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Geo 4430

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Research Proposal

1. **Problem Statement:** I believe, as do many, that there is a link between the petrochemical industry and cancer. In particular, the southeast region of Texas and south Louisiana is known as “cancer alley” for this very reason. Texas City, TX is home to some of the largest petrochemical plants in the United States, and is located within “cancer alley.”
2. **Purpose of study:** I intend to find out 1) whether or not there is a significant risk in developing cancer by living in a close proximity to power plants and toxic waste dumps in Texas City, TX, and 2) whether the residents of Texas City perceive that they are at a greater risk because of their location.
3. **Research Matrix:** I will personally survey 35 Texas City single-family residents by going door-to-door to randomly chosen houses about their perception of risk. I will also examine the CDC online statistics. My interviews will be limited to two days over Thanksgiving break (November 28th and 29th), and the rest of my project will be limited to 1 month. The cost of my study will be limited to the gas money needed to drive to and around Texas City, and the cost of my final presentation materials.
4. **Objectives:** Hypothesis: 1) Texas City residents will show a statistically significant difference in the rate of cancer when compared to residents of San Marcos. 2) Texas City residents will perceive that their risk of obtaining cancer is greater because of their location.
5. **Literature Review:**
   1. **Study Area:** Texas City, Texas is located on the Texas Gulf Coast in Galveston County ten miles northwest of Galveston and thirty-seven miles southeast of Houston. Its absolute location is 29°24’00”N, 94°56’02”W. The city encompasses a land area of 62.4 square miles (Texas City). According to the U.S. Census, the population was 41,521 in the year 2000 (U.S. Census 2000). It is notable that Texas City was the site of what is considered the worst industrial accident in U.S. history: the 1947 Texas City Explosion of the SS. Grandcamp and SS. High Flyer (Texas City).
   2. **Topic:** Cancer is defined as an abnormal growth of cells in the body tissue. These abnormal cells divide without control, invading other tissues and spreading to other parts of the body. Cancer results when the genetic material (DNA) of a cell becomes damaged or altered, resulting in mutations that hinder normal cell growth. This leads in an upset of the body’s normal system. Cells do not die when they should and new cells begin to form unnecessarily, resulting in tumors (Medicine Net).
   3. **How cancer rates are normally studied:** Cancer rate studies are distinguished between cancer incidence and mortality rates. I will be studying cancer incidence rates. The statistics are generally divided by race, age and type of cancer. These rates can also be studied based on geographic area, which is what I will be studying.Rates are per 100,000 persons. Cancer rates are studied and reported by various agencies, including the Center for Disease Control, National Cancer Institute, and the U.S. Department of Heath and Human Services (U.S. Cancer Statistics).
6. **Methods:** I will identify 35 random single-family residences using a randomly generated dot overlay of the mapped area. I will be going door-to-door surveying 35 random single-family residents of Texas City with a number of standardized, carefully crafted questions. I will also examine the data on cancer rates on the CDC website and compare the rates in Texas City and San Marcos in SPSS to see if there is a statistically significant difference.
7. **Methods of analysis:** I will be using the t-test function of SPSS to determine whether or not there is a statistically significant difference between the cancer rates of Texas City and San Marcos. I will analyze the results of the interviews by separating the results into three different categories: 1) do perceive a higher risk, 2) do not perceive a higher risk, and 3) do not know. I may choose to add or modify categories as I analyze my results. I will then examine the count of each category and the specific answers given to determine whether or not the majority of Texas City residents perceive that they have a higher risk of forming cancer.
8. **Method of presentation:** I will be presenting my findings in a poster approximately 32” by 40” in size.
9. **Work plan, timetable and budget:** I will begin my research by collecting data from the CDC on cancer and tumor rates for Texas City and San Marcos. I will then enter this data into SPSS and run a t-test to see if there is a statistically significant difference between the two. If there is a difference, I may consider informing the Texas City residents of this after they answer my initial questions about their perception of risk. (Is this ethical?) I will work on the sections of my poster having to do with the analysis of the CDC data and construct my interview questions until Thanksgiving break. On November 28-30, I will conduct my interviews of the Texas City residents. If I decide to interview San Marcos residents, I will probably conduct those interviews before Thanksgiving break. Once I am back in San Marcos I will begin analyzing the results from the interviews and incorporate them into my final presentation. I will then finalize my poster and print!
10. **Closing:** I hope to link cancer incidence rates to toxic chemical exposure or close proximity to power plants and toxic waste dumps. There is a personal significance of this project for me because of the number of family members and friends I have seen stricken with cancer in the Galveston County area in recent years.
11. **References:**

Medicine Net. “Cancer.” <http://www.medicinenet.com/cancer/article.htm> (Last accessed 6 November 2008.)

U.S. Census Bureau. “Total Population.” Census 2000 Summary File 1, 2000. <http://fact finder.census.gov/servlet/DTTable?\_bm=y&geo\_id=16000US4872392&ds\_name =DEC\_2000\_SF1\_U&-\_lang=en&-mt\_name=DEC\_2000\_SF1\_U\_P001> (Last accessed 5 November2008).

Texas City. “City of Texas City.” <http://www.texas-city-tx.org/ctcindex.htm> (Last accessed 5 November 2008).

U.S. Cancer Statistics Working Group. “United States Cancer Statistics: 2004 Incidence and Mortality.”Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control andPrevention *and* National Cancer Institute; 2007.