

DIPLOMA & PART I MEMBERSHIP EXAMINATION

JANUARY 1999 EXAMINATION PAPER

PAPER I

COMMUNICABLE DISEASE AND HEALTH INFORMATION

1. Write short notes on two of the following three:

- a) **Campylobacter Enteritis**
- b) **E. Coli 0157**
- c) **Legionnaire's disease.**

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

Candidates are expected to show knowledge of the following, giving a brief presentation:

- identification
- causative organism
- incidence (approximate)
- reservoirs of human importance
- how transmitted
- methods of control including prevention

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

- well structured answers
- comprehensive answers (within time allowed)
- emphasis on what is important and what is less so

Comments

Generally candidates answered this question satisfactorily. Most gave structured answers but some candidates did not relate structure to the specific question asked. Key associations were often missed (e.g. **campylobacter** and poultry, **E. Coli 0157** and beef). Areas for improvement are recognition of the importance of the disease and more attention to control measures.

2. What data can be used to assess the health care needs of either a primary care practice of 10,000 people or a population of 100,000 people?

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

a) a primary care practice of 10,000 people

Automatically collected data:	Data that may be available:
<ul style="list-style-type: none">• PACT (prescribing data)• Patient registration• Screening target registers• Immunisation target registers	<ul style="list-style-type: none">• Mental health register• Death register• Morbidity register• Chronic disease management (screening) data

<ul style="list-style-type: none"> • Elderly review screening data • Maternity payment data • Patient records • Social deprivation payment scores 	<ul style="list-style-type: none"> • New patient registration screening data • Minor surgery claims data • Child health surveillance data • Family networks data • Repeat prescribing system • Computer held records • Clinical audit data • Referral/investigation volume (fund-holding invoices) • Referral letter volume and mix • 'Sick note' records
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b) a population of 100,000 people

Automatically collected data:	Data that may be available:
<ul style="list-style-type: none"> • Office of National Statistics (ONS) census/General Household Survey data • Health Authority patient registration data • Registry of births and deaths • Social benefits (Benefits Agency) data • Nursing home/residential home registration data • At-risk registers • Mental health register • Electoral roll • Communicable disease surveillance records • Chronic Sick and Disabled register • Dental records (eg. DMF data) • Eye testing records (ie. Glaucoma, diabetes) • Child health surveillance records • Sexually Transmitted Disease (STD) notifications • Abortion notifications 	<ul style="list-style-type: none"> • Hospital admissions and outpatients activity - volume and mix • Screening programmes (eg. antenatal HIV testing, Neonatal PKU testing) • Local cancer registry • Local drug misuse database • Local diabetic register • Local Health and Safety Executive reports • Incidental local health and social science research data • Environmental Health Office records/reports • Absenteeism records (schools and local major industry) • Statutory sick pay records • Maternity benefit payments • School registers • Pre-school childcare registration records • Congenital malformation notifications

Candidates should know most of the sources of automatically recorded data, particularly where statutorily required.

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

Candidates who also demonstrate awareness of other potential useful sources.

Comments

Sometimes very little idea of what data is available. Many spent too much time on how to use the data and how to interpret it. This was not asked for.

CHRONIC DISEASE EPIDEMIOLOGY AND ENVIRONMENTAL HEALTH STATISTICS

3. A test for a disease has a sensitivity of 90% and a specificity of 70%.

a) Patient A comes from a population group in which the prevalence of the disease is 5%. For patient A, the test is positive. What is the probability that A has the disease?

b) Patient B comes from the same population group. For patient B, the test is negative. What is the probability that B has the disease?

In your view, could this test be suitable for population screening of this disease? Justify your answer in concise notes.

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

From the data, we construct a table, for 1000 representative people in the population group:

	Test+	Test-	Total
Disease+	45	5	50
Disease-	285	665	950
total	330	670	1000

(Using the facts that 90% of the 50 with disease will test positive, and 70% of the 950 without disease will test negative).

The probability for patient A is $45/330 = 15/110 = 3/22$, approximately 0.136.

The probability for patient B is $5/670 = 1/134$, approximately 0.007.

Either "yes" or "no" could be justified, depending on associated circumstances:

- standard points about screening tests: existence of effective treatment for disease detected, importance of health problem, acceptability of test, overall cost benefit.
- personal and health consequences for individuals of false positive (and false negative) test results: as shown, over 86% of those tested positive will turn out not to have the disease, and may suffer anxiety and additional interventions while this is established.
- organisation and management (and opportunity cost) of overall screening programme within which the test is just one component.

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

- Depends on the precise population group designated to be screened (for example, age range).
- Explicit mention of positive and negative predictive values.
- Mention or demonstration of sensitivity of predictive values to precision of sensitivity and specificity, which are often not known accurately.

Comments

Disappointingly few candidates could turn the concrete given data into a simple two by two table, despite in some cases having a grasp of the theoretical framework. Those who did found little difficulty with the question, whereas those who attempted to apply bayesian ideas frequently came unstuck, usually by being unclear about the distinction between probability and odds. Part (c) was generally answered well, although often the impact of false positive results was not elaborated.

4. Write short notes on two of the following three:

- a) Meta-analyses of observational studies**
- b) Measurement errors in epidemiological studies**
- c) Community based intervention studies.**

a) Meta-analyses of observational studies

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

- Brief definition of meta-analysis: statistical analysis of a collection of studies.
- Observational studies: non-experimental studies, mainly case control and cohort studies.
- Role of meta-analyses: could be synthetic (estimation of overall or average effect across studies) or analytic (identification and estimation of differences among study-specific effects).
- Steps of a meta-analysis: specifying study variables (exposure, outcome, confounders, intermediates, effect modifiers), identifying studies, quantifying effects, examining heterogeneity between studies.

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

- Pointing out that use of meta-analyses in observational studies is more controversial than in intervention studies
- Description of regression models, statistical adjustment for confounding, selection bias and misclassification
- Mentions statistical reanalysis of individual studies using raw data if available.

b) Measurement errors in epidemiological studies

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

- Some measurement or classification errors are almost inevitable in epidemiological studies.
- Could affect exposure, outcome and confounders.
- Explain differential (classification error depends on the values of other variables) vs nondifferential (error does not depend on other variables). An example would be useful in illustrating the difference.
- The direction of bias arising from differential misclassification is often unpredictable. Can give overestimated or underestimated effects.
- Nondifferential or random misclassification generally results in bias towards the null value.
- Nondifferential misclassification of confounders results in uncontrolled or residual confounding (thus bias can be in either direction).
- Description of ways to reduce errors of measurement of exposure and outcome.

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

- Mentions statistical methods of dealing with measurement errors

c) Community based intervention studies

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

- Definition: trials or experiments in which the units of study are entire communities instead of individuals
- Mentions at least two of the following reasons or need for such studies: some interventions cannot be delivered at an individual level without contaminating the control group; can be less costly per person; many behaviours are socially related; environmental changes may be more effective than trying to modify individual behaviours.
- Examples: fluoridation trial, COMMIT, North Karelia Project.
- Require control as well as intervention communities.
- Allocation to treatment groups by randomisation, pairing or matching.
- Outcome information can be collected at either individual or community level.
- Sample size calculation needs to take into account the fact that individuals within clusters are more similar.

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

- Mentions more than two points in the rationale for such studies
- Description of intraclass correlation and design effect in sample size estimation
- Mentions the options of cohort sampling and repeated cross section sampling in subject selection
- Gives good examples of such studies

Comments

In (a), too few candidates addressed the particular issues concerning observational studies. The other two parts were generally answered fairly well, although many candidates did not interpret (c) as referring to studies where the study unit is a population.

DISEASE PREVENTION AND ORGANISATION & MANAGEMENT

5. Write short notes on the epidemiology of colorectal cancer in relation to screening for the condition.

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

- Structured answer based on Principles of Screening (Wilson & Junger 1968)
- Natural history. Example headings might include: incidence and mortality
- Natural history, tests available, diagnostic test, treatments for screen detected disease, evidence of effectiveness of screening.

Screening:

- Specific examination of well individuals to identify an existing illness at a pre-symptomatic stage or to identify susceptibility to a specific disease.

Importance of problems:

- Colorectal cancer accounts for approx. 13% of newly diagnosed malignancies in males and females. It is third commonest cancer diagnosis in females and second in males. It is the second commonest cause of cancer-related death in the UK.

