**EPDM 509 - Review for midterm exam**

**Surveillance**: Active (SEER program), Passive (health providers), Sentinel (“first case”),

Special (NHANES)

External and internal **validity**: Definitions

 *External:* extent to which study results are applicable to the general population

 *Internal:* extent to which the study reflects the “truth” about the study population

**Prevalence** and **Incidence**, and how they are dependent on each other

 Prevalence ≈ Incidence \* Duration

Effect of **Prevalence** on **predictive value:** Low Prevalence (<10%): PV+ high, PV-

lower. High Prevalence (>40-50%): PV+ high, PV- lower.

Serial **testing** and parallel testing: effects on sensitivity and specificity

 Serial (sequential) testing decreases sensitivity, increases specificity

 Parallel (simultaneous) testing (shotgun) increases sensitivity

**Epidemic, Endemic, Pandemic**

**Proportion** (A/A+B), **Rate** (A/(A+B)T and **Ratio** (A/B)

**Lead time bias:** Increase in survival as measured from detection of a disease to death,

without lengthening of life.

**Length biased sampling = Length time bias:** Prognostic selection (of survivors).

**Characteristics of a good screening program**

**Disease outbreaks**: Point source, Common source, Propagated

**Randomized Controlled Trial (RCT):** Random assignment is intended to make the

control and intervention groups similar at the start of a study in order to reduce

selection bias.

**Designs**: Parallel, Cross-over, Factorial, geographic, historic

**Explanatory** trials -testing efficacy (does the treatment work when actually taken)

**Pragmatic** trials – testing effectiveness (does treatment work under normal conditions)

**Attack rate** (%): (# of new cases of the disease/total # at risk) x 100

In a food-borne epidemic you may calculate the attack rate for each food item to find the source (usually one) of the outbreak. Expect contamination of other food items from the source, and that people do not remember exactly what they ate.

**Sensitivity, Specificity, PV+, PV-, accuracy, false positive/negative “Rate”.**

 

 

 

For screening purposes, how do you use highly sensitive or highly specific tests?

*First:* Use a highly sensitive test = low cut-off (**↑FP** – false positives)

 

 *Second:* Use a highly specific test = high cut-off (**↑FN** – false negatives)

 

**Type I error:** Rejecting the null hypothesis (H0) when it is true.

**Type II error:** Rejecting the alternative hypothesis (Ha) when it is true.

**AR** = RD (attributable risk/risk difference) and **ARP** (attributable risk percent)

**RR** (relative risk = rate ratio) = Risk exposed/Risk unexposed = Incidence

exposed/incidence non-exposed (cohort studies)

**Mortality measures**:

***Crude mortality*** = # of deaths in a year/total population

***Case-fatality rate (%)*** = (# individuals dying during a specified period of time after disease onset or diagnosis/# of individuals with the specified disease) x 100

**Prevention**: Primary, Secondary, Tertiary

**Adventist Health Study (AHS)**: Questions on main issues (cancer, longevity, nut intake)

among Adventists.

**Experimental studies – Blinding:**

* Single - Subjects/patients
* Double - Subjects/patients + clinicians/caretakers
* Triple - Subjects/patients + clinicians/caretakers + assessors (of outcome)

***Extra credit Questions:***

**Proportionate Mortality** = # of deaths from a specific cause in a defined year / total

deaths in same year.

**Cause-specific mortality** = (# of deaths from a specific cause in one year / Total

population at midyear) x 1,000

**Infant mortality “rate”** = (# of deaths in a year of children less than 1 year of age /

number of live births in the same year) x 1,000