DATA VISUALIZATION

INDIVIDUAL PROJECT REPORT

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GUIDED BY MICHAEL SCHERMANN

SUBMITTED BY SAPTHAMI SHETTY(W1283646)

Contents

Project outline

This project shows the analysis of potential dangers of mobile phone radiation and its effects possibly causing brain cancer. It has been assumed that the radiation from phones did not cause any sort of damages but the recent findings have changed plates.

Data manipulated

The idea behind this visualization is to identify the effects of increased phone usage on brain cancer chances and compare various facts and study results to determine whether there is a relationship between the two.

Data Source

Collected data from various sources. scanned through various sites to find data pertaining to the different sheets.

Visualization

https://public.tableau.com/profile/sapthami#!/vizhome/Individualproject/IncreaseinMobilephoneusersovertheyears

Claim

Cell phones causing brain cancer?

Why I chose this claim:

- This has been a controversial topic for long. The usage of mobile phone is reached all time high with around 91% of individuals owning some or the other kind of cell phone device.
- Many studies are conducted on this and outcomes have been inconsistent.
- Recent studies showed cell phone radiations boosts cancer rates in animals. This could very well be applicable to human as the studies were conducted in similar environment as humans are exposed to.

- People need to be aware of the effects of mobile phones and inculcate precautionary steps in their daily routine.

Appendix

Project book

Data Understanding

- Understanding the data and relevant fields for this visualization, adjusting the fields as per requirements, removing redundant and incomplete data.
- Required to scan through various sites to find relevant datasets so that it is possible to compare and contrast the various aspects that are taken into consideration.
- As the topic was mostly based on studies it was hard to find dataset that was available in csv or excel format.
- Relevant fields from different data sets needed to be selected so as to ensure it is compatible with the other data fields to facilitate comparison of various fields.

Data Cleaning

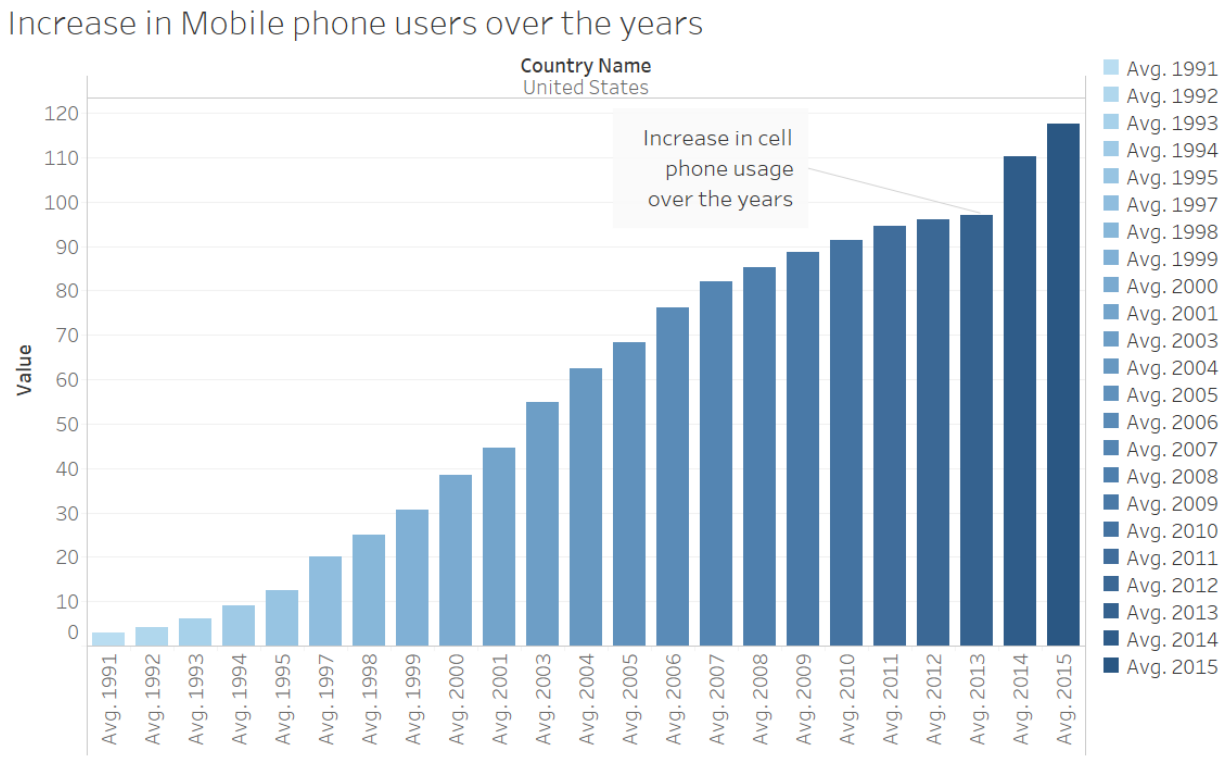
- Obtaining the data field that were relevant to the idea behind the visualization that I am trying to depict.
- Filtered the year range to accommodate the range that is consistent across the data.
- Emphasis on key attributes in order of importance such as increase in phone users over years, increase in brain cancer cases over the years, causes for brain cancer, various studies on cancer etc.
- Used python on Jupiter to clean data and perform various transformations such as deleting of row, deleting irrelevant columns.