Natural history:

- There appear to be two distinctly genetically influenced processes - the first of adenoma production (eg. the activated protein C (APC) locus, the second the transition to invasive adenocarcinoma (eg. loss of tumour suppresser gene at the p.53 locus). Some patients with colorectal cancer come from high risk groups- about 10% have genetic predisposition - approx a tenth (1%) inherited cancer, for example, familial adenomatous polyposis (FAP) the remainder familial cancers - best characterised hereditary non polyposis colorectal cancer (HNPCC) or the increased risk posed by adenomatous polyps. Risk of colorectal cancer increases with age, diet low in vegetables (possibly high dietary total fat, or saturated fat or obesity), lack of physical exercise, cigarette smoking and bowel diseases such as ulcerative colitis.

Cost effective test:

- For normal risk populations, age approx 45-75, 2 trials of screening by faecal occult blood (FOB) published in 1996, (one UK, one Scandinavian) showed earlier diagnosis and mortality benefit; previously 5 USA trials showed earlier diagnosis, and one of these also showed mortality benefit. The sensitivity, specificity and costs of FOB tests vary depending on the specificity of the immunological test and whether specimens are hydrated. Screening frequency for FOB of annual or biannual have both been advocated. Screening by flexible sigmoidoscopy at age 55 is being evaluated in an ongoing study. High risk patients - where FAP or HNPCC are diagnosed genetic screening should be offered to first degree relatives. Taking account of age, physical status, and compliance; for FAP screening from teens by sigmoidoscopy 1-3 years and colonoscopy/barium enema every 2-3 years; for HNPCC screening by sigmoidoscopy or colonoscopy/barium enema every 2-3 years; for colonic polps colonic surveillance not more than once every 3 years have been recommended.

Effectiveness of treatment:

- The main treatment option is surgery. At present about one third of patients are admitted to surgery as emergencies and clinical outcomes are less favourable in these circumstances. Staging severity of disease is important for prognosis and decisions about optimum therapy - sometimes TMN classification is used but usually Duke's system (A. growth limited to mucosal wall; B growth beyond media propria but node negative; C. growth in local nodes; "D" distant metastases - usually liver). In cancer of the colon Dukes C or "D" chemotherapy improves survival. In rectal cancer, radiotherapy is the main proven adjuvant to surgery for Dukes C but limited data suggests additional chemotherapy may improve survival, but at the increase in toxicity and cost. In patients with Duke's B chemotherapy is considered where histology shows poor differentiation. There are several ongoing trials to determine the most effective schedules of adjuvant therapy.

Conclusions:

- Several countries have recently moved to offer screening by FOB on a pilot service basis. Issues to improve acceptability and compliance are being studied. In the UK the National Committee on Screening has issued recent advice that there should exist pilot screening services for colorectal cancer using FOB; one pilot service in Scotland, one in England. Screening at age 55 by flexible sigmoidoscopy is under study. Genetic screening to identify patients with FAP and HNPCC is at various stages of development.

Comments

This question was well answered by the majority of candidates. The subject is topical because of the recent well publicised report from the UK committee on screening. Possibly too many recent Part I exams have had a question on screening so that sensible candidates had perhaps “spotted” the topic was likely to be on the exam. Candidates were penalised, if they did not relate the epidemiology to screening principles.

6. Identify key issues for monitoring a health promotion programme.

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

Would expect detailed information to be offered under the following type of areas:

Structure:

- Good baseline information about needs obtained by validated methods eg. Epidemiological, comparative, consultative studies.
- What is the expected time course and how long will the monitoring continue?
- Are there impact or short term / intermediate outcomes which can be measured?
- Is a control group or comparison possible?
- Is it a programme where outcome evaluation is possible or will it have to be limited to process evaluation?
- Does current knowledge / resource consideration mean process evaluation is preferable to outcome evaluation?
- Does planning and implementation conform to theory?

Processes:

- Was the process of delivery of health promotion adequate? This might include community involvement, healthy alliances, quality of materials, quality of activities.

Outcomes:

- What were the intended outcomes of the programme? Were these reasonable?
- Assess outcome measures of effectiveness which will impact on health:
For example, intermediate eg. changes in knowledge, attitudes, behaviours, smoking, diet, exercise, etc, longer term eg. teenage pregnancy rates, prevalence of obesity, etc.
- Was the impact adequate? This includes whether people were aware of the programme and did key people participate or interact with the programme?

Comments

In general, this was poorly answered. Candidates did not appear to have a framework to relate this question to, and the majority of answers were wordy and diffuse. Candidates would be well advised to use actual examples to highlight points they wish to make. It seemed clear that most candidates had more information and thoughts about “implementing” health promotion than about “monitoring” it.

SOCIOLOGY AND PSYCHOLOGY & SOCIAL POLICY

7. Write short notes on professional self regulation from a sociological viewpoint.

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

1. **Background.** The concept of professionalisation and the historical fight by the medical profession for a professional monopoly.
2. **Who are the professions?** Within health care, medicine is the oldest and best established profession but other groupings have established their professional status while still others seek it.
3. **Advantages to being a profession.** The monopoly brings financial advantage and power.
4. **Self regulation is seen as a key component of professionalisation.**
5. **Professionalisation as a source of power within society.**
6. **Professions have power over:**
 - criteria for recruitment
 - content of training
 - terms and content of work
 - who their patients should be (the object of work)
 - tools of their profession (drugs, equipment etc)
 - means of labour (premises)
 - amount and rate of remuneration
7. **These elements make up professional autonomy**
8. **Rise in countering forces to professionalism have been identified**

These are:

 - consumerism
 - managerialism
 - and, arguably, a more scientific perspective which leads to evidence based medicine that might be called: scientificism.

As a consequence, the medical profession control the elements of autonomy listed above.

Key authors include Goode and Freidson

Most students would be expected to cover points 2-7.

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

Points 1 and 8 covered.

Comments

Most candidates understood the concept of professionalism and discussed it well. The main weakness in some answers was a failure to relate the discussion to the sociological literature and quote relevant authors.

8. What are the obstacles to implementing clinical guidelines?

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

- Practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care in specific clinical circumstances. They can change clinical practice and affect patient outcome but their effectiveness depends on how they are developed, implemented and monitored.
- Guidelines are more likely to be effective if they take into account local circumstances, are disseminated by an active educational interventions, and implemented by patient specific reminders relating directly to professional activity. They should be firmly based on reliable evidence of clinical and cost effectiveness and recommendations should be explicitly linked to the evidence.
- Obstacles to implementation therefore include:
 - an inadequate evidence base
 - poorly structured guidelines
 - absence of local ownership through involvement in their production
 - poorly co-ordinated dissemination strategy
 - failure to link marketing of guidelines to educational initiatives
 - accessibility of guidelines when required in the clinical context
 - lack of resources from audit or academic detailing
 - professional resistance: audit, fatigue, priority overload
 - Priority should be given to the development of local guidelines when nationally produced, vigorous guidelines exist. The new National Institute of Clinical Excellence should provide these.

Comments

Most candidates answered this question satisfactorily but few excelled. Many candidates did not define the nature of clinical guidelines. Although most answers listed many obstacles as requested, few quoted evidence that relates guidelines' effectiveness to how they are developed, implemented and monitored. The tension between national development and local ownership was rarely explored. NICE was hardly mentioned!

PAPER IIA

EPIDEMIOLOGY

- 1. Describe the methods of enquiry which you could employ to examine the adverse effects of maternal smoking on the foetus and infant. Identify at least two outcomes which could be studied by each method.**

The following would be required for a pass:

At least 3 of these epidemiological studies are needed for a pass:

- *Ecological studies:*
Reproductive health and obstetric outcomes in populations with high and lower smoking rates in women of child bearing age. Problems of ecological studies.
- *Retrospective case control studies:*

Use of clinical record to assemble data bases on pregnancy outcomes in smoking, ex-smokers (who quit for pregnancy) and non-smoking mothers.

- Randomised controlled trials of smoking, quitting interventions, and maternal and foetal outcomes.
- *Retrospective and prospective cohort studies:*
Long term follow-up studies such as use of clinical records to assemble retrospective cohorts (problems of clinical record content and retrieval).
- *Animal studies:*
Biological studies on the effects of short term and chronic exposure to different components of tobacco smoke. Include effects on growth and on genetic material of foetus. Nicotine, carbon monoxide, other products plus hypoxia.
- *Biological effects:*
Nicotine versus other products of combustion.
- Purpose designed prospective studies with accurate smoking histories and complete follow-up to capture pregnancy events; outcome of delivery and health of the infant through first and subsequent years of life.

