d) recall bias
   - in case-control studies the potential for bias is of particular concern because in the cases disease, as well as exposure, has already occurred at the time information is collected*
   - recall bias occurs when knowledge of disease status influences the way in which exposure is reported by the study participants*
   - answer illustrated with example relevant to a case-control study

e) 'over-matching'
   - although matching of cases and controls is often helpful, matching can be harmful*
   - it can result in failure to recognise a true association (i.e. can force the association under study towards the null)*
   - If matching is on a variable in the causal pathway then bias results (illustrate with example)
   - If matching is on a variable associated with exposure but not disease then loss of power results

COMMENTS

Many candidates provided information superfluous to the question e.g. explaining in great detail what a case control study was before beginning to address part a).
The question explicitly calls for explanations in the context of 'case control studies'. However, many people answered the five sections without focusing their response on the case control method and thus often included completely irrelevant material. The inclusion of appropriate examples to illustrate responses often strengthened answers.

QUESTION 3

You are a public health practitioner with responsibility for communicable disease control. The head teacher of a school of children aged 4-10 years in your area reports that there is an outbreak of hepatitis A amongst the staff and pupils. Outline how you would investigate and manage this outbreak.

KEY POINTS

- Include a simple statement describing the presenting symptoms of Hepatitis A, what causes it, and the sequelae
- Verify the diagnosis of Hepatitis A:
    - clinical
    - microbiological
- Verify the diagnosis of an outbreak:
    - definition of an outbreak
    - background surveillance
- Mention study design and data analysis:
  a cohort study or case control study depending on the nature of the outbreak and putative exposures
- Convene an incident control team:
    - define membership
    - allocate roles and responsibilities
    - review the evidence and describe the outbreak in terms of time, place and person
    - initiate case finding
    - determine any common exposure history
    - identify specific at risk groups
    - decide and implement immediate control measures
    - disseminate information (professional/public/media)
    - monitor the implementation and outcome of the immediate control measures
    - determine criteria to declare the outbreak over
    - write a report with recommendations to prevent reoccurrence
- Demonstrate specific knowledge about the national and international epidemiology and control of Hepatitis A which is appropriately related to each of the above

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

- Mention how reports are received – Notification and laboratory confirmations
- Demonstration of an awareness of the debate about the use of human normal immunoglobulin and Hepatitis A vaccine in the control of Hepatitis A
- Mention national vaccination policy
- Demonstration of an understanding of the role of legislation in the control of Hepatitis A
- Demonstration of an awareness of current national guidance on the control of Hepatitis A in particular where to get specialist advice and help – web/other
- Demonstration of understanding of the roles of those in different health economies in the investigation and control of the incident (PCT, HPA, Env Hlth, St HA, micro at NHS Trust or HPA).
- Mention of the relevance of the type of school – e.g. if for mentally handicapped children or ethnic minority population (introduction of infection from abroad)

COMMENTS

Few candidates answered the question well. Few candidates described the epidemiology, diagnosis or clinical features of hepatitis. Many candidates showed a lack of understanding of the practical aspects of outbreak investigation and management. Few mentioned the potential role of Human Normal Immunoglobulin or Hepatitis A vaccine. Some candidates did not describe the role or membership of an outbreak control team. Few candidates were able to describe accurately the design or purpose of an epidemiological study in their investigation.

The papers were very theoretical with little about organisational aspects. In general not well answered.

QUESTION 4

Write short notes on the relative power of individuals, professionals, politicians and commercial interests in controlling alcohol consumption.

KEY POINTS

- Power needs to be defined and a brief description of different types of power attempted
- The various groups involved need to be identified and may include:
  - Professionals such as doctors
  - Politicians of differing political views
  - Commercial interests such as brewers and pub landlords
- The different perspectives of individuals and of the various interest groups need to be discussed
- An understanding that power is not evenly distributed in society and that the exercise of power may, or may not, be legitimate/moral
- Examples of the different types of power, negative and positive, that can be exerted in controlling alcohol consumption need to be given e.g. expert power exerted by doctors advising patients to reduce alcohol consumption
- Discussion of power relationships and conflicts, and examples given e.g. opposition to government alcohol taxes
- Some discussion of the process of controlling alcohol consumption, in the context of power and power relationships, should be discussed such as: influencing, alliances, power blocks, pressure groups, role of education, role of the media

