Previous exam questions in clinical research and epidemiology

Mean incidence of influenza in Norway in week 45 in 2009 was 14%. We may consider that the duration of influenza to be on the average 3 days. What was the mean prevalence of influenza during that week?
a) 2.25%
b) 4.5%
c) 6%
d) 14%

Mean incidence of influenza in Norway in week 8 in 2012 was 3%. We may consider that the duration of influenza to be on the average 5 days for that epidemic. What was the mean prevalence of influenza during that week?
A) 2.1%
B) 3%
C) 6%
D) 14%

Mean incidence of a virus epidemic in Trondheim in in a certain week was 6%. On the average 1.7% of the people were ill each day. What was the average duration of the disease?
A one day
B two days
C three days
D Four days

The prevalence of diabetes has increased over the last decades. What are possible explanations for this increase?
A) More people get diabetes.
B) People who get diabetes live longer with the disease.
C) Both A and B.
D.) Neither A nor B.

What happens to the frequency of a disease if a new treatment prevents people from dying, but has no curative (= healing) effect?
A The prevalence of the disease will decrease (= go down)
B The incidence of the disease will increase (= go up)
C The prevalence of the disease will increase
D The incidence of the disease will decrease

In a case-control study of the association between an exposure and a disease;
A the controls should not be exposed
B 10% of the controls should be exposed
C the controls should represent the distribution of the exposure in the population that the cases come from

D the controls should be matched to the cases so that the exposure is similar between cases and controls

How can confounding change the effect estimate (e.g. a relative risk) of a cohort study? The effect estimate

A can become either too large or too small
B can only become too large
C will not change
D will not change if the study is large enough

Compared to cohort studies, what is a major limitation of the case-control design in the study of a causal relation between a factor (= exposure) and a disease (= outcome)?

A. A case-control study is more expensive and takes longer time
B. There may be bias (= systematic error) in the measured presence or absence of the suspected factor (exposure)
C. There may be bias (= systematic error) in the measured presence or absence of the resulting outcome (disease)
D. It is difficult to identify (ascertain/skaffe) appropriate controls

The association between hypertension (high blood pressure) and stroke was examined in a cohort study. The study showed that the relative risk of stroke was 3 among people with hypertension, compared with people without hypertension. What is the correct interpretation of this result?

A) People with hypertension had a 3 times higher probability of getting a stroke, compared with people without hypertension.
B) When people with hypertension got a stroke, they had a 3 times higher probability of dying from the disease, compared with people without hypertension.
C) The prevalence of stroke was 3 times higher among people with hypertension, compared with people without hypertension.
D) The brain area affected in stroke patients was on average 3 times larger in people with hypertension, compared with people without hypertension.

A certain clinical study shows treatment 1 to be better to reduce the mortality (number of deaths) than treatment 2 for a certain disease with a p value (significance) of 10%. What does this mean?

A The probability of dying of the disease with treatment 1 is 10% lower than with treatment 2
B The number needed to treat the disease with treatment 1 instead of treatment 2, in order to reduce the number of deaths by one patient, is 10
C The difference may be real, with a probability of 90%
D The difference may be real, but only with a probability of 10%

The results of the study above were a little disappointing, as we like the significance level of a clinical study to be below 5% for the result to be useful. So the study power was calculated, and was found to be only 70% for the patient number and desired significance level of 5%. What does that mean?

A That only 70% of the patients would profit from treatment 1 over treatment 2

B That 70% of the patients would survive with treatment 1, as opposed to only 30% with treatment 2
C That there was only 70% probability of achieving a p value of 5%, even if the difference was real
D That there was only 30% probability that the difference was real

Aclinical study of a certain disease, comparing treatment A with treatment B, found a difference in mortality between treatment A and treatment B (A<B) with a significance of <1%. What does that mean?
A) That the mortality is reduced by ≥ 1% with treatment A compared to B
B) That the study strength was 99%
C) That this finding was almost certainly real (with a probability of ≥ 99%)
D) That this finding was almost certainly random (with a probability of ≥ 99%)

A certain clinical study shows treatment 1 to be better to reduce the mortality (number of deaths) than treatment 2 for a certain disease with a p value (significance) of 5%. What does this mean?
A The probability of dying of the disease with treatment 1 is 5% lower than with treatment 2
B The number needed to treat the disease with treatment 1 instead of treatment 2, in order to reduce the number of deaths by one patient, is 5
C The difference may be real, with a probability of 95%
D The difference may be real, but only with a probability of 5%

For a treatment result to be significant, what is the customary limit for the p value?
A 2.5%
B 5%
C 10%
D 20%

What is evidence based medical practice?
A Practice that is founded in solid physiological experiments as evidence
C Practice that takes into account both clinical studies, medical background knowledge and patients experience and preferences
B Practice that is only founded in clinical studies
D Practice that is founded on large epidemiological studies

Study power is a measure of the probability of proving a given hypothesis by a clinical study. What is the study strength dependent on?
A Only study size
B Only variability of the outcome variable
C Only the desired significance level
D All of the above

What does it mean that a study is controlled?

A The study is under the regulations of the FDA (Food and Drug Agency) or similar regulating bodies

B The study has a control group (for instance receiving no treatment or an established treatment)

C The study is approved by the ethical committee

D The study has a built in quality check system

The significance (p value) of a controlled study result, is often given as a percentage, for instance 5%. What does this mean?

A The probability of the study result being true (non random) is 5%

B The probability of the study result being wrong (random) is 5%

C The study effect (difference in outcome between groups) is 5%

D The study