for screening:** (Wilson and Jungner)

- **Mortality:** There are marked global variations in mortality. High in UK; low in Africa. Increasing in countries adopting western lifestyles such as Japan. 20000 deaths from colon cancer in UK each year. About 450 in Hong Kong (population 6.5M in 1997).

- **Incidence of colorectal cancer:** In the range 3rd to 6th most common cancer in developed countries (USA, Australia, Europe) (3rd in USA; 2nd in Hong Kong). Incidence and mortality has been stable for many years. Now incidence falling in both UK and USA but increasing number of deaths in many countries. (Recent paper from South Thames NHS Exec. apparently suggested that colorectal cancer is second commonest malignancy in men and women in the western world.) About 300,000 new cases/yr in UK; about 2500/yr in Hong Kong (42/100,000 in males; 35/100,000 in females) (1996). Recent rise in incidence in >50 age group in Hong Kong.

- **Lack of early detection in routine health care:** Two thirds of the tumours occur in rectum or sigmoid colon. Affects equal proportions of men and women, mostly between ages 60 to 80y. About one quarter of patients with colorectal cancer present with intestinal obstruction or perforation. Presentation with obstruction is common in some districts in Hong Kong.

- **Natural history of the tumour:** Sojourn times: lead time from benign lesion to invasive cancer is several years (10-25?).

- **Screening strategies:** Faecal occult blood (FOB), colonoscopy, double contrast barium enema. FOB on faeces from stool or digital rectal examination.

- **Performance of tests:** Sensitivity of FOB, double contrast enema and sigmoidoscopy/ colonoscopy.
  FOB: Sensitivity limited because tumours bleed intermittently. Fail to detect 20-50% of Ca and up to 80% of polyps. Specificity low and depends on dietary intake of haemoglobin/myoglobin/peroxidase sources.
  Colonoscopy: Flexible sigmoidoscopy; hospital visit; enema; uncomfortable. 30-40% tumours beyond a 60cm scope. Mortality lower after sigmoidoscopy in case control studies.

- **Selection of population:** Average and high risk populations; emphasis on public and professional education to identify family history of CRC or personal history of polyps

- **High risk groups:** Genetic predisposition. Lifestyle and prevention (diet; exercise).

- **Workloads and feasibility:** Screening intervals for FOB (eg 1 year) or sigmoidoscopy (5 years). Coverage. Positivity of the tests.

- **Benefits of screening:** Randomized controlled trials report 15 to 33% mortality reduction. Follow-up of screened populations continuing to determine whether screening and reduction of adenomas leads to reduced incidence of cancer. In Nottingham trial both test and control groups had same stage of cancer (D) but local vs regional spread in test group. Danish trial similar to Nottingham.

- **Disbenefits:** Complications of invasive tests. False negatives. The "worried well" resulting from promotion of information about risk and screening.

- **Costs:** Costs to detect a polyp/cancer/prevent a death: generally high. In UK Aitken et al (1996) estimated £8500 (GBP) per cancer death prevented. In US Lieberman estimated up to US$280K per death prevented at 100% compliance, or $350K at 50% compliance.
  Compliance and cost of colonoscopy key to cost-effectiveness. Lower costs would be achieved with nurse endoscopists. New FOB tests have higher sensitivity. Molecular bioepidemiology may demonstrate new detection strategies from DNA in sputum, urine, faeces.

- **Guidelines for screening:** UK, USA etc. Variations between and controversy about guidelines.
  Need for screening in average risk populations: Much between country variation. American Cancer Society: recommends rectal (digital) *annually* >40 yrs; FOB>50 yrs; sigmoidoscopy 3-5 yearly >50 years.
  Germany: FOB offered annually in cancer "check up"
  Canada: Not recommended.
  UK Kings Fund: Not recommended.

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

Translation of trials into community strategies:

- **Simulation models for evaluation:** Used to test hypotheses.

- **High risk groups:** General population lifetime risk about 1 in 50. Those with affected first degree relative about 1 in 17 (if relative >45y) or 1 in 3 to 1 in 6 (if two fd relatives, or more affected)

- **Small proportion associated with germ line genetic disorders:** familial adenomatous polyposis (FAP) (<1%); hereditary non polyposis colorectal cancer (HNPCC) (2-5%).
  In Hong Kong there is a relatively high incidence of colorectal cancer in young people and a raised proportion of mutations in the p53 oncosuppressor gene in comparison with Caucasians.

COMMENTS

Several candidates did not answer the question properly and this was a cause of failure. They either did not know anything about colorectal cancer and its screening or they misinterpreted the question. Several responses were simply padded out with detail about general issues related to population screening.

SECTION A
QUESTION 2

Several weeks ago, a traffic accident in a small rural town involving a tanker lorry containing chemical waste led to the spillage of a large quantity of noxious chemicals. A plume of gas hung over the town for several hours. Since the accident, the local haematologist has reported an apparent increase in bleeding disorders in local residents. How would you investigate the relationship between the event and reported health problems?

KEY POINTS

Association and causation

Association - a statistical dependence between two or more variables. May be artefactual or spurious; true but not causal; causal

Causation - concepts of necessary and sufficient; Bradford Hill criteria: consistency; dose response; biological plausibility; temporal relationship; specificity; coherence; strength of relationship; removal of causal factor.

Designing a study: general points with specific reference to problem described

- Define problem and aim of the study
- Define type of study appropriate to problem - hypothesis testing
- Describe existing data and how you would assemble evidence to support or refute the hypothesis
- Discuss ethical considerations that might be encountered
- Define inclusion and exclusion criteria for cases and controls: who would make the diagnosis? Are the cases real or artefactual?
- Define the exposure: to the gas, chemicals or local water sources?
- Determine whether the chemicals are known to be a cause of bleeding disorders
- Define outcome measures of interest and how you would measure them
- Define your study strategy to ensure external validity - sampling frame, sample size, sample method, randomisation
- Consider a pilot study
- Estimate how much the study might cost
- Discuss analysis, potential sources of bias and interpretation of results

COMMENTS

Several candidates focussed on the public health action to deal with a critical incident rather than on the establishment of a possible causal relationship between the spill and the incidence of bleeding disorders. Perhaps with hindsight the presentation of the question could have been changed to avoid this. In general candidates with good answers were given benefit.

General Points for Questions 1 and 2

The standard of presentation of questions does not improve. Many answers are unstructured amorphous tracts of information which are difficult to assess. On the other hand a few candidates do produce structured summaries followed by skilfully designed text with subheadings/sub-subheadings. The problem has not been helped over the years by the existence of a set of advisory notes from the Faculty which tells candidates that they will not get credit for presenting structured summaries.