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

- A particularly clear understanding of the theory of power and it's different types: coercive power, reward power, expert power, legitimate power (i.e. power conferred by social or moral authority), referent power (i.e. use of social position or status) and of power relationship and structures
- Providing several examples of how this theory applies to the practical case given

COMMENTS

Many candidates failed to answer the specific question which related to "relative power" and instead chose to describe actions that different groups could take to control alcohol consumption. Few candidates defined "power" or described the different types of power. Few candidates demonstrated an understanding of theories of power or attempted to link theory to practical examples related to alcohol consumption.

QUESTION 5

a) Why is information about health at work of importance to a public health practitioner?

b) How would you obtain information about health at work in a named country? Distinguish information that is readily available from that which would require special collection.

KEY POINTS

Section a

- Work (and unemployment) and health are closely linked, both generally and specifically.
- Employment is one determinant of socio-economic status, which in turn is closely related to health.
- There are also specific hazards that relate to specific industries, occupations, or groups of occupations (e.g. asbestos exposure and mesothelioma).
- The workplace also provides an opportunity for promotion of health, both specifically (in relation to minimising occupational hazards) and generally (e.g. smoking, healthy eating, exercise).
- Workers suffering from certain conditions and who are employed in certain occupations pose a more general public health risk (e.g. typhoid carriers in food industry).

Section b

- Routine information that you could seek would include:
    - Demographic information – age, sex, proportion employed by age and sex, type of employment by age and sex. In the UK, this would be derived from the Census, General Household Survey and National Labour Force Survey. Official statistics would only include officially-employed individuals, and those in unpaid employment, or working unofficially (and who might be at high risk) would not be included. To get information about these groups a special survey would be required.
    - Routine morbidity and mortality data linked to occupation. In the UK, occupation is registered at time of death. However this doesn't reflect occupation throughout life. The ONS Longitudinal Survey is a cohort study examining risks of death by occupation derived from the Census.
    - Other sources of routine data that could be used include GP records, hospital records, sickness absence records, pre-employment medical assessments, referrals to specialist services, ill-health retirement, and compensated illness pensions. Some employers would have access to these, but not all.
    - Specific employment risks and hazards in the workplace. In the UK, responsibility for health and safety now falls under the Health Protection Agency. Information about some work-related hazards would not be available routinely, and would require special surveys. This might include issues such as stress.
    - Industrial disease and compensation payment registers. Incidents of release of toxic or hazardous substances may be recorded (e.g. by Chemical Hazards Surveillance Centres or National Radiation Protection Board).

- Special studies that might be required might include:
    - Cross-sectional studies to establish prevalence of various potential work-related problems
    - Case-control studies to determine whether there may be an increased risk associated with a particular exposure
    - Cohort studies to establish the incidence of health problems associated with certain occupations or particular jobs within an industry.
    - Intervention studies to determine the effectiveness of interventions to minimise work-related risk.

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

- A discussion of the results of certain specific studies linking occupation, grade of job and type of work to health outcomes e.g. the Whitehall study, the ONS Longitudinal study.
- A recognition of the weakness of some of the sources of information. E.g. sickness absence records might be a poor reflection of illness because people may feign illness, people may fear to admit to illness for fear of losing their job, and people may be willing to put up with ill health in order to keep a job, particularly seasonal or casual workers.
- Overall days off work are a correlate of mental health of the workforce (Psychiatric Morbidity Survey 2000); injuries at work and days off work (e.g. For back pain and repetitive strain injury) can be indicative of attention to workplace safety and ergonomics.
- Mention of Health and Safety Executive if country is UK.
- The healthy worker effect – you can only get or keep certain types of job if you are already healthy, so general risk might be underestimated in these occupations.

