Faculty of Public Health

of the Royal Colleges of Physicians of the United Kingdom

Working to improve the public's health

PART A EXAMINATION FOR MEMBERSHIP OF THE FACULTY OF PUBLIC HEALTH

Of the Royal Colleges of Physicians of the United Kingdom

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EXAMINATION QUESTIONS WITH KEY POINTS AND EXAMINERS' COMMENTS

N.B. Please note that these are key points, not model answers

General examiner comments on the January 2011 sitting

Answers to the questions in the January 2011 sitting of the Part A examination ranged from excellent to extremely poor. Those candidates who scored highly had clearly read the questions carefully and followed carefully the general instructions relating to each paper and the specific instructions relating to each question or section. Where marks were divided across questions, candidates scoring highly had clearly apportioned their time appropriately to the credit available for each section.

Highly scoring answers tended to be presented in a logical order with an appropriate structure, and where appropriate using a framework or headings and judicious use of bullet points. Those candidates who used a ‘scattergun’ approach in their answers, that is providing a broad general answer to a specific question, scored lower marks. Examiners look for direct answers to the questions asked, they do not expect to read through a general answer in the hope of finding key points amongst general material not directly relevant to the question asked.

Legibility of answers was once again a problem for a number of candidates; it is not possible for examiners to give credit for answers they are unable to read. We strongly advise candidates in their exam preparation that, in addition to writing answers to individual questions, they spend time sitting and writing answers to questions for the equivalent duration of the separate papers. This will enable candidates to ‘practice’ the need to sit and handwrite answers for several hours thereby we hope improving the legibility of their answers.

Paper IA

Question 1

Describe the meaning and use of the following terms with reference to systematic reviews and meta-analysis:

a) Grey literature (30% of marks)

b) Analysis of heterogeneity (40% of marks)

c) Funnel plot (30% of marks)

KEY POINTS (suggested layout)

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

a) Grey literature: this is literature that is not easily identifiable via standard medical database searches, but may be relevant when performing a full systematic review. Grey literature includes data published as internal reports, non-peer reviewed reports such as project evaluations or non-systematic reviews which are commissioned and then placed on web pages. Means of findings the grey literature include internet searches using search engines such as google, agency searches (e.g. NICE) and references from primary peer-reviewed papers. Reviewers also often seek to access this literature by writing directly to experts in the area that they are studying.

b) Analysis of heterogeneity: all meta-analyses should investigate statistical heterogeneity between study results that they are merging. The chi-squared test for heterogeneity is commonly reported, but lacks statistical power (i.e. whilst statistical heterogeneity may be present when $p<0.05$, results where $p>0.05$ do not preclude heterogeneity). Where heterogeneity is identified this needs to be explained and if severe, statistical pooling across studies is potentially inappropriate. Among other factors it may relate to differences in the study populations, or the interventions, or study quality.

c) Funnel plot: this is plotted to investigate publication bias. The plot compares the summary measure of effect against sample size. The expectation is that the plot should look like an inverted funnel, with a wider diversity of effects observed with smaller sample sizes. If there is no bias, the plot resembles an inverted funnel. Where funnel plots appear unbalanced with few small trials observed with e.g. negative results, this may imply that there has been publication bias – with possibly such studies having been conducted, but not reaching publication.

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

A) Grey literature may be distinguished from "Black" literature in so far as black literature is often treated as confidential (e.g. commercial in confidence data). There are also databases of "grey literature", including SIGLE – system for information on grey literature in Europe, as well as patent databases. Bias may occur if grey literature is not included in a review

B) Increasingly, the I^2 test is used. Values below 20 imply minimal heterogeneity, values from 30-50 imply moderate heterogeneity, and values >70 imply severe heterogeneity. Pooling by random effects model may be used instead of fixed

effect models where moderate heterogeneity is found. Alternatively, it can be explored by stratifying by variables that may affect heterogeneity.

C) Techniques exist to modify summary estimates based on funnel plots using statistical estimation of missing data e.g. “trim and fill”.

EXAMINER COMMENTS

General observations on the performance of candidates

In general, candidates performed satisfactorily but relatively few did very well. Candidates often did not perform consistently well on all parts of the question.

Candidates appeared to have sufficient time to complete the three parts of this question. Many candidates, however, wasted considerable time and effort writing about systematic reviews and meta-analyses in general rather than focusing on the questions asked.

Ways in which candidates performed particularly well

Most candidates had a good grasp of funnel plots and a good idea about sources of grey literature.

Ways in which candidates performed poorly

Those candidates who did less well failed to relate their answers to systematic reviews and meta-analyses. This was particularly evident when candidates were discussing the grey literature, for example highlighting materials such as blogs, newspaper articles, and student essays as useful sources.

A number of candidates discussed different types of heterogeneity and did not adequately discuss the analysis of heterogeneity.

Common pitfalls in answering the question

Some candidates confused forest plots and funnel plots

Advice from examiners

Candidates need to make sure when they are answering the question that they relate it to the topic area in the stem of the question.

Question 2

Write brief notes on each of the following, outlining the inferences or suppositions that each of the statements supports:

a) The correlation coefficient between variables in a sample of 50 observations was 0.03.
(40% of marks)

b) The survival curves for time to death of two groups of patients, treated with different drugs and followed up for three years in a clinical trial were plotted. The curves initially diverged then converged by the end of the second year, and thereafter remained coincident.
(40% of marks)

c) On a scatter diagram a point has been found to be far removed from the main body of the data.
(20% of marks)

KEY POINTS

a) The correlation coefficient between variables in a sample of fifty was 0.03.

A correlation coefficient measures the linear relationship between two variables and lies in the range -1 to +1, with 0 indicating no correlation. A genuine population correlation of 0.03 is, in the context of the practice of public health, of no practical interest.

A genuine correlation, of any magnitude, does not by itself imply a causal relationship but a lack of correlation suggests that there is no association between the variables. However, the data should be visually examined, as not all important relationships are linear, for example there could be a strong ***non-linear*** association between the variables, such as portrayed by a 'U' shaped curve.

b) The survival curves for time to death of two groups of patients treated with different drugs followed up for 3 years in a clinical trial diverged, then converged by the end of the second year period and thereafter remained coincident.