Handwriting in two papers gave both examiners a headache.

SECTION B
QUESTION 3

Describe the key elements of a comprehensive hospital infection control service.

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

- Aims and Functions of hospital infection control
  - surveillance
  - outbreak investigation and control
  - prevention
- Staffing and other resources to support staff in the function (e.g. IT)
- Importance of hospital infection control committee and who should be on it
- Accountability structures and clinical governance
- Details about how infection is controlled in hospital, such as
  - development and implementation of policies and guidelines
  - teaching and training
  - advice to health professionals
  - key advisors on cleaning and sterilisation of equipment
  - cleaning of hospital
  - role in prescribing of antibiotics
  - food hygiene/kitchens
  - audit
- antimicrobial resistance
- understanding of some the major problem organisms e.g. MRSA, MDRTB, C Diff
- Liaison with relevant agencies/personnel e.g. CCDC, PHLS, Environmental health

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

- A structured answer e.g. use of structure/process/outcome model
- Demonstrated knowledge of the local implementation of national recommendations e.g. Cooke Report, NAO report, HSC 2000/002
- Role of PHLS
- Discussion of the role of a hospital based infection control service in relation to the continuum of communicable disease and infection control in a geographically defined population of which hospital population is a part, ie the relationship with community infection control services, GPs, CCDC
- Description of examples of good practice
- Recent guidance on spongiform encephalopathies and use of disposable equipment

- Use of SLA and contracts to ensure good infection control arrangements
- Importance of links between infection control services and occupational health and health and safety within the hospital setting

COMMENTS

Most people answered this question reasonably well, though some sort of structure was missing in a lot of the answers. Some candidates produce very rounded responses and clearly had had experience of working with infection control teams, understanding the difficulties and limitations of how they work. Better candidates discussed the role of the infection control team in reducing the burden of antimicrobial resistance.

It was surprising how many people failed to mention a hospital infection control committee. Many candidates failed to use examples of particular problems faced by infection control teams (such as MRSA, MDRTB) in determining the key elements of a service.

SECTION B
QUESTION 4

In a country of your choice, describe and criticise the current routine system for the surveillance of influenza and influenza-like illness. How could this system be improved?

KEY POINTS

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

- Name the country
- Description of the epidemiology of influenza and influenza-like illness
- Description of the current routine data sources for the surveillance of influenza and influenza-like illness
- Critique of the current routine data sources for the surveillance of influenza and influenza-like illness
- Description of the possible improvements to the current routine data sources for the surveillance of influenza and influenza-like illness
- Discussion of the need for the timely provision of information for action and monitoring

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

- Demonstrated understanding of the relative worth of clinical versus laboratory based surveillance for the surveillance of influenza and influenza-like illness
- Demonstrated understanding of the pyramid of the surveillance of influenza and influenza-like illness
- Discussion of the use of novel data sources for the surveillance of influenza and influenza-like illness
- Demonstrated appreciation of a need to develop early warning surveillance of influenza and influenza-like illness to inform vaccine development and policy and the need for health care services provision

COMMENTS

Most candidates who answered this question produced a reasonable response. Many people focussed on a description of the surveillance system in a country with little attention to how it could be improved. Some candidates discussed an ideal surveillance system rather than focussing on how their local one could be improved. Many candidates paid relatively little attention to the second part of the question and almost exclusively described a surveillance system. Some candidates appeared to think that influenza was a notifiable disease.

Very good candidates produced a well structured response with ideas of using prescribing data to strengthen surveillance, mentioning the possibility of using drug sales and prescribing of anti-flu drugs to give an idea of the burden of disease in the community. Many candidates recognised the difficulty in using laboratory results to draw any conclusions but few recognised the need to continue and strengthen laboratory systems to monitor antigenic shift. Some politically aware candidates recognised the importance of surveillance systems in managing winter pressures.

SECTION C
QUESTION 5

What is the rationale behind efforts to record information on ethnicity in healthcare records? What are the epidemiological concerns one should be aware of when considering data on ethnicity?

KEY POINTS

Candidates should give evidence of an understanding of the issues around ethnicity and health in the health service. Briefly, these are:

Ethnic minority groups are widely believed to have poorer access to health care and worse health outcomes than the indigenous population.
While this may be due to specific factors for particular diseases, it is also accepted that a part of the problem is due to the experience of discrimination leading to poorer educational, employment and life opportunities.
As such ethnic minority groups constitute an important part of the socially excluded segment of the population.
In order fully to understand the extent of the problem as it relates to the health service there is a good case to be made for the systematic recording of data on ethnic group as part of the health care record.

Candidates should be able to show that they are aware of the problems of recording and using data on ethnicity. The ideal answer would include most or all of the following:

- Problems of definition. Ethnicity is not the same as racial origin, nor is it defined by skin colour alone. Country of birth is an inadequate proxy for ethnicity. As such it is conventional to ask the individual to identify his own ethnic group from a standard list defined by the ONS for the 1991 census. However there is a tendency to lump heterogeneous categories together (e.g. Asian, Black). These are unhelpful and the drawbacks have been pointed out by Bhopal.

- Selective analysis. Ethnicity data tends to be used most when it can help to show that ethnicity gives rise to health ‘problems’. However systematic unbiased analysis may often show better health outcomes for certain categories.

- Inadequate control of confounding factors. It is easy to ascribe any differences between ethnic groups to ethnicity. However smarter analyses may show that confounding factors such as social class, social disadvantage, poorer education and lower income may explain all or most of the observed difference.

- Inappropriate use of analyses. This is a political problem. Research on ethnicity has tended to get politicised. Epidemiologic analyses can often aid this tendency by focusing on differences, whereas in depth qualitative studies are often more helpful in understanding the underlying processes at work. Such insight may also be of benefit to deprived sections of the indigenous community.

COMMENTS

Generally answered reasonably well. The difficulties of assigning individuals to ethnic groups appeared to be poorly understood by some, and the potential for confounding by socio-economic status and poverty in analyses on ethnicity was mentioned by very few. The political sensitivities in this area were only discussed by a minority of candidates. A number of candidates failed completely to address the questions and presented an unfocussed discussion about the impact of ethnicity on health.

SECTION C
QUESTION 6

The Table below shows some data relating to maternities (live and stillbirths) in England and Wales.