COMMENTS

This shows in general, candidates have little understanding of occupational health, and inadequate knowledge on the nature and source of important statistics specific to occupational health and safety: compensation data (few quoted this), industrial accident data, and notifications of prescribed occupational diseases. Likewise, the understanding of health and work is insufficient. Most candidates could put in their answers "stress", "asbestos" and the broader "socioeconomic status and health", but few candidates (probably those with some experience in Occupational Medicine) were able to give some aetiological groupings of hazardous agents like physical, chemical, mental, ergonomic etc. A few candidates failed badly because their answers never addressed "health at work", but only gave a general commentary on health information.

QUESTION 6

Outline the potential limitations and benefits to patients of:

a) patient-held electronic health record (*e.g.* the health 'credit card')
b) hospital-based electronic patient records.

KEY POINTS

a) Patient-held electronic records

Benefits for patients

- Portable i.e. go with the patient. All essential information is available at whatever health-care facility the patient is attending so reduced risk of mistakes
- Empowerment – patient has responsibility for and ownership of the record
- Convenient – reduces trips to doctor if e.g. repeat prescription information is contained on the card
- Security – more secure and confidential than information written on a card, bracelet or necklace (e.g. SOS or Medic Alert) which can be seen by anybody. A thief would need special technology to read it (unlike paper-based record)
- Communication – a GP will know changes to medication instantaneously following a hospital visit if recorded on the card

Limitations for patients

- It is easy to forget or lose a card and then a health care worker would have no record at all
- Patients may trade cards, or falsify information, or feign loss of cards so that they can get particular treatments
- Access needs to be controlled – not all patients would want all health care workers to see all their record. Access to various parts of the record needs to be controlled according to who is accessing it. This may in turn weaken its value, particularly in an emergency.
- The value of a stolen card could be quite high e.g. belonging to a celebrity
- Empowerment may increase inequalities by benefiting some groups more than others
- The record size is limited, and therefore may not contain sufficient detail for specialist or hospital treatment.
- Technology is required to read it – this may not be universally available
- Patients may have difficulty obtaining access to the information on the card
- The record may not be useful while abroad
- It may further disenfranchise some groups e.g. asylum-seekers, illegal immigrants, homeless who aren't on the NHS/NI system and therefore can't get access to a card. How do they access health care?
- Relies on appropriate coding systems being available to record health care and health care events.
- Cost may be high, particularly if they have to be frequently replaced due to loss.
- Use in audit and management is limited if the patient has the only copy – a back-up is required.

b) Hospital-based electronic patient records

Benefits for patients

- They can contain an unlimited amount of information subject to the system employed, and so can provide the detail required for specialist treatment
- The responsibility for them rests with the hospital, and so they are not vulnerable to falsification or loss by the patient
- Security can be high subject to the system employed
- Facilitate clinical audit and clinical governance
- Facilitate hospital management and planning
- Can facilitate rapid access to results of investigations and of the care process during a hospital stay, by all professionals involved in care, and at multiple locations.
- Can be lined to clinical guidelines, care pathways or expert systems to improve care and reduce errors.
- Access can be controlled so that professionals see only that information that they need to know to provide care.

Limitations for patients

- Records can be difficult for patients to access, despite a right to do so under the Data Protection Act
- Security and confidentiality can also be poor depending on the system.
- There can be tension between maintaining security and confidentiality and professionals having access to the information at hand when required.
- A single hospital doesn't have access to past medical history from other hospitals or primary care. The patient may forget to pass on important elements of their medical history, or be unable to do so (e.g. unconscious, confused). Thus the hospital team may be using only part of the patient's medical record.
- Records may not be compatible with systems held at other sites.
- Paper summaries may still have to be produced for GP's and upon transfer to another hospital with a different system. Such a summary may take a while to produce, and is vulnerable to loss or theft.
- The record is vulnerable to system and power failures.
- Requires a high level of staff skill and training to ensure all staff can access the record if required.

A good to excellent answer should mention the benefits of patient-held records in complying with policy direction inherent in legislation such as the Freedom of Information Act (in the UK).

COMMENTS

Most candidates gave a reasonably satisfactory answer, and the examiners gave greater weighting to "important points" like data confidentiality, patient empowerment, record linkage & problems encountered, clinical governance, audit etc. than points that most candidates could produce: cost, loss of card, etc. Overall, most candidates came up with a reasonable answer.

PAPER IB

QUESTION 7

Write short notes on the components that should be included in assessing the cost of hospital acquired infection.