Kaplan Meier methods can be used to construct survival tables from which survival curves can be plotted. This method takes into account censoring of patients at the end of the study period or because they have been lost to follow up. The statement above suggests that the frequency of death in one group initially exceeded that in the other group and then became similar. If the early survival benefit is not a chance finding, then it may indicate that either one treatment offers a short term benefit or patients on one treatment are particularly susceptible to high initial mortality. However, comparisons of survival proportions at different time points can be misleading and need to be interpreted with due regard to the overall mortality experience. Particular care needs to taken when interpreting survival curves towards the end of study periods if only a few patients are still being observed as even a single death can substantially alter the appearance of the curve. Methods such as the log-rank test exist to compare the overall survival experience of the experimental groups.

c) On a scatter diagram, a point has been found to be far removed from the main body of the data.

The outlying point could be an artifact resulting from a study error (e.g. measurement error or coding error), and this possibility should be checked. A far removed artefactual point can generate a spurious correlation between the variables which may seriously mislead the investigator. If the possibility of measurement error remains after checking then a sensitivity analysis should be conducted including and excluding any outliers to assess their overall impact on the results. If the point is genuine it could be at the extreme end of the expected range or it could be an exciting new finding generating further questions.

EXAMINER COMMENTS

General observations on the performance of candidates

Broadly, the candidates answered the questions quite well, but few did very well. Candidates often did not perform consistently well on all parts of the question.

Candidates appeared to have sufficient time to complete all parts of the question. There were a few answers that stretched to only a page or two for all three parts and it appeared that candidates did not seem to understand that more detailed answers were needed.

Ways in which candidates performed particularly well

Most candidates had a good grasp of the graphical representation of scatter plots and showed their understanding of correlation through this.

Most candidates also understood survival curves and grasped the fundamentals of their interpretation.

Ways in which candidates performed poorly

The difference between correlation coefficient and significance was elucidated by very few. Many seemed to think that the correlation coefficient referred to the gradient of the line.

A substantial proportion failed to address differences between correlation and causality. Similarly, a substantial minority did not indicate that a correlation coefficient measures a *linear* relationship.

Relatively few candidates provided an interpretation of the public health or clinical importance of the correlation coefficient or the survival curves.

Common pitfalls in answering the question

Whilst most candidates understood the concept of an ’outlier’, a minority failed to consider study error as a cause. Many candidates failed to indicate that outliers could be important in helping generate new insights.

Advice from examiners

Candidates need to understand better correlation coefficient, significance, gradient, and the potential importance of outliers when it comes to scatter plots.

Question 3

a) What potential disease and healthcare burden arises from hepatitis C virus infection?
(40% of marks)

b) Describe the main risk factors for acquiring or having acquired hepatitis C in a named country.
(60% of marks)

KEY POINTS

a)

- Summary - Progression of acute hepatic inflammation to chronic hepatitis, then end stage liver disease (cirrhosis and/or hepatocellular carcinoma). End stage liver disease poses a disease burden in terms of hospital management of the complications of cirrhosis, and the demand for liver transplantation
- Note, the burden is likely to be underestimated as there is much undetected infection. However with increasing national and international campaigning and increased awareness in primary care detection improving.
- Mention of which sources information used to capture or predict morbidity and mortality of Hep C (e.g. in UK, HPA surveillance, blood transfusion, modelling)
- Estimated UK prevalence (0.7% 15-65 years olds)
- Comment on trends in prevalence by age and geographically
- Estimated that 12% of individuals with hep C go on to have end stage liver disease.
- Mortality – rates higher with hep C and both liver related and underlying cause, rates increasing particularly in men
- Transplant – lists show increase particularly in men and account approximately for 10% of liver transplants in the UK;
- Hospital episodes in the UK doubled between 1998 and 2006
- Predicted modelling in the UK shows the future burden, but may be affected by availability of newer effective treatments although uptake and tolerance to side effects is variable

(b) Main risk factors for the UK

- Current or previous injecting drug use. Many injectors or former injectors can be accessed through drug provider services or through prisons. Hepatitis C is often asymptomatic, and there is an opportunity in primary care to question adults about needle sharing and injecting many years ago during their youth.

- Blood transfusion (prior to 1991 in most developed countries), *i.e.* before the introduction of screening in donors and blood/products for the virus.

- Recipient of blood products, *e.g.* people with haemophilia, again prior to 1991 in most developed countries.

- Invasive clinical procedures, injections, transplantation, and renal dialysis (especially in developing countries). This would include travellers, back packers, and those who have travelled overseas for transplants.

- Born and raised in an area where the infection is endemic (*e.g.* Egypt, Pakistan). For example, recent work in England has suggested a prevalence of around 2 to 3% in first generation Pakistani people.

Less likely transmission routes (i.e. additional information – see comment below when many candidates overemphasised some of these parts omitting the commoner routes of transmission):

- Vertical (mother to baby) or household; lower compared with hepatitis B or HIV.
- Sexual exposure. Again, not as efficiently transmitted sexually, as in hepatitis B or HIV.
- Occupational, *e.g.* health care setting, from exposure prone procedures. In the past, hepatitis C in health care workers has been associated with look-back exercises.
- Other drug use, *e.g.* intranasal cocaine.

Additional points for candidates naming HK as an example

Background

Viral hepatitis is a notifiable disease in Hong Kong. Locally, voluntary reporting was started in as early as 1966 and, since 1974, the disease has become notifiable. It was not until 1988 that the reported cases were classified by viral aetiology, namely hepatitis A, hepatitis B, non-A non-B hepatitis and unclassified hepatitis. Since 1996, non-A non-B hepatitis has been further categorized into hepatitis C, hepatitis E and hepatitis (not elsewhere classified).