	1995		1996		
Age of mother	Number	Rate per 1000 women	Number	Rate per 1000 women	% rate increase1995-6 (95% CI)
<16 years	4035	4.3	4279	4.6	6.7% (2.2 to 11.4)
16 to 19 year olds	55,878	38.0	59,612	39.8	4.6% (3.4 to 5.8)

From Nicoll A et al, BMJ 1999.

1. **Summarise briefly what is shown in the table.**

2. **Give <u>three</u> indicators (other than that shown in the Table above) that could be derived from routine data that could be used to monitor sexual health of teenagers within your locality. Indicate briefly how each indicator would aid understanding of the issues.**

3. **List <u>three</u> examples of information which might be collected from local surveys that would be useful in understanding the sexual health of teenagers in your location. For each, discuss briefly how such data might be collected and indicate why you feel this information would be important.**

KEY POINTS

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

1. The table shows that there were approximately 4000 births in girls under 16 in E&W in 1995. This number has increased by 1996 to 4550. The rate has increased from 4.3 to 4.6 per 1000, a rise of 6.7%. The confidence intervals suggest that it is likely to be a real increase. There were approximately 55000 maternities in 16-19 years olds in 1995, rising to nearly 60,000 in 1996, a rise of 4.6%. The rate of maternities in 16-19 year olds was about 9 times more in 1995 than that in under 16 year olds, and over 8 times more in 1996.

2. Possible indicators from routine data

i. Termination rates per population; together with maternities these give an indication of total conceptions within a population. These may reflect access to family planning services. Rates may be complicated by provision in the private sector.

ii. Prescriptions to under 16 year olds and 16-19 year olds. These can provide information about contraceptive services to this age group, including place of registration and type and location of service accessed.

iii. Rates of genito-urinary infections, particularly chlamydia, gonorrhea, genital warts, and genital herpes.

3. Local survey data

A wide variety of different approaches could be used. Some are listed below.
Access to family planning services; distribution of services, opening times, locations;
Survey of amount and quality of sex education programmes within local schools;
Survey of teenagers undergoing termination to determine quality of local contraceptive services;
Other answers are likely to be acceptable if justified adequately.

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

An excellent answer will be clearly presented, indicate clearly detailed information about the sources and limitations of different sources, and present a clear rationale for local surveys.

COMMENTS

This was a straightforward question in a topical area, which was generally answered well. Some candidates failed to demonstrate a real understanding of the routine sources of data available, and were very vague about the practical details of such information. Some were unable to define areas of interest of local surveys except in the most general terms. Given the evidence of the effectiveness of sex education linked to appropriate contraceptive services, it was disappointing that so few indicated that local surveys of the amount and quality of sex education in schools or access to youth family planning clinics would be useful at local level.

SECTION D
QUESTION 7

List and define some measures used to describe relative and absolute differences in rates of disease between two groups of subjects in prospective studies. Describe (with examples) contexts in which these measures can be more (or less) useful.

KEY POINTS

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

If p1 = proportion of subjects acquiring disease in group 1 (exposed) (similarly p2 for unexposed)

Absolute difference = p1-p2 (if p1>p2, otherwise =p2-p1)
For RCTs, can define NNT = 1/absolute difference

Relative risk (risk ratio) = p1/p2
(or transpose p1, p2)

Odds Ratio = [p1/(1-p1)]/[p2/(1-p2)], better measure of relative difference because it is robust across range of values of p1,p2.

To take account of varying follow up times, use rate ratio = no. events per person year at risk in group 1 / same in group 2.

NNT useful for quantifying benefits of intervention in RCT, can be thought of as "Number Needed to Harm" (NNH) if observational study of disease aetiology.
NNT and absolute differences are dependent on disease incidence (has lower values for high risk group, even when relative risks are same)

RR are inclined to overstate benefit or harm when used for disease of low incidence.

OR and RR are similar when disease incidence is low; OR more appropriate when overall incidence exceeds 10%.

Absolute differences are more useful for health service planning; has clearer interpretation in estimating treatment benefits for a population.

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

If theta = proportion of subjects in group 1
Can use RR to give attributable fraction = theta x (RR-1) / [1 + theta x (RR-1)]

Confidence intervals should be calculated for any statistic listed, though very complicated to interpret for NNT when result is not significant.

Odds ratios are easier to combine from different studies in meta-analysis

Adjusted odds ratios may be obtained using Mantel-Haenszel technique, or multiple logistic regression. Other statistics not easy to adjust directly.

COMMENTS

The question was answered rather well in general. Most candidates were aware of the strengths and weaknesses of absolute and relative differences in risks (or rates) of disease. Most mentioned population attributable risk and population attributable fraction very competently. Examples were usually appropriate, most commonly citing Doll's study of smoking among British doctors.

Some candidates wasted time talking about case-control studies, which are not prospective (apart from nested case-control studies). There also seemed to be a belief that one CANNOT calculate an odds ratio (OR) for prospective studies. This is of course not correct; many prospective aetiological studies make use of both unadjusted ORs and adjusted (via logistic regression) ORs.

SECTION D
QUESTION 8

a) The following table shows the frequency of people who suffered an injury in the previous 12 months by sex taken from a random sample survey of 100 men and 100 women:

	Injured	Not injured
Male	30%	70%
Female	10%	90%

Describe how you would statistically analyse the data to see if proportion of injured people varies significantly by sex. What requirements need to be fulfilled before the test can be used ?

b) The following is a subset of the above group based on those less than a certain age:

	Injured	Not injured
Male	3	7
Female	2	8

What statistical test would you use to analyse these data ?

c) The following is a table of the success or failure of two drugs on a group of 20 patients. Each patient tries both drugs in a cross-over design (with suitable washout periods).

	Success	Failure
Drug A	60%	40%
Drug B	50%	50%

What statistical test would you use to analyse these data ?

KEY POINTS

The appropriate statistical tests would be the chi-square test or the Z test for two independent proportions.

a) To carry out the chi-square analysis it is necessary to use actual numbers in the cells rather than percentages or proportions.

The chi-square test can be employed where the sample size is greater than 40 or between 20 and 40 where no more than 20% of the expected numbers in the cells are less then 5, and where no cells have an expected frequency of less than 1. In the 2x2 situation, this means that all of the expected numbers must be greater than 5.
The test statistic must be compared with the chi-square distribution to determine the probability of obtaining the value or a more extreme result.