KEY POINTS

Costs in economic appraisal may be broadly classified as 'direct' or 'indirect' (to a named entity) and 'tangible' or 'intangible'.

Direct and tangible costs to the NHS health system would include:

- In-patient: number of additional bed days, investigations, procedures, drugs, dressings, wages of doctors, nurses, and others involved in care. Opportunity costs – foregone use of resources for alternative patients, needs to be included. A portion of the hospital overheads, management function, and capital assets should also be included.
- Community: costs of GPs, practice nurses, and district nurses; drugs, dressings and equipment; hospital out-patients dept, and transport. Opportunity costs to the primary and community sector also need to be included.
- Direct costs of infection control system - surveillance of acquired infections; the hospital infection control team; the lead director for infection control.
- Litigation costs.

Direct and tangible costs to Local Authority Social Care system might include social assessments, social care support or enhanced community support, e.g. day services. (Opportunity costs and overheads apply as above.)

Tangible costs to the individual(s) with a hospital acquired infection include: foregone paid employment, costs of additional child care, cost of any additional drugs, dressings, visits or additional care not borne by state through one or other benefit e.g. NHS or Income Support. Tangible costs to informal carers – as for the individual, especially if a relative.

Intangible costs include mortality from HAI; pain and suffering; foregone leisure time; diminished quality of life borne by individual(s) and others (e.g. family, friends), loss of confidence in the health care system.

Costs to society from loss of productivity and the cost of caring activities.

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

Variation in prevalence of HAI between different categories of patient (highest in ITU and surgical patients), therefore caution needed in extrapolating or generalising findings of assessment.

Additional costs attributed to HAI may be marginal, i.e. patients might have died regardless of HAI; longer length of stay may not be entirely attributable to HAI; and additional investigations may be undertaken in patients who subsequently are shown to NOT have HAI.

COMMENTS

This was a relatively easy question but many candidates did not structure their answers and overlooked some important components to include in an economic analysis.
Many candidates presented irrelevant information on HAIs, others got side-tracked into presenting 'everything I know about health economics'.

QUESTION 8

Write short notes on the relationship between unemployment and health.

KEY POINTS

- The unemployed do not form a single category but have many subdivisions. Ill health affects subdivisions differently (e.g. psychological effects are marked in first 12 –18 months of unemployment, after which there is no further deterioration; unsatisfactory jobs can be as depressing as unemployment)
- Studies show unemployed have higher prevalence of self rated ill health, higher mortality, and high SMR for suicide.
- Possible mechanisms include:
    - Direct health selection – ill health a risk for both job loss and for subsequent chances of re-employment (studies show only a limited effect).
    - Poverty - deteriorating diet; poorer psychological health in long term unemployed who had to borrow money compared to those who didn't. Less deterioration in psychological health and serum cholesterol in older men who face redundancy with less financial uncertainty because of early retirement packages etc.
    - Stress – non financial benefits of work; unemployment as a form of bereavement, with loss of structure, and self esteem. Negative psychological effects of unemployment are similar in Scandinavian countries where the financial benefits are more generous than the UK.
    - Health behaviours – these are more damaging in unemployed people (alcohol, cigarettes, lower body weight.) Unemployment increases the chance of other adverse events e.g. home and marriage breakdown
    - Job insecurity - Health begins to be affected when people anticipate unemployment but are still at work.

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

- Life-course approach shows unemployment occurs as a much longer-term sequence of events. Material hardship in early life is linked with slow growth in childhood, poorer educational attainment, and psychosocial stress. They are all linked to unemployment in later life. Unemployment is often a part of a more general pattern of accumulation of disadvantage.
- Effects of unemployment on the wider society. High employment situations lead to more training and apprenticeship opportunities, more pensions, and less dependency on benefits by people with health problems, fewer disaffected youth. Tendency of unemployment and chronic job insecurity is to lower the value of human resources that an individual brings to the labour market.
- Discussion about social capital and social cohesion in relation to unemployment – both effect of social capital on those unemployed and the effect of unemployment on social capital. There can be both positive and negative effects; social capital as minimising the effect of unemployment by e.g. employment tips, inclusion, or social capital as consolidating unemployed status by clique-like exclusion of the unemployed from the social and political environment.