The following might improve the answer to “good” or “excellent”:

- *Calculation of relative risk for outcomes:*
Research design issues:
Comprehensive design issues: comprehensive and complete identification of characteristics which may be associated with outcomes of interest. Adjustment for confounders.
- *Confounders:*
Socio-economic group
Alcohol
Diet and nutrition
Parity and reproductive history
- *Outcomes:*
Biochemical markers of exposure in foetus (eg. thiocyanate)
Growth retardation
Prematurity
Spontaneous miscarriage
Stillbirths
Perinatal deaths
Sudden Infant Death Syndrome (SIDS)
Neonatal/infant health and growth
Respiratory morbidity
Admission of baby to hospital with acute respiratory infections
Cognitive impairment in babies

A discussion of several methods employed in observational epidemiological approaches would be required together with examples of the most common and important outcomes which would be measured.

Comments

Overall the standard was reasonable. Several candidates appeared to have “spotted” the topic of the questions, from the way in which some of them pulled in names and details of special studies and population surveys in a very structured way.

Several responses were very marginal. After discussion, the examiners tended to give benefit of the doubt; the basis for doing this was quite heterogeneous but arguably fair.

Several candidates did not produce a very good mix of both methodology and outcomes in Q1, but were compensated if one or the other was done adequately, or better. Most candidates correctly discussed the use of case control and cohort studies.

Few candidates recognised that no treatment is not the only possible comparison in a randomised controlled trial and that several trials of intensive intervention versus usual management have been undertaken. Few candidates paid sufficient attention to the problems of confounding and the ways in which these might be overcome.

Many candidates still do not use any kind of structure in formatting their responses, so they deliver a rather amorphous piece which makes work for the examiner and is unlikely to help the candidate organise information.

2. Discuss the epidemiological evidence for the health risks of being overweight in relation to possible health policy interventions.

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

- Definition of overweight
- Cohort studies linking weight to health outcomes
- Mention of effect of smoking on weight and health
- Broader policy approach to prevention of obesity
- Mention food policy in workplace, NHS, community development
- Overweight is variously defined. The most widely used definition is based on body mass index (BMI)

$$\text{BMI} = \frac{\text{weight in kilograms}}{(\text{height in metres})^2}$$

The “ideal” range is usually defined as 20-25 k/m² with more than 25-30 k/m² as overweight and >30 k/m² as obese. Different standards may apply to individuals such as elite sportsmen. BMI is not an appropriate measure for children. Other definitions are based on ratio of waist to hip circumference.

- Early studies based on insurance company data (very non representative sample) showed lowest mortality among those in “ideal range” and higher mortality among those who were below or above “ideal”. Clinical anecdote strongly supported the notion that overweight people experienced numerous health problems, restricted mobility, digestive problems, hypertension, type 2 diabetes, osteoarthritis, respiratory problems. Also overweight patient more difficult to operate on therefore more surgical complications (including wound infection etc) and more difficult to nurse. Subsequent cohort studies have confirmed increased risk associated with overweight.
- Good evidence from clinical series that many clinical problems are alleviated by weight loss eg angina, hypertension, type 2 diabetes.

- Some evidence that in the elderly being overweight is less disadvantages. Fat may protect neck of femur from fracture.
- Smokers tend to have small increase in weight on quitting but excess risk associated with smoking is greater than excess risk associated with small increase in weight.
- Prevalence of overweight and obesity is rising in UK. This is probably due to decreased physical activity without corresponding change in energy intake possibly exacerbated by increase availability of energy dense foods.
- Policy approach needs to avoid stigmatising overweight or increasing prevalence of eating disorders (anorexia nervosa and bulimia). Press and fashion tend to create quite unrealistic expectations of body shape especially in women.
- Need to emphasise positive aspects - be more physically active eat more fruit and vegetables (fruit with low energy density). Emphasise policy and environmental approaches rather than educational. Increased availability, subsidised facilities, workplace initiatives, community development approaches etc. NHS can help through attention to health of NHS workforce, increased interest of primary care workers in obesity and schemes such as exercise on prescription.
- Need to consider prevention in childhood. Promotion of healthier eating and increased physical activity through schools.

The following might improve the answer to “good” or “excellent”:

Other material mentioned in key points.

Comments

This question was generally adequately answered. Most candidates defined overweight in terms of BMI and some mentioned other definitions. The links between overweight and health were reasonably fully listed. The discussion of policy was generally weak with not enough attention to the social and physical environment aspects and too much emphasis on the individual action and education aspects.

ENVIRONMENTAL HEALTH AND COMMUNICABLE DISEASE

3. In a named country of your choice, describe how the epidemiology of meningococcal disease informs the prevention and control of the infection.

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

- Name of the country
- Description of the epidemiology of meningococcal disease:
 - morbidity
 - mortality
 - age/sex distribution
 - geographic/risk group distribution
 - seasonality/time trend
 - sporadic cases/outbreaks
 - asymptomatic carriage/mode of transmission/incubation period
 - communicability/susceptibility

- clinical/laboratory diagnosis
- infectious agent
- Prevention and control measures:
 - notifiable disease
 - vaccination
 - chemoprophylaxis
 - early treatment
 - education and training of the public and professionals
 - national and local policies
 - health service/public health service infrastructure.

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

- Structured answer, relating epidemiology to specific prevention and control measures
- Mention of relevant national policy/guidance
- Knowledge of relevant research findings
- Mention of the needs of special risk groups: asplenic, travellers
- Knowledge of the added value of enhanced surveillance systems

Comments

All but one of the 32 candidates passed, with several giving “good” answers. A good understanding of epidemiology and the principles of the prevention and control of meningococcal disease was demonstrated by most candidates, although detailed knowledge was sometimes confused or wrong. Candidates adopting a primary/secondary/tertiary and host/agent/environment approach to the prevention and control aspects respectively of their answer, and candidates who related specific elements of the epidemiology of disease to its prevention and control, scored best. Improvements in presentation (improved legibility of handwriting, underlining of key words and phrases) and evidence of planning (draft outline) of the answer would have been beneficial in some cases.

4. Define “emerging” infectious disease. Using disease specific examples, discuss the factors precipitating disease emergence or re-emergence.

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

- Definition: an infectious disease which has newly appeared in a population or has previously existed but is rapidly increasing in incidence or geographic range
- Factors (broad areas):
 - ecological changes, including economic development and land use
 - human demographics and behaviour
 - international travel and commerce
 - technology and industry
 - microbiological adaptation and change
 - breakdown in public health measures
- Disease examples:
 - Hantavirus
 - HIV / sexually transmitted diseases
 - Dengue fever
 - E. Coli O157

- bovine spongiform encephalopathy (BSE) / new variant Creutzfeldt - Jacob disease
- hepatitis C
- influenza/MDRTB/MRSA/VRE
- tuberculosis / diphtheria

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

- Structured answer, using appropriate disease examples for the factors discussed
- Knowledge of international surveillance and liaison mechanisms
- Awareness of the need for international collaboration on the development and implementation of prevention and control strategies and policies.

Comments

This question was answered well by most of the 6 candidates, with one or two giving near model answers. A good definition was given by all candidates. The adoption of the host/agent/environment approach to the structuring of their answer was used to good effect by some candidates, others choosing to use broad sub-headings with equally good effect. The disease examples given were generally well chosen and appropriately related to the precipitating factor under discussion.

HEALTH INFORMATION

5. The Table below shows data on deaths from peptic ulcer taken from the Public Health Common Data Set 1996.

Standardised mortality rate from peptic ulcer per 100,000 for persons aged 25-64 years in the period 1993 to 1995

Health Authority	No of deaths	Rate	LL (95% CI)	UL (95% CI)
1	6	0.76	0.15	1.36
2	7	0.95	0.24	1.65
3	20	1.29	0.53	2.06
4	14	1.63	0.77	2.49
5	18	1.79	0.96	2.63
Region	126	1.30	1.07	1.53
England	1274	1.81	1.71	1.91

- Summarise briefly what the data in the table show.**
- Describe the different sources of routine data that you would use to build up a more complete picture of peptic ulcer disease in a district.**

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

- Descriptive data
 - Small number of deaths (range of 6-18 deaths) over three years across health authorities
 - Range of standardised mortality rates from 0.76 to 1.79 across districts; two districts higher than regional average; all less than England rate
 - Wide confidence intervals due to small numbers.

- b) Candidates should demonstrate that they are familiar with the fact that the importance of deaths from peptic ulcer disease is due to avoidable nature not size of problem.

Further exploration would be expected to encompass the following:

- Analysis of deaths by type of ulceration-duodenal versus gastric
- Hospital admission data for peptic ulceration and reason for admission
- PACT data on ulcer healing drugs
- Discussion of the problem of examining PACT data for take up of eradication therapy eg few agents used exclusively for this purpose
- PACT data on non steroidal anti inflammatory drugs (NSAIDs)
- Possibly audit data examining management of peptic ulcer in primary care or in secondary care.