The test statistic for the Z test is the difference between the proportions divided by the standard error of the difference. The test statistic needs to be compared with the standard normal distribution to determine the probability of achieving that or a more extreme result.

b) Fisher's exact test is used to analyse these data because the requirement of the chi-square and Z test do not hold (small numbers in cells).

c) The appropriate test for paired proportions is the McNemar test also called a test for correlated proportions. The data need first to be reorganised in the following fashion:

		Drug A	
		Success	Failure
Drug B	Success	a	b
	Failure	c	d

The test statistic is based on discordant pairs (b and c). The pairs in which the drugs have the same effect (either both successful or both unsuccessful) do not contribute to the test statistic.
A chi-square statistic is calculated = (b-c)(b-c)/(b+c).

For small sample sizes the sign test can be used where the number of pairs with a preference for one drug can be can be referred to a table for the sign test with n = the total number of untied pairs.

Additional points carrying extra marks.

The Z test for independent proportions is approximate as the normal distribution is being used to approximate the binomial distribution. The normal distribution can be used as an approximation of the binomial distribution when the total sample size is greater than 20 and n1p, n2p, n1q, and n2q are all greater than 5 for sample sizes between 20 and 40. For sample sizes greater than 40 the approximation should be valid.

Fisher's exact test involves calculating the p value directly without the use of a particular test statistic.
Fisher's test assumes fixed row and column totals. The calculation provides a one sided p value which must be doubled if a 2 sided value is required. Fisher's exact test is based on the hypergeometric distribution.

COMMENTS

This question was attempted by 30/55 candidates. The quality of answers was mixed with just over half passing. Quite a number of candidates failed to note that part c involved a paired analysis and that McNemar's test was required. Several candidates were unaware of the minimum number in cell requirements of the Chi Square test.

JUNE 2000 DIPLOMA & PART I MFPHM EXAMINATION KEYPOINTS

PAPER IIB

SECTION E
QUESTION 1

A local community of 20,000 residents report adolescent problem behaviours. These include drug abuse, youth crime, and school failure. What factors predispose to this? In a named country, what agencies can be brought together to form an action plan to reduce adolescent morbidity related to problem behaviours?

KEY POINTS

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

- Family risk factors e.g. low income and poor housing, poor parental supervision and discipline
- School e.g. school disorganisation, aggressive behaviour including bullying
- Community e.g. availability of drugs, disadvantaged neighbourhood
- Individuals, friends and peers e.g. alienation and lack of social commitment, peer pressure
- Headteachers; authorities responsible for education, Social Services, health care; City Council, Director of Housing, Chief Constable, Health Authority, Community Trust.
- Without their informed support the viability of any programme would be in doubt.

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

- Approaches to effect change, with examples
- Identifying and quantifying the risk factors can inform the protective action plan.

COMMENTS

The best responses defined the risk factors and moved on to describe social exclusion and social capital.

SECTION E
QUESTION 2

Knowledge about the genetic basis of health and disease is likely to be the best way of promoting the overall health of a population." **To what extent do you agree with this statement? Illustrate your answer with reference to at least two of the following conditions:**

a) Down's Syndrome
b) Sickle Cell Disease
c) Cystic Fibrosis
d) Diabetes Mellitus

KEY POINTS

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

- Brief description of the genetic basis of disease; chromosomal abnormalities; Mendelian dominant and recessive modes of inheritance; sex linked conditions; familial conditions where the mode of inheritance is multifactorial; the variety of problems encountered by human populations from spontaneous abortion in the first trimester, to gross congenital malformations, slow progressive conditions (both physical and mental) to single biochemical defects; routine and non-routine sources of information; limitations of easily available information (e.g. mortality)

- Principles of screening programmes as applied to conditions with a predominant genetic component; criteria to be achieved before setting one up; reference to current screening programme for Down's syndrome; false positives and false negatives; difficulties with uptake; consistency of the programme; ongoing quality assurance and audit; ethical issues in relation to termination of pregnancy as a key option

- Distinction between screening a population and testing individual people/families thought to be at high risk; what is meant by high risk and who decides this; costs of any screening or testing programme; direct and indirect costs; costs to the service, the patient and society; psychological problems

- Importance of information and counselling; ethical issues surrounding involving families rather than individuals; usefulness of information if no curative treatments available; value given to information as an end point in its own right; impact on individuals and families as a result of information e.g. insurance; likely impact of "genetic shops"; usefulness of mapping the entire genome; citizen power

- Understanding of overall impact of genetic knowledge on the health of populations; role of health services; link between primary care, specialised genetics services and non-genetic secondary and tertiary care; controversy regarding use of termination of pregnancy to "cure" affected foetuses; perspective between specific (often uncommon) diseases and overall health of the population, and influences on this

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

- Proper inclusion of at least two of the genetic conditions mentioned in the question as an integral part of the answer

- **Down's Syndrome**: the commonest chromosomal abnormality; issues around screening of pregnant women; use of TOP; morbidity of people with Down's Syndrome; impact on Learning Disability services in general; use of cardiac services and the controversy that surrounds this

- **Sickle Cell Disease**: inherited as an autosomal co-dominant trait; issues here will include the possible selective screening of certain ethnic populations; cultural issues surrounding prenuptial, antenatal and neonatal testing; rapid access to health services for those affected

- **Cystic Fibrosis**: the commonest recessively inherited disorder; possible use of prenuptial testing in those thought to be carriers; importance of health services and high levels of care for affected children; high resource use for small numbers of people; much greater quantity of life balanced by quality; issue of specific adult services as many children are surviving into adulthood

- **Diabetes Mellitus**: a good example of a condition where the exact mode of inheritance is not known yet is certainly familial; usefulness of this information for patients, families; multiple genes involved; still a research area

COMMENTS

This question was generally answered quite well. Most candidates were able to give a lucid account of the role of genetics and genetics services in the promotion of health generally in a population. Most people argued well that in fact the overall health of the population is not improved that much by improvements in the knowledge about genetic disorders, but the impact on individuals and families can be profound. Stronger candidates were able to put the genetic basis of 2 of the 4 named conditions properly in the context of how that condition should be managed, whilst weaker ones merely described the genetic basis of the condition.

Some people did not appreciate the distinction between screening a population and testing people at high risk. However, people were generally aware of the psychological, moral and ethical issues surrounding such testing and the impact this can have on primary care services.

SECTION F
QUESTION 3

Which factors need to be taken into account in formulating and implementing policies to combat the spread of HIV?