COMMENTS

Many candidates did not answer the question posed, focusing their answers exclusively on an overview of the topic of health inequalities.

After stating the link between unemployment and health, many candidates failed to describe this any further, or limited further discussion to the range of explanations that had been set out in the Black Report. Consequently, many candidates confused social class categorisation and employment classification, making inappropriate and inaccurate statements.

Answers tended to focus on the psychological aspects – with limited discussion on other diseases. Categorisation of employment was limited – indicating lack of insight into the range of employment status categories.

A small number of better answers recognised the wider impacts on family and community, but few linked unemployment with wider disadvantage from the earliest years.

QUESTION 9

What are the main advantages and disadvantages of the use of targets as a tool for the performance management of health services? Illustrate your answer with examples from a named country.

KEY POINTS

Advantages

- Targets can provide a focus on outcomes and work best when a clear outcome e.g. reduction in the prevalence of disease correlates with target attainment e.g. Hib 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
- Provide a means of accountability for Governments and are a prominent part of national strategies e.g. Health of the Nation, NHS Plan, National Service Frameworks
- 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
- Enable audit against the targets at both individual and service level

Disadvantages

- 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
- Conversely aspects of care which are important but difficult to measure may not appear as targets e.g. in UK sexual health is an example
- 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
- monitoring targets can be costly e.g. new GP contract, hospital targets require staff, computerised systems, data entry costs etc

A good answer will show:

- Management theory on the use of targets as a means of ensuring organisational development and maturity
- The use of quality assurance mechanisms within the health care system as a means of achieving targets
- Knowledge of the research base supporting secondary prevention interventions and screening programmes
- Analysis of the use of targets in the local health care system i.e. the impact of one of the NSFs on a local health care system if UK example
- Clarity about current government targets in the example used and analysis of the issues being raised locally

COMMENTS

In general this question was answered in a very mediocre way. Some candidates spent more time than was necessary discussing different examples of targets without addressing the advantages and disadvantages of targets in general. However, it was helpful to distinguish between targets of a performance indicator type and aspirational targets (some candidates chose the term inspirational).

Good candidates mentioned relevant management theory e.g. Herzberg's motivating factors or other management concepts. However, in general there was a lack of application of management theory. Some candidates displayed a degree of sophistication e.g. Shewart control charts or the importance of the baseline and the rate of change as being of as much importance as whether the target was achieved. Good candidates mentioned the time and expense of monitoring information for target surveillance, obsession with targets and 'gaming'.

QUESTION 10

In some countries, the primary health care practitioner can act as the 'gatekeeper' to health care. Discuss the advantages and disadvantages of this system.

KEY POINTS

Definition of primary care

- Include accessibility, first point of contact for the health system, staffed by generalists (nurses, doctors), based within the community (e.g. dentists, optometrists), provides for the possibility of continuity of care.

Advantages

Potential to:

- reduce the number of patients seeing a specialist inappropriate to their needs
- Baseline investigations can be undertaken to direct the patient appropriately or indicate possible management entirely within primary care
- screen patients who do not need to see a specialist
- Reduces the potential requirement for the patient to travel, particularly relevant where the patient is housebound
- see the individual patient holistically and to prioritise management of presenting health problems
- have prior knowledge of domestic and social circumstances relevant to the presenting health problem
- maintain an up to date medical record covering all medical problems
- act as a focus for all community-based multidisciplinary health-related activity for the patient

Disadvantages

- Specific need may be obvious e.g. most breast lumps reviewed by a specialist, pregnant women reviewed by midwives or obstetricians
- May be difficult for a generalist to maintain the knowledge and skill base when knowledge about disease, diagnostic tests and therapeutic possibilities are becoming more numerous
- A failure to appreciate the urgency of a need for specialist care may lead to a delay in investigation and treatment
- May shield an inappropriate lack of secondary care level provision
- Where clear access criteria to secondary care along with their monitoring are not in place, gate keeping may be used as a means of inappropriate rationing

A good answer will show some knowledge of patient satisfaction with a primary care based service together with the economic arguments. It will also mention comparative clinical audit against guidelines as a tool for ensuring appropriateness of the gate keeping process.