Expectedly, virtually all of the notified cases were acute viral hepatitis. From 1996-2008, only 13 hepatitis C cases were reported to DH under the statutory notification system; four of which were reported in 2002, two and three cases in 2007 and 2008 respectively. While the figures captured under the local system could be a good reflection of the acute disease burden of viral hepatitis, ***the extent of chronic infections resulting from some hepatitis, notably hepatitis B and C, has to be determined by other mechanisms***.

Examples of sources of information for Hepatitis C

- Department of Health
- Hospital Authority
- Microbiology laboratories in the public service, which test clinical specimen for the virus
- Hong Kong Red Cross Blood Transfusion Service, which screens all donors for hepatitis C
- Academic units, where related studies are conducted.

Main Risk Factors

Although HCV shares similar transmission routes with hepatitis B, the two infections may not be of equal prevalence in HK. While HBV is still prevalent in many populations in Hong Kong, HCV prevails only in isolated communities.

HCV was common in injecting drug users but not persons at risk through sexual contact. Blood screening has decreased the risk of transmission to the haemophilia, haemodialysis and other patients requiring frequent blood/blood product transfusions

A recent HCV seroprevalence study conducted in methadone clinics targeting IDU echoed the high prevalence rate of HCV in this community. Of 567 IDU participants recruited in 2006, 84% were male and 98% were ethnic Chinese. The median age was 49 years and median injection duration was 17 years. Two-thirds (62%) admitted ever sharing injecting equipments. Prevalence of anti-HCV was 85% (95% confidence interval 82.5 – 88.3%). Injection duration,

recent injection, ever sharing injecting equipments and concomitant use of other drugs were independent factors associated with HCV infection.

HIV/AIDS patients, with a proportion being IDU, is another group with consistent data showing a comparatively high HCV prevalence. The higher HCV prevalence, coupled with the hastened liver disease progression in HIV-infected patients, would no doubt result in a unique HCV/HIV coinfection that demands attention.

Limited genotypic studies in Hong Kong has identified that 1b and 6a were the prevalent HCV genotypes locally, a scenario different from that in western countries where 1a predominated.

Data from new blood donors who were mostly adolescents and young adults in the last decade suggested that HCV infection is around 0.1% locally. This is much lower than the prevalence of HAV, HBV and HEV.

Among the new blood donors, anti-HCV was most commonly detected in middle-age group (30-39 year-old group or > 49 year-old group in male; >49 year-old group in female).

Findings of the household study of the entire spectrum of adult age groups conducted in 2001 further supported the uncommon scene of HCV infection among general population in Hong Kong; the overall positive rate was 0.3% in 936 subjects.

Information from the government's post-exposure management clinic did not suggest health-care-worker as a high risk occupation.

EXAMINER COMMENTS

General observations on the performance of candidates

This question was generally poorly answered. Many candidates wrote all they knew about hepatitis C without answering the specific questions asked.

Some candidates also interpreted 'healthcare burden' as solely from an economic perspective and missed other obvious points (e.g. liver transplant, expensive drugs, etc.).

The majority of candidates completed the question. A few wrote very short answers suggesting a lack of knowledge or that they had wider timing issues across the paper.

Ways in which candidates performed particularly well

There were some good answers demonstrating wider thinking with regards to healthcare burden, including transplants, treatment costs, DALYs (only a brief mention needed).

Ways in which candidates performed poorly

Not answering the question set and using a scattergun approach. Candidates lost marks if their answer was not clearly applied to answering the questions – i.e. it was not sufficient to have hidden some facts relevant to the question in a longer answer.

Common pitfalls in answering the question

Whilst healthcare burden was asked for, there was too much focus on society burden and writing about control of risk factors, which was not asked for.

One or two candidates also wrote about the wrong type of Hepatitis (e.g. Hep A).

Advice from examiners

Answer the question set – even if it is not the question you would like to answer or seems a bit different from questions set before. It was not necessary or sufficient to write everything you know about Hep C and hope the examiner would find the facts related to the question somewhere in the answer.

Question 4

What preventive health care strategies are needed to reduce disease complications and death in people with Type 2 Diabetes Mellitus?

KEY POINTS

Background information:

- Demonstrate an overview of who is affected and the size of the problem currently and future predictions
  i.e. Brief definition of DM; common problem affecting from 3.5 to 5% of population in the UK, associated with obesity and middle to older age (although becoming more prevalent in younger ages due to lifestyle), more insidious onset than type 1, can present with complications,
- Risk factors (lifestyle, obesity and ethnicity e.g. South Asian communities, complex heredity), knowledge of main complications (cardiovascular, renal failure, retinopathy, vasculitis, neuropathy)
- Comments on prevalence (increasing with obesogenic lifestyle)

Strategies:

- Link to national strategy (e.g. National Service Framework or equivalent)
- Preventive strategies – primary and secondary prevention; how it would differ in young and middle aged or older population. Lifestyle management. Use of opportunistic testing in high risk groups. Widespread screening not recommended but there may be place for high risk screening, possibly as part of cardiovascular risk checks.
- Primary care/management and care in community
- Incentivising practice (performance measures in primary care and secondary care)
- Baseline measures and targets (i.e. brief mention of how health needs might be measured and attainable targets set and monitored – e.g. in primary and secondary care, use of registers).
- Role of secondary care – multi disciplinary approach.
- Targeted approaches – innovative approaches may be needed to reach specific high risk groups (e.g. those at increased risk because of ethnicity)
- Links between professional disciplines (ophthalmology, chiropody, shared care arrangements, obstetrics for diabetics who become pregnant), multiagency approach
- Use of self care, patient groups and support groups, support networks, managed networks – patient education programmes.
- Importance of regular monitoring of DM – blood sugars/urinalysis, foot care, retinopathy, annual checks
- Treatment strategies – management of blood sugars which may move from diet alone to diet and drugs and finally diet and insulin, lifestyle, weight loss, exercise, stop smoking

Additional points (excellent answer)

- Disease complications –
  - microvascular – retinal, visual, neurological
  - macrovascular – cerebrovascular and cardiovascular
- Diabetic retinopathy screening – role of optometrists in achieving high uptake of screening and digital imaging
- Control of hypertension (higher targets compared to non-diabetics)
- Control of hyperlipidaemia
- Adequate glycaemic control HbA_1C monitoring

EXAMINER COMMENTS

General observations on the performance of candidates

This question was generally reasonably well answered.