KEY POINTS

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

- Consideration of economic factors; Infrastructure with regard to disseminating information/delivering health education/promotion

- Power relationships – economic and gender relations; the role of paid sex workers

- Understanding of cultural factors and their impact on sexual practices; situational constraints on the practice of safer sex (including the contributory role of alcohol and/or other drugs)

- Different modes of transmission

- Profile of the sectors of society most affected and scale of the ‘epidemic’

- The importance of the difference between risk groups and risk practices

- Awareness of the speed with which the virus mutates, modes of transmission may change in importance, and the constantly evolving behaviour changes in the population

- The interaction between economic, social, and cultural factors

The following are additional points that might improve the answer to "good" or "excellent":

- Potential role of health care provision in spreading the infection (e.g. the necessity of re-using needles; procedures in place for screening blood)

- The potential for misinterpretation of health education messages and the necessity of materials appropriate for target audiences

- Weighing up individual needs (e.g. to reproduce) against population needs (in terms of reducing spread of infection)

COMMENTS

Both examiners were disappointed by the generally low standard of answers to this question. Several candidates had omitted discussion of major routes of transmission (i.e. IV drug use and vertical transmission) and their implications for prevention strategies. Relatively little mention was made of the appearance of new strains of the virus and economic issues (e.g. the importance of the situation in which migrant workers and sex workers find themselves). A central concern was the widespread tendency to talk about risk groups rather than risky practices. Many candidates took up valuable time and space in providing definitions of HIV and prevalence figures. Much of the material relating to modes of transmission was descriptive rather than addressing policy implications.

SECTION F
QUESTION 4

Discuss both the potential and limitations of user involvement in influencing government funded health service provision.

KEY POINTS

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

- Issues surrounding representation; conflicting agendas/communities of interest

- Misinformation/media scares

- Budgetary constraints

- Political/ideological issues/concerns

The following are additional points that might improve the answer to "good" or "excellent":

- Professional interests/expertise

- Discussion of how this debate relates to specific user groups – e.g. the role of social class and the service response to a vocal middle class minority; the impact of the gay community in determining responses to HIV/AIDS provision.

- Discussion of emotive issues – such as the closing of local hospitals – the tensions between public opinion and research - e.g. that which identifies increased risks associated with 'cottage hospitals'/environments without access to technology.

COMMENTS

These answers were generally of a higher standard and there was less variation. One shortcoming in many of the answers, however, was the over-concentration on health services provision at the expense of discussing wider determinants of health and the potential impact of user involvement. There was also little attention paid to the important role of Local Authorities and the limits of elected councillors' powers/representative mandate. Many of the answers provided thoughtful discussion with regard to the difficulties associated with representativeness and the potential for the process to be high-jacked by vocal minorities and several highlighted the importance of briefing patient/lay representatives to enable more meaningful participation. However, some did not discuss rationing, and broader political or professional interests and the potential for conflict/contradictory policy imperatives (e.g. evidence-based medicine vs. users as experts).

Overall, both examiners were surprised at the difference in the standard of answers to the two questions set - i.e. they had expected candidates to perform better with respect to question 3 whereas the opposite was true.

SECTION G
QUESTION 5

Though devolving budgets for health services to small populations (about one hundred thousand people) may allow responsiveness to local health needs, its contribution to addressing inequalities across larger populations is questionable. Discuss.

KEY POINTS

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

- Definition of health needs and inequalities
- Issues for discussion should include:
    - Allocation of resources to small populations; difficulties and use as a means of addressing wider inequalities.
    - Capital and revenue: may need capital budget to be held for a larger population and historic capital assets (e.g. buildings) may influence ability to make local changes.
    - Efficiency of small commissioning units including cost.
    - Local sensitivity to local health needs based on local intelligence.
    - Local intelligence may not reveal inequalities across the larger population if comparisons between small populations is not explicitly made.
    - Ability to make changes; critical mass for change; co-terminosity with partner organisations; small population probably not sole commissioner in secondary and tertiary care thus limiting scope for change.

- Low prevalence, high cost patients - small population may not have contingency to cope with year to year variation in need.
- Capacity of public health to support many small population units.
- Ability to use techniques, such as community development, to address inequalities may be greater with small populations.
- Difficulty in gaining wider ownership of local health needs to allow resource shifts from outside small population to address local inequalities.
- Successfully addressing health needs/inequalities may also need action at a higher level e.g. by regional or national government.
- A 'healthy' small population may achieve health improvement making inequalities with adjacent populations worse.
- Distortion from local pressure groups.

COMMENTS

This was answered variably. Some omitted any but the most cursory reference to inequalities of health and one or two spent too long on this without covering the rest of the question in enough depth. There was little mention of budgets and their control, nor enough on the practical difficulties of providing public health influence. Setting performance targets and monitoring them was rarely mentioned. Some answers included a wide discussion on factors influencing health. Excessive use of acronyms was not necessarily helpful. Candidates were often reluctant to either address the question from a health economics perspective or to demonstrate how health economics described would be specifically applied to this question.

SECTION G
QUESTION 6

What are the advantages and disadvantages of adopting three of the following alternatives to general taxation as the sole means of funding health services?

a) Hypothecated taxation
b) User charges
c) Private medical insurance
d) Social insurance

KEY POINTS

All alternatives may include a discussion in terms of moral hazard.

a) Hypothecated taxation

Candidates should define hypothecated tax as a component of general taxation, usually based on income, that is levied for a particular purpose. Good candidates will recognise that the current National Insurance scheme was started by Lloyd George in 1911 as a form of hypothecated taxation.

The advantages are:-
- The electorate are generally willing to pay if they can see what they are getting for their money
- There is an identifiable link between the money paid and the service received

- The scheme is progressive that is those who earn more pay more
- Nobody is excluded from the service because they cannot pay – service is still free at the point of delivery
- Allows preventive services to be funded

The disadvantages are:-

- Because the service is free it encourages over-use and it will not reduce demand
- Over-use may be exacerbated if people want to get back what they have paid in
- In time it may not increase funding if contribution from general taxation is withdrawn as hypothecated tax increases
- May require a separate and complicated administration
- Difficult to resist demands for further fragmentation of general taxation (e.g. for education, social security).

b) User charges

Candidates should recognise that there are two forms of user charges – those that top up funding from other sources (general taxation or various insurance schemes) and those that cover the entire cost of treatment. They should also recognise that the former exists in the NHS e.g. prescription charges, charges for dental treatment, charges for eye examinations.

Advantages are:-

- Demand may be reduced because people think before spending money on health care
- People do not spend money on food or heating while in hospital, so charges do not penalise people if they are used as top-up

Disadvantages are:-

- People who most need service cannot afford to pay (inverse care law)
- Many people will cover themselves with private insurance leaving those who cannot afford charges doubly disadvantaged
- Where full user charges exist (e.g. US) the proportion of GDP spent on health is high, but the public health benefits are questionable.
- There tend to be a large number of exemptions requiring funding from general taxation (e.g. elderly, chronic sick, certain conditions).
- People with stigmatising conditions, or those where insight into their health problems may be lacking (such as HIV, GU infections, psychotic mental illness) may be deterred from seeking help.
- Preventive services may lose out in funding terms to acute/curative services

c) Private medical insurance

Candidates should recognise that private insurance is run by companies, usually for profit, and that contributions are paid by individuals.