Comments

Many candidates failed to give a brief (or accurate) description of what the data presented showed, and its interpretation. Very few demonstrated any appreciation that deaths from peptic ulcer in young people are considered “avoidable”, and that an assessment of the associated morbidity is essential to develop a complete picture of the burden of disease. Most candidates were able to list relevant data sources, although some gave little indication of what they would choose to examine using these sources.

6. “Mortality data are more useful than morbidity data in assessing the health needs of the population”. Discuss this statement, using examples to illustrate your points.

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

Mortality data

- identifies serious health problems
- gives some indication of size of problem
- legally required
- refers to an event unlikely to be missed
- even so, data can be unreliable particularly with elderly
- crude mortality rate/specific mortality rate/standardised/indirect standardised rate
- avoidable deaths/years of life lost prematurely
- becoming less reliable as window on illness
- good starting point? More accurate indicator of necessary health care easily measurable

Morbidity

- important to establish and describe more directly size of pool in population. No single source of data can provide comprehensive picture. Self reporting variable
- **2 major issues:** coverage of disease & ascertainment of validity
- iceberg concept
- less accurate than mortality
- far wider range of measurements to inform planning for diverse and wide ranging services

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

- Well organised, clearly set out, well reasoned illustrated answers with evidence of clarity of thought.

Comments

Many candidates did not answer the question but threw out related information. It is unclear whether this is due to a) not reading the question or b) not understanding it. Analytical and discussion skills in the main were poor. Most candidates did have basic knowledge about mortality and morbidity data. Many candidates did not present their answers clearly and handwriting continues to be problematic.

STATISTICS

7. The following data represent two continuous physiological variables collected in a standardised fashion from a group of subjects (*numbers are rounded to the nearest integer*).

Individual	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Variable A	110	104	114	122	123	130	102	104	106	112	112	114	112	98
Variable B	21	22	32	42	51	60	24	30	35	45	52	54	58	20

- Assume that variable A is systolic blood pressure and variable B the body weight of children. Present the data in an appropriate graphical format.**
- What statistical test would you use to measure the strength of association between variable A and variable B?**
- What type of statistical technique would you use to analyse the effect of body weight on systolic blood pressure? What criteria relating to the underlying distribution of the data need to be satisfied before this statistical technique can be employed?**

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

- The data represent two continuously distributed variables which are best graphically presented in a scatterplot. Once graphed it can be seen that as variable A increases so does variable B. The pattern suggests a linear relationship between A and B.
- The strength of a linear relationship between two continuous variables is calculating r , the coefficient of linear correlation, sometimes called Pearson's Product Moment Correlation.
- Regression analysis is used to determine the effect of an independent continuous variable (weight) on a dependent continuous variable.

In the case of linear regression the general regression equation can be expressed as

$$\hat{y} = a + bx$$

where \hat{y} is the computed or expected value of y given any value of x . a and b are constants, determined on the basis of the data. b is the regression coefficient and is the slope of the regression line. The regression line passes through the middle of the scatter points.

For statistical inferences relating to linear regression analyses the following assumptions should hold:

- the distribution of y for each value of x is normal
- the standard deviation of this normal distribution of y is the same for each x
- the mean values of the y distribution are linearly related to x

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

- Non parametric version of correlation and regression also exist. Spearman's Rank correlation is frequently used for correlation of ordinal data. Kendall's Tau is an alternative.
- The correlation coefficient varies from minus one to plus one. A correlation coefficient of zero indicates no linear relationship. Even small correlation coefficients are often statistically significant. The size of the effect has to be taken into account along with the p value.
- In a regression analysis, r^2 is the proportion of variation in the dependent variable which can be explained by the independent variable(s). r^2 is the square of the correlation coefficient, which may be called the coefficient of determination.
- In regression analyses statistical testing usually involves testing whether $b = 0$. Confidence intervals for b can be calculated.
- Non linear relationships may be linearized prior to regression by use of transformations. Non linear regression such as polynomial regression may also be used.
- The assumption of normality underlying linear regression may be checked using an analysis of residuals.

Comments

The general standard of answers to Question 7 was quite low. Most candidates attempted this question. Many forgot to mention that correlation looks at linear association. Many forgot that in regression, the variance of y for each value of x should be constant, or mixed this up with an assumption of the t test that the two samples should have equal variance. There is no requirement for the variance of the dependent and independent variables to be the same in regression.

8. What approaches can be used to determine sample size in quantitative studies and trials?

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

- a) Basic (Neyman-Pearson) calculation requires:
- Size of minimal effect to be detected
 - Power
 - Significance
 - No. of tails
 - Variance under null hypothesis (H_0)
 - Variance under alternative hypothesis (H_1)
 - Allocation ratio between sample groups and controls
- b) Precision-based:
Define sample size as that which would give a desired standard error (or confidence interval width) - possibly with reference to the size of minimal effect to be detected.

c) Guessing:

Use simple assumptions about the form of the distribution and a plausible range (eg if binomial, right triangular, uniform) to guess the standard deviation and then plug this into the calculation.

d) Use effect size:

i.e. effect / standard deviation - values of 0.25 or more are commonly used, but the appropriateness of the magnitude of the effect size depends on its clinical importance.

e) Two-stage:

Use a pilot sample of N subjects to get a preliminary estimate of the variance; then recruit an extra M subjects so that the final M+N subjects is the desired final sample size.

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

- Variances usually taken as the same (nearly true if normalising/variance stabilising transformation used)
- Allocation ratio (in randomised controlled trials normally 1:1 but this is optimal only if the variances are the same)
- Usually based on the Normal distribution but need not be (eg if comparing variances)
- Feasibility: can the study be done in the given area/time scale with the power etc specified?

- Survival analysis sample size is determined
 - by number of deaths NOT number of subjects
 - and by accrual period and length of follow-up
- Paired t-test comparisons sample size is determined by number of pairs NOT number of subjects
- For rank-based paired comparisons it is the number of discordant pairs
- Cluster randomised studies require knowledge of intra-class correlation - hard to obtain.

Comments

Candidates generally answered this question as though it only concerned trials. They were required to be rock solid on the main principles in order to have any chance of passing. These were

(i) Setting the probability of a Type I error

(ii) Setting the probability of a Type II error, and explaining the relationship with "power".

(both the above needed to be explained in a convincing manner; simply mentioning terms was not good enough).

(iii) Deciding on the minimum difference of clinical interest in the outcome variable between the intervention groups (a difference in means for a quantitative variable, or a difference in proportions for a categorical variable).

(iv) Estimating the standard deviation of the outcome variable (if it is quantitative rather than categorical). This is generally assumed to be the same in the two groups.

Examples would have been illuminating.

Candidates might have mentioned that the allocation ratio (usually 1:1 in trials) does influence the total sample size; if all 4 criteria mentioned above remained fixed, the sample size would increase the further the allocation ratio departed from 1:1.

Mention might have been made of crossover trials, where each subject acts as their own control (thus decreasing the total number of subjects used), and the *within subject* standard deviation is used for (iv).

The same broad approach is needed for other comparative studies. In cohort studies, the comparison of two subgroups will involve a predetermined “allocation” ratio depending on the distribution of the variable which defines the subgroups. In case control studies, the outcome variable will be replaced by the exposure variable of interest in criteria (iii) and (iv).

Candidates failed to mention quantitative studies where the purpose is not to make comparisons but to estimate some population parameter (for example in a survey). Here the chief criterion is the maximum tolerable width of the 95% confidence interval which will result; the larger the sample size, the narrower the CI. Halving the width of a CI requires a quadrupling of the sample size.

Many other points could have been made which would have earned credit but a failure to explain the four main criteria above was fatal.

PAPER IIB

DISEASE PREVENTION

- 1. The local “Accident Prevention Task Force” has asked for your advice in developing a health promotion programme, which will be multisectoral in nature, and involves active participation by the public. They would like to target children and young people under age 24, and older people over age 65. What advice would you give on the programme content, giving the reasons for your choice?**

Most of the following would be required for a pass:

- Include a discussion of the epidemiology in giving reasons for choice of programme content eg in younger people, traffic accidents, fires, choking and falls are important causes of death. In people aged 65 and over, falls account for about 50% of accidental deaths and traffic accidents for about 30% of accidental deaths.
- Discussion of models of health promotion. The traditional focus was on the individual. Now the importance of recognising the source of danger, creating safer environments and encouraging alternative safer choices eg public transport are recognised.
- Include description of at least one area e.g. traffic accidents. Educational measures alone do not have a significantly measurable impact upon accidental injury rates. Engineering measures that create safer environments can be effective (eg traffic calming measures, providing window locks to those living in high rise housing). Legislation requiring safety protection (e.g. restraints in vehicles, child resistant packaging of harmful products).
- Make the group aware of the association between childhood accidents and deprivation.
- Discussion of which agencies can be involved in the programme.
- Discussion of public participation approaches and importance of lobbying.