Some answers were rather narrow in interpretation and conversely some were too wide – writing a broad ‘strategy’ answer.

The majority of candidates completed the question. A few wrote very short answers suggesting a lack of knowledge or that they had wider timing issues across the paper.

Ways in which candidates performed particularly well

Being specific to Type 2 Diabetes Mellitus, while at the same time thinking broadly across health care professions and mechanisms for change, e.g. targets, incentives.

Ways in which candidates performed poorly

Not answering the question set and using a scattergun approach. Writing a broad strategy framework, which did not relate specifically to the question or Diabetes Mellitus.

Common pitfalls in answering the question

Some answers were too generic, i.e. with candidates providing everything they know about the principles of developing a strategy or too focused on individual care, which is part of the answer but alone was not sufficient.

Advice from examiners

Give specific application to the topic. Anyone can write a generic framework, but if used it is how it relates to the question that will lead to marks. Sometimes using a framework can trip you up if it doesn’t really fit the topic in the question which was set.

Question 5

Cancer registration is a routine practice in many countries.

a) What is a cancer registry and what functions does it perform?
(50% of marks)

b) What are the confidentiality concerns about the cancer registration process?
(30% of marks)

c) What are the risks of not having an effective national cancer registration process?
(20% of marks)

Key Points

<u>An introductory comment about cancer</u>
A comment that cancer is a significant health burden, one in four people will contract cancer and one in three people will die from it in the UK.

<u>An explanation of what a cancer registry is and what it does.</u>

Not all countries in the world have a cancer registry.

Cancer registries have been in place in the UK since the 1950s. In Hong Kong, the population-based Cancer Registry is established in 1963. It is a member of the International Association of Cancer Registries (IACR). The Hong Kong Cancer Registry has access to a number of channels in both private and public sectors through which data are collected
Cancer registries are a well established source of morbidity data. They contain not only epidemiological information, but information relating to the patient's staging and treatment. They also contain mortality data which makes calculations of life expectancy possible.
Purpose of a cancer registry

Understanding the epidemiology of cancer
Planning cancer services
Monitoring of national cancer plans and targets
Identification of the outcomes of treatment
Evaluation of the quality and effectiveness of cancer services (including screening services) at a local, regional and national and international level
Research

<u>Confidentiality issues in relation to the use of registers</u>

Candidates would be expected to discuss recent controversies which have arisen as a result of increased legislation around data protection. The discussion should include the suggestion that anyone having personal data recorded on registers should be required to give specific consent and the risks that this could have for the completeness of cancer registration. An understanding of the value of identifiable information (e.g. NHS number, name, DOB etc) to registers to ensure that multiple notifications of the same person are not double counted and also to appropriately link information about the same person from different sources.

- In Hong Kong, the Government's Personal Data (Privacy) Ordinance is designed to protect the privacy of the cancer patient and the use of the related information. It is strictly adhered to.
- All the staffs of the Hong Kong Cancer Registry understand and are bound by the Privacy Ordinance before beginning work with the Registry. All data are surrounded with

appropriate security and no un-authorized person is allowed to access the computer system.

Risks of not having an effective cancer registration process
Would lead to a lack of high quality (that is accurate and valid) statistics to monitor cancer rates. Register data are particularly important for cancers with a low mortality. Cancers with a high mortality (e.g. lung cancer) can be monitored using mortality statistics, although these are not useful for cancers which can be more successfully treated.
Register data is also particularly important for monitoring and evaluation of diagnosis and treatment following national screening programmes.
Time lag in reporting will also be a problem without a co-ordinated registry.

EXAMINER COMMENTS

General observations on the performance of candidates

Broadly, performance on this question was average, with very few candidates either excelling or doing poorly.

Candidates seemed to have sufficient time to complete the question.

Ways in which candidates performed particularly well

The first part of the question was very well answered. There were good descriptions of cancer registries (occasionally with named national and international examples), the data items that they collect, their sources of information, and comprehensive lists of the functions that they perform.

The second part of the question was reasonably well answered, although fewer candidates were able to provide fully rounded answers to this section (e.g. covering identifiable information, de-duplication, consent issues, data protection legislation, information governance, and security).

Ways in which candidates performed poorly

The third part of the question was generally poorly answered. Almost no-one discussed the particular advantage of cancer registration systems for monitoring cancers that have a low mortality.

Common pitfalls in answering the question

Some candidates answered the third part of the question by just repeating the list of functions from the first part and stating that these would not be achieved; this alone was not sufficient.

Advice from examiners
The same or similar answers to different parts of the same question are highly unlikely to be sufficient.

Question 6

How would you assess the mental health needs of a population in a defined geographical part of a named country?

KEY POINTS

Purpose of the assessment:
Firstly it should be clear why any assessment of the mental health of the population is being undertaken, what are the issues, what are the service pressures, who is commissioning the work?

The components of any needs assessment would include the following:

Defining the population.

The population to be assessed needs to be carefully defined and could be a country, a local area, a general practice or a neighbourhood. The area selected will influence how the needs assessment will be carried out. Mental health needs are specific to certain population groups and these will need to be tightly defined. Is it the whole population, a sub set by age (older people, young people), or a group with specific needs such as homeless people?