Advantages are:-

- Weighting of premiums according to use means there is a deterrent effect on demand.
- Countries offering this system spend a high proportion of GDP on health care
- The costs of every aspect of care are made more explicit
- Insurance companies may manage care to ensure only effective forms of treatment are used

Disadvantages are:-

- Those who need insurance most cannot obtain it e.g. poor, chronic sick
- Employers often offer this as a benefit, leading to double disadvantage for unemployed
- May increase demand as people seek to get what they pay for
- Preventive services may lose out in funding terms to acute/curative services
- There still needs to be a system to cover those who cannot be insured
- There still needs to be a system to cover public health and preventive programmes
- Not all the money that is paid in goes on health care – profit motive.
- People have to seek prior approval for spending, even in emergency situations
- People will shop around until they get what they want – demand may increase among some sectors.

d) Social insurance

This means that insurance is compulsory, and premiums are underwritten by the state for high risk and non-employed groups. Employers and employees make contributions which are compulsory. National Insurance is a form of social insurance, although in practice is part of general taxation. People generally have to pay for services then make a claim afterwards, and re-imbursement may not be complete.

Advantages are:-

- Funding of health services tends to be removed from the political arena
- A system of payment and retrospective claim may limit demand
- Payment by employers may act as incentive to health and safety if they are penalised for ill health
- Non-profit so all money paid in goes on either admin or health care.

Disadvantages are:-

- May not limit demand as there is an element of getting what you have paid for
- May deter employers from taking on sick or disabled employees
- A high proportion of demand is not covered (elderly, unemployed, chronically sick, children) and therefore substantial amount of state underwriting remains.
- Claims scheme may be complicated and deter genuinely sick from seeking help, particularly in conditions such as HIV, psychotic mental illness (see above).
- Social insurance is not as progressive as general taxation and may be regressive if the sickest groups have to pay highest premiums.
- Responsibility for funding preventive and public health services is unclear
- High earners may be allowed to opt out in favour of private schemes which depletes the social insurance scheme of funds.
- Patients may shop around and see several doctors until they get what they want, increasing demand without increasing benefit

<u>COMMENTS</u>

A general introduction about general taxation gained marks, as did many of those who included a tabular presentation of their main points. It was difficult to mark down anyone who had made a reasonable attempt and showed evidence of thought and deep understanding of the issues.

SECTION H
QUESTION 7

Using specific clinical services to illustrate your answer describe the issues which arise in organising services so that inequalities in health are reduced.

KEY POINTS

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

- identify morbid conditions whose incidence and/or prevalence and resulting levels of mortality or disability are higher in some sub-groups of the population than others ***and*** for which there is scientific literature on the differential uptake of preventive or curative services;
- consider systematically the organisational barriers to the use of the services, e.g. in terms of availability, accessibility, appropriateness, acceptability, affordability, or in terms of differences at various stages in the patient's career from noticing symptoms, through the referral and investigative processes to (more or less) effective treatment; and how these barriers may be more easily surmounted by some population sub-groups than others;
- consider whether services may be delivered differentially to the groups with the greatest measured need for service without infringing the rights of all individuals to effective health care for equivalent levels of need, irrespective of their population group; and if so, whether and how this has been or might be accomplished, such as by differentially reducing the levels of the state-funded service to groups with high rates of use of private treatment for those conditions.

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

- utilise a wide range of clinical services to illustrate the points made, and/or will show sophistication in discussing the tensions between supplying needs and observing rights.

COMMENTS

This question was poorly answered by a third of the candidates, many of whom wrote simply about health inequalities in general without addressing any specific clinical service.

Candidates who blended appropriate examples with evidence of relevant reading scored well, as did those who conveyed an understanding of the practical difficulties involved in implementing changes in services aimed at reducing inequalities.

SECTION H
QUESTION 8

Discuss the issues which affect the organisation of emergency ambulance services in a named country.

KEY POINTS

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

- Scope of the service - ambulatory and/or emergency?
- Mix of trauma and non trauma cases to be serviced.
- Environment - urban/rural - relationship to target response times.
- Public beliefs/attitudes/expectations about quality of care given by paramedics, value of helicopter assistance etc.
- Ambulance staff beliefs about crew skills and value of extra training - advance life support, advance trauma life support, etc.
- The evidence base for the effectiveness of elements of the service - value of helicopters except where inaccessibility or large distances involved or specialist hospital transfers needed.
- Lack of evidence for benefit of paramedic training.

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

- Ability to quote the main sources of evaluative literature
- Awareness of effects of professional conservatism and resistance to change among ambulance staff
- The effects of shrinking budgets and steps to improve efficiency - amalgamation of services, careful deployment of staff numbers and skill levels according to evidence of effectiveness.

COMMENTS

Most candidates dealt adequately with this question in terms of general organisational principles. However, most answers would have been improved by a demonstration of knowledge and reading relevant to this specific service issue of emergency treatment services. Few showed much idea of the evaluative literature or current developments in the services they described.

JUNE 2000 DIPLOMA & PART I MFPHM EXAMINATION KEYPOINTS

PAPER III

SECTION A - UK AND HONG KONG PAPERS

QUESTION 1

A local magazine has found the following article in the British Medical Journal and has reported the findings. The magazine reporter implied that infants have been put at risk of SIDS due to the local crowded living environment.

a. Write a critical appraisal of the paper.

b. Write a press release clarifying the results and implications of the study for your locality.

The paper to be used is: Blair *et al*. **BMJ 1999;319:1457-61**.

KEY POINTS

Critical Appraisal

- Case-control study an appropriate design but may be subjected to bias
- Cases from three former health regions of England, questionable applicability to other regions and to Hong Kong
- Controls matched appropriately to cases
- A large number of variables examined, probability of significance due to multiple testing existed
- Ascertainment of factors necessarily retrospective due to nature of study
- Statistical testing correct; use of odds ratio appropriate

Press Release

- This is a retrospective study
- This study describes associations not causation
- Need to consider significance of risk factors in the light of living arrangement for locality/Hong Kong
- Cigarette smoking and alcoholism are much less prevalent in Hong Kong than in the study population
- Having said the above, formulation of preventive strategies for future testing of effectiveness is feasible
- Given the crowded living environment in Hong Kong/locality, findings of some significance

COMMENTS

Candidates often did not refer to over-crowding (the topic of concern) in the press release. They also:

- Rarely mentioned matching for age
- Often failed to mention that seemingly significant associations disappeared when corrected by other factors
- Were often confused between wide confidence limits and limits that cross unity (significance and precision).