Calculated fields

- Determined the calculated field increase in number of mobile phone users by multiplying the given values by 1000 as the previous value represented increase in number of mobile phone users per 100 population.
- Created a calculated field to represent the values for cause of cancer in percentage.

Visualizations:

More than 90 percent of American adults use cell phones. Relatively little is known about their safety, however, because current exposure guidelines are based largely on knowledge about acute injury from thermal effects, not long-term, low-level exposure. The International Agency for Research on Cancer in 2011 classified RF radiation as a possible human carcinogen.



Avg. 1991, Avg. 1992, Avg. 1993, Avg. 1994, Avg. 1995, Avg. 1997, Avg. 1998, Avg. 1999, Avg. 2000, Avg. 2001, Avg. 2003, Avg. 2004, Avg. 2005, Avg. 2006, Avg. 2007, Avg. 2008, Avg. 2009, Avg. 2010, Avg. 2011, Avg. 2012, Avg. 2013, Avg. 2014 and Avg. 2015 for each Country Name. Color shows details about Avg. 1991, Avg. 1992, Avg. 1993, Avg. 1994, Avg. 1995, Avg. 1997, Avg. 1998, Avg. 1999, Avg. 2000, Avg. 2001, Avg. 2003, Avg. 2004, Avg. 2005, Avg. 2006, Avg. 2007, Avg. 2008, Avg. 2009, Avg. 2010, Avg. 2011, Avg. 2012, Avg. 2013, Avg. 2014 and Avg. 2015.

The above graph represents the increase in the cell phone users over the years.

- It is quite evident form the graph that there is increase in the number of cell phone users over the year
- There is a drastic increase in the number of users over the recent years more evident from 2014 as seen from the graph.
- With newer technology and features there is going to be probably much users using cell phones.

How I did this:

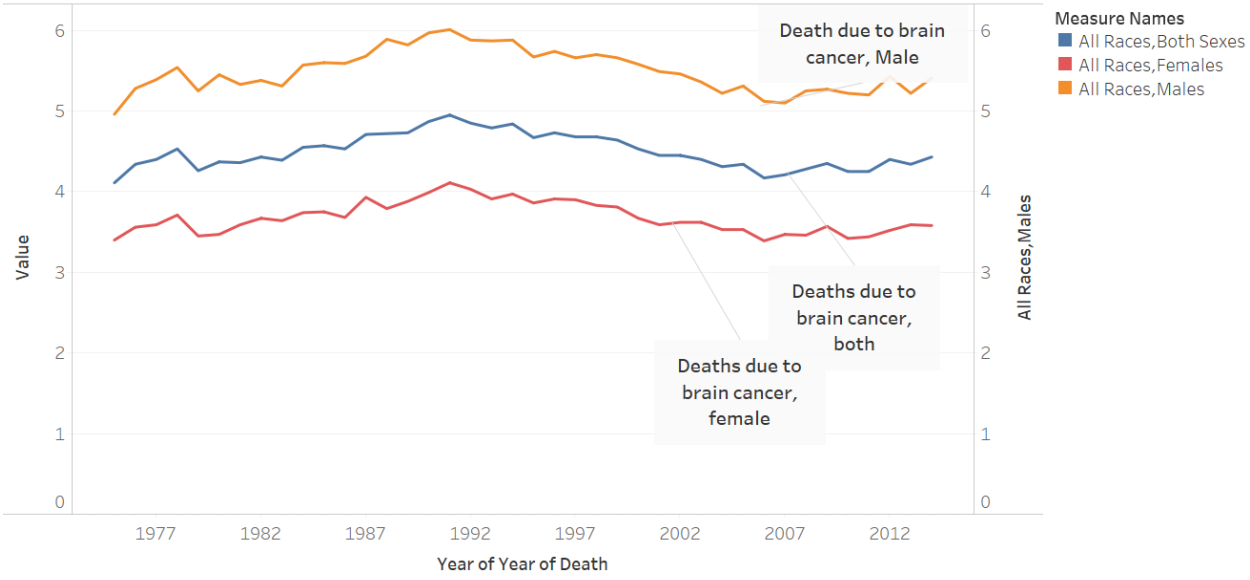
- Browsed through various site and found the following dataset which represented the number of users over the years for various countries
- I used python script to clean data that and to come up with compact data set.
- The dataset contained records for a wide range of years. Dropped years that were irrelevant and retained only those dates that were sufficient to show the rise in trend.
- Dataset contained records for various countries. Selected row pertaining to United states as to narrow down the scope.
- Represented the data on a simple bar chart that represented the increase in cell phone users, year over year

