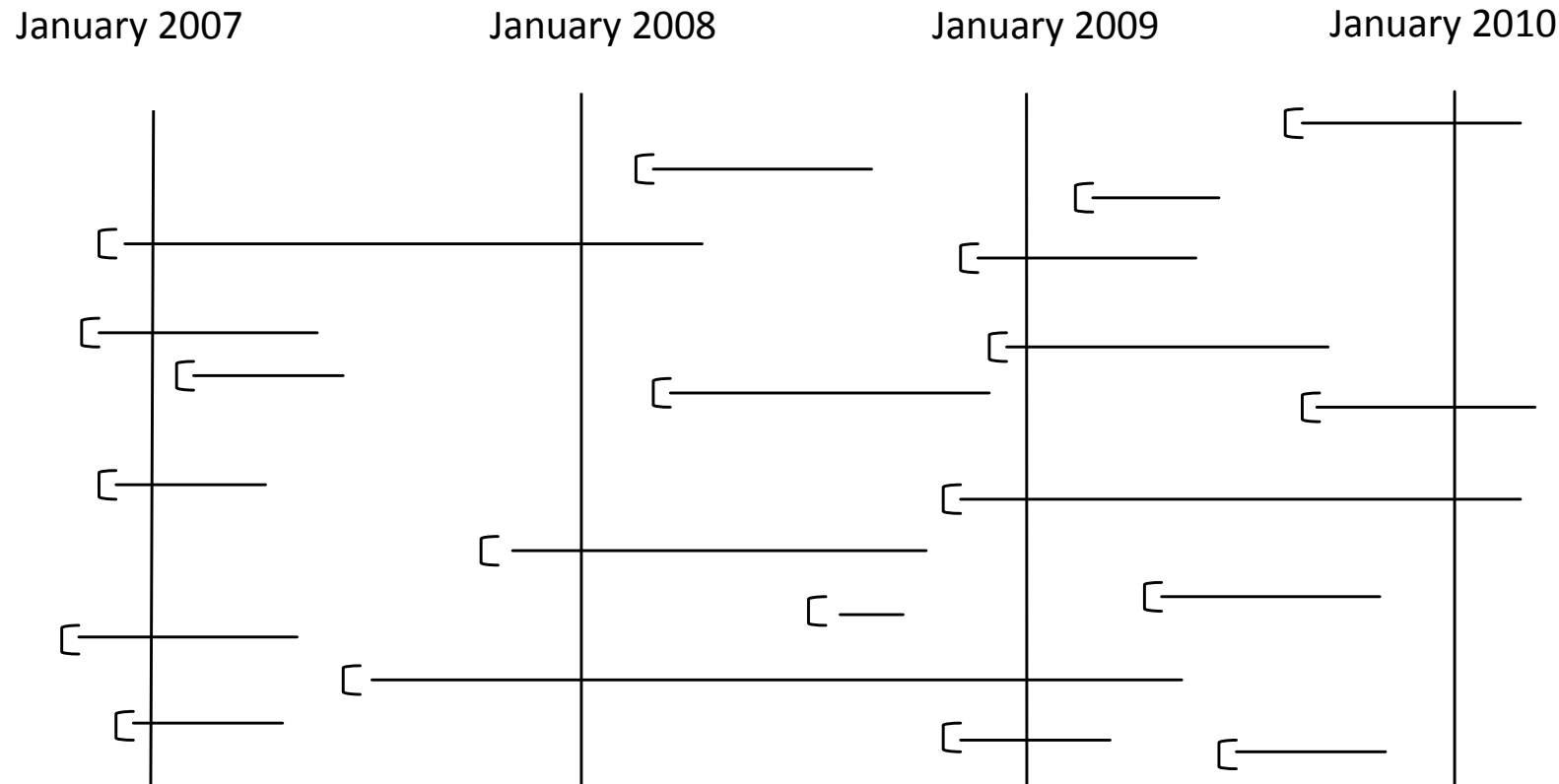# Epidemiology midterm

1. The figure below depicts the occurence of chronic myelocytic leukemia (CML) in a population of 100 patients treated at a research hospital over a four year period. During the observation period, the population remains stable (i.e., no members die, move away, or refuse to be examined at the beginning of every year).

January 2007   January 2008   January 2009   January 2010

1.1 What is the prevalence of CML in January 2007?
1.2 What is the prevalence of CML in January 2009?
1.3 What is the three-year CI of CML for the period 2007-2009?
1.4 What is the CI of CML for the year 2009?

. The results of a study of the incidence of pulmonary tuberculosis in a village in Neverland are given in the following table. All persons in the village are examined during two surveys made two years apart, and the number of new cases was used to determine the incidence rate.

category of household at first survey	number of persons	number of new cases
with culture-positive case	500	10
without culture-positive case	10 000	10

2.1 What is the incidence of new cases per 1000 person-years i n households that had a culture-positive case during the first survey?

2.2 What is the incidence of new cases per 1000 person-years in households that did not have a culture-positive case during the first survey?

2.3 What is the relative risk of acquiring tuberculosis in households with a culture-positive case compared with households without tuberculosis?

. Tortuga is a seacost community with a population of 99 000. Its residents can be divided into three age ranges: 25-44, 45-64, and 65 and older – each comprising one third of the population. In 2009, 100 cases of hepatitis A occured in Tortuga and were traced to the consumption of conatminated oysters. Of these 100 cases, 20 between the ages of 25 and 44, 10 between the ages of 45 and 64 and 5 over the age of 65 ultimately proved fatal. Prior to 2009, Tortuga had never reported a case of hepatitis A.

3.1 What is the 2009 crude mortality rate for hepatitis A in Tortuga?

3.2 What was the incidence of hepatitis A in 2009 (assuming that no cases of the disease occurred in Tortuga prior to 2009)?

3.3 What is the age-specific mortality rate for residents over 65 years of age?

3.4 What is the case-fatality rate for hepatitis A in Tortuga?

4. A new test for chlamydial infections of the cervix is introduced. Half of the women who are tested have a positive test. Compared with the gold standard of careful cultures, 45% of those with a positive test are infected with chlamydia, and 95% of those with a negative test are free of the infection. Calculate the epidemiological terms below!

4.1. Sensitivity:
4.2. Specificity:
4.3. Positive predictive value:
4.4. Negative predictive value:

Outcomes

1.1 5/100
1.2 5/100
1.3 15/95
1.4 5/85
2.1 10
2.2 0,5
2.3 20
3.1 3,535/10 000
3.2 0,00101
3.3 1,515/10 000
3.4 350/1000
4.1 90%
4.2 63%
4.3 45%
4.4 95%