Also:

- Still some scripts difficult to read
- Association and causation often not distinguished
- Ethical clearance often not mentioned
- Importance of multiple testing often not mentioned.

QUESTION 2

The head of your local police force has written expressing concerns about people with mental health problems being cared for in the community, because of the risk of violence. He has drawn to your attention the attached BMJ paper.

c. Write a critical appraisal of the attached paper by Trieman *et al*.

d. Draft a reply to the Head of Police.

The paper to be used is: Trieman *et al*. BMJ **1999;319:13-16**.

KEY POINTS

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

a) Critical Appraisal

Objective

To examine the outcome of a population of long stay psychiatric patients resettled in the community.

Methods

Prospective study with 5 year follow up of 670 long stay patients discharged to the community. Outcome measures included continuity and quality of residential care, readmission to hospital, mortality, crime and vagrancy.

Results

Of the 523 patients who survived the 5 year follow up period, 469 (89.6%) were living in the community by the end of the follow up, 310 (59.2%) in their original community placement. A third (210) of all patients were readmitted at least once. Crime and homelessness presented few problems. Standardised mortality ratios for the group were comparable with those reported for similar populations.

However, the outcomes are narrow, e.g. no indication of exactly how these people actually functioned is given. There is nothing said about their clinical condition, how well or ill they are, to what extent they are disabled …

Validity

There is little evidence of data validity or instrument validity.

Bias

People lost to London were lost!!

The study concentrates on people who are already in long term care. It cannot estimate the effect on people who would be admitted to long term care if the policy were to continue (including what would be likely to happen to them with a Community Care approach).

There is no control population. Therefore, are the rates of "criminality" given high or low?

Generalisability

The population studied is old (average age: 54) - only a few were accumulated throughout the study period. This tells us nothing about a newer younger population. The results are therefore only relevant to a particular population.

The study was conducted in London. Although the two hospitals in the study were "similar" there are both in the same sort of area. This sort of internal consistency tells us little about wider generalisability.

We don't know how typical the study population is in relation to the current population of people with long term psychiatric illness.

Discussion

Despite the low incidence of aggressive attacks, they still occurred.

Mistakes were made (e.g. failure to adequately provide acute facilities for acute recurrent readmissions for approximately 10% of the cohort).

Risk factors were mentioned but their predictive value not quantified.

Although mortality statistics for the cohort were said to be consistent with other groups of mentally ill people, the next sentence admits that the figures for women were significantly higher for no explicable reason.

The costs of the "intervention" are high - 78% are in staffed residential care.

Conclusions

This study suggests that this sort of care CAN be successful for a particular population at a cost.

It tells us little about the risk of violent behaviour in the population in the community as we know that a risk factor for violence is youth and the study is mainly on older people in a particular urban environment.

We can learn little about successful interventions for potentially violent people with a history of mental illness from this study.

b) Main Points for Draft response for CEO to Chief Police Officer.

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

We cannot categorically say from this paper that there is no risk of violence from people discharged from long stay psychiatric units.

However, we have evidence of higher risk groups (young, male, drug misusers). It would be possible to use resources effectively by stratifying the monitoring and surveillance system for individuals after their discharge. An early warning system if contact is lost with a person from a high risk group would be possible.

We can also say that it is possible to discharge long stay patients from psychiatric care and there is unlikely to be a higher rate of adverse incidents in the community if this community care is adequately resourced. This resourcing is likely to be high and is only known to be workable in an urban environment. However, we can say little about the state of these individuals in terms of mental health or disability.

We are unable to say what might happen if the Care in the Community policy were to be extended through generalising this knowledge too far (e.g. to young acutely ill men who are drug misusers).

Other data have shown that the frequency of homicide by mentally disordered offenders has been constant for many years.

Happy to discuss any practical implications within the relevant partnerships (RAPs).

COMMENTS

Only a few candidates referred to important current literature/policy statements (e.g. Modernising Mental Health Services/NSF).

Much less effort given to letter to Chief Constable than given to Critical Appraisal (often did not mention the evidence (or lack of it) from the paper).

Difficult to place patients were not of primary concern as they were not going into community.

Too many candidates just repeated methodology etc. without analysing its use (e.g. systematically addressing possible bias, confounding, false logic).

Too much personal opinion stated.

Rarely mentioned that risk factors are not quantified.

Ethical approach often not referred to.

Resources, and learning lessons from the research, rarely mentioned.

Additional comments for both questions 1 and 2.

Candidates tended to describe the papers rather than appraising them; and when appraising often assumed that the absence of (any) 'gold standard' for research meant that no conclusions could be drawn.

Hong Kong candidates did slightly better than past cohorts.

SECTION B - UK PAPER

QUESTION 3

Your Director asks you to undertake a health needs assessment in your local prison.

a) Discuss the key health issues within prisons. How do the relationships between prison health services and NHS services help or hinder the health care provided to prisoners?

b) Suggest an outline for the Needs Assessment that you would undertake.

KEY POINTS

a) Key health issues include:
Mental Health Problems. High level of mental ill heath – higher in remand prisoners. Higher levels of all type of mental illness than in community. High rates of suicide attempts – particularly women and those on remand. High levels of psychosis – again higher in remand prisoners. Transfers to hospital under the mental health act accounts for about 25% of admissions to secure mental health services.
Drug and alcohol problems. High levels of drinking and about 50% dependence on drugs in the year before coming to prison. High levels of opiate drug dependence on remand.
Communicable Disease. Prisoners should be offered HBV vaccination – potentially high levels of Hep C in Prisons. HIV and TB both potential problems.
Health promotion. Captive audience and a deprived community. Good opportunity for health promotion.