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

- Reference to sources of information and needs assessment eg home accident surveillance, special surveys.
- Evidence based advice. International studies indicate that community wide initiatives that embrace a range of initiatives and multi-agency community involvement can have an impact upon accident rates.

Comments

Candidates showed varying ability to describe the main types and causes of accidents in the different age groups. Most discussed key interventions demonstrating understanding of the principles of health promotion. The best answers clearly defined the different approaches for the age groups specified.

2. What are the key elements of a strategy to reduce conceptions in teenagers?

Most of the following would be required for a pass:

Information about local rates of teenage pregnancies, for example:

- Britain has the highest teenage conception rate in Western Europe. Rates higher in more socially deprived areas and with lower educational attainment.
- Teenage pregnancy is associated with increased risk of poor social, economic and health outcomes for both mother and child.
- Sex education plays a vital role in delaying sexual activity and improving uptake of contraception.

Elements of a strategy should cover the following areas:

- Ensuring availability of comprehensive, effective and appropriate sex and relationships education and information for young people.
- Broadening access to good quality and culturally sensitive advice, and to contraceptive and sexual health services. Importance of confidentiality.
- Tackling inequalities and developing alliances between relevant local agencies eg. schools, youth services, health services and social services.
- Prioritising vulnerable groups eg ‘looked after’ teenagers.
- Promoting a social climate built upon openness supporting young people’s sexual development as part of the process of becoming a mature adult.
- Strengthening research knowledge on needs assessment, effective service delivery and preventive measures for teenagers.
- Evaluation of interventions.

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

- Comparison with other countries, eg Netherlands. Examples of successful initiatives
- Influence of development of Health Action and Education Action Zones
- Knowledge of Department of Health’s framework for a National Programme

Comments

Candidates scored highest who covered the range of interventions from primary prevention to available treatments. Most candidates explained the special needs of young people, the changing behaviour patterns in society and the rising trends in teenage conceptions.

MEDICAL SOCIOLOGY AND HEALTH PSYCHOLOGY

3. Discuss the relationship between ethnicity, mental health and the use of health services. How can these differences be explained?

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

- International comparisons show above average rates of admission to psychiatric hospitals for schizophrenia in Afro Caribbean population in the UK compared with the 'white' population. Not observed in USA. Rates of schizophrenia admissions are even higher for children of Afro Caribbean immigrants. High rates of admission for this group under Mental Health Act. Also observed - higher re-admission rates, more likely to be given ECT and higher doses of medication, less likely to be offered psychotherapy.
- Explanations offered: selective pattern of migration, experience of living and working in a climate of limited opportunity, culturally determined response to adversity, patterns of service utilisation, diagnostic inaccuracy? Experts suggest that racism and discrimination are powerful aetiological factors.
- Related to intra-familial violence/alcohol and drug use.
- High incidence of single parent families, multiple cohabitants.
- Asians have lower rates of consultation for depression. Similar rates for psychosis. Young Asian women high a high rate of suicide outside of Asia.
- Explanations offered for patterns of mental illness in Asians - genuinely less illness? Less recognised by GPs? More likely to present somatically, therefore more difficult diagnose, mental illness may be managed in the family due to stigma, effects on marriage prospects, psychological causation of illness poorly understood, problems of female patients consulting male doctors, older Asians may consult healers.
- Need for much stronger family cohesion and support.
- Chinese - lowest detected rate for all forms of mental illness except anxiety. Explanations - effect of racism, educational aspirations of younger generation at odds with the older generation feeling 'secure' with traditional sources of employment.

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

- Difficulties of cross cultural issues in mental health services and research.
- Recent Policy Studies Institute Survey - higher rates of mental illness in South Asians more acculturated. Observed higher rate of depression in Afro Caribbean population.
- Alcohol dependent admissions rising in ethnic minority populations.

Comments

16 candidates answered this question. Most candidates were aware of the mental health issues relating to the African/Caribbean populations. The better answers demonstrated knowledge of

mental health issues relating to other ethnic groups. The poor answers had no coherent structure and covered very few key points.

4. Discuss the ways in which parents can influence the health of children. Describe the types of action which can be taken to overcome adverse influences.

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

- Maternal, nutrition and maternal smoking and educational attainment of the mother and health of the child. Breast feeding, bonding, care of sick children, self esteem and confidence building in the child.
- Role models for smoking and alcohol consumption.
- Health effects of physical, emotional and sexual abuse.
- Parental conflict and its adverse effects on the child. Parents who have been poor school achievers and association with truancy (and substance misuse) in children. Family break-up and criminal activity in children.
- Action-national in the UK, actions include Our Healthier Nation, (the Strategy for Health in England), Tackling Drugs to Build a Better Britain, and Crime and Disorder Bill, etc address the crucial importance of the role of parents on the health of children. The concepts of healthy living centres, healthy neighbourhoods, social exclusion, social capital have parenting as an important way to address health improvement and at community level.
- Community level - action to strengthen the family - pupil/parent partnerships in schools, parents support networks, community mothers' support groups, variety of community developments which strengthen parental responsibility in relation to children's health and welfare.

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

- Discussion of links between child health, parenting skills, health and social inequalities.
- Physical health (bronchitis, early death, obesity etc) and mental health difficulties. Adverse childhood events: **Felliti** 1998 (Alcohol/drug, domestic violence, mental illness). **Paterie, Pesson** - Sexual emotional and sexual abuse.
- Emotional literacy.

Comments

This question proved to be more popular, with 22 candidates choosing this rather than Q3. Most candidates approached this question in a structured way with a systematic discussion of genetic, nutritional and some lifestyle issues, but surprisingly few discussed the importance of parenting in any detail. Some candidates had excellent knowledge of research evidence of community interventions to overcome poor parenting. In addition, few candidates mentioned the importance being attached to parenting as key to tackling a number of issues relating to health and social inequalities, at the national policy level.

HEALTH ECONOMICS AND SOCIAL POLICY

5. How do economists account for the fact that some of the costs and consequences of interventions occur in the future? Why is this issue of importance for public health interventions?

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

- Economists use the technique of discounting. This is because we exhibit positive time preference, preferring benefits as soon as possible and costs delayed, for three main reasons:
 - we have a short term view of life
 - the future is uncertain
 - and experience of economic growth in the second half of the 20th century in Europe means that most individuals expect to be better off in the future. The process involves discounting future costs and benefits to net present values. In the UK a nationally determined discount rate is used for all public sector projects, this is currently 5%.
- The issue is of importance for public health interventions since these will frequently lead to benefits into the future. Benefits into the future are of substantially reduced value; a 5% discount rate reduces value by 50% in 14 years and by 66% in 22 years.

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

- The discounting of benefits is controversial. There is evidence that individuals discount future health differently than they do future wealth. Some argue that as public health interventions can benefit future generations but the costs are met by the current generations the benefits should not be discounted. It is considered good practice to show results with benefits both discounted and not with a sensitivity analysis.

Comments

This was a fairly straightforward question. Whilst all candidates who attempted it identified that the question was about discounting there were few strong answers. Some candidates confused positive time preference with an assumption that inflation is inevitable. Few candidates were clear about the theoretical reasons for discounting. Some candidates provided unnecessary information about the different types of economic evaluation without indicating why these were relevant to their answers.

Most public health interventions involve benefits which are distant in time, when compared with clinical interventions. The way in which benefits are discounted and the level of the discount rate applied are very important when analysing the costs and benefits of these interventions. A good answer would refer to the importance of being transparent about the approach to discounting and to submitting the results to sensitivity analysis with different discount rates in view of the controversy which surrounds the discounting of benefits.

6. Should those who contribute to their own ill health have the same access to services as those who do not? Discuss.

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

- The principal of equity of access:
 - particularly equal access for equal need
 - concepts of need
 - are the needs of a smoker the same as a non-smoker?
- Health need and the ability to benefit:
 - eg. smoking and anaesthesia or coronary artery by pass graft (CABG)
- Rights and responsibilities:
 - a right to health care but responsibility for one's own health
 - should one burden others with the costs of ones own actions, eg dangerous sports; effects of diet; HIV from sharing needles versus HIV from blood products.
- Finite nature of resources in the health system:
 - opportunity costs
 - use of insurance for medical care following road traffic accidents (RTAs) or dangerous sports
 - non-health taxes eg. tobacco

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

- How you might include the public in addressing this issue eg locally, using citizens' juries
- Balancing ethical and health economic arguments
- Natural justice:
 - does this allow a doctor to be judge and jury and to 'punish' legal behaviour
 - can the doctor be adequately informed in a timely manner to decide.
- How fully informed or autonomous are people and what is our ability to influence their behaviour?