Challenges faced:

- Figuring out python script to select a row.
- Unable to select particular row which I figured out was because the column headers had name separated with space. Re named the columns.

Cancer has a major impact on society in the United States and across the world. Although statistical trends are usually not directly applicable to individual patients, they are essential for governments, policy makers, health professionals, and researchers to understand the impact of cancer on the population and to develop strategies to address the challenges

Brain Cancer cases among male,female and the average rate.



The trends of All Races,Both Sexes, All Races,Females, All Races,Males and All Races,Males for Year of Death Year. Color shows details about All Races,Both Sexes, All Races,Females and All Races,Males.

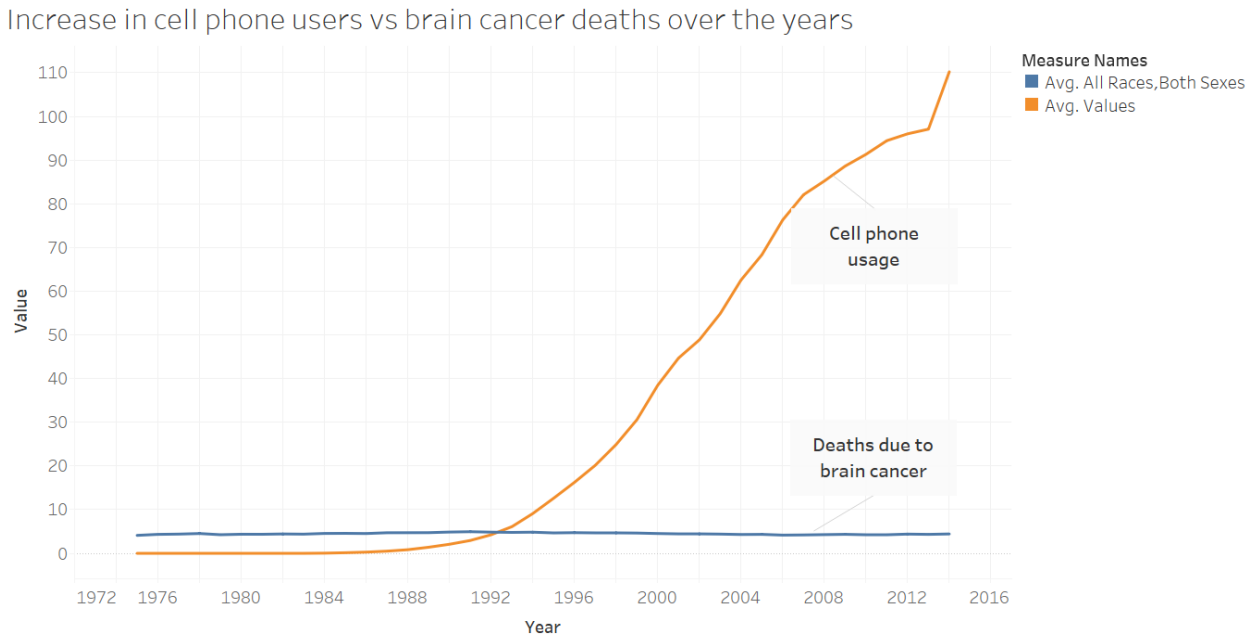
The above graph represents constant stats of brain cancer cases.

- We can see that the number of cases of brain cancer has been constant over the period.
- The chances of brain cancer among men is higher when compared to that of women.

How did I do it:

- Cleaned the data to contain only relevant fields.
- Represented using the line graph so that value for men, women and average can be contrasted.

The possible connection between cellphones and cancