

Chapter 10 Health protection and communicable disease control – answers

Self assessment

Question 1 of 8

Answer C. The management of ambulance services is a health care management, not a public health, role.

Workplace smoking bans may be included within health protection although it is not, generally, in the UK.

Question 2 of 8

Answer E. Data show that the incidence of all four of these sexually transmitted infections has risen in the last ten years

Question 3 of 8

Answer D – low-cost therapeutic interventions are constantly produced and are available. One of the reasons for our inability to control the resurgence of infectious diseases is the lack of political and pharmaco-industrial will to develop low-cost remedies for unprofitable infectious diseases.

51% of the years of life lost globally are due to communicable diseases. In the African region, the burden of disease from infections is four times that for non-infectious causes. Infectious diseases are more common in low income countries compared to high income countries, with 68% of years of life lost compared to 8%. Some infectious diseases once thought to be under control are re-emerging as major public health issues, e.g. tuberculosis.

Question 4 of 8

Answer E. Data show that drug resistance is an issue with all four diseases. Drug resistances are emerging and linked in part to increasing use of anti-microbial agents.

Question 5 of 8

Answer B – isolation of cases. This is not effective and is usually employed to prevent the spread of disease transmitted through the faecal-oral or respiratory route.

Needle exchange is an effective way of preventing the spread of blood-borne infections in injecting drug users. Screening blood products is an effective way of preventing transmission during medical procedures such as blood transfusion and the use of blood products such as human insulin. Sterilisation of products/instruments prevents infection during invasive procedures. Safe operating practices ensure transmission does not occur from doctor to patient or vice versa

Question 6 of 8

Answer C – smallpox. This led to the global eradication of the disease.

There are many animal reservoirs for rabies, including bats and other mammals, and for salmonella; particularly important in transmission of Salmonella to humans are domestic animals such as chicken, pigs and cows. Cryptosporidium has many reservoirs outside the human host including animals; of particular importance in transmission to humans are cattle. Non-human reservoirs of Legionella exist, e.g. hot water systems

Question 7 of 8

Answer D – oral polio vaccine contains live attenuated organism.

Cholera vaccine is an inactivated organism. Whooping cough vaccine is a suspension of killed organism. Tetanus vaccine contains products derived from serum.

Question 8 of 8

Answer D – Hepatitis B. As the incidence of hepatitis B is very low in the UK, this vaccination is not routinely offered to children as a part of the childhood schedule

Short answer questions

Question 1 of 10

The following are control measures that are employed to prevent food and water-borne infections:

- Good hygiene practices for food safety (hand washing is of central importance)
- Separation of raw and cooked food, clean water and sewage
- Destruction of contaminated goods
- Production controls assurance
- Legislation
- Good management of water supply systems/effective cleaning and maintenance

Question 2 of 10

The following measures help to reduce the spread of hospital acquired infections:

- Surveillance
- Clear infection control standards
- Maintaining clean hospital environments
- Strict antibiotic prescribing practices
- Isolation of infected patients

Question 3 of 10

Smallpox is the only disease which we have managed to eradicate from the globe entirely. Salmonella enteritidis has been eliminated in chickens by vaccinating flocks. Tuberculosis and E. coli O157 have been eliminated from milk by pasteurisation. Influenza control is an example of where we try to contain the disease through winter vaccination programmes which aim to limit spread in vulnerable groups such as the elderly and those with asthma.

Question 4 of 10

This is the immunity of a community, i.e. the degree to which a population is resistant to an infection. High levels of immunity protect the non-immune. For example, the World Health Organization recommends vaccine uptake rates of over 95% to maintain herd immunity to measles. When levels drop below this, there is an increased risk of outbreaks.

Question 5 of 10

Clear objectives are needed for the system so that it can be evaluated and to ensure that it is relevant to the needs of the population to be covered.

Clear case definitions are required for the conditions under surveillance so that the same thing is counted accurately all the time. Data needs to flow from clear sources to a clear collection point.

Easy reporting mechanisms maximize the number of cases reported and useful, timely feedback to reporters encourages participation and enables action.

Not every case will be reported – for example, the incidence of gastrointestinal infection can be up to 100-fold greater in the community than that reported. A clear understanding of what proportion of cases are reported is needed so that estimates of true incidence can be made. This may require population-based surveys.

Data validation systems should be designed and used to maximise accuracy and enable efficient analysis and interpretation.

All of this requires adequate resourcing and aims to maximise the completeness, accuracy, relevance and timeliness of the system. More complex systems may be more sensitive, predictive and representative of the true disease status but they will be costly, take longer to operate, be less acceptable to those participating and lose flexibility. A balance is required.