The assessment of need for mental health services in a population will include the following:

a. An understanding of the **epidemiology** of mental health in the population. Sources of information would include the ONS Psychiatric Morbidity Survey (or equivalent), and census data. The Association of Public Health Observatories in the UK has produced estimates of prevalence of common mental health conditions.
b. **Comparative** assessment of local provision against national norms. National norms are relatively weak method of assessing needs, and may be confounded by the level of service provision. Prescribing data and other data from general practice will provide valuable information.
c. **Individual assessment of need.** Often information is not available in a useable form. In some areas long term registers may exist which could provide a useful source of information. The Care Programme Approach in England contains individual level data which it may be possible to access or to sample.
d. Service User Views – it is important to include the views of service users, and to discuss how these views may be gathered. The views of the voluntary sector may also be sought, but as potential service providers, their views may have to be carefully evaluated.
e. **Rapid Appraisal.** This can be a useful technique to seek views on the needs within a local community. It is a highly participative approach, but is unlikely to produce statistics for planning purposes.

<u>The following points are also applicable to candidates from Hong Kong:</u>

Hong Kong at present lacks detailed data of people suffering from various mental and behavioural disorders. Nevertheless, the following local surveys do exist and provide some insight of the situation:

- The **Population Health Survey** 2003/04 (collaborated work of the Department of Health and the University of Hong Kong)

- In 2006/07, the **Census and Statistics Department** conducted a territory-wide survey (with representative samples drawn from both land-based non-institutional population and residents in sampled institutions with residential services) to estimate the number and prevalence rate of persons with selected types of disabilities, including mental illness or mood disorder.

At present, the **Hospital Authority** (HA) provides various medical services for mental patients, including inpatient, outpatient, medical rehabilitation and community support services. However in-patient figures alone will not suffice since there is an international trend to shift the focus of the treatment of mental illness from inpatient care to community and ambulatory services.

Information from the **Social Welfare Department** (SWD) is equally important since it provides ex-mentally ill persons and their families with a series of social rehabilitation services, including residential care, day-time training, vocational training and community support services. This is to help ex-mentally ill persons adapt to community life and reintegrate into the society.

On the other hand, it is worthy to mention that information like lifestyle choices (e.g. substance abuse) is also important since it has impact on the onset, course and outcome of mental illness

EXAMINER COMMENTS

General observations on the performance of candidates

Many candidates had a good 'factual recall' (how things are) whereas their ability to analyse options and explain their findings was more disappointing.

Candidates appeared to have sufficient time to complete the question.

Ways in which candidates performed particularly well

Most candidates were able to list several of the relevant routine data sources. Relatively few mentioned using information from other statutory and voluntary organisations, or enhancing the utility of information such as converting episodes to a person base, and using record linkage.

Candidates who discussed particular needs of population subgroups (such as the elderly or homeless) were also more likely to describe the different types of mental health conditions faced by these people. A small number of candidates significantly enhanced their answer by relating mental health needs to the socioeconomic characteristics of the population they had chosen.

Ways in which candidates performed poorly

A significant minority of candidates seemed to be unaware that there are different techniques for conducting a health needs assessment, for example that local provision can be compared against other areas (comparative assessment was rarely mentioned), or that good estimates of the prevalence of common mental health conditions are available.

Common pitfalls in answering the question

A small number of candidates failed to identify a defined area in a named country, as was required by the question.

Advice from examiners

Candidates who use a well-structured approach towards describing health needs assessment had a relatively easy opportunity to score high marks.

Question 7

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

a) Anti-hypertensive drug treatment versus a health-service funded weight reduction programme for the treatment of hypertension (high blood pressure)

(30% of marks)

b) Health-service funded nicotine patches for smoking cessation versus investment in a local job club (employment) initiative

(40% of marks)

c) Coronary artery by-pass surgery for coronary heart disease versus health-service funded chiropractic for low back pain.

(30% of marks)

KEY POINTS

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

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

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

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

EXAMINER COMMENTS

General observations on the performance of candidates

On the whole this question was adequately answered, although there were very few good or excellent answers.

Candidates seemed to have ample time to complete the question.

Ways in which candidates performed particularly well

Candidates generally stated the correct type of economic analysis for each section.

Those candidates who had planned their answer and had a clear structure scored better marks.

Ways in which candidates performed poorly

Some candidates inappropriately used a cost minimisation analysis in answer to part a).

Common pitfalls in answering the question

Once a candidate had answered with an incorrect type of economic analysis on one subsection of the question, it was then very difficult for the person to pass the question.

Advice from examiners

Candidates should discuss the identification of costs and the fact that evidence of clinical effectiveness of interventions is required for all three types of economic analysis.

Question 8

Discuss whether those who contribute to their own ill-health should have the same access to healthcare services as those who do not. Give examples to illustrate your answer.

KEY POINTS

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

- The principle of equity of access:
  - particularly equal access for equal need
  - concepts of need
  - are the needs of a smoker the same as those of a non-smoker?
  - lifestyle factors are influenced by socio-economic factors – smoking and drinking are far from acts of free will

- Health need and the ability to benefit:
  - e.g. 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 one's own actions? e.g. 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 e.g. tobacco
  - rationing involves consideration of both equity and efficiency

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

- How you might include the public in addressing this issue e.g. 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?
- sometimes rationing occurs at the micro level e.g. some clinicians refuse to offer by-pass to smokers

EXAMINER COMMENTS

General observations on the performance of candidates

Generally this question was disappointingly answered with very few good answers.

Candidates seemed to have ample time to complete the question.

Ways in which candidates performed particularly well

Candidates were given clear passes if they addressed most of the key points, i.e. discussion of equity, rights and responsibilities and the finite nature of health care resources.

Ways in which candidates performed poorly

Some candidates spent a large amount of space in their answer discussing one aspect of the answer, e.g. wider determinants of health. Although this was relevant it was not a sufficient answer to the question that was asked and too great a concentration of one aspect presumably left candidates with little time to consider other aspects.

Advice from examiners

Answer all aspects of the question.

Question 9

You are responsible for implementing a new national clinical guideline in your local setting. For a named guideline and named setting:

a) Write short notes on one theory of change management, and critique its application in this context.

(30% of marks)

b) Write short notes on one management tool or technique, and describe how you would use it to implement the guideline successfully.

(40% of marks)

c) Discuss factors that may influence whether you can introduce the guideline successfully.

