

**Faculty of Public Health Medicine**  
*Of the Royal Colleges of Physicians of the United Kingdom*  
4 St Andrew's Place  
London NW1 4LB

**DIPLOMA AND PART I MFPHM EXAMINATION**

**JANUARY 2001**

**EXAM QUESTIONS WITH EXAMINERS' KEY POINTS AND  
COMMENTS**

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

*Registered Charity No. 263894*

**DIPLOMA & PART I EXAMINATION FOR MEMBERSHIP OF THE FACULTY OF  
PUBLIC HEALTH MEDICINE**

**PAPER I**

**Thursday 18<sup>th</sup> January 2001: 9:30 – 12:30**

**SHORT ANSWER QUESTIONS ON PUBLIC HEALTH MEDICINE**

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**You must answer all eight questions**

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*This paper is intended to test knowledge across the broad range of the discipline. Candidates will be heavily penalised if they fail to attempt any of the eight questions or give grossly inadequate answers to **any** of them. It is, therefore, essential that candidates **ALLOW SUFFICIENT TIME FOR EVERY QUESTION.***

1. You are phoned by the microbiology laboratory to be told that they have isolated *C. diphtheriae* from a throat swab. What further microbiological information would you want in order to decide on your course of action? In the absence of these data, what clinical information can guide your decision, and what action can you take?
  
2. How might electronic health information management lead to better patient care in a named country? What are the likely barriers to implementation?
  
3. You are undertaking an analytical study of the relationship between exposure to a certain chemical (X) and development of a particular cancer. Of the 40 patients with cancer, 30 had been exposed to X; of the 110 patients without cancer, 20 had been exposed to X.
  - a) Calculate the relative risk and odds ratio.
  - b) Assume this is a case-control study. How would you interpret the findings?
  
4. A well conducted study shows a significant association between an exposure and a disease. What criteria can be used in drawing conclusions as to whether the relationship is causal?
  
5. What are the characteristics of effective teams in health services management?
  
6. Discuss the trends in asthma related morbidity and mortality in developed countries during the last decade. How can our understanding of the aetiology and epidemiology of asthma support health policy and preventive strategies?

**(questions continued overpage)**

**7.** For TWO of the following three pairs of competing priorities for health or public spending, state which type of economic analysis might be most appropriate to assist your decision. Explain why your chosen type of economic analysis is appropriate and indicate briefly what steps you would take to carry out the analysis.

- a) Anti-hypertensive drug treatment versus a health-service funded weight reduction programme for treatment of hypertension;
- b) Health service funded nicotine patches for smoking cessation versus investment in a local job club (employment) initiative;
- c) Coronary artery by-pass surgery (CABG - coronary artery by-pass graft) versus health-service funded chiropractic for low back pain.

**8.** What are the main characteristics of a profession? Briefly summarise the arguments for and against self-regulation of the medical profession.

**DIPLOMA & PART I EXAMINATION FOR MEMBERSHIP OF THE FACULTY OF  
PUBLIC HEALTH MEDICINE**

**PAPER IIA**

**Thursday 18<sup>th</sup> January 2001: 2:00 – 5:00**

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**Candidates should answer one question from each of the four sub-sections A B C and D**

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*Style, clear grammatical English and legibility will be taken into consideration by the Examiners.*

**SECTION A**

1. Discuss the variation in survival for patients with breast cancer and its implications for service provision in a named country.
2. Discuss the epidemiology of chronic obstructive pulmonary disease (COPD). What are the implications for its prevention and the provision of medical care?

**SECTION B**

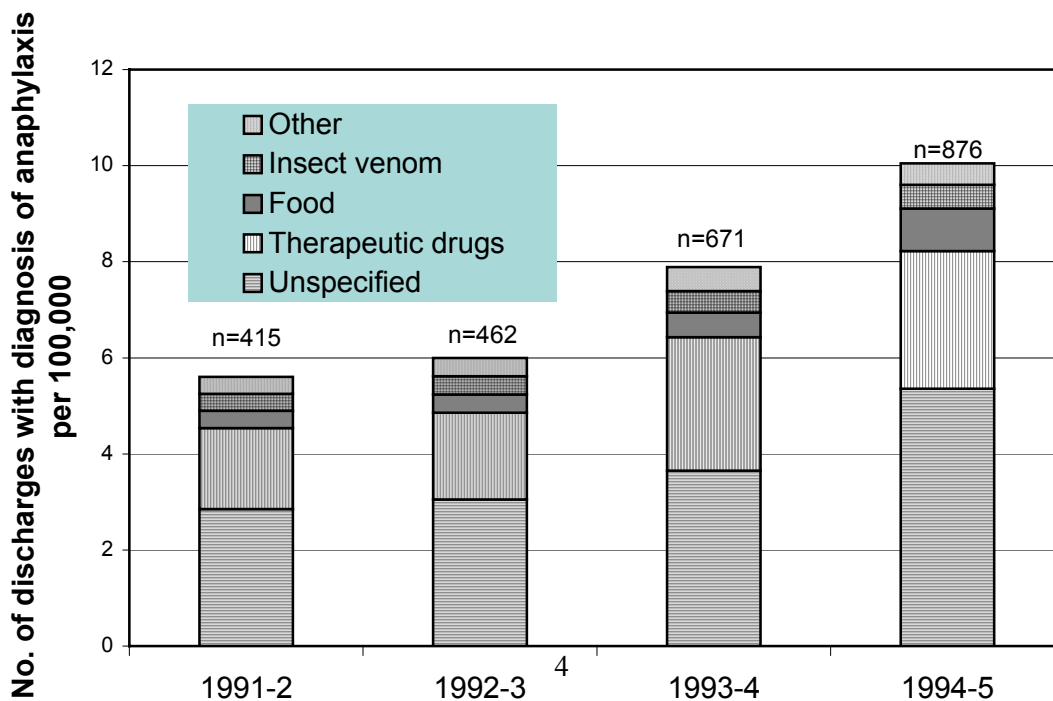
3. Describe the effects of radon gas on human health. What mechanisms can be used to reduce these effects?
4. Why is malaria of public health importance (a) globally, and (b) in non-tropical countries? How can the impact of malaria be lessened in non-tropical countries (e.g. UK)?

**SECTION C**

**5. (question continues overpage)**

Health service researchers carried out an investigation into trends in anaphylaxis between 1<sup>st</sup> April 1991 and 31<sup>st</sup> March 1995 and published the chart below (BMJ 2000;320:1441 (27 May)).

**Cause of anaphylaxis**



5. i) Describe what the chart shows and explain what conclusions may be drawn from the data.
  - ii) Mention one test by means of which the significance of the observed change could be determined.
  - iii) List possible factors that may explain the apparent increase in anaphylaxis between 1991 and 1995.
6. a) Describe briefly the following measures:
    - i. Disability Adjusted Life Years (DALYs)
    - ii. Potential Years of Life Lost (PYLL)
    - iii. Short Form 36 (SF36)
  - b) How might an assessment of the burden of disease in a population appear to differ using these health measures? Illustrate your answer using cervical cancer, low back pain and coronary heart disease.

#### SECTION D

7. There is growing interest in measuring agreement between clinical raters. The following table adapted from a paper (BMJ 1992;304:1491-4) compares hypothetical agreement ratings between two rheumatologists as to the presence or absence of a radiological sign in 100 patients seen by both doctors.

Rheumatologist 2	Rheumatologist 1		
	Present	Absent	Total
Present	72	8	80
Absent	8	12	20
Total	80	20	100

- a) Describe the level of agreement between the two rheumatologists.
- b) What statistical technique would you use to assess the level of agreement between the two?
- c) How is the result of this technique interpreted?
- d) If two observers were found to differ, what would be the main sources of disagreement between them?

8. Cluster randomised trials are increasingly popular in the evaluation of certain types of health care intervention.

- a) Describe circumstances where the use of cluster randomised trials is appropriate.
- b) Describe the principles involved in choosing an appropriate sample size.
- c) Describe approaches to analysing data that arise from a cluster randomised trial.

**DIPLOMA & PART I EXAMINATION FOR MEMBERSHIP OF THE FACULTY OF  
PUBLIC HEALTH MEDICINE**

**PAPER IIB**

**Friday 19<sup>th</sup> January 2001: 9:30 – 12:30**

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**Candidates should answer one question from each of the four sub-sections E F G and H**

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*Style, clear grammatical English and legibility will be taken into consideration by the Examiners.*

**SECTION E**

1. Local gastroenterologists have proposed that individuals with any one of the following criteria should be referred to the genetics department for a full family history and risk assessment for colonoscopy in order to detect colon cancer. The referral is for any one of the following:

- A. One first degree relative under 45 with colorectal cancer;
- B. One first degree relative and one second degree relative on same side of the family with colorectal cancer;
- C. Two first degree relatives with colorectal cancer (including both parents);
- D. Three relatives with colorectal cancer;
- E. Family history of known cancer syndrome.

From a public health perspective, what principles would you ask the clinicians to consider before adopting such a policy for case finding through a family history?

2. What strategies would you adopt to reduce the morbidity and mortality in people with diabetes mellitus? Illustrate your answer with reference to the action you would take in a defined population of your choice.

**SECTION F**

3. Discuss the impact of increased economic prosperity in a region (e.g. through the discovery of oil or the introduction of tourism) on the health of the population.