Relationships between prison health and NHS
Prison responsible for primary care. Recent joint prison service/NHS report (the Future Organisation of Prison Health care) suggested that secondary care the responsibility of HAs. However the majority of prisoners in a prison are not residents of that HA area. Formal links between NHS and Prison health necessary yet very variable. Tensions within prisons between custody and care. Net result is a lower standard of care for most prisoners than that available to those outside prison. Recognised by NHS and Prison service as unacceptable. Resource implications and culture changes necessary before progress can be made.

b) Suggested outline for health needs assessment:

Background
Context/recent reports

Description of Prison
Type of Prison/Type of prisoner – age, sex, ethnicity, turnover
Effectiveness
Evidence of health care interventions in prisons
Health and Healthcare issues
Estimates of prisoners with particular health problems using published literature
Corporate needs assessment – prisoners, staff, external health professionals. Methods could include focus groups or questionnaires. Ownership
Local joint work in place (if any)
Review of prison health care case notes
Services available
Services/interventions
Human and physical resources
Existing protocols/pathways of care
Use of NHS services
Training/CPD/Clinical Governance

Which Services and Procedures are required to ensure the health care needs of prisoners are met?
Recommendations.

Candidates would be expected to have a broad overview to pass and all of the above would provide a good answer.

COMMENTS

This question was well answered by most candidates. Answers demonstrated a good understanding of the health issues within prisons and the relationship between prisons and the NHS.

Whilst the majority of candidates were familiar with models of needs assessment, some did not make their suggested outline relevant to prisons.

QUESTION 4

Your local Joint Investment Plan for the elderly has allocated £40,000 to a group of primary care practices to run a pilot project in the early detection of depression in local residential and nursing homes. The project is to "roll out" across the Health District if it is successful. The group has asked you, as a public health practitioner, to join a steering group to develop the project.

a) What information would you wish to identify to prepare yourself for the first meeting?

b) Produce a draft project plan for the group to consider

c) Discuss the potential implications of this project for the group of primary care practices.

KEY POINTS

a) Who are the members of the steering group and do they have expectations of the project?
What is group's understanding of the term "successful"?
Identify the expected prevalence of depression in the elderly

Identify Screening tools available for the detection of depression in the elderly (i.e. Geriatric Depression Scale)
Search and review published literature of similar projects
What is the expected time scale?

b) There is no "correct " answer for this but an example would be:
Preliminary work
Identify residential/nursing homes willing to participate
Ensure GPs linked with these homes are willing to participate
Determine how the consent of individuals will be obtained and whether ethical approval would be necessary
Identify a job description for a project manager (using part of the £40,000) to run the project and appoint.
Agree care pathways for those identified as having depression
Identify those with depression
Train nursing/residential home care staff in the use of the depression scale
Agree time scales and start assessing residents of chosen care homes
Collate information from the depression scales
Co-ordinate and record the services required to meet the needs identified
Evaluate the project
Identified need, impact on primary and secondary care services and prescribing.

c) Implications:
Advantages – identification of unmet need – better treatment of depression in the elderly population in residential care
Disadvantages – potential increased workload for primary and secondary care – raised expectations of care homes – potential increase in primary care prescribing costs

If all the above points were covered this would represent a good answer.

COMMENTS

This question did not require detailed knowledge of Joint Investment Plans or depressive illness in the elderly. It did require an ordered approach to preparing for a meeting and setting up a project with others.

Most answered the first part well, although some included a lot of irrelevant information. Many had problems with the project plan and there seemed to be a poor understanding of what was meant by this together with a lack of appreciation of what needed to be done in practical terms. The third part of the question asked for potential implications although most discussed the disadvantages and did not include benefits that the project might bring.

SECTION B - HONG KONG PAPER

QUESTION 3

In Hong Kong recently, there is increasing publicity in the mass media, from private health services providers, to encourage women to come forward for breast cancer screening. A legislator has asked the Government to provide breast cancer screening for all women free of charge.

The Secretary for Health and Welfare has asked you, as a public health professional, to prepare for a briefing paper and to draft a reply to the legislator.

(a) Describe what would you do to prepare the briefing paper and outline what should be included in the content of the briefing paper.

(b) Draft the reply to the legislator for the Secretary for Health and Welfare.

<u>KEY POINTS</u>

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

- Background haphazard situation in Hong Kong – no clear policy, no organised programme, no evaluation; but increasing publicity particularly from the private service provider, to attract clients.
- Epidemiology of breast cancer in Hong Kong, incidence/prevalence much lower than those in the West (e.g. US, Europe) – low positive predict value and much less benefits.
- Evidence of benefits of screening in the literature, the controversies, and applicability to Hong Kong Chinese. Studies in Hong Kong on screening and the lessons learnt (e.g. from Kwong Wah Hospital).
- Discussion on principle of screening (sensitivity, specificity, positive predictive value, Wilson and Junger criteria).
- Consultation with different sectors involved about the different views and practices.
- Problems on cost-effectiveness, psychosocial problems for false positive cases.

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

- Ethical issues in advertising to attract clients.
- Evidence on effectiveness of Breast Self Examination as an alternative.
- Suggestions for setting up a "Screening Council" to review and to establish policy and guideline.
- Special problems in mammogram in Chinese women: e.g. no local data on sensitivity and specificity, smaller breast, more conservative, low acceptance and coverage.

<u>COMMENTS</u>

Two candidates answered this question. The answers were satisfactory. The different situation in Hong Kong as compared to the West, and the controversies, were explained with different depth by different candidates. Candidates should emphasize the unique and haphazard situation in Hong Kong.

QUESTION 4

The Hong Kong Government has recently been criticised that it has been slow in tackling the problem of obesity in Hong Kong. As a public health medicine trainee in the Department of Health, you are asked by your senior to prepare a briefing paper and to draft a reply.

(a) Describe what would you do to prepare the briefing paper and outline what should be included in the content of the briefing paper.

(b) Draft the reply for your senior in the form of a press release statement.

KEY POINTS

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

- Critical review of the literature on obesity and health.
- Special focus on the literature and other materials on the Hong Kong situation – in adults and children.
- Review the actions being done in Hong Kong: Government actions; other actions.
- Reasons supporting and against the criticism that government is slow.
- The special problems in Hong Kong in tackling obesity.
- Suggestions for measures needed: e.g. a policy including healthy diet, physical activity, research, involvement with other sectors involved (such as food and catering industry, school meals, sports sectors); and evaluation.

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

- The Faculty of Public Health recent publication on Tackling Obesity (Davis et al, Jan 2000).
- Comparing Hong Kong problem with the problems in the West (e.g. UK, US).
- Data on obesity and adverse health effects in Chinese is scanty and research is needed.
- Development of an obesity action plan.
- The need for a strong government policy with multi-sectoral involvement.

COMMENTS

Three candidates answered this question. On the whole, the answers were not satisfactory. The criticisms that the government has been slow in tackling the problem of obesity were not answered directly and adequately. Candidates did not demonstrate adequate knowledge and understanding of the problems and they made simplistic suggestions. The Press Release Statements demonstrated a lack of professionalism in using this medium to communicate with the public.