

Classwork 24 Type I/II Errors Worksheet

Statistics 1272 and 1372 Spring 2012 Hallieck City Tech (CUNY)

Name _____

Null and alternative hypotheses are given. State the effect and practical implications of both Type I Error and Type II Error; then identify which error is more potentially harmful.

- E1. The city of NY is considering spending \$350 million on a computerized mathematics curriculum that for grades 3 – 10. They pilot the program with 250 students in grades 5 and 6.

H_0 : Computerized math works equally well as traditional method

H_a : Computerized math works better than traditional method

- E2. Pharmaceutical researchers are testing a new drug for acne. Side effects may include vomiting, upset stomach, mild fever and/or hyperactivity. Their sample size is 40.

H_0 : New drug same as Control Group

H_a : New drug better than Control Group

- E3. Researchers are studying the effects of TV watching on cognitive development in toddlers. Recent surveys have shown that 21% of 3-year-olds watch more than 5 hours of TV per day, and reports from cognitive psychologists indicate TV exposure may “rewire” the developing brain in adverse ways. They wish to test if toddlers who watch 5 hours or more of TV daily score less than average on tests of cognitive ability when entering first grade. Their sample size is 95.

H_0 : TV watching does not affect cognitive ability

H_a : TV watching affects cognitive ability (negatively)

1. Pregnant women take a glucose tolerance screening during the 24th week of pregnancy to detect developing gestational diabetes. This condition can lead to premature labor.

H_0 :

H_a :

2. A manufacturer is testing light bulbs in the quality assurance lab. Each bulb receives a durability score. 100 bulbs from each production run are analyzed. If 10% or more are found to be defective, the entire run of bulbs is discarded. Discarding a run costs the company \$28,000.

H_0 :

H_a :

3. Crop researchers are testing a hybridized soy bean to see if it yields more produce per acre than former strains. An increase of 2% could mean increased corporate profits of nearly \$3 million. Seventy-two plots are analyzed.

H_0 :

H_a :

4. A hotel chain which, beginning in 1995, has spent several million dollars on a manager development-and-retention plan tests the mean length of employment of its managers. They are comparing length of service to the nationwide hotel manager average of 3.2.

H_0 :

H_a :

5. The state of New York wishes to estimate how much a teacher-preparation program would help prospective teachers meet the guidelines set forth in the No Child Left Behind Act. They pilot the program at Hunter College and SUNY-Binghamton. The program would cost several million dollars but would help school districts across the state meet the federal guidelines and qualify for many millions of dollars in federal funds.

H_0 :

H_a :