4. Describe the social and health needs of prisoners and why these needs are of relevance to the wider community.

**SECTION G**

5. You have been asked to set up a process to identify and prioritise health issues to be taken forward as a programme to improve the health of your local population. Outline how you would undertake this work in a named health economy of your choice, explaining why you would adopt the approach you have outlined.

6. Outline evidence for the existence of inequalities in health in a named country. Discuss how joint working between health services and non-health service organisations can help to reduce inequalities, and outline possible obstacles to such working.

## **SECTION H**

7. A recent newspaper article on the tragic case of a neonate found dead in a local park after being left there by an unsupported 15 year old mother has highlighted the problem of unplanned teenage pregnancy in your area. Describe how you would go about reviewing the problem locally and building a programme aimed at reducing the risk of a repeat occurrence.

8. Managers of the main hospital in your area have sought your advice as a public health practitioner on how to understand and manage the increasing demand for its accident and emergency department (emergency room) services. Outline your approach to explaining the situation and discuss how any ensuing organisational changes might be managed.

**DIPLOMA & PART I EXAMINATION FOR MEMBERSHIP OF THE FACULTY OF  
PUBLIC HEALTH MEDICINE**

**PAPER III**

**UNITED KINGDOM CANDIDATES**

**Friday 19<sup>th</sup> January 2001: 2:00 – 5:00**

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**Candidates should answer one question from each section. Candidates are advised to spend approximately two hours on Section A and one hour on Section B**

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*Style, clear grammatical English and legibility will be taken into consideration by the Examiners.  
Answers should be written in a form appropriate to the audience specified in the question.*

**SECTION A**

1. You have been asked to offer public health advice to a national working party set up to review the organisation of primary health care. A member of the working party proposes that using nurse practitioners as the first point of contact may be a more efficient use of resources. They cite the enclosed paper as evidence to support this proposal.

- a) Write a critical appraisal of the attached paper  
"P Venning, A Durie, M Roland, C Roberts, B Leese. Randomised controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care: *BMJ* 2000; **320**:1048-53".
- b) Outline, in a document to be discussed at the next meeting of the working party, the issues which would need to be considered for making a decision on such a proposal.

2. As part of its review of mental health services, the locality in which you work is keen to ensure that there are effective services to complement local Care in the Community policies. As a public health member of the locality team, you have been asked to consider what the enclosed paper contributes to the decision making.

- a) Write a critical appraisal of the attached paper  
"Johnstone P, Zolese G. Systematic review of the effectiveness of planned short hospital stays for mental health care. *BMJ* 1999; **318**: 1387-90"
- b) Write a briefing paper for the next Executive Team meeting.

## **SECTION B**

**3.** Your Health Authority is planning a smoking cessation service as part of its action to reduce the deaths caused by tobacco. Produce a discussion paper for the first meeting of the group which is developing the service. Include:-

- a)** The aims of such a service;
- b)** A brief overview of the evidence of effective interventions;
- c)** A possible approach to providing such services at different levels within different settings (i.e. a tiered approach).

**4.** Your Health Authority does not currently fund services for the treatment of sub-fertility, but does fund diagnostic services.

Write a policy paper for your Health Authority on the question of whether the Health Authority should continue with its current policy or whether it should fund services for the treatment of sub-fertility. The paper should identify what options are available to the Health Authority, and you should state which option you would recommend.

**(HONG KONG PAPER III OVERPAGE)**

**DIPLOMA & PART I EXAMINATION FOR MEMBERSHIP OF THE FACULTY OF  
PUBLIC HEALTH MEDICINE**

**PAPER III**

**HONG KONG CANDIDATES**

**Friday 19<sup>th</sup> January 2001: 1:30 – 4:30**

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**Candidates should answer one question from each section. Candidates are advised to spend approximately two hours on Section A and one hour on Section B**

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*Style, clear grammatical English and legibility will be taken into consideration by the Examiners.  
Answers should be written in a form appropriate to the audience specified in the question.*

**SECTION A**

**1.** You represent the Department of Health in a working party to review primary health care in Hong Kong. A member of the working party proposes that using nurse practitioners as the first point of contact may reduce the cost of primary health care in Hong Kong, and the enclosed paper is cited as evidence to support this proposal.

- a)** Write a critical appraisal of the attached paper  
"P Venning, A Durie, M Roland, C Roberts, B Leese. Randomised controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care. *BMJ* 2000; **320**:1048-53".
- b)** Outline, in a document to be discussed at the next meeting of the working party, the issues which would need to be considered for making a decision on such a proposal.

**2.** As part of its review of mental health services, the locality in which you work is keen to ensure that there are effective services to compliment local Care in the Community policies. As a public health member of the locality team, you have been asked to consider what the enclosed paper contributes to the decision making.

- a)** Write a critical appraisal of the attached paper  
"Johnstone P, Zolese G. Systematic review of the effectiveness of planned short hospital stays for mental health care. *BMJ* 1999; **318**: 1387-90".
- b)** Write a briefing paper for the next Executive Team meeting.

## **SECTION B**

**3.** The Hong Kong Council on Smoking and Health is planning a smoking cessation service as part of its action to reduce the deaths caused by tobacco. Produce a discussion paper for the first meeting of the group which is developing the service. Include:-

- a)** The aims of such a service.
- b)** A brief overview of the evidence of effective interventions.
- c)** A possible approach to providing such services at different levels within different settings (i.e. a tiered approach).

**4.** You are appointed by a non-government public health organisation in Hong Kong to be the co-ordinator/chairperson of a Working Group on Genetically Modified (GM) Food. The main aims are to review the issues related to GM food, to make recommendations to the government, and to promote public health. Describe how you would form the Working Group and write an action plan for the Working Group.

# EXAMINERS' KEY POINTS AND COMMENTS

## PAPER I

### Question 1

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

- want to know whether or not this is a toxigenic strain; as soon as possible
- clinical data, immunisation history, whether had full primary course and boosters or not, travel history, whether recently in an endemic area or not, presentation, symptoms consistent with diphtheria (particularly whether or not a membrane present).
- Action which can be taken is to start primary immunisation or boost immunity in contacts and index, give oral erythromycin or penicillin i.m. to contacts and index, swab contacts, and if clinical suspicion high give penicillin and antitoxin to case in addition and place in isolation.

A pass answer will spot the need to have information on the toxigenicity or otherwise of the isolate and will recognise that in the absence of a suggestive travel history or symptoms it is reasonable to treat the case with erythromycin, check immunity get a list of contacts and await tox results. They will also recognise that if the index case is toxin positive, there is a need to take throat swabs from close contacts, treat close contacts with erythromycin and boost immunisation or immunise as necessary.

*The following are additional points which might improve the answer to “good” or “excellent”:*

A good answer will include all the above, in more detail, preferably with a decision tree or flow diagram.

### Comments

This question was generally not well answered. Perhaps candidates felt unhappy about the format of the question, framed as it was in the context of an everyday problem which could potentially have serious implications. Relatively few candidates specifically mentioned that the pathogenicity of *Corynebacterium diphtheriae* is dependent on toxin production and that this is the major determinant in whether this is an incidental finding or a potential major incident. They should then have gone on to describe how whilst waiting for the toxin result, a risk assessment can be made on the basis of clinical symptoms, immunisation history and travel history. On the basis of this it can be decided whether contacts need to start prophylactic treatment or whether a “wait and see” policy can be adopted. A number of candidates correctly suggested that if diphtheria was seriously suspected, an outbreak control team should be convened. No candidate actually produced an algorithm as appears in the WHO guidance, but this would have been helpful.

### Question 2

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

Health information management:

- Definition – ‘using information to improve the quality and efficiency of health services’
- Electronic information management implies networked healthcare facilities, for rapid dissemination of information
- Historically, information has mainly been gathered to assist health services managers
- New focus is on using health information to improve patient outcomes

- New concept of the electronic health record (EHR), which is a longitudinal, lifelong patient record

Improved patient care:

- Computer-based records are more legible, and easier to access
- Clinicians should have desktop access to appropriate and up-to-date information sources, to improve their clinical decision-making
- Networks allow swift dissemination of best practice, e.g. accredited clinical guidelines
- On-line communication between GPs and hospitals facilitates referrals, outpatient bookings, discharge information, ordering and reporting tests
- Patients may benefit through electronically-monitored clinical indicators

Likely barriers to implementation:

- Cost (capital costs, running costs and training should all be mentioned, with some discussion of each)
- Difficult to impose a uniform system (NHS GPs are independent contractors)
- Use of computer in a consultation lengthens the transaction by 50-130 seconds, leading to less time overall for direct doctor-patient interaction
- Cost-benefit profile of some new technologies (e.g. patient smart cards, telemedicine) is currently unfavourable
- Potential for infringement of patient confidentiality, through electronic transfer of patient information
- Difficult to agree on appropriate clinical indicators
- Patients may lose/falsify/lend out their cards

<p><i>The following are additional points which might improve the answer to “good” or “excellent”:</i></p>
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1. Specific mention by the candidate of key central government strategy papers (e.g. NHS white paper, *Information for Health*, published in September 1998)
2. Some examples given of on-line or CD-ROM sources of evidence (e.g. National Electronic Library for Health, *Clinical Evidence*, electronic BNF, *Cochrane Library*)
3. Mention by the candidate of need for a uniform coding language (e.g. NHS standard is currently Read version 3/CTV3, but in 2001 the standard will become SNOMED Clinical Terms)
4. Some figures given on costs (e.g. anticipated cost of implementing NHS-wide informatics strategy is £3 billion, start-up cost of networking an acute hospital is US \$9000 per bed with annual running costs of US \$3000 per bed)

### Comments

On the whole this question was attempted well by most candidates, although a number wrote large amounts of repetitious or irrelevant material which did not score them any marks. Candidates needed to talk about the electronic health record, networked healthcare facilities, the advantages of legibility and easy access. They should also have said something about electronic clinical guidelines, and the use of electronic data in quality monitoring and audit.