COMMENTS

Given that in the UK the health service is said to be primary care-led there was an alarming lack of good answers. There could have been a lucid and cogent presentation of the

advantages of this system. Very few candidates talked of primary care beyond general practitioners and practice nurses. There was often ignorance about primary care.

Good candidates drew comparisons from health systems internationally and this provided a framework for their answers. Very few mentioned patient satisfaction with a primary care led service, the screening of undiagnosed illness and the focus of preventive health programmes in primary care.

PAPER IIA

You are part of a review group considering policy for tobacco control in your area. The group is considering promoting smoking bans in public spaces. A group of local businesses is concerned that this will damage their trade, and produces the attached paper in support of their argument:- Enstrom, James E. and Geoffrey C. Kabat. "Environmental tobacco smoke and tobacco related mortality in a prospective study of Californians, 1960-98." *BMJ* 2003;326:1057-0.

A local radio station has invited you and a representative of the business group to participate in a short radio debate.

1. Write a structured abstract of the attached paper in no more than 250 words. *(20%)*

2. Critically appraise the paper, paying particular attention to:

   Methods used including statistics;
   Results;
   Confounding;
   Conclusions drawn. *(40%)*

3. Outline the preparation you would make for this radio interview, including the key points you hope to make. *(40%)*

KEY POINTS

Abstract

Should have usual headings:-

- Objective
- Design/ methods
- Setting
- Subjects/ participants
- Outcome measures
- Results
- Conclusions

Should be succinct and give the bottom line results. Should not exceed 250 words.

Critical appraisal

1. A good rationale for study, health effects of environmental tobacco smoke (ets) are not clear, have been imputed from meta-analyses of small studies. Health effects of ets underpin much policy making related to tobacco control therefore good evidence base important. Opportunistic study. Authors criticise publication bias in existing meta-analysis
2. Secondary analysis of large prospective study (CPS I)

3. Analysis only restricted to Californian residents 30-96 at enrolment – not a representative sample => ? generalisability although authors address – never smoked mortality close to that of US population
4. Cohort studies compare outcomes amongst groups with different exposures. In this study compared outcomes of people enrolled in original cohort (1959). Exposure definition and measurement critical in this study. Defined no exposure group as spouses of people who never smoked, ets group as spouses of people who did smoke. This is an appropriate methodology for this kind of question
5. Stratified exposure by volume of cigarette consumption but no pack year estimation
6. Smoking status based on self-reporting – no cotinine estimation (what effect would this have - "non-smokers" may lie about their smoking status and be true smokers – this may increase outcome rates in non smokers in either arm so effect may be unpredictable but small – not accounted for in analysis)
7. Key outcome measures; mortality from smoking related disease – lung cancer, CHD, COPD. Deaths were well ascertained. Unlikely to be any important bias in death coding based on exposure status
8. Analysis used Cox proportional hazards regression. This technique measures hazard ratios - a form of time adjusted relative risk. It includes a time to outcome measure and the outcome is binary i.e. dead or alive. In other words it adjusts for person years of follow up either to death or the end of the study. The baseline hazard is for never smokers in never smoking households. Regression analysis is a good technique for adjusting for confounding and effect modification e.g. of age. Proportional hazards is an appropriate techniques where there is a person year dimension and where there are censored data (i.e. observation ends at time of loss to follow-up, time to outcome or study end)
9. Confounders included race, education, exercise, BMI, urbanisation, fruit, health status. These are clearly factors which could influence outcome and are linked with smoking status and their inclusion is appropriate. Analysis is stratified by smoking volume at the start of the study. It is not clear if this an appropriately stratified measure of ets in the exposure arm. This is done however to look for a dose-response relationship.
10. Results are presented with confidence intervals – the degree of precision
11. The main results of this study are negative. There appeared to be no excess risk in non-smoking spouses of smokers against non-smoking souses of smokers for any of the outcomes measured. There did not appear to be a dose response. Results are presented for males and females separately.
12. The authors argue that the study provides no evidence of association let alone a causal relationship.
13. They performed various analyses to try and "concentrate" the risk (to increase the power of the study).
14. For lung cancer and COPD the numbers are very small. They are larger for CHD. For both COPD and lung cancer results are very imprecise and includes the probability that there is no excess risk. For CHD and lung cancer there appears to be no dose response although the risks for COPD do increase with smoking but the results are not significant.
15. Conclusions – this a negative study. There are a number of reasons why it could be a false negative:
    a. Under powered – there is no power calculation because the study was not designed or powered to test this hypothesis. In public health terms even a small excess risk amongst a large population of ets exposed people could constitute a public health hazard. The numbers of outcome events are very small. Within the study this could have been addressed by using all cause