Comments

This question was answered by about a third of candidates. Good candidates addressed most or all of the key points. In general, the quality of discussion was poor. The points were made, but not discussed.

ORGANISATION AND MANAGEMENT OF HEALTH CARE

7. Health service resources are increasingly being spent on complementary therapies. Local hospital clinicians protest that there is inadequate evidence of effectiveness to support this. Describe the public health practitioner's role in addressing this problem.

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

- Understanding of the health authority's sentinel role in how the funds it allocates are utilised and the limits of its prescriptive powers. Health Authorities need a policy on the issue. The public health professional's (PHP) role and strategy in managing the debate - the purveyor of evidence, and facilitator of an accommodation of opposing viewpoints.

- Demonstrating the PHPs grasp of the evidence of the scope of complementary medicine; cost effectiveness and cost minimisation of various treatment modalities in common clinical conditions such as low back pain, asthma for which complementary therapies are used; costs avoided through investment in complementary therapies. Ability to discuss the value of the placebo effect.

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

- Awareness of the growing popular support for complementary therapies - its relationship to consumers' rights on the one hand and to the promotion of evidence-based practice and the identification of core services on the other. The emergence of the registered complementary practitioner professions as a force requiring representation in national and local negotiations on health care development.

Comments

Most candidates made a reasonable attempt at this question - a few wrote an overly generic management of conflict answer and were penalised.

8. A consultant surgeon in one of your local hospitals has made the allegation that surgical practice in a neighbouring hospital is unsatisfactory.

Describe how you would investigate this allegation, referring to recent developments in audit, clinical effectiveness, clinical governance and statutory regulatory body oversight of the profession.

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

- how, when, where and to whom was the allegation made?
- what precisely was said or written?
- does the consultant still stand by this allegation?
- what is his/her evidence for the allegation?
- work with the Trust Medical or equivalent remembering their emerging clinical governance role and keep trust and health authority (HA) Chief Executives informed.
- investigate specific cases raised - keep detailed records.
- provide a channel for concerned members of hospital staff eg. anaesthetists/theatre sisters to come direct to you
- ask to see the results of all surgical audit in the hospital under suspicion and in the accusing consultant's hospital for the last three years.
- remember to fully consider factors such as case mix and sub-specialisation when you interpret any outcome based audit
- consider the prevailing professional climate within the hospital with regards clinical effectiveness and audit.
- reappraise yourself of General Medical Council (GMC) or other national body requirements and guidance regarding such cases and act accordingly.
- keep your regional office or Welsh/Scottish/N Ireland office national senior colleagues up-to-date.
- have a plan to handle press interest which balances legitimate public interest with the need to pursue fair and impartial enquiry.

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

- are there any hidden agendas, personal or professional that may have given rise to these accusations being made now?
- is there any evidence of a culture within the trust of bullying potential whistleblowers?
- what are the trusts whistleblowing arrangements?
- are there any national audit programmes/results relevant to the subspecialty in question?
- can you use this investigation as a lever to improve the audit of surgical practice in both hospitals?

Comments

Well answered by most candidates - exceptionally so by a few. The best answers integrated a practical and credible approach with a demonstration of detailed knowledge of recent developments of audit, clinical effectiveness, clinical governance and the GMC.

PAPER III (UK)

SECTION A

1. Your District has several localities. Your Chief Executive suggests, based on the attached paper ‘Variations in population health status: results from a United Kingdom national questionnaire survey’ (Kind P et al, BMJ 1998:316:736-41), that the EuroQoL (Quality of Life) instrument be used to establish baselines and set outcomes for reducing health inequalities between the localities.

a) Write a critical appraisal of the paper;

b) Prepare a report to your Chief Executive, discussing the key features required of instruments to measure health outcome in populations, and the suitability of the EuroQoL instrument in this regard.

a) Critical Appraisal

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

Objective	To measure the health of a representative sample of the population of the UK by using the EuroQoL EQ-5D questionnaire.
Method	Stratified random sample of addresses in England and Wales selected by post-code. Eighty postcode areas chosen proportionately to the number of addresses in each area, after areas stratified by regional health authority, socio-economic group, and population density. One adult aged 18 or over sampled from each address using a Kish grid. EuroQoL EQ-5D questionnaire administered to respondents by interview. Information also collected on age, sex marital state, education, employment housing tenure, and smoking behaviour.
Results	i) EQ-5D gives scores in five dimensions, each dimension being subdivided into three categories (no problems, moderate problems or severe problems). Moderate problems on at least one dimension reported by 42% of respondents. Six percent reported any extreme problem. Problems most commonly reported in areas of pain or discomfort.

ii) EQ-5D also includes a visual analogue scale for recording of overall health perception. Mean values for each age group are reported. They present mean scores for subgroups studied, but present no evidence of the normality of their data.

iii) Analysis of scores by various subgroupings was undertaken. Differences are reported between widowed, separated or divorced people and (presumably) those not so, and a range of scores across social class was reported, the lower social classes reporting poorer health. Similar patterns reported for education and economic status. Those who smoked also had poorer health. Analysis of variance of visual analogue scales against background variables showed significant effect for education, employment, and smoking behaviour.

iv) The authors describe those reporting any problem in any dimension as (arbitrarily) having a disability, and compare the distribution of scores with those obtained in the General Household Survey and in the OPCS national disability survey of 1985. The EQ-5D is described as giving higher rates of disability than either of the other two instruments. They do not discuss the validity of this concept, however. Disability and health are two distinct entities, and can therefore be expected to give different score distributions.

Bias In the methods section of the paper the authors state that individuals living in institutions, hostels, care homes, or bed and breakfast accommodation were excluded from the sample. Local Authorities in England and Wales accepted some 120,000 households (350,000 people) as being homeless in 1987. This figure excluded most young, single homeless people, estimated by Shelter to be 150,000. Thus, 1.5% of the population, who would likely score badly on the EQ-5D, were excluded, as were people living in homes for the mentally ill or for people with learning disability.

Generalisability A clear response rate is not quoted. It is stated that a total sample of 8080 addresses were obtained, and that 12% (730?) were unproductive because they were non-residential, empty, or untraceable (leaving 5350?). The final sample comprised 3395 subjects, leaving us to assume that the response rate was 63%. No data are given comparing the characteristics of responders to non-responders. This could reduce the generalisability of the results, especially when taken together with the previous point.

Discussion The authors discuss some of the limitations of this survey, and of the EQ-5D, including sampling bias (see below). They then go on to state that the EQ-5D “provides the capacity to measure change in health status, and hence outcomes, in a simple standardised ways”. They attribute this to the EQ-5D’s ability to measure change in health status. They provide no evidence in this paper, however, that it does so. In only one of the references they quote was the instrument used in a randomised controlled trial (**Sculpher et al**) — the visual analogue component only was used, and this failed to find a difference, despite clinical ratings showing improvement — candidates will not be expected to know this, however!)

b) Report to Chief Executive

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

Candidates should discuss the need for validity, reliability and responsiveness to change as being desirable attributes of an instrument to measure outcome. In the context of the EQ-5D, they might comment upon the fact that the instrument is relatively insensitive, with, for instance, fewer than 5% of people reporting any difficulties with self care, and that this might

limit its responsiveness to change in anybody not moving across from the very large “normal” group to the small disabled” group.

A brief discussion of “league tables” would be better included, but failure to do this is not a pass/fail issue.

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

Better candidates might refer to the list of characteristics described in ‘The new NHS ... a National Framework for Measuring performance’ ie that an indicator should be attributable, important, must avoid perverse incentives, should be robust, responsive to change, useable and with data available in a useful timescale.

In terms of attributability, exceptional candidates might refer to the paper by Leyland and Boddy (Lancet 1998:351:556-8) who question the usefulness of league tables in the assessment of the performance of different hospitals, by looking at the effects of case-mix upon coronary heart disease mortality in Scotland, and who conclude that 99% of the variation in deaths in hospital and after discharge could be attributed to unmeasured differences between individuals, rather than to the effect of admission to this or that hospital.

Comments

Generally speaking, the critical appraisal was well done. Only one candidate identified the assumption of normality in the data as an issue, and there was a surprising absence of discussion about whether the instrument was sensitive to change or not.