Some candidates forgot to mention any barriers to implementation and there was perhaps an overemphasis in the responses on confidentiality and Caldicott in the responses. A number of candidates were confused about the difference between an electronic *health* record and an electronic *patient* record. Few candidates, if any, mentioned the time added to patient transactions by using a computer and no-one mentioned that the cost benefit profile of some electronic healthcare technologies is currently unfavourable.

### Question 3

a) Set up a 2 x 2 table:

		<u>Cancer</u>		
		<u>Yes</u>	<u>No</u>	
Exposure to x	Yes	- 30	20	- 50
	No	- 10	90	- 100
	Total	----- 40	----- 110	----- 150
RR	=	$\frac{30/50}{10/100}$	=	6.00
OR	=	$\frac{30 \times 90}{20 \times 10}$	=	13.50

*Good answer to section a) could add:*

- Definitions of RR and OR, and/or
- Formulae based on 2x2 table (e.g.  $OR=ad/bc$ ).

*b) Required for a pass:*

- Case-control study, so use OR rather than RR
- Odds of being exposed to chemical were 13.5 times higher in cases than controls. (Also acceptable to say that odds of developing cancer were 13.5 times higher in those exposed to chemical.)
- No information in question as to whether OR is statistically significant.

*Additional points to improve answer to section b):*

- RR should not be used as true size of exposed and unexposed unknown and so denominators unreliable. Use OR as an approximation of RR.
- Appropriate statistical tests are 95% CI for OR or a Chi-square on 2 x 2 table.
- Eyeballing data: probably is significant.
- Calculation of Chi-square.
- Controls also have quite a high level of disease.
- OR only approximates RR if disease rare.

### Comments

A small number of candidates were unable to perform these basic calculations and a larger number made simple arithmetic errors. A surprisingly large number did not mention tests of statistical significance when asked to interpret the findings. Some candidates wasted a significant proportion of their time providing detailed information on areas of only limited relevance to the question (e.g. bias, confounding and Bradford-Hill criteria). However, 80% of candidates passed this question, a marked improvement compared to questions requiring calculations in previous papers.

#### Question 4

<i>Most or all required for pass</i>	<i>Additional details which might improve answer</i>
Strength of association	- Statistical probability - Relative risk - Independent of confounders
Consistency of relationship	- Across multiple studies - Different places, circumstances and times - Different study methods (e.g. retrospective and prospective)
Specificity of relationship	- Exposure linked to one outcome - Not an absolute requirement (e.g. smoking causes many diseases)
Temporality of association	- Outcome follows exposure - Can be difficult to assess which came first (e.g. low cholesterol and cancer)
Biological gradient	- Dose-response effect i.e. greater exposure leads to increased risk of disease - May be a threshold
Biological plausibility	- Depends upon biological knowledge of day
Coherence of evidence	- Should not conflict with current knowledge (if well founded)
Experimental evidence	- Does removal of the exposure reduce the risk of disease? - Best if control group, but may be unethical
Reasoning by analogy	- Relationship similar to that in known relationships
Epidemiological studies do not provide absolute proof of causation  Association does not have to fulfil every single criterion	There is current debate in what constitutes adequate criteria (e.g. Kenneth Rothman - extra marks for Rothman's arguments - very good candidates may quote him and discount all criteria except temporality of association!  Some would add ability of the observed relationship to predict other relationships correctly (e.g. Susser)  Compare to Koch's postulates

#### Comments

This question was generally addressed by using Bradford-Hill's criteria (even if occasionally mis-attributed to Wilson and Younger) which allowed the large majority of candidates to achieve an adequate mark. The main weakness was a failure to demonstrate that the candidate understood what each criterion actually meant. Better answers gave examples, although it was rare for any candidate to quote anything other than (the now rather historic example) smoking and lung cancer.

#### Question 5

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

- Clarity of task: purpose, aims, objectives (specific, measurable, ambitious, realistic, time-bound), milestones, deadlines, end-points
- Clarity of process: agreed way of working, regular constructive feedback, regular team contact, "team building" if scale of objective and time-scale warrants it, regular appraisal
- Clarity of roles and relationships: attention to inter-personal relationships, supportive, mutual respect, openness to honest disagreement,
- Leadership, co-ordination
- Stages of development, e.g. forming/storming/norming/performing/adjourning

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Mention of specific theoretical models, e.g. Tuckman, 1977; Kormanski and Mozentner, 1987; Katzenbach 1997.

### **Comments**

The pass rate for this question was 25%.

Fewer than half of all the candidates cited any named model, theory or study of teamwork. Where they did, Belbin was the most common (17), followed by many others: Handy (2), Tuckman (2), Maslow (2), Adair (2), and a further nine authors once each.

Some candidates ascribed certain theories to the wrong author, or remembered only part of their model.

Several candidates engaged in “name-dropping”, i.e. citing authors but not elaborating on their theories. No marks were added for these.

Some of the answers were purely descriptive or observational and cited no theoretical framework at all – examples from personal experience can add value (and marks) to an answer but are not sufficient on their own.

Many candidates saw tension and conflict in the team as always destructive, and to be avoided, but this is not necessarily true – if handled well, differences of opinion can add to the creativity and effectiveness of teams.

Good additional points included:

- ◆ a clear definition of “team”,
- ◆ the importance of seniority or delegated decision-making authority,
- ◆ clear lines of accountability for team members where they were drawn from different organisations.

### **Question 6**

*Most of the following would be required for a pass*

#### *Morbidity*

Common condition, difficult to define at the margins

True increases in incidence, especially in children and young adults

Hospital admissions doubled

Peak admissions associated with pollution peaks

Role of allergic triggers

GP consultations doubled (recent paper shows decline but methodologically flawed)

Prescriptions for asthma up by 75%

Impact of changes in diagnostic habit on trends

Impact of treatment thresholds on trends

Routine data based on clinical assessment, epidemiological studies often involve formal testing of airway responsiveness using histamine or exercise challenge

At risk groups

M>F <age 15

F>M >age 15

### *Mortality*

Small percentage of total deaths

Mortality rates relatively stable

Observed rise in number of deaths is amongst elderly (contributing factors include ageing population and less reliable information on death certificate)

Severity of fatal attack often not recognised

No trend in mortality amongst younger people

SMR demonstrates a social class gradient

### *Potential for prevention and health policy:*

#### *Lifestyle*

Smoking cessation

#### *Healthy environment*

Encourage avoidance of parental smoking, especially of infants with family history of atopy and allergy

Reduce exposure to chemical irritants in the workplace

Reduce exposure to indoor allergens (mites in bedding, pets, cockroaches)

General measures to reduce air pollution

#### *Appropriate care*

Patient education

Encourage self management programmes and provision of drugs for emergency use

Raise public and professional awareness of opportunities for asthma control

Improve equity of access to care for severe exacerbations

### **Comments**

The pass rate for this question was 25%.

There were two main elements to this question, each subdivided further. The candidates who failed had generally omitted to answer a significant element of the question.

The best answers had a clearly defined structure, following that laid out in the question, and covered the ground systematically.

Additional marks were awarded for correct citation of major published studies in named developed countries.

Too many candidates gave unnecessary clinical details about asthma and its treatment. Too few made any critical comment about the quality of data sources.

Under the health policy part of the question, the better answers included evidence-based guidelines on treatment and caring services, not just primary prevention.

Some candidates used inappropriately value-laden comments such as “mortality in asthma is thankfully falling”, or used expressions like “parents are to blame...” – they did not lose marks but did not gain any either.

Some statements were ambiguous, eg “... smoking in public places could be planned to reduce exposure to pregnant women”.

Overall, clarity and brevity were conspicuous by their absence.

## Question 7

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

- Correctly identifying that the most appropriate analysis for a) is cost-effectiveness analysis (CEA), for b) is cost-benefit analysis (CBA) and for c) is cost-utility analysis (CUA). CUA would also be acceptable for a). Good candidates may recognise that CBA is not always valid and outline the difficulties associated with application in case b).
- Correctly identifying the difference in the measures of input and outcome between the different types of economic analysis: costs are all in monetary units, but for CEA outcome is measured in *natural* units (mmHg blood pressure reduction), for CBA outcome is also measured in monetary units, and for CUA, outcomes is measured in *derived* common units of utility.
- Correct justification of choice: for a) CEA can be used because the outcome can be measured in natural units. For b) CBA is most appropriate because the outcomes cannot be measured solely in terms of health gain – there are broader economic costs and benefits. For c) CUA is most appropriate because a derived common unit of outcome is needed that reflects both duration and quality of life.
- Correct identification of costs – direct, indirect, intangible.
- Correct identification that evidence for effectiveness of interventions is required for all three types of economic analysis – this could come from clinical trials or other sources.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Choice of CUA for option a) provided it is justified on the grounds that both drugs and exercise can have benefits *other than reduction of hypertension* making simple CEA less appropriate.
- Good candidates may recognise problems of validity relating to CBA when applied in case b)
- Correct explanation of and employment of discounting of future costs and benefits.
- A correct definition of utility and brief description of how it is measured
- Employing sensitivity analysis to test assumptions (e.g. regarding costs, uptake, effectiveness, discounting rate) upon which economic analysis is based

## Comments

Although most candidates identified the correct method of economic analysis and gave an appropriate reason for their choice, many discussions of method lacked detail. Only a minority of candidates addressed the use of evidence to measure effect sizes, either indirectly, or directly by undertaking the economic analysis in the context of a clinical trial. Candidates would have been expected to consider issues such as direct, indirect and intangible costs and demonstrate that they knew what these terms mean. Most candidates identified the categories, but many provided no evidence that they could define them. Good candidates discussed the issues of marginal cost-effectiveness, technical versus allocative efficiency, discounting and sensitivity analysis. Some candidates provided good reviews of the methods used to assign utility weightings (time trade-off, standard gamble, Rosser index), and methods used to cost out the benefits in a cost-benefit analysis (e.g. human capital, willingness to pay). A few candidates did not read the instructions and answered all three parts of the question.

## Question 8

Characteristics of professions:

Candidates should identify the majority of the key characteristics of professions including:-

- Specialised knowledge and scarce skills provided as personal services to clients
- Practice based on knowledge that includes theory, research and practical skills
- Monopoly of practice

- Controlled entry to profession including controls on training in institutions controlled by professions.
- State register of fitness to practice achieved via examinations leading to monopoly of practice
- Resistance to outside contributions to knowledge
- Only fellow members considered competent to assess work, leading to relative autonomy from clients' criticism and managerial control
- Based on a public ideology of service
- Process of socialisation moulds new members in the image of old
- Role of uncertainty in knowledge base leads to need to use expert judgement
- Tend to be well-paid particularly if male-dominated

Good candidates will note that Friedson enumerated the characteristics of professions, and may also mention some of Illich's work on iatrogenesis and social control.

Self-regulation of the medical profession:-

Candidates should mention that it is currently regulated by the General Medical Council which is dominated by medical professionals although has some lay members.

Arguments for include:-

- Only professional members can understand the complex issues involved in self-regulation
- The medical profession has been established a long time and self-regulation has been successful during this time
- Professional members will only accept criticism and censure from other members
- It is a right of professionals to be judged by their peers
- Victims of infringements have recourse to criminal and civil law in any case

Arguments against include

- Over narrow and restrictive view of competence and fitness to practice
- Dominated by certain groups e.g. men
- Others' views on quality of practice are legitimate
- There have been a series of high-publicity failures e.g. Bristol Children's Heart Surgery, Dr Shipman case.
- It is necessary for medical professionals to be regulated within the framework of clinical governance and risk management
- Medical professionals must be accountable for their use of public money
- The current processes are long-winded and do not protect patients
- Codes of conduct lead to protective practices and concealment of problems.

A good candidate will mention all or more of these, and may also refer to GMC guidance documents.

## Comments

A high number of answers were of a "sunday supplement" level of knowledge, particularly considering the very high level of publicity and attention that has been directed towards the issue of professional self-regulation. Candidates tended to answer either one or other part of the question well, but not both, and only a few both discussed features of professions thoroughly and also rehearsed a range of arguments. In many answers the two parts of the question appeared to be unlinked, with no reference back to the characteristics of professions identified in the first section. Few candidates mentioned clinical governance and how this integrates with self-regulation. Quite a large number of candidates wrote a lot but did not address the precise subject of the question, writing pages about loss of confidence in self-regulation, rather than discussing the actual advantages and disadvantages. The majority of candidates mentioned some key points that define professions.

## PAPER IIA

### Question 1

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

- Factors Influencing Survival
  - Age of patient
    - : Cancer survival decreases with age.
    - : but women aged 40-49 years at diagnosis have best prognosis.
  - Disease extent at presentation (tumour size, histological grade, nodal involvement)
    - : aggressive tumour with metastasis indicate poor prognosis.
  - Degree of deprivation
    - : a gradient exists between cancer survival and deprivation.
    - : more deprived areas have poorer survival rates.
    - : Switzerland and Finland have better 5-year survival rate than England and Scotland. (74% vs 55-64%)
    - : Thames region have better 5-year survival rate than North and West Region.
  - Treatment Regimens
    - : use of adjuvant therapy and tamoxifen confer better survival rate.
    - : adherence to treatment protocols results in better care.
    - : one Scottish study showed no major differences in treatment between women in top and bottom deprivation quintiles.
  - Specialisation of breast care team
    - : observational evidence suggests specialisation confers better survival outcome.
    - : one Scottish study suggests women treated by breast cancer specialists had an 8% better chance of survival at 10 years. Reduction in risk of death was 16% after adjustment to other factors (95% CI: 6%-25%).
    - : one Yorkshire study suggests surgeons who treated more than 30 new breast cancer have better survival results.
    - : co-morbidities
- Service Implications
  - Promote early detection including appropriate screening.
  - Tackle the wider agenda of inequality in health.
  - Promote interdisciplinary specialist breast care team, with appropriate throughput to maintain competency.
  - Use of treatment protocols and wider use of adjuvant therapies.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Cancer registry data provide the observation that there is a variation in survival for patients with breast cancer. A discussion of the potential sources of bias resulting in this observation deserves additional marks.
- A discussion of recent controversy of the Swedish study casting doubt about the effectiveness of mammographic screening also deserves additional marks.

## Question 2

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

1. • Chronic obstructive pulmonary disease (COPD) (ICD9 490-496 excluding 493) is a group of related or overlapping conditions which comprises chronic bronchitis, emphysema, bronchiectasis, bronchial catarrh and other non-specific obstructive airway diseases. Under different definitions it may be referred to as chronic obstructive lung disease (COLD).
2. • The prevalence of chronic bronchitis is increasing as the populations of post-industrialised countries age. It may be considerably underdiagnosed in some populations.
3. • Among WHO member states the global burden of COPD is estimated at 28.6 million cases, about half of all respiratory diseases, with more than 90% occurring in lower and middle income groups and nearly 60% in China alone.
4. • Most (75%) mortality from respiratory disease is attributable to COPD which is the fifth most common cause of death after infectious disease (including respiratory infections), cardiovascular, malignant and traumatic conditions.
5. • In the UK and US, where it is the fourth most common cause of death, COPD is uncommon in those under 40 years of age but the prevalence reaches 10% in 60 to 85 year olds. In 1996 it was estimated to be the principal cause of mortality 35,000 (UK) and in 100,000 (US) deaths and contributory in many more.
6. • Strongest risk factor for COPD is smoking. It increases (a) the rate of decline of lung function and (b) the risk of symptoms and premature death. Global patterns of COPD reflect geographic/demographic smoking pattern. Future COPD will be determined by smoking trends. Gender differences in rates of increase can be expected with increased prevalence of smoking in women.
7. • In UK the pattern of increase and decline in COPD is associated with increases/declines in smoking in men in the twentieth century. Other potential causes of chronic respiratory illness/decreased lung function include birth weight, serious childhood infections, occupational exposures and air pollution.
8. • The health care costs of COPD are high including frequent hospital admission and long term oxygen therapy. Other economic losses include years of life lost, disability and reduced quality of life.
9. • In primary care settings (UK) consultations for COPD are up to four times higher as for ischaemic heart disease. In US COPD is third most common cause of hospitalization.
10. • Treatment and rehabilitation improve clinical aspects and quality of life/reduce the overall costs of care. Long term oxygen therapy improves survival and quality of life in COPD. In acute exacerbations of chronic bronchitis the use of third line antibiotics increased pharmacy costs lower mean total costs. Improved outcomes include reduced failure rate, lower need for hospitalization and increased remission times.

*The following are additional points which might improve the answer to “good” or “excellent”:*

11. • Only a minority of smokers develop COPD. Genetic factors also contribute to its development ie homozygosity for the 2 allele of the  $\alpha_1$ -antitrypsin gene. Heterozygotes may also be at increased risk. Other genes,  $\alpha_1$ -antichymotrypsin and cystic fibrosis membrane regulator and blood groups, and several others have shown a significant association between polymorphisms and COPD.
12. • Epidemiological evidence for a causal relationship between nutrition and adverse effects/for or from asthma and COPD has focused on intake of sodium, n-3 fatty acids, antioxidant vitamins and fresh fruit and vegetables.

13. • Pulmonary rehabilitation may confer substantial benefits in COPD including improved walking distance and maximal exercise capacity. However all interventions are likely to be ineffective without smoking cessation and the provision of quitting support services is of paramount public health importance.

#### **Comments for 1&2.**

- In general question 2 was answered better than question 1.
- Many candidates did not address the question properly in question 1. Marking was relatively lenient and "counter-marking" for irrelevant points would have led to a high failure rate.
- On the other hand some candidates brought out points which are not in the key points, including issues such as "policy".
- The standard of presentation for some candidates was simply appalling including unreadable writing and lack of structure. There has not been any improvement in this aspect over the past 5 years.