mortality, combining male and female etc.. The study could have used other outcome measures e.g. hospital admissions for smoking related disease, smoking related intermediate outcomes like FEV if the data were available. Alternatively they could have analysed the whole cohort (they seem to have analysed what was available to them with dangers of sub-set analysis)

b. Exposure misclassification. This was addressed to some extent – if exposed and non-exposed groups are heavily misclassified the outcomes in both groups will be incorrectly estimated. Other possible problems include extra household exposure of non-smokers in the workplace or public places which may have decreased over time (this would reduce the apparent risk) or lying about smoking status
c. Over control of confounding – not an issue

16. This is a relatively under-powered negative study. It does not support hypothesis that there is a causal relationship but possibility cannot be excluded for COPD.
17. Conflict of interest. A major criticism that has been levelled is that some of the authors had links – funding and sponsorship – from tobacco industry. This in itself does not undermine the study but may have influenced design and rationale.

Radio interview

Candidates need to recognise that this study provides potentially powerful ammunition to people opposed to control of environmental tobacco smoke for commercial, political or civil rights reasons. The briefing paper should be written in lay language and avoid the use of jargon. The candidate should recognise that there will be limited time therefore to restrict to a few well rehearsed arguments. Need to come across as professional and authoritative without being authoritarian.

A carefully prepared brief would include the following arguments:

1. Understand others position but need to look at whole picture
2. Health protection argument – this study does not disprove causal effect – power, etc. Only one study – need to look at all the evidence. Duty to protect health of people exposed to hazards. Smoking bans also have benefits for smokers – encourages people to give up. Also precautionary principle – often take drastic measures for small or theoretical risks e.g. SARS, BSE. High level support and recommendation from senior doctors for harms e.g. CMO, Surgeons General
3. Choice argument – works both ways - smokers argue civil liberties but non-smokers also have right to choose. Need balance
4. Commercial argument – this may vary between countries but empirical evidence base suggest that there can be commercial benefits – can see it as commercial opportunity. Majority don't smoke and substantial minority won't use smoky environments because find it unpleasant or for health reasons e.g. asthma
5. Precedence argument – places with smoking bans – e.g. California
6. A good answer would have some numbers e.g. no-safe limit, even exposure equivalent to only 1 cig per day would lead to n excess deaths
7. Could offer phased introduction with evaluation of health and commercial impact. May affect some types of businesses more than others

COMMENTS

Given the importance of the topic and the need for the craft to be able to critically appraise an epidemiological paper, answers were mostly very disappointing.

Candidates shouldn't bother writing such things as 'the statistical test was the right one to use' or 'a cohort study was appropriate' without explaining **why**.

Candidates should refer to the original Abstract, which few candidates came close to.

Very few candidates were able to correctly identify the size of the cohort either at enrolment or at the end of the study. The ascertainment of outcomes was one of the strengths of the study, but some thought it weak. Neither were many able to identify any correct or accurately described results. Candidates were confused by the tables. Not enough attention was paid to the issues of the size of the study (perhaps not surprising if they couldn't work out the actual size) and the problem of misclassification of ETS exposure status (which the authors had used to dismiss other studies). Few appreciated that classification of ETS exposure status was unaltered by the final small questionnaire that was no more than a belated attempt at validation.

The third part was stronger for most, especially preparation, but too many failed to mention the clash of Human Rights (and how to 'resolve' that conflict), effects on staff and evidence of actual effects on business. Many took the opportunity to indulge in a rant against smoking, unfocused on the specific issues: that would not make for a good and effective broadcast.