(30% of marks)

KEY POINTS

- Describe the guideline and setting
- Explain national guideline context (NICE/ Map of medicine/ WHO etc)

(a) One theory of change management

- Outline one change management theory e.g. Kurt Lewin, Gleicher's Formula or Roger's innovation adoption curve

Critique this change management theory in the context of the chosen guideline. Apply the change management theory to this context, recognising potential strengths and limitations

(b) One management tool or technique

- Outline a management tool you would use (such as Mckinseys 7S, Stakeholder analysis, SWOT or PEST analysis)

Apply the tool to this context, recognising its strengths and limitations

(c) Factors influencing success

- Outline levers and barriers to change (ownership/ professionalism/ negotiation, power, politics/funding)
- List key success factors (including stakeholder management)

EXAMINER COMMENTS

General observations on the performance of candidates

Answers to question 9 demonstrated a general lack of understanding of management theory and its usage.

Most candidates seemed to have ample time to complete the question.

Ways in which candidates performed particularly well

Candidates did well by answering the question posed, avoiding irrelevance, providing a good structure, richness of context and examples.

Ways in which candidates performed poorly

Candidates performed poorly by not answering the question and adopting a scattergun approach.

Common pitfalls in answering the question

Misunderstanding the difference between management theory and management tools. Most candidates did not offer a critique to the theory. When the question asks for **one** example, only one should be used.

The contextual information was also very poor.

Advice from examiners

Candidates should look at the marking structure and proportionalise their answers appropriately.

Answer the question asked and avoid the inclusion of irrelevant information

Question 10

What are the main advantages and disadvantages of the use of targets as a tool for improvement of health services? Use examples from a named country to illustrate your answer.

KEY POINTS

Essential: Advantages (max 40% of marks)

- Targets can provide a clear focus on outcomes e.g. reduction in the prevalence of disease correlates with target attainment e.g. influenza vaccination or measles/ MMR immunisation programme, or reduction in mortality with a population screening coverage e.g. breast or cervical screening
- Provide a common agenda with shared objectives for professional and managerial endeavours: possibility of team cohesion, individual/team/organisational rewards and sanctions. This is particularly important if it is a complex process that you are implementing e.g. a breast screening service
- Provide a means of accountability for governments (national, local, other) and are a prominent part of national strategies e.g. NHS Operating Plan, Vital Signs, World Class Commissioning, National Service Frameworks. LAA National Indicators, QOF
- (Problem in HK, lack of explicit target shared among different providers has hindered the coordinated efforts in service improvement)
- Enable audit against the targets at both individual and service level to enable identification of areas for service improvement

Essential: Disadvantages (max 40% of marks)

- Focus clinicians and organisations on the 'measurable' and the masking of clinical priorities e.g. waiting lists and the prioritisation of those waiting longest over those with urgent clinical need, not enough follow up services for screening programmes, shifting of focus away from other important measures for infectious disease prevention such as hygiene practices
- Aspects of care which are important but difficult to measure may not appear as targets e.g. in UK sexual health is an example. Same for HK ; for infectious diseases: the measurement of hygiene practices and other infectious disease control measures
- a target may oversimplify and mask complexity making valid comparisons difficult e.g. debate over use of post operative mortality statistics that ignore case mix; different degree of susceptibility, complication rates and vaccine efficacy among different groups of influenza vaccine recipients
- monitoring targets can be costly e.g. GP contract, lack of good infrastructure for collecting practices in private healthcare sectors in Hong Kong, hospital targets require staff, computerised systems, data entry costs etc

Additional Key Points: (20% of marks)

- targets work best when closely correlated to a clear and measurable clinical outcome
- selection of targets require consensus building, taking into account evidence, feasibility and acceptance etc, may set short, intermediate and long term targets
- means of demonstrating to the public that priorities have been identified and met
- means of educating the public about the importance of the problems
- Are a practical expression of research expressed in evidence based guidelines e.g. target blood pressures for diabetics, call to needle time for thrombolytic drugs

Supporting evidence:

    - Management theory on the use of targets as means of ensuring organisational development and maturity
    - Understand and demonstrate the importance of targets in project planning
- Critical understanding / contextual relevance
    - The use of quality assurance mechanisms within the health care system as a means of achieving targets

EXAMINER COMMENTS

General observations on the performance of candidates

There was surprisingly poor performance by many candidates on this question.

Most candidates seemed to have ample time to complete the question.

Ways in which candidates performed particularly well

Candidates did well by answering the question posed, avoiding irrelevance, providing a good structure, richness of context and examples.

Ways in which candidates performed poorly

Candidates performed poorly by not answering the question and adopting a scattergun approach.

Common pitfalls in answering the question

There was a lack of examples and context. There was also a lack of policy-awareness. This question gave the opportunity to mention *local* targets which was missed by many candidates.

There was a lot of irrelevant material and a focus on the disadvantages of the use of targets to the expense of more discussion of the advantages.

Advice from examiners

Answer the question asked and avoid the inclusion of irrelevant information.

Paper IIA

You are the screening co-ordinator for your area. A patient group has written to you asking why there is no local organised screening programme for prostate cancer. The group encloses a recent paper from the *New England Journal of Medicine*, which it claims provides clear evidence that screening for prostate cancer based on the prostate specific antigen (PSA) test should be introduced immediately. The paper is:

Screening and Prostate-Cancer Mortality in a Randomized European Study. *Schroder et al, New England Journal of Medicine 2009; 360:1320-1328.*

1. Write a critical appraisal of this paper.

(40% of marks)

2. What is meant by an intention-to-screen analysis as opposed to per-protocol analysis, and what are the implications of these different approaches for the interpretation of the results in the paper?

(10% of marks)

3. What additional information do you need in order to decide whether or not to introduce an organised prostate cancer screening programme?

(20% of marks)

4. Outline the points that you would include in a letter of response to the patient group's request for immediate prostate cancer screening in your area.

(30% of marks)

KEY POINTS

Q1. Critically appraise the paper

The candidate should demonstrate a systematic approach, covering the following areas:

Did the study ask a clearly focussed question? Is there a clear rationale for the study?