#### **Question 3**

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

- Radon is a natural radioactive gas present universally in the atmosphere but usually at low levels. Colourless and odourless.
- Commonest source of natural ionising radiation exposure.
- Collects in enclosed spaces. Levels depend upon local geology, ventilation and atmospheric conditions.
- Epidemiological and experimental evidence suggests that exposure to high levels increases the lifetime risk of lung cancer. Risk increases with exposure.
- Risk reduction by:
  - National detection surveys (e.g. NRPB surveys in UK) to identify high risk areas
  - Mapping high risk areas and offering local testing of homes and workplaces
  - Education of public
  - Modification of dwellings which contain radon above defined action levels.

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

- Formed through radioactive decay of uranium.
- Inhaled radon gas decays into alpha-emitting solid particles which are deposited on the lung mucosa.
- Health risk greatest in smokers
- Indoor levels vary from hour to hour and day to day and show seasonal variation.
- Modifications of dwellings and workplaces by blowing air into houses from lofts, installing underfloor sumps, increasing underfloor airflow etc
- Local government radon policies – measurement, remediation, advice, works, enforcement.
- Radon prevention measures included in design of new houses in high risk areas.
- Population often does not take up offered prevention measures. May relate to risk perception.

#### **Comments**

Most candidates answered this question competently but there were few outstanding responses. Most candidates accurately described the evidence for health risks associated with radon exposure, but descriptions of the measures available to reduce the health risks were less comprehensive. Few

candidates mentioned the importance of mapping or local government radon policies. Few candidates discussed the management of perception of risk or the economic impact of detection of high levels of radon in homes or business premises.

#### Question 4

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

Malaria:

- An acute tropical infection transmitted by the bite of infected female anopheline mosquitoes, mainly in the evening or at night
- Most severe form of the disease is from *Plasmodium falciparum*
- Variable clinical picture – classically, fever, tachycardia, rigors and sweating
- Easily treated with antimalaria drugs, if diagnosed promptly

Global importance:

- 40% of the world's population is at risk
- 300-500 million clinical cases each year, and about one million deaths (mostly in sub-Saharan children)
- Around 2000 imported cases in UK each year
- Malaria is resurgent worldwide, due to many factors (e.g. abandonment of local vector control measures, effects of war and social upheaval, parasite resistance to drugs, vector resistance to insecticides)
- Malaria contributes to underdevelopment, because it hits hardest during times of planting and harvesting

Importance in non-tropical countries:

- Explosion of intercontinental travel has caused rise in cases of imported malaria
- 90% of travellers who contract malaria do not become ill until after they return home – then are a burden on local health services
- *P. falciparum* case fatality rate in returned adult travellers is 1-10%
- In UK most malaria cases are in immigrants from endemic areas, who return to their original home for a brief stay without adequate protection against malaria (but who in the meantime have lost their semi-immunity to the disease)

Lessening the impact in non-tropical countries:

- Good surveillance of imported cases
- Simple control measures (e.g. spraying interior of aircraft arriving from the tropics)
- Clear, evidence-based malaria prevention guidelines for overseas travellers and those who advise them (GPs, travel nurse practitioners, occupational physicians)
- During travel abroad, emphasis should be on –
  - lifestyle modification (avoiding visits to malaria-endemic areas in rainy season, wearing long-sleeved shirts and trousers, staying indoors in the evening and at night);
  - regular chemoprophylaxis, continued for 4 weeks after return home (because most antimalaria drugs only suppress parasite replication, and do not eradicate it);
  - use of an effective topical insect repellent (e.g. DEET-based);
  - use of insecticide-treated bednets and clothing;
  - environmental vector control (e.g. screened windows, “knock-down” aerosol insecticide)

*The following are additional points which might improve the answer to “good” or “excellent”:*

1. Malaria due to a protozoan infection of red blood cells with one of four species of the genus Plasmodium: *P falciparum*, *P vivax*, *P ovale* and *P malariae*
2. Mean incubation period of malaria is 13-14 days for all species except *P malariae* (35 days)
3. Disease may present up to 18 months following exposure
4. There is a theoretical potential for nosocomial transmission of malaria in many non-tropical countries (because suitable vectors exist)
5. Mention by the candidate of WHO’s “Roll Back Malaria” campaign (aims to halve malaria-associated mortality by 2010 and again by 2015)
6. Figures cited for intercontinental travel (e.g. 20 million people from US, and 50 million from European countries, visit malaria-endemic regions each year)
7. Figures cited for incidence of imported malaria (about 2000 cases each year in UK, and 11,000 throughout the European Union)
8. Mention of public unease about the side effects of antimalarial drugs, especially mefloquine (need for randomised controlled trials in tourists)
9. For Hong Kong candidates. Malaria was endemic in Hong Kong decades ago, but is not now. Single indigenous cases occur occasionally, but about 100 cases are imported annually. Most imports are *P. vivax* (70%), followed by *P. falciparum* (25-30%), with occasional *P. malariae* and *P. ovale*. There are some deaths from drug-resistant *P. falciparum* (recognised late and inadequately managed)

### Comments

Most candidates answered this question but the standard of the answers varied markedly. Despite the structure of the required answer being given in the question, some candidates either did not answer the question or did not keep to the required structure and omitted to answer some part of the question.

Some candidates overemphasised the importance of nosocomial or aircraft transmission of the infection. Few candidates were able to correctly identify the considerable global health impact of malaria or the annual incidence of the disease in non-tropical countries such as the UK.

Some candidates focussed entirely on prevention of disease in individual travellers and did not consider national or international programmes for prevention and control of malaria.

### Question 5

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

- The chart shows a steady rise in both the number of admissions to hospital for anaphylactic reactions (from 415 to 876 cases - a 2 fold rise), as well as in the proportion of all hospital admissions accounted for by anaphylaxis ( from 4.5 per 100,000 discharges to just over 10 - just under a 2 fold rise) between 1991 and 1995.
- The rise is accounted for mainly by an increase in cases due to a miscellaneous category (‘unspecified’) and anaphylaxis due to therapeutic drugs.
- A smaller increase is noticeable due to food allergies but the other two categories show only small rises the significance of which we cannot comment on.
- It would be a reasonable first conclusion to infer from these data that there has been an increase in anaphylactic reactions between 1991 and 1995
- A chi-square test for trend is the statistical analysis the authors used to confirm that the change is statistically significant.
- Factors that may explain the apparent increase: Changes in the completeness and accuracy of clinical coding may be at least in part responsible for the apparent rise. The threshold for

admission may have altered between 1991 and 1995 leading to a greater tendency to admit cases which, earlier may have been managed in A&E units or in general practice. Completeness and accuracy of clinical coding could be better, leading to fewer deaths and more discharges.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Good candidates might note that rates are extremely low, and a better test than a chi-square test for trend would be a Poisson regression.
- Anaphylaxis is not a specific disease, rather it is a common pathway for the clinical manifestation of allergy to many possible antigenic substances. This is shown by the largest group of cases being unclassified - i.e. no incriminating antigenic substance was identified. This could also call into question the accuracy of the diagnosis.
- A lower threshold as a possible explanation of the apparent rise could be examined by studying the age and sex distribution of the cases and whether there was any geographical clustering.

### Comments

The majority of candidates chose to tackle this question. While most managed a reasonable answer, only a few candidates gave an outstanding answer.

A number of candidates failed to notice that data of this nature (counts of a rare or infrequent occurrence, expressed also as rates) do not behave as continuous variables and consequently suggested wholly inappropriate statistical tests such as analysis of variance and t tests.

There was an ambiguity in the question in that the annotation of the chart did not make it clear that the rate was expressed per 100,000 discharges. Some candidates took the common sense approach of stating their assumption that it was per 100,000 population (it was in fact per 100,000 discharges), and proceeded to answer the question on this basis. They were not penalised.

Most candidates appeared to understand the possible explanations for the apparent rise in the incidence of anaphylaxis but many answers suffered from a lack of structure. Those who gave a well structured answer, even if it was brief, earned a higher mark. A few candidates were misled into offering biological explanations why there may have been a real increase in incidence of anaphylaxis

### Question 6

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

- **DALYs.** The DALY (disability-adjusted life year) measure combines the (estimated) number of life years lost due to premature death and the number of years lived with disability using a set of disease specific empirical weights to value the level of disability following standardised methods. These were derived from the Global Burden of Disease (GBD) Study which provided quantitative, internally consistent estimates of the burden of disease, including non-fatal outcomes, attributable to 107 causes, per sex, for different age groups and per region in the world for 1990.
- **PYLL.** This measure attempts to quantify the potential years of life lost by looking at average age of death from conditions compared to average life expectancy
- **SF-36** (Medical Outcomes Study Short Form 36) is a self-completion questionnaire consisting of 36 questions across eight domains (physical functioning, role physical, bodily pain, general health perception, energy/vitality, social functioning, role emotional, and mental health). It is usually

used to provide an eight-item profile of scores across the range of health domains, but summary scores are sometimes used.

- b) For cervical cancer, PYLL may be quite high as deaths although infrequent can occur at a young age. For low back pain, the condition has a low mortality but high prevalence so PYLL will be low, but population SF36 scores will be high, and DALYs will be moderate. For coronary heart disease, all three indicators are likely to record a significant burden on population health.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- The SF-36 also exists in shorter forms: the SF-20, SF-12 and SF-6.
- UK norms exist for the SF-36.
- A well-structured answer illustrating the importance of understanding how different measures of health status are derived and applied to influence health policy.