The report to the chief executive was generally done poorly. No candidates mentioned the NHS Performance Framework, and the explanation of the development of outcome measures was generally poorly done.

2. Following the publication of the attached paper, ‘Effect of exposure to 15% oxygen on breathing patterns and oxygen saturation in infants: interventional study’ (Parkins K et al, BMJ 1998:316:887-94) the local radio station has asked you to be interviewed live on air about the risks of taking small babies by plane.

a) Write a critical appraisal of the paper.

b) In your notes for the radio interview, summarise the main points you would like to get over.

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

a) Purpose/aim of study is to assess the response of healthy babies to airway hypoxia in order to explore the possibility that air travel associated hypoxia can lead to sudden infant death syndrome (SIDS).

Methods

- Interventional study on 34 babies recruited via two approaches (structured sampling of births at a GP unit (21) and by approaching families receiving support following a sudden infant death (13)).
- Response rate not stated. Selection bias is inevitable but implications not known and not explored.

- Not entirely clear if these numbers (21 and 13) include or exclude some cases who were excluded from the study.
- Not clear what their intention to “study infants who had undergone apparent life threatening events” means.
- Careful process of informed consent described.
- All babies recorded three times over two nights on a range of cardio respiratory variables.

Night 1 Pre challenge at home
 Night 2 Breathing air with reduced oxygen in an oxygen test (the challenge) - room air in hospital immediately after ‘the challenge’ (post-challenge)

- Intervention ended if parents wished or if hypoxaemia less than 80% oxygen saturation for more than one minute was observed
- Generally well described, though the word “baseline” is confusing

Definitions results

- Definitions stated clearly, but importance of them not always clear
- Results of means of variables presented clearly
- No differences in any variable between 2 samples
- Various cardio-respiratory measures changed during the challenge (oxygen saturation, % time spent breathing regularly, number of episodes of desaturation, % time spent in periodic apnoea, heart rate, length of apnoeic pauses)
- Most variables returned to normal post challenge
- Six babies were removed from the hypoxic exposure early (2 inappropriately) and one needed oxygen for an hour after
- No data or analysis presented of relationships between variables pre-challenge and hypoxaemia during challenge. Predictive values would have helped. However, abstract states there was no correlation
- Presentation of babies withdrawn confusing. Would be clearer to say (*see chart below*):

Total sample 34

	28 not withdrawn	6 withdrawn	
	25 normal baseline during challenge	4 appropriate	2 inappropriate
	3 low baseline during challenge	3 low baseline during challenge	
			baseline not known

- The babies appear to sleep a great deal for babies of this age!
- No data presented on relationship between hypoxaemia and other known risk factors for SIDS (parental smoking, sleeping position, ethnicity).

Discussion:

- Weak section as it fails to explore explanations and implications adequately.
- Not clear if it is possible to generalise from the effects of breathing this gas mixture to breathing air in planes.
- No exploration of bias (from any source).
- Ethical issues are explored. While there will be conflicting views as to whether this study was ethical, exposing healthy babies to potentially risky environments is a serious issue.
- No exploration of other epidemiological studies that should be done eg. case control study of SIDS in relation to aircraft flights and reliable data on SIDS associated with flights.
- The 2 cases they quote might be what would occur as a result of chance association.
- Not clear that authors have considered effects of this paper or decisions about (and consequent anxiety) taking babies on planes. In reality, the risks must be very low and this should be stated more clearly in the context of other known risk factors (parental smoking, sleeping position).
- Healthy babies were exposed to an air mixture containing less oxygen than we normally breathe; and similar to that available on planes. Some of these babies (4 out of 34) had less oxygen in their blood during this exposure than we would normally like to see. However, they all made full recoveries.
- This is a study of a small number of babies. It is not possible to be certain what the results mean in relation to either the causes of SIDS or the risks of taking babies on planes.
- We know that the important risks for SIDS are whether or not the parents smoke and the position babies sleep in. Clear advice is not to smoke and to put babies to sleep on their backs.
- SIDS is uncommon (less than 1 per 1000 births).
- As regards taking babies on planes, there is no reason to think that healthy babies will be at any significant risk. However, if a listener's baby is unwell or has just been born, or if parents have any worries they should see their GP.

Comments

This was reasonably well answered - the candidates did better on the radio interview notes than on the critical appraisal. No candidate did excellently.

Most identified the major issues in the critical appraisal (selection bias, lack of response rates, fishing expedition approach to statistics) but a few picked up on the rather odd way in which the study had been developed. That is, it was initially set up to explore group differences, but later focused on aggregate analyses. Hardly any candidates proposed other epidemiological studies (case control in particular) to further investigate the issue.

As regards the notes of the radio interview, some candidates were inconsistent. That is, they were very critical within the critical appraisal (part a) but nonetheless made firm recommendations about avoiding airline flights in their radio interview! Also, there was an excessive focus on further research that was needed - rather than on briefly explaining the study, exploring its implications, and providing appropriate reassurances. In general, candidates didn't give a sense that they knew how to work in the "real world".

In both questions, the critical appraisal often (if rather slavishly) followed a structure - but without enough critical thought. It was as though the emphasis on structure was a distraction from criticism.

SECTION B

3. A recent paper in The Lancet alleged that measles mumps and rubella (MMR) vaccination causes Autism and Crohn's disease. Examination of the issue by an expert group has refuted this (CMO Letter PL/CMO/98/2 MMR vaccine, Crohn's disease and Autism): government policy remains unchanged. Your local newspaper has discovered a number of children whose parents claim they are victims of this policy; a local campaign has begun to persuade parents to refuse MMR vaccine.

a) Review the evidence for the alleged link. What effect has the campaign had on 'cover'?

b) Write a brief for a Consultant in Communicable Disease Control (CCDC) who has agreed to take part in a radio phone-in on this subject.

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

a) This needs to include comments on the body of evidence for and against a causal link between MMR, autism and Crohn's disease. The bulk of evidence is against a link and the Lancet article that caused all this concern only involved 12 cases.

b) Briefing paper should include 3 points to make the case for MMR. Although the CCDC will understand jargon, better to keep away from this as the public will need clear information. It will be same for the CCDC who will have to deal with this.

Comments

This question was generally not well answered. Most candidates had a reasonable knowledge of the Lancet paper, but many did not include the other evidence examined in the CMO's letter.

Some candidates answered the CCDC radio phone-in briefing in a focused way with an understanding that it would be necessary to get across key points in a jargon free manner, that is, by using language which would have impact on the radio (for example, the MMR vaccine is *safe*, measles infection can *kill*). However many answers were full of waffle and not clear. Also, most candidates were briefing the CCDC for any eventuality rather than concentrating on the three key messages that they should put across from the Public Health perspective.

4. You have been asked to write a chapter for the Director of Public Health's annual report on the inequalities of health and health care in your district.

a) Discuss critically the research evidence of which you are aware that explores this issue.

b) Outline the data sources you would use to examine this issue and comment on their strengths and weaknesses.

c) Assuming that Tudor Hart's 'inverse care law' is supported, outline how you would seek to address this particular inequality.

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

Answers should give approximately equal weight to each part of the question a), b) and c).

a) Answers should include some references to recent and sentinel reports on inequalities eg in England, the Black report and Health of the Nation and Green Paper 'Our Healthier Nation'. They will need to give some examples of key research particularly around the causes of inequalities and the cause/effect debate on poverty and ill health. They should show that they have a systematic approach to appraising the literature. Also they might refer to international comparisons and discuss the implications of these. The research evidence about how these inequalities could be reduced would gain extra marks. A useful framework might be:

- What inequalities
- Why inequalities
- How to reduce inequalities.

b) List of data sources and strengths and weaknesses:

- Determinants of ill health including socio-economic, lifestyle and local authority data.
- Ill health indicators eg. deaths, morbidity. There are many and are varied. Should mention public health (PH) common dataset in the UK.
- access to seminars.

c) Answers should mention:

- Redistributing health services, primary, secondary, local authority.
- Targeting deprived areas with new community development and tackling the wider determinants of social exclusion and thus ill health. Healthy living centres. Making services more accessible to the socially deprived and minority groups. Taking services out to those who will not or cannot come.
- Mention of Our Healthier Nation contracts for health would gain extra marks.

Comments

This question was reasonably well answered, with most candidates having a broad understanding of the issues. Some answers were rambling and not in the sort of language that would be suitable for a Director of Public Health's annual report. Those who scored well also kept their mind on how the likely recommendations for action could be implemented locally in a health district.