- Scientific background and rationale is clearly defined: Prior to the trial the effect of PSA-based prostate cancer screening on mortality was unclear.
- Aim of the current trial is clearly defined: to determine whether PSA-based screening reduces mortality from prostate cancer.

What was the study design and was the choice appropriate?

- This was a multi-country randomised control trial comparing 82,816 men offered PSA-based screening versus a control group of 99,184 men not offered such screening.
- An RCT is the most appropriate study design for assessing the effectiveness of prostate cancer screening.

Were participants appropriately allocated to the intervention and control groups?

- Randomisation at a 1:1 ratio was carried out on the basis of random number generators, but without the use of blocks or stratification.
- It is unclear how the sequence of allocation was concealed, until assignment, from the individually randomised men.
- Age at randomisation was similar in the intervention and control arms across all 7 countries, but other baseline data were not presented to reassure that the randomisation and allocation procedure worked.

- Inclusion/exclusion criteria: men aged 50-74 were included but the core age group for the main analysis was 55-69; men with prevalent prostate cancer were excluded.

Were participants, staff and study personnel 'blind' to the participants' trial arm?

- The physicians and men were not blinded as it would have been impractical to mask men to their PSA results and possible subsequent need for biopsy and treatment.
- Importantly, the primary outcome assessors (for evaluation of cause of death) were blind to trial arm allocation and used an algorithm to assign underlying cause of death. This should guard against differential misclassification of outcome/ ascertainment bias.

Were participants who entered the trial accounted for at its conclusion?

- Yes – see flow chart (figure 1 of the paper):

Are primary and secondary outcome measures clearly defined and were the methods for outcome assessment appropriate?

- The primary outcome was prostate cancer mortality, defined as definite/probable prostate cancer death or an intervention-related death. It is unclear in this paper whether intervention-related deaths included deaths as a result of radical treatment or just deaths as a result of procedures directly related to screening, such as biopsy.
- Expert review of medical records to assign underlying cause of death is appropriate to minimise ascertainment bias present when just relying on death certificates.

Presentation of the results

- Baseline tables showing the results of PSA screening
- Nelson-Aalen graph showing the cumulative hazard of prostate cancer death by trial arm.
- Deaths rates/rate ratios by age and centre.

Was the statistical analysis clearly described and appropriate?

- Statistical analysis is described: primary analysis was an intention to screen analysis using Poisson regression to compute rate ratios and 95% confidence intervals (unadjusted).
- The rate ratio and p-values were then adjusted for two previous interim analyses.
- A sample size calculation was presented.

What were the results? Could the results be explained by chance?

- After a median nine years of follow-up, the data monitoring committee recommended publishing the results of a third interim analysis, on the basis that 'significance' (adjusted $p = 0.04$) had been achieved after statistical correction of the p-values to take account of the previous two interim analyses.
- The cumulative incidence of prostate cancer was 8.2% in the screening group and 4.8% in the control group, showing that the screening intervention was effective in identifying prostate cancer.
- The authors reported a 20% reduction in prostate cancer mortality, with the 95% confidence intervals indicating that the benefit could be as much as 35% or as little as 2%.
- The authors went on to calculate that these small to modest benefits came at a cost, for each life saved, of the overtreatment of up to 48 men with prostate cancers that did not become clinically manifest (at least in the first nine years of follow-up).

What was the target population? Was the study population representative of the target population?

- The target population was men aged 50-74.
- We are only given the number of men who underwent randomisation, so we do not know whether the study population was representative of the target population.

Are the results of clinical or public health significance?

- Yes, because prostate cancer is a leading cause of incident and fatal cancer in men worldwide and there are no alternative (e.g. primary) prevention strategies currently available to reduce the burden of prostate cancer.
- However, the possible benefit of screening in reducing prostate cancer was shown to be associated with a high risk of both overdiagnosis and overtreatment.

Additional key points

- Note the complexities of the trial, which involved 7 European countries, each with slightly different trial protocols e.g. differences in start dates (between 1991 to 1998); recruitment strategies (3 trials based on randomising men identified from population registers prior to consent; 4 trials based on randomising men after obtaining their consent); screening strategies (variable PSA thresholds of between 3 to 10 ng/ml; two trials including digital rectal examination (DRE); one trial including the ratio of free to total PSA); biopsy protocols (variable number of biopsy cores) and screening intervals.
- The treatment of screen-detected prostate cancers was according to local policies.
- There is no mention of whether informed consent was sought but the trial had ethics approval.
- Secondary outcomes were overall mortality and adverse events of screening procedures, including biopsy.
- Methods for ascertaining the primary outcome varied by country (6 countries verified cause of death after expert review of medical records, 1 country based their endpoint on Cancer Registry cause of death after a validation study).
- The p-value adjusted for the two prior interim analyses was p = 0.04; this suggests that the magnitude of the observed effect estimate had a 4% probability of having arisen by chance i.e. the study provides only modest evidence of a reduction in prostate cancer deaths with PSA screening.

Q 2. What is meant by an intention-to-screen analysis as opposed to per-protocol analysis, and what are the implications of these different approaches for the interpretation of the results?

- The intention-to-screen analysis implies that men were analysed according to the trial arm they were allocated to (screening or no screening), irrespective of whether they complied with their trial allocation i.e. 18% of men allocated to the PSA screening arm were never screened (non-compliance) and some (perhaps 20%) men allocated to no screening were likely to have opted to be screened anyway (contamination in the control arm).
- This analysis strategy (intention to screen), based on the randomised treatment arms, provides an unconfounded estimate of effectiveness but the effect estimate (rate ratio) will be attenuated by non-compliance (with allocation to PSA testing or biopsy) and contamination (by PSA screening in the control arm), so will have underestimated efficacy amongst men who were actually screened compared to those who were not.
- The authors presented a ‘per-protocol’ analysis - i.e. according to who actually received screening.
- A per-protocol analysis may have been confounded by differences between men who do and do not agree to screening, and so the per-protocol result needs to be treated with caution. Thus in this analysis the benefits of randomisation (ie dealing with known and unknown confounders) are effectively lost.