### Comments

In general this question was answered reasonably well. A number of candidates failed to demonstrate an understanding of the different methods used in assessing the burden of ill health and health status in individuals and more particularly to populations. The factual knowledge about the theoretical underpinning and practical development of DALYs and its approach to combining morbidity and mortality was weak in many cases. Some candidates failed to demonstrate familiarity with the SF36, a common tool for measuring health status.

Most candidates were able to give some indication of how the different measures would perform differently in different conditions, although a number were weak on the epidemiology of cervical cancer and unsure of how it would relate to the different measures.

### Question 7

*Most of the following points would be required for a pass.*

The rheumatologists agree when both decisions are the same - in this case 72/100 both present and 12/100 both absent so agreement is 0.84.

Agreement can arise due to true agreement or chance agreement (such as by tossing two coins). Statistical analysis needs to distinguish between the two - the test used is the kappa statistic. This compares the proportion of agreement with the proportion expected by chance alone. Since both observers judged 72% to have the sign the proportion of agreement that would be expected by chance alone for positives is  $0.72 \times 0.72 = 0.52$ , and  $(0.2 \times 0.2) 0.04$  for negatives to give 0.56 total agreement by chance.

The kappa statistic is the extra amount of agreement over chance divided by the maximum amount of such agreement which could theoretically occur ( $= 0.84 - 0.56 / 1 - 0.56$ ) or  $(0.28 / 0.56) = 0.5$ .

Values of kappa usually lie between 0 and 1 with 0 indicating only chance agreement and 1 perfect agreement. Higher values of kappa indicate better agreement.

The main sources of disagreement are within-and between-observer disagreement. Within-observer disagreement may explain an apparent between-observer disagreement.

*The following points would improve an answer to good or very good.*

The kappa statistic depends on the prevalence of the attribute being measured with lower kappa values in higher prevalence situations as agreement by chance is more likely.

Landis and Koch suggested the following values for Kappa:

Value of k	Strength of agreement
<0	Poor
0 - .20	Slight
.21 - .4	Fair
.41 - .6	Moderate
.61 - .8	Substantial
.81 - 1.00	Almost perfect

Systematic bias between observers can be assessed by comparing of the two discordant cells which should be symmetrical if there is no bias (as in this case). This can be tested by the McNemar test. The kappa test can be extended to more than the 2x2 situation.

### Comments

This question was attempted by half of the candidates. Overall, it was not well answered and only one third of the candidates reached a pass mark. Quite a number of candidates did not mention the kappa statistic and made inappropriate comparisons using correlation or chi-squared analysis. Several candidates did not mention that some agreement by chance was possible. Very few candidates mentioned that systematic bias between observers can be evaluated using McNemar's test.

### Question 8

- Some interventions are implemented at the level of an area or organisation. Individuals within the area may all receive the same intervention *ipse facto*. A health promotion message delivered through the media may bring contamination between individuals.
- The ordinary sample size calculation, which involves estimating the difference between the intervention and the control group, may be carried out but it needs to be inflated appropriately, allowing for the interdependence of outcome data between individuals within a cluster. This involves quantifying the homogeneity of response between individuals within a cluster. The usual statistic required for this is the “intra class correlation coefficient” (ICC).
- Data arising from the individuals should be aggregated to the level of the cluster, so that the notion of statistical independence is retained. The unit of analysis is the cluster, not the individual subjects within it.

*Additional points for a good answer:*

- Good example of a cluster randomised trial, with justification for the cluster design
- The Design Effect =  $1 + (m-1) \times \rho$ , where  $\rho$  is the ICC and  $m$  is the average number of individuals within a cluster. This should be multiplied by the number required for an individual based trial, where the same benefit of the new intervention is assumed.
- Aggregated data (even if derived from binary outcomes measured on individuals) may be analysed using a two-sample t test.
- If outcome data are available at the individual level, and covariates are available at both the individual and the cluster level, the benefit of the intervention may be analysed using a multilevel model with appropriate adjustments for the covariates.

## Comments

The answers to this question were of variable quality. Most candidates answered part (a) sensibly, but few were aware of the analytic issues. Hardly any candidates mentioned the intra-cluster correlation, or the "Design Effect". Answers to part (b) tended only to mention issues pertaining to sample size calculation for individual randomisation, and did not mention special issues for cluster trials.

A number of accessible papers have been written in the British Medical Journal on this subject; for example Okoumunne *et al*, 1999 (Vol 319, pp376-9). Statistics notes by Sally Kerry and Martin Bland in the BMJ (Vol 316, p1455, p549, p54; Vol 315 p600) have also been written.

## PAPER IIB

### Question 1

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

- Colorectal cancer is a common disease – it affects 1 in 50 people during their life. Predominantly older people. Need to define an affected individual e.g. 3 adenomatous polyps, colorectal cancer, an HNPCC-related cancer, one adenomatous polyp in someone under 60 years if it exceeds 10mm or is villous or secretory dysplastic.
- Science of the genetics is changing rapidly
- Evidence of effectiveness and cost-effectiveness of interventions needs to be clear
- Practicalities of referral for genetic advice or endoscopic screening need to be considered
- There is rarely a clear physical sign e.g. multiple polyps in familial adenomatous polyposis. In the absence of other signs, family history becomes the only tool to identify those at higher risk. There can be a clear pattern of inheritance e.g. hereditary non-polyposis colon cancer (HNPCC), but more commonly family history gives a rather crude estimate of risk due to genetic and environmental interaction. In addition as colorectal cancer is a common disease, lots of families will have a positive history without being a particularly high risk, and lots of people at high risk will not have a positive family history (an individual may have died young from another condition).
- Purpose of family history is for accurate risk assessment, effective genetic counselling and appropriate medical follow up. The worrying features in a family history include: cancer in more than two relatives, early age of onset, multiple primary tumours, bilateral or multiple rare cancers, evidence of autosomal dominant inheritance. Therefore the criteria selected in the question are a reasonable starting point for further epidemiological and economic considerations. However the risk groups need to be categorised as high, medium or low, with different management strategies. There is no national policy.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- One in 5 colorectal cancer patients have a close relative with colorectal cancer (RR 2 – 3)
- Relative risk increases with increasing number of affected relatives and decreasing age of onset in relatives. Name the rare genetic syndromes which have a high risk (>15)
- Consider absolute risk.
- Ethics.

### Comments

The candidates scoring the better marks were able to discuss the level of increased risk associated with positive family histories, and to discuss the other conditions predisposing to colorectal cancer. The question expected some discussion of this and whether the service would be offered to the relatives of newly diagnosed cases or applied to the population in general. Many candidates launched into the criteria for evaluating a screening program without fully considering the disease under question, or the five listed family history criteria. Candidates were expected to demonstrate knowledge about the family history of colorectal cancer, and associated syndromes.

### Question 2

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

- Brief definition of diabetes mellitus; common problem affecting 2% of the population; type 1 insulin dependent normally starting in childhood or early adult life; incidence in children rising; symptoms obvious and management straightforward; type 2 associated with obesity and middle to older age; more insidious in onset; can present with complications; complex management problem; more common in Asian communities; complex heredity; knowledge of main complications (renal failure, retinopathy, vasculitis, neuropathy, iatrogenic)
- Measures of diabetic health and their limitations; routine and non routine sources of information; difficulties in obtaining health status measures; limitations of easily available information (e.g. mortality); measures of monitoring diabetic morbidity; access to primary care information; use of registers
- Prevention strategies limited; limitations of any population screening measures; use of opportunistic testing in those at high risk (e.g. antenatal, elderly, obese); prevention of complications a key objective of care; retinopathy screening; annual checks; urinalysis; foot care
- Treatment strategies; knowledge of range of treatment services available; primary and secondary care; concept of shared care arrangements; links with obstetric, renal, vascular, ophthalmic professionals; relative effectiveness and costs; difficulties in co-ordination
- Proper description of a defined population and practical points in relation to implementation depending on the population under discussion (e.g. elderly, Asian community); to include evaluation and audit; role of Local Diabetic Services Advisory Groups; integration with service planning processes

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Understanding of national priorities
- Use of proactive self help groups
- Limitations of research evidence in relation to preventive services

**Comments**

This question was generally answered quite well. Most candidates were able to give a lucid account of the nature of diabetes mellitus and its main risk factors. Most people described well the range of preventive and treatment strategies that need to be put in place for this condition. Stronger candidates put particular emphasis on the work required within their own specifically defined population, whereas weaker ones just listed the range of activity necessary.

Some people did not appreciate the difficulties of co-ordinating the range of action needed at local level, whereas stronger candidates explained well the role of the individual diabetic, and their interaction with local services and self help groups in a sensible manner. Only a few candidates were able to discuss well the costs and benefits of retinopathy screening; a small number did not even mention this issue!

**Question 3**

Distinction between long and short term impact

Positive Effects:

Impact on poor health due to poverty, inability to buy food, or via increasing choice via access to healthy foods.

Opportunity to be employed in less risky/health-threatening work

Impact on service provision – indigenous population could benefit from facilities introduced for incoming workers/tourists

Negative Effects:

Pollution – immediate impact and effect on future generations

Loss of land for agricultural use – which may lead to greater reliance on processed foods

Potential for spread of infection – including sexually transmitted diseases – through introduction of new strains

Potential for exploitation of indigenous population – e.g. as sex workers

Impact on traditional culture/values – especially re. morality and raising children.

*Additional points:*

- Quality of life – pluses and minuses.
- Impact of the speed of change.
- Unlikely that everyone would benefit – potential for widening of the gap between those who become involved in new earning opportunities and those who do not.
- Broadening of the genetic pool through inter-marriage.

