**Chapter 9 Screening – questions**

Self assessment

Question 1 of 8

The major difference between a screening and a diagnostic test is that the screening test identifies:

1. People with the disease
2. People with risk factors for the disease
3. People at increased risk of the disease
4. People with symptoms
5. None of the above Question 2 of 8

Potential harmful effects of a screening programme include all of the following except:

1. Incorrectly identifying healthy people as diseased, leading to false positives
2. A test might result in unnecessary diagnostic tests and investigation
3. Leading to a labelling effect in people testing positive
4. Leading to early identification of a condition and hence a better outcome
5. Leading to significant opportunity costs due to the screening programme Question 3 of 8

Which cancer has the highest incidence in women worldwide?

1. Breast cancer
2. Lung cancer
3. Ovarian cancer
4. Colorectal cancer
5. None of the above Question 4 of 8

All of the following diseases are screened for in the newborn period except:

1. Cystic fibrosis
2. Phenylketonuria (PKU)
3. Down’s syndrome
4. Sickle cell and thalassaemia
5. Automated hearing screen Question 5 of 8

Which of the following statements is true regarding a screening test?

1. A sensitive test has few false negatives
2. A specific test accurately identifies a high proportion of the positive cases
3. The lower the positive likelihood ratio of a test, the better its performance
4. Screening is particularly useful for diseases which have a long course with no known cure
5. Screening tests can be employed for diagnosis as they perform equally Question 6 of 8

In a study of patients with seizures, 50 patients had EEGs performed, of which 30 had abnormalities. Ten per cent of normal people have EEG abnormalities. Which of the following statements are true?

1. The specificity is 62%
2. The specificity is 5%
3. The value of the EEG in detecting seizures depends upon the prevalence of the seizures
4. The positive predictive value is 70%
5. If the prevalence of seizures in the population is 5%, and if 1000 persons are screened in one month, the number of false positives will be 30

Question 7 of 8

Which of the following pairs of test characteristics is not influenced by the prevalence of the condition in the population?

1. Sensitivity and positive predictive value
2. Specificity and negative predictive value
3. Positive and negative predictive values
4. Positive and negative likelihood ratios
5. None of the above Question 8 of 8

Lead time bias can be defined as the:

1. Period between detection of disease by the screening test and the start of treatment for the given condition
2. Period between early detection of disease and the time of its usual clinical presentation
3. Period between disease diagnosis and final outcome for the patient
4. Period between two screening tests for the same condition in a given population
5. None of the above Short answer questions

Question 1 of 6

Define the terms ‘screening’ and “quality assurance”.

Question 2 of 6

Name three types of screening based on the population to whom it is applied. Question 3 of 6

List the conditions that need to be met before a screening programme is introduced into the UK.

Question 4 of 6

The table below shows the results from a screening test for diabetes used on 10,000 persons (Test A). The cut-off level used was 8 mmol/l or above blood glucose.

*Results from a screening test for diabetes*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | *True diagnosis* | | |
| *Diabetic* | *Non-diabetic* | *Total* |
| *Screening test results* | *Positive* | 34 | 20 | 54 |
| *Negative* | 116 | 9,830 | 9,946 |
| Total | 150 | 9,850 | 10,000 |

In Test B, the screening cut-off level was lowered to 6 mmol/l or above blood glucose. Which of the following statements are true based on the above data (choose all that are true)?

A Sensitivity of Test A = 22.7% B Specificity of Test A = 75%

C The specificity of Test A is greater than that of Test B

D The number of false positives is greater with Test A than Test B

E Initial screening provides a prevalence estimate and subsequent screenings provide an incidence estimate

Question 5 of 6

The 2x2 tables for a TB screening test in two populations are shown. Calculate for both populations:

* 1. Prevalence of TB
  2. Sensitivity
  3. Specificity
  4. Positive predictive value
  5. Negative predictive value
  6. Likelihood ratio

|  |  |  |  |
| --- | --- | --- | --- |
| Population 1 | | | |
|  | Infection | |  |
| Tuberculin  test result | Present | Absent | Total |
| Positive | 90 | 90 | 180 |
| Negative | 10 | 810 | 820 |
| TOTAL | 100 | 900 | 1000 |

|  |  |  |  |
| --- | --- | --- | --- |
| Population 2 | | | |
|  | Infection | |  |
| Tuberculin  test result | Present | Absent | Total |
| Positive | 9 | 99 | 108 |
| Negative | 1 | 891 | 892 |
| TOTAL | 10 | 990 | 1000 |

Question 6 of 6

Name the major sources of bias in a screening programme.

Web resources and further reading

1. [Online calculator to calculate screening test parameters](http://www.hutchon.net/Diagnostic-test.htm)
2. [UK National Screening website – UK policies on screening](https://www.gov.uk/guidance/principles-of-population-screening)
3. [International Agency for Research on Cancer Screening Group (cancer screening)](http://screening.iarc.fr/)
4. [United States Department of Health and Human Services, Preventative Services –](https://www.uspreventiveservicestaskforce.org/uspstf/topic_search_results?topic_status=P)

[US policies on screening (Includes testing which this book would describe as diagnostic rather than population screening)](https://www.uspreventiveservicestaskforce.org/uspstf/topic_search_results?topic_status=P)

1. [An article on prostate cancer screening which includes a useful description of lead and length time biases](http://www.aafp.org/afp/2005/0515/p1915.ht%20ml)
2. [A 2023 summary of the evidence for the efficacy of breast cancer screening](https://www.cancer.gov/types/breast/hp/breast-screening-pdq)
3. [English e-learning resources on screening](https://www.e-lfh.org.uk/programmes/nhs-screening-programmes/)