Additional key point

- In interpreting the intention-to-screen analysis, the results will also be affected by the fact that 14% of screened men recommended for biopsy did not agree to have a biopsy. Non-

compliance with biopsy may attenuate the effect estimate. At the same time this anlaysis represents more closely the real life implementation of a screening programme; not all people invited will be screened and not all 'screen positive' people will opt for the diagnostic test. The intention-to-screen analysis is a pragmatic test of whether the screening programme has benefits when implemented in the real world.

Q 3: What additional information do you need in order to decide whether or not to introduce an organised prostate cancer screening programme?

- What are the adverse effects of screening, biopsy and of treatment, how frequently do they occur, how serious are the adverse effects and do the potential benefits outweigh the potential harms? Need more detailed information on the impact of screening and associated treatments on morbidity and quality of life.
- False positive results: need more understanding of the impact on (morbidity and mens' quality of life), and management of, false positive results.
- Is there evidence for selective screening in particular high risk groups?
- What is the most effective treatment for screen detected prostate cancer?
- An appraisal of the cost and resource issues: Results of cost effectiveness analyses, applicable to your setting; costs of implementing a screening programme, including costs of administering & explaining the test, responding to positive tests, counselling those who on further investigation turn out not to have prostate cancer, providing treatment and follow-up to those who have prostate cancer.

Additional key points

- Also required is an understanding of the acceptability of the screening programme to men, including uptake rates, and compliance with recommendations to biopsy.
- Find out the current state of play with respect to consideration of a national screening programme at the government / Department of Health level.
- How to quality assure the programme.

Q 4. Outline the points that you would want to cover in a response to the patient group's request for immediate prostate cancer screening in your district

- Use of appropriate language for professional-to-patient group correspondence.
- Thank them for their interest and acknowledge the local situation.
- Give brief lay summary of findings highlighting the key points (not just re-doing the critical appraisal) – results, any key limitations, any practical issues in relation to implementation.
- Discuss lack of information on the best way to treat men with screen detected disease.
- Highlight that very large numbers of men need to be screened and to be treated to prevent one death, so many more men may be harmed by a screening programme than the small number who might benefit.
- Lack of information on the rates of adverse effects and on quality of life.
- Discuss merits of improved management of men with clinically diagnosed disease.
- Decision will be made after full consideration of the issues: benefits, harms, costs and cost-effectiveness, acceptability, and quality assurance.
- Outline any further work that is planned by the local public health department in this area or nationally.
- Offer further discussion with the group in response to ongoing concerns.

Additional key points

- Mention of the PLCO trial from the USA that was published at the same time and showed no benefit of screening, although the conclusions were controversial because of the limitations of that trial.

- Mention of any recent national / consensus guidelines for the management of prostate cancer.

EXAMINER COMMENTS

General observations on the performance of candidates

Overall the questions were answered well, with many candidates giving clear, structured answers that covered the depth and breadth of the questions. Candidates who did not do well gave answers that lacked structure and precise, clear answers and failed to cover the depth and breadth of the questions.

Most candidates appeared to have enough time.

Ways in which candidates performed particularly well

Candidates who did well gave clear, structured answers that covered the depth and breadth of the questions. They recognised the public health importance of the question (in this case, related to screening for prostate cancer) and were able to draw out the public health implications of the study. They pointed out both the strengths and limitations of the study, and were able to draw a sensible overall conclusion about the study's contribution to public health practice. Most candidates knew the difference between intention to treat (ITT) and per protocol analysis and could understand the implications. Those who composed good answers for the 'Letter' question, covered the public health importance of prostate cancer screening, the limitations of the study, provided a range of sensible recommendations and pointed out current local policies.

Ways in which candidates performed poorly

Those candidates that performed poorly lacked a clear critical appraisal structure and so did not provide sufficient depth and breadth in their answers; they failed to come to a balanced appraisal of the paper, commonly focusing on one or two limitations without highlighting any key strengths of the design. It is important to critique the study rather than just reiterate what the authors say. Some candidates answered poorly to Question 3 because they only listed the screening criteria but did not show they understood the question asked about what **additional** information was needed.

Common pitfalls in answering the question

- It is important to understand the difference between blinding and concealment of allocation;
- whether or not randomisation worked should not be inferred from follow-up mortality rates, which could have been influenced by the intervention;
- selection bias is not the same as generalisability – it is important to know the difference;
- the involvement of a large sample across 7 European countries will not eliminate confounding in itself – only correct randomisation and concealment of allocation can guard against confounding in an RCT;
- the varied protocols in different countries may not necessarily BIAS the observed association (HRs), but does make it impossible to know what the optimum 'intervention' for screen-detected prostate cancer is;
- it is important to state why RCTs are the most appropriate study design to assess the effectiveness of screening;
- poor answers emphasised the limitations without recognising the strengths of the trial;

- some candidates did not appear to understand what an ITT analysis is and why it is important; some candidates did not state that ITT preserves the initial randomisation and should mean that results are not confounded by any baseline imbalances;
- The outline points of a letter (Q4) frequently omitted to discuss local policies or to provide convincing/clear recommendations for future action. Note also that a full letter was not required; the question asked candidates to outline points they would include in a letter.

Advice from examiners

Develop a clear critical appraisal structure; aim for depth, breadth and balance.

Paper IIB

In its new format Paper IIB questions, key points and detailed examiner comments on each section are not released. Below are general remarks on candidate performance provided by the examiners.

General observations on the performance of candidates

Generally candidates performed well with a good understanding of the issues.

There were few uncompleted sections and many candidates were able to answer all questions at considerable length.

Ways in which candidates performed poorly

A substantial minority of candidates wrote poorly. Some scripts were difficult to read due to poor handwriting, poor spelling and inaccurate grammar.

Some candidates were clearly able to manage the statistical calculations but were unable to interpret the results.

Common pitfalls in answering the question

Failure to read the question properly and therefore the answer did not address the question asked.