### **Comments**

Overall, answers to this question were disappointing. This was surprising in particular because the issue is often the subject of national (and international) political debate and is frequently reported in the national press. Hardly any candidates distinguished between short- and long-term implications of increased economic prosperity and there was little attention paid to cultural issues such as the impact on traditional values. Several answers concentrated exclusively on the positive impact of increased economic prosperity. However, some of the better answers did raise several points not included in the key points, such as the influx of immigrant workers, globalisation, safety issues and increased traffic hazards. Some candidates had ignored the question completely and had instead responded with an answer on ‘how to do health impact assessments’.

### **Question 4**

Number of people received into custody in any year is large.

Prisoners may belong to a ‘hard to reach’ group, and are at risk of re-offending. Prisoners may have primary care needs similar to those of the wider community but some health needs are untypical - they have a disproportionately high incidence of mental health problems, heavy alcohol use and drug misuse. They are also at greater risk of contracting communicable diseases such as Hepatitis B/C. Anxiety, depression and psychotic disorders common. Also suicides and incidents of deliberate self harm. The constraints of the prison environment to provide care may exacerbate health and social problems.

High proportion from socio-economically deprived backgrounds - an over-representation of unemployed and undereducated. Homelessness. Poor childhood experiences, with a high proportion having been in local authority care. Experience of stressful life events. Domestic violence especially relevant to women. Prisoners and their families may suffer victimisation and stigma. Families may reflect the same socio-economic disadvantage and the problems of separation from the prisoner.

Most prisoners are a transient population and return to the wider community with their social and health problems.

Increasing recognition being given to appropriate health needs assessment within the prison, with obvious advantages to the individual, family and community of such needs being resolved. May require the prison service responsible for custody and rehabilitation and health and social services available to the wider community to work together to meet the needs of prisoners and their families..

Socio-economic rehabilitation and rehabilitation of the prisoner within the family and the wider community needs special consideration.

*The following are additional points which might improve the answer to “good” or “excellent”:*

Blacks over-represented in prisons (10%). Need for better understanding of the basis for this and the specific health and social issues relating to ethnic minority prisoners.

Understanding of the organisation of prison health care (a mixture of directly employed prison health service and NHS facilities) and the need for better partnerships to develop a better understanding of “how to return to the community” and to avoid re-offending.

### **Comments**

The answers to question 4 were generally of a higher standard than those to question 3. Many candidates demonstrated a reasonable understanding of the health and social needs of prisoners, although the relevance of these needs to the wider community was less well discussed. However, many answers did not address the needs of prisoners' families or those of ethnic minority prisoners or women prisoners. Another omission in many of the answers was discussion of behaviour in prison - particularly continued IV drug use and implications for needle-sharing. Nearly all candidates highlighted the social class backgrounds of prisoners and how this impacted on health prior to imprisonment. Most also discussed HIV/AIDS, tuberculosis and Hepatitis C. The better answers distinguished between the issues affecting different types of prisoner - e.g. those on remand and those with long and short sentences. Some answers also raised important issues such as dental health care needs and the lack of provision for exercise, which were not included in the key points. The best answers included a good description of prisoners' mental health needs, and the needs of women prisoners.

### **Question 5**

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

- Define scope e.g. health service or beyond
- Method to identify issues from different areas e.g. national, local health service, local non health service
- Method to prioritise including considerations such as: size of the problem; are there effective interventions? can progress or health gain be measured? are interventions cost effective?
- Whose views to consider
- How many issues to include

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Need to use the process of identifying the issues etc to gain wide commitment to implementing the final programme

### **Comments**

Relatively few candidates answered this question. In general, those that did answered it well.

### Question 6

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

- 'Inequalities in health' must be defined
- Evidence must be presented covering areas such as:
  - Occupational social class
  - Gender, age, deprivation
  - Ethnicity, accessibility
  - Health (as well as ill health)
- Joint working examples between agencies such as:
  - Education
  - Transport
  - Social Services
  - Voluntary organisations
  - Health Care providers
  - PoliticiansIllustrating the benefits in terms of (for example):
  - Information
  - Skills
  - Resources
  - Change
- Obstacles include:
  - Lack of political will
  - Differing organisational priorities
  - Limited resources
  - Poor leadership
  - Differing organisational cultures

### Comments

Most candidates answered this question adequately with a good balance between the different parts of the question. In general, those doing poorly failed to answer all the components of the question or merely listed non Health Service organisations which might contribute to health rather than discussing the benefits of joint working. Not all candidates provided definitions, for example, for the scope of 'health' and those that did gained marks.

### Question 7

- Start with local and national (international) data on teenage births and terminations
- Analyse these by locality
- Review the evidence on effective interventions
- Review existing provision
- Develop a development plan – sharing an understanding of the likely complexity of the issue and difficulty of demonstrating short term change

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Demonstrated an understanding that issues surrounding sexual health are socially, morally and politically sensitive
- Made reference to specific studies or country examples
- Committed themselves to programme evaluation.

### Comments

The answers were generally well structured, with a comparative review of the local situation followed by a development plan and its evaluation. However, there was widespread ignorance of the relevant statistical indicators that are derivable from the various data sources. Too many candidates confined their plan action to the structures of stakeholders to be established, without addressing the specific actions these structures were meant to facilitate. Better candidates acknowledged the need to base approaches on an analysis of published evidence and referred to the importance of programme evaluation and the political and religious sensitivities surrounding this issue.

### Question 8

- Measure trend in demand; compare with similar and national situations
- Look for area/population group concentration of demand
- Identify possible associated changes in service - closure of neighbouring hospitals; effect of introducing (or not introducing) telephone triage at first point of contact; sudden changes in demographic structure; impact of changes in other rescue services; etc.
- Assess appropriateness of attendance in terms of investigations used and treatment given
- Weigh up cost of attendances against cost of alternative methods of management
- Suggest any remedial action needed; discuss barriers and how they might be overcome.
- Changes to primary health care.
- Public expectation of health care changing societal structures.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Demonstrate familiarity with examples from international literature of successful demand management; i.e. quote the evidence base.

### Comments

Most candidates correctly identified the three main aspects of this question – understanding the reasons for the increase in demand – suggesting changes to the structure and processes of the system to improve the situation – and describing how desirable changes might be managed.

Analysis of the situation was generally competent, and embraced pre-hospital and in-hospital elements, and differentiated real and perceived (apparent) increases. Solutions offered were on the

whole rational. The strategy for managing change in the organisation was usually too general. Candidates offered good theoretical frameworks but in terms which were not well applied to the specific situation of demand management. Few took the opportunity to select one particular practical problem in this broad field to illustrate in depth what impediments might be encountered and how these difficulties might be approached.

## PAPER III - UK/HK

### SECTION A

#### Question 1

##### a. Critical Appraisal

1. The trial addressed a clearly focused question.
2. Patients and practices were not recruited at random but could be said to be representative.
3. Patients were assigned to treatment at random but double-blinding were not feasible.
4. Measurements of outcome –  
Outcomes were relevant but the interpretation of the results by the authors were subjective, for instance, was it a good thing that the nurses ordered more tests and investigations? Were opportunistic screening tests cost-effective? The conclusion was not based on the results. There was no evidence that nurses' consultations could be more cost-effective.

##### b. Working Party Discussion (Hong Kong Paper - needs adaptation for UK candidates)

The results of the study are not applicable to Hong Kong for the following reasons:-

- 90% of primary health care are delivered by private general practitioners. They will not consider using nurse practitioners.
- Chinese patients would not view encounters with nurse practitioners as a proper consultation and their satisfaction level will be very low.
- There is no evidence from the study that using nurse practitioners would be 'cost-effective'.
- Training for nurse practitioners would be expensive – if the practice is not proved to be cost-effective, investing resource in training is not evidence-based.

#### Comments

Many scripts were more descriptive than analytical. Many candidates wasted time transcribing what was already written in the paper with no critique.

Critique often confined to what was said in the paper - what was NOT said (and perhaps should have been) was often ignored.

The importance of rare adverse events often not mentioned.

Only some candidates mentioned that the evidence refers to Nurse Practitioners working within teams, rather than completely autonomously.

Many candidates who failed used the terms blinding and randomisation interchangeably.

Many candidates failed to mention the current Policy context in their region/country.

Supply induced demand (as a feature of a new service) rarely mentioned.

Lack of breadth in part b).

## Question 2

### a. Critical Appraisal

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

#### Objective

To assess how long people with serious mental illness should stay in hospital. In particular, do short stays result in readmissions?

#### Methods

Systematic review of all randomised controlled trials comparing planned short hospital stay versus long hospital stay or standard care for people with serious mental illness.

Four RCTs that enrolled 628 patients.

Cochrane criteria for selection used throughout.

Outcomes measures: Relapse/readmission; deaths (suicide/all causes); lost to follow up; premature and delayed discharge; lack of improved mental state, and average length of hospital stay (although the data on the last outcome were too poor to be summated).

#### Results

Results: Patients allocated to planned short hospital stays had:

- no more readmissions (in four trials, odds ratio 0.93, 95% confidence interval 0.66 to 1.29 with no heterogeneity between trials)
- no more losses to follow up (in three trials of 404 patients, 1.09, 0.62 to 1.91 with no heterogeneity between trials)
- more successful discharges on time (in three trials of 404 patients, 0.47, 0.27 to 0.85) than patients allocated long hospital stays or standard care).

