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| **Project Title** | Application of Graph Theory to Modeling and Visualization of Epidemiology Data |
| **Group** | F |
| **Student Names** | 1. Ayan Ali Mohammed  2. Jason Driscoll  3. Jeswanth Reddy Dwaram  4. Sathish Reddy Kallu |
| **External Advisor (if any)** | NA |

**Background***: Describe the problem or topic area the project will address*

Epidemiology research makes extensive use of geographic data visualizations.

Graph Theory contains numerous concepts that have utility in analysis of distribution and diffusion throughout a population. Comparison of the standard representations of epidemiology data and the associated visualizations to the data represented via nodes and edges may suggest benefits to more liberal application of graph theory data representations and application of graph theory concepts to analysis.

Possible concepts to raise:

1. Misinterpretation
2. Ignorance of Scientific Method (P-values: IE, P-value of 95% means on average 1/20th of studies produce an unexpected result, often receiving disproportionate coverage

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| https://xkcd.com/882/ | |

1. Misinformation and Denialism
2. Statistical Ignorance
3. Resistance and Delayed/Failed Adoption

**Significance:** *Explain why this problem is important and relevant*

Relevance, acceptability and potential impact of epidemiological research is dependent on the extent of its penetration among stakeholders and the extent to which stakeholders understand the results. The use of more concise and easily understandable visualizations enhance these factors.

The ability to construct and deploy disease models is dependent on a variety of factors, among which are subject matter expertise and technical resources. Application of graph theory concepts broadens the range of available analytical techniques, while representing data via nodes and edges suggests the possibility of increasing efficiency by reducing the size of data sets in computation steps.

**Objective:** *Define the specific goals or questions the project aims to address*

The projected goal of the project is to conduct the following steps:

1. comparing epidemiological data in standard format to epidemiological data represented via nodes and edges.
2. Demonstrating the use of the node-and-edge representation to model [epidemiological function].
3. Comparing the standard format representation to the node-and-edge representation to determine comparative accuracy, resource consumption and communication of results.