Question 6 of 10

Surveillance is used to identify individual cases of disease so that action can be taken to prevent spread (for example, excluding food handlers from work if they contract food poisoning). This can also be used over time to monitor the incidence of disease so that rises in incidence can trigger an investigation. A microbiology laboratory, for example, might notice several cases of legionella infection and trigger an investigation into the possible source in order to prevent further cases. Trends in infection, which are continuously monitored through surveillance systems, can indicate changes in risk factors or that certain elements of a population are at increased risk (for example, a rise in sexually transmitted infections in young women). This allows interventions to be targeted appropriately. Knowing the epidemiology of infectious diseases in close to real time through surveillance can help to evaluate current control measures such as vaccination programmes. A fall in incidence may allow control measures to be relaxed. For example, it is no longer necessary to vaccinate against smallpox. Lastly, and very importantly, surveillance allows new infections to be detected and hypotheses produced regarding their causes. Many countries have communicable disease surveillance programmes which carry out these functions.

Question 7 of 10

These include initial investigation, convening an outbreak control team, initiating initial control measures, undertaking a descriptive study and further control measures, following it up with an analytical study, obtaining microbiological evidence, if possible, and taking steps to prevent further outbreaks.

Question 8 of 10

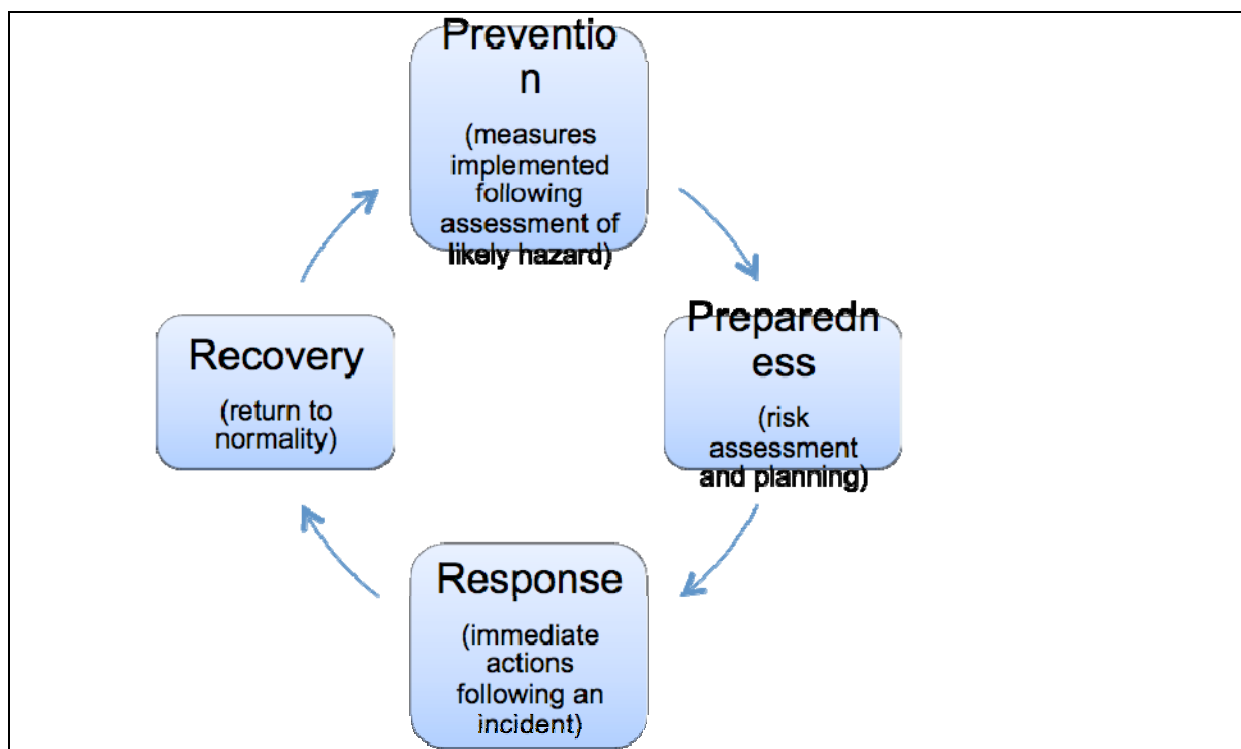
- Vaccination of health care workers against infectious diseases they may acquire through their work, e.g. hepatitis C.
- Work station assessment to prevent health effects due to poor posture for office workers.
- Care of substances hazardous to health where workers may be exposed to chemical hazards.
- The assessment and reduction of physical workplace hazards such as risk of slips, trips and falls and hazards due to lifting.

Question 9 of 10

An emergency is an event or situation which threatens serious damage to the environment; or war; or terrorism, which threatens serious damage to security.

Question 10 of 10

The four phases are prevention, preparedness, response and recovery.