#### Bias

Many exclusion criteria. Only 20-65 year olds without learning disorders, organic brain disease, and drug and alcohol abuse were included. None of the raters in any of the trials was blinded.

Overall length of care was unclear as rarely was length of stay for *previous* admissions available

#### Generalisability

Only four trials were eventually selected (out of over 200) and these were from only two research groups (one in the USA and one in the UK). Three of the four papers reviewed came from the USA and were over 20 years old. This is well before the adoption of both modern diagnostic classifications (DSM/ICD) and modern treatments methods.

#### Discussion

Then overall strength of the evidence in this paper is not strong. Despite this, there was no evidence that planned short hospital stays encourage a “revolving door” pattern of care for people with serious mental illness. In some instances patients who had planned short stay did better than those who had less structured longer stays.

## **b) Briefing paper for the next Executive Team meeting**

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

The effectiveness of care within mental hospitals is important to patients, carers, and policy makers. The longer term policy of care in the community should not distract us from providing the highest possible in-patient care for those who need it.

Inpatient costs use around 80% of mental health resources, although the evidence base for these of these resources is poor.

The evidence that exists suggests that planned short hospital stays seem to be as successful, or more so, than standard care. Patients experienced no more readmissions and no more losses to follow up and were more likely to be discharged on time than those receiving standard care.

An important determinant of overall outcome seems to be the degree to which the stay is planned, rather than simply its length.

The advantage of a shorter stay may be related to the reduced risks of institutionalisation.

It is still not clear exactly the most effective and efficient way to organise hospital care of seriously mentally ill patients. Considering the resources spent in this area, it is particularly worthy of further research. Despite the fact that three of the four papers reviewed came from the USA and were over 20 years old, the importance of the question remains.

Policy implications: if length of stay is going to be continually reduced on the basis of cost and avoidance of institutionalisation, there is little evidence to support it. However, there is no evidence that it actively causes poorer outcomes. Such a policy should be conducted in a strict evaluative way.

### **Comments**

Most candidates failed to address what was NOT mentioned in the paper (see key points).

Many candidates very general, vague, discursive. Few were specific, committing themselves to addressing particular strengths and weaknesses in the methodology and conclusions.

Many candidates did not refer to perhaps the most significant conclusion of the paper i.e. that the PLANNING of the hospital stay appeared to be the most important feature of the intervention.

Little mention of policy environment in part b).

## **SECTION B**

### **Question 3**

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

- a. The aim of such a service would be:-
- To provide accessible, effective and appropriate smoking cessation services
  - To target at risk groups such as disadvantaged adults, pregnant women, young people
  - To contribute to the aims and targets set out in the White Paper on Tobacco (Smoking Kills) which are to decrease smoking in children (aimed to halt the rise) decrease adult smoking in

all social classes and decrease the percentage of women who smoke during pregnancy (to improve health in expectant mothers and their families)

- b. It has been shown that there are highly cost effective ways to help people stop smoking – Cochrane collaboration and Thorax publications. When cessation rates of people that have interventions are compared with controls, estimates are.

Intervention Element	Increase in % of smokers abstinent for 6 months or longer
Very brief advice to stop (3 min) by clinician versus no advice	2
Brief advice to stop (up to 10 min) by clinician versus no advice	3
Adding NRT to brief advice versus brief advice alone or brief advice plus placebo	6
Intensive support (e.g. smokers' clinic) versus no intervention	8
Intensive support plus NRT versus intensive support plus placebo	8
Cessation advice and support for hospital patients versus no support	5
Cessation advice and support for pregnant smokers versus usual care or no intervention	7

Nicotine placement therapy has been shown to help smokers stop even if they have tried it before. Clinical trials suggest that NRT doubles the chance of success of smokers wishing to stop. For the best results it should be used in sufficient quantities for long enough. Few people become addicted to NRT and although it provides the nicotine it does not contain the tar and carbon monoxide that tobacco does.

- c. It has been suggested that the most cost effective way of providing such a service would be a tiered service (HSC 1999/087) with the following three tiers:-
1. **Brief interventions** by GPs or other health professionals performed as part of the normal course of duties
    - Smoking cessation advice would become a routine part of healthcare
    - Healthcare workers would therefore be expected to identify smokers and give brief advice
    - Would require some training.
  2. **Intermediate interventions** provided on a one to one basis by smoking cessation advisers or practitioners.
    - Advisers and practitioners would require training and probably payment
    - Could include practice nurses, GPs, nurse councillors, pharmacists or advisers working in community centres.
    - Would need to be available in primary and secondary care settings
    - Should target those high risk groups such as pregnant women, children, disadvantaged groups and those with conditions that relate to conditions such as heart disease, respiratory disease and vascular disease.
  3. **Specialist smoking cessation clinics/services**
    - Run by specialists who would have received training for the role
    - To be evidenced based and offer intensive treatment over the course of five to six weeks including the use of nicotine replacement therapy
    - Could be run in clinical or community settings.
    - Would co-ordinate the whole service, training and supporting smoking cessation advisers and the education of other staff. Data collection, monitoring and evaluation.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Details of White Paper targets
- Discussion of cost effectiveness
- Debate relating to NRT and prescriptions
- The details in b) re interventions and percentage increase of smokers abstinent would not be expected for a pass and would be additional
- HK candidates would not be expected to know of UK circulars/white papers but would be expected to be aware of the issues contained in them, as they are based on accepted evidence.

## Comments

This was a popular question and whilst there were some very good answers, many were weak. Knowledge of effective interventions was generally good although often not focused on smoking cessation. Although candidates were not penalised for showing an awareness of the broader issues the question was about smoking cessation services and NOT about producing a broad strategy to decrease deaths due to smoking. Those candidates that focused on the question generally produced good answers.

### (Comments on Hong Kong candidates)

A few candidates spent too much time describing the adverse health effects of smoking. Few gave quantified effects of different smoking cessation methods (differences in quitting rate comparing intervention and control groups), citing recent reviews on the evidence from randomised trials. Some did not understand the meaning of "tiered" approach. This question specifically asked for cessation services but a few candidates spent too much effort on other tobacco control measures.

## Question 4 (UK paper)

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

- The paper should be written in an appropriate style and language suitable for the Health Authority.
- A description of the background to this topic, e.g. the debate about whether this service should be funded by the NHS, the Effectiveness Health Care Bulletin, Department of Health Review, the ethical issues.
- An account of the issues facing the NHS with regard to NHS funding of sub-fertility services, i.e. high levels of demand for treatment that is in excess of available resources, the difficulties of developing and applying eligibility criteria, the debate regarding whether the benefits are predominantly health or social.
- A description of the need and likely demand for infertility services within the district, including a short description of the epidemiology of sub-fertility.
- A description of the main treatments that are available for sub-fertility, i.e. ovulation induction, tubal surgery, intra-uterine insemination, IVF, ICSI.
- An estimate of the cost and of the effectiveness of each treatment, including the risks of treatment, i.e. multiple births, high perinatal mortality.
- A critique of the Authority's current policy, e.g. the relatively low cost-effectiveness of funding diagnostic services only; the likely public/political demands for change.
- An outline of the options that are available to the Health Authority; arguments in favour of the preferred option should be presented.

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

- If all of the above points were covered this would represent a good answer; an excellent answer would include more detail.

### Comments

This was not a popular question but most of those that answered it made a good attempt. Answers were weakest in discussing the debate over whether the services should be funded by the NHS, the cost-effectiveness of the current HA policy and the likely need and demand for the services. The options available for the HA were generally well described.

### Question 4 (HK Paper)

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

- Potential membership of working group – other members of the organisation, officers involved in GM food in the Food and Environmental Hygiene Department, independent scientists in the relevant biology of agriculture and genetic science, overseas consultants, representatives from consumers or consumers’ organisation, environmentalist organisations.
- Careful consideration on whether people from other organisations should participate as individuals or as representatives of the organisations. To ensure that the members can really work together.
- Clear and pragmatic terms of reference for the working group.
- Action plan should include consultation with people and organisations within Hong Kong and outside Hong Kong, particularly countries which have some experience in handling the issue, review of the controversial issues and the available literature, discussion forum for members or others concerned and what areas should the recommendations cover.
- Recommendations should be evidence based as much as possible including measures to collect more evidence and to monitor the situation.
- Public health should be the primary consideration, although political, economic and other issues need to be addressed.
- A time schedule and a structure (e.g. sub-committees) for the working group.
- Consultation and dissemination plan for the Working Group Report.

*The following are additional points which might improve the answer to “good” or “excellent”:*

- Awareness of the sensitivity of the issue and the current debates.
- Potential problems of conflicts of interests and opinions that the working group cannot function.
- How conflicts can be handled or resolved – e.g. the report can contain majority and minority views.
- Public health priorities may conflict with other priorities in government and other organisations, such as trade and foreign relations.
- How the Working Group or its parent organisation should function in this issue after the Working Group has completed its tasks.

### Comments

A few candidates spent too much time explaining GM food and did not answer the question directly. Several did not realise that the working group is just a non-governmental group and the limitations on how much the group could do. To give a good answer, the targets and actions proposed must be realistic and practicable for such a group. The question does not require candidates to provide solutions to all the problems and controversies, but does require understanding of the complexity of the matter and a sensible approach.

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