Although most candidates listed the main data sources, few specifically mentioned the PHCDS or how they would examine mortality/morbidity data in the context of health inequalities. Section c) was well answered when structured around Our Healthier Nation contracts for health. Many candidates did not

follow this or any other structure, and did not address issues such as redistribution of resources or the benefits of working with partner agencies.

When there are three parts to a question, it is always best to assume that marks are apportioned equally between them unless otherwise indicated. Many of the candidates who scored poorly on this question had concentrated disproportionately on one part of the question, to the detriment of the others.

PAPER III (HK) Taken by 3 candidates

SECTION A

1. **The Hong Kong Council on Smoking and Health (COSH) has set up a working party to prepare a document to recommend “Legislation on total ban of smoking in all public places in Hong Kong” to the SAR government. You represent the Department of Health on the working party.**
- a) Write a critical appraisal of the paper ‘Economic burden of environmental tobacco smoke on Hong Kong families: scale and impact’ (Peters J et al, J Epidemiol Community Health 1998;52:53-58).**
- b) Summarise the results of the study for the non-medical members of the council, highlighting how the results can be applied in preparing the recommendations.**

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

- a)
- Study design relevant to objective
 - Objectives important for public health intervention to control smoking
 - Sampling - Two schools studied. Question of representativeness

Measurement of smoking:

- Questionnaire developed from internationally validated instrument.
This does not imply that students will all report parental smoking correctly. No validation of parental smoking status carried out.
- Measurement of upper respiratory tract (URT) symptoms valid and complete.
- Statistical and economic calculations correct and accurate.

- b)
- Candidates should demonstrate their ability to present the economic cost of environmental tobacco smoke, by interpreting the odds ratios and what the cost of care means.
 - Candidates should be able demonstrate how the economic and health impact of environmental tobacco smoke can be applied in proposals to convince the public on tobacco control.

Comments

No comments were submitted by the examiners.

2. The Hong Kong SAR Government has set up a working party to review the care of psychiatric patients in Hong Kong. You are the representative of the Department of Health on the working party.

a) Write a critical appraisal of the paper 'Randomised controlled trial of two models of care for discharged psychiatric patients' (Tyrer P et al, BMJ 1998;316:106-9).

b) Summarise the findings of the study for non-medical members of the working party, highlighting the relevance of the findings for Hong Kong.

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

- Study design of randomised controlled trials (RCTs) appropriate for research objectives i.e. evaluating 2 alternate forms of care.
- Entry criteria - rigorous, clearly defined, appropriate for target population.
- Randomisation - rigorous and unbiased.
- Evaluation of outcome - standardised and blinded. Different researchers evaluate different groups (a possible source of variability, though not necessarily a source of bias).
- Statistical analysis - multiple testing on 7 clinical outcomes. High probability of inducing 'significant' results in some tests.
- Comparison of cost of care in two areas not in the original objectives but formed a large part of the results and discussion.
- Candidates should demonstrate the ability to interpret the lack of significance of various 'clinical' outcomes, the difference in cost of the two types of care, and difference in cost in the two areas in clear, non-medical language.
- Care of psychiatric patients is still very hospital focused in Hong Kong, with a tendency to frequent readmission.
 - The feasibility of alternate forms of care should be discussed.
 - The results of the study imply that at the very least, local RCTs should be conducted with important local cost components built in.

Comments

No comments were submitted by the examiners.

SECTION B

3. As a public health medicine specialist, you are invited by a newspaper reporter to comment on the manpower situation of public health medicine practitioners in Hong Kong. The reporter would like to have your comments in writing and to follow up with an interview.

a) Prepare your comments in writing for the reporter; and

b) Prepare yourself for the interview by writing a list of possible questions from the reporter and your answers to the questions.

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

(a)

- The comments should address the issues leading to the reporter's queries (eg. a recent outbreak, criticisms about the government's handling of a public health issue).
- Information on the manpower situation of public health medicine (PHM) in Hong Kong - number of doctors, where are they? What are their roles?
- Is there a shortage? In terms of absolute number, doctor/population ratio, specific roles (such as control of communicable diseases, food hygiene, specific health services and workload, need and demands of public health, special skills or expertise).
- How does Hong Kong compare with other countries? eg doctor/population ratio. Pros and cons of such comparison.
- Main conclusions - is there a shortage or not?
- Recommendations:
 - a systematic review of needs and manpower for long-term manpower planning
 - urgent measures to increase manpower, if justified
 - where should the resources come from?

b) Should give a list of Questions (Q) and Answers (A):

Q: Do you think that there is insufficient PHM in Hong Kong? Why?

A: Yes, in terms of the increasing needs and demands; very few PHM doctors in Hong Kong, very low ratio.

Q: How many more are needed?

A: A systematic review is needed before we can come up with exact numbers. In the short-term, realistically, we can only expect to have a few consultants and a few doctors.

Q: Who should fund the extra manpower needed? Why?

A: The government is responsible for most of public health functions in Hong Kong and the Department of Health is the responsible government department.

Q: Do you think the recent problems (eg outbreaks) are due to the lack of PHM manpower?

A: There are many factors for the recent problem. The lack of PHM manpower is not the cause of the problem. The recent problems show that there is increasing need and demand for PHM manpower to handle these problems and to prevent future problems.

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

- Comments and Q&A on training: what are the training needs and how these can be met and funded.
- Manpower in public health include non-PHM doctors and non-medical professionals; government and non-government sectors.
- Public health issues cannot be solved only by increasing manpower - there is a need to review public health policy.

Comments

Not answered by any candidates.

4. As a public health medicine specialist, you are invited by a newspaper reporter to comment on whether the infectious disease situation is out of control in Hong Kong. The reporter would like to have your comments in writing and to follow up with an interview.

a) Prepare your comments in writing to the reporter; and

b) Prepare yourself for the interview by writing a list of possible questions from the reporter and your answers to the questions.

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

a)

- The comments should address the issues leading to the reporter's queries (eg. recent outbreaks of infectious diseases) and why some people feel that the situation is out of control.
- Give specific examples of outbreaks to illustrate whether they have been brought under control or not.
- Despite the eventual success in control, comment on the problems encountered and the criticisms from the media/public.
- Cite the comments from external experts, such as the World Health Organisation or the US Centre for Diseases Control on the situations/issues in Hong Kong.
- Main conclusions - under control or not?
- Recommendations - what lessons are learnt?
- What can be done to prevent future outbreaks?
- What measures are needed to control outbreaks in future, if not preventable?

b) Should give a list of questions (Q) and answers (A):

Q: Do you think the situation of infectious diseases in Hong Kong is out of control?

A: >From previous outbreaks, such as bird flu, eventually they were well controlled. But there may be future outbreaks and we need to have a good system of surveillance.

Q: Do you think the government is responsible for the outbreaks?

A: The outbreaks of new or old infectious diseases are not always predictable. The government has the responsibility for public health but it cannot prevent all these outbreaks. The community has to cooperate with the government in the control of infectious disease.

Q: What do you think should be done to prevent these outbreaks or to control them better when they occur?

A: There must be a good disease surveillance system. We need better manpower, expertise and facilities (such as laboratories and advanced assays too). We need international collaboration. We need the cooperation of the public and media. We all need to be on the alert and work together.

Q: Do you think there should be a Centre for Diseases Control in Hong Kong?

A: This is a good idea. Hong Kong needs a stronger and better coordinated centre to control infectious diseases. It will not be identical to the United States Centre for Disease Control (USCDC) but we need to learn from them.

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

- Frankly admit that there were problems and room for improvements. Not everything is under the control of public health specialists and many sectors, government and non-government, are involved.
- Accept the role of the media (although a lot of criticism can be gratuitous) and the need to inform the public, and to solicit cooperation and involvement of the public.
- There is a need to review the system for the control of infectious diseases in Hong Kong - need to involve Hospital Authority, private doctors, legislators and the community as well as other concerned government/non-government organisations.
- Give specific examples, such as bird flu, enterovirus, etc. with careful analysis of the lessons learnt.

Comments

This is a difficult but very relevant question, and there are no standard model answers. Most candidates argued that the situation is not out of control mainly from the viewpoint often adopted by the government. There is a lack of specific responses to the background of why the question of “out of control” was asked by the reporter, and the underlying problems, concerns and criticisms from the public or the mass media. Candidates need to be sensitive to these, and be frank to admit problems and to learn from the lessons. More emphasis is needed to explain the surveillance system and how this can be made to work better to control or prevent future outbreaks. The need for international collaboration with WHO, US CDC and other organisations has not been explained adequately.

The candidates should prepare more provocative questions from the reporter, and try to answer them tactfully.