Exercises (you may need to look up additional material to complete these exercises)

Exercise 1 of 3

a) Talk to the Environmental Health Officer (EHO) at the local authority to see if there are any further cases and to obtain information about the restaurant. Talk to cases and obtain preliminary data – are any other family members or friends ill? Are there any other potential sources of infection other than the Chinese restaurant? When did people become ill?

b) Public health, microbiologist, EHO, press officer. Produce a questionnaire for cases including name, address, sex, symptoms and date of onset. Obtain a list of food items from the restaurant. Undertake case finding – ask ill people if others had become ill, obtain a list of regular patrons, ask GPs to inform of any cases with gastrointestinal symptoms. Request stool samples from cases for microbiological investigation. Ensure EHOs inspect premises and request voluntary closure if necessary. Obtain food and environmental samples for analysis. Produce press release.

c) Cohort. All people who had eaten at the restaurant on the 27th or had takeaway food.

d) Yes. Only three dishes have both a relative risk above 1 and a significant difference between those who had eaten the dish and those who had not. These are egg fried rice, special fried rice and chicken fried rice.

e) Ensure that the control measures begun earlier continue. Continue to monitor the situation to assure yourself the outbreak is over. Thoroughly investigate the restaurant – HACCP* would be a useful tool – to try to ensure that no further instances occur. Identify the source of the infected eggs and ensure chicken flocks are vaccinated.

*HACCP stands for Hazard Analysis Critical Control Point. It is a system of food safety management that has been adopted many countries including the US and in Europe and Australasia. It is a process control method involving knowledge of microbiology, chemistry and physical hazards, the ability to make judgments on risk, as well as insight in how to manage a manufacturing/production/service system effectively.

The World Health Organization and the Food and Agricultural Organization of the UN are backing HACCP and it has been incorporated into the World Trade Organization agreements controlling world trade. It is the reference standard for international trade, i.e. no HACCP means no permit to import food into most Western countries.

So, HACCP is needed to export food. It protects home populations from risky imported foodstuffs, it can be used in all production of food to ensure safety, and many tourist organizations require the hotels they use to have HACCP.

Exercise 2 of 3

Suggested points to include in answers:

a) Fuel crisis

Prevention measures in place to limit impact

- May not involve health sector if preventative measures are legislative or international trade negotiations to secure fuel supplies and pricing policies.
- All organisations should have business continuity plans in place to ensure they can carry on when capacity is reduced.

Preparedness risk assessment and planning

- Identification of key workers who need fuel access, e.g. GPs, hospital clinical staff and admin staff, and those who can travel to work without a car.
- Develop home working policies.
- Identify and ensure sufficient fuel stockpiled for emergency generator needs (e.g. for hospital backups and flood plain pumping stations (where increased flooding might lead to increased communicable disease outbreaks).

Response – immediate

- Implement home working policies.

- Issue key workers with guidance on accessing fuel locally.
- Step up tele-access to health care, e.g. NHS Direct cover.
- Issue press release on health care services availability.
- Secure fuel for emergency services.
- Cancel non-urgent procedures to manage with reduced capacity.

Recovery – return to normality

- Put in place additional services to manage increased waiting lists due to cancelled procedures.
- Put in place cover arrangements for any staff who have worked overtime.
- Formalise learning and update plans.

b) Hurricane

Prevention measures in place to limit impact

- Support and advice for voluntary agencies who help provide emergency aid, e.g. training and funding grants.

Preparedness risk assessment and planning

- Identify risks to health and advise on need to evacuate.
- Plan for mass casualties and mass deaths of any origin.
- Purchase health response pods (e.g. containing emergency medical supplies, protective equipment).

Response – immediate

- Provide emergency medical aid, food supplies and other necessities with partner authorities.
- Provide emergency rescue support.
- Advise and issue guidance on health risks such as communicable diseases in flooded areas, necessity for clean water.

Recovery – return to normality

- Continue immediate actions until normality restored.
- Provide support for reconstruction of medical services in affected areas.
- Formalise learning and update plans.
- Provide counselling services for staff involved in rescue work.

Exercise 3 of 3

Diseases notifiable (to Local Authority Proper Officers) under the Health Protection (Notification) Regulations 2010 (available from

http://www.hpa.org.uk/infections/topics_az/noids/noidlist.htm):

- Acute encephalitis
- Acute meningitis
- Acute poliomyelitis
- Acute infectious hepatitis
- Anthrax
- Botulism
- Brucellosis
- Cholera
- Diphtheria
- Enteric fever (typhoid or paratyphoid fever)
- Food poisoning

- Haemolytic uraemic syndrome (HUS)
- Infectious bloody diarrhoea
- Invasive group A streptococcal disease and scarlet fever
- Legionnaires' disease
- Leprosy
- Malaria
- Measles
- Meningococcal septicaemia
- Mumps
- Plague
- Rabies
- Rubella
- SARS
- Smallpox
- Tetanus
- Tuberculosis
- Typhus
- Viral haemorrhagic fever (VHF)
- Whooping cough
- Yellow fever

As of April 2010, it is no longer a requirement to notify the following diseases: dysentery, ophthalmia neonatorum, leptospirosis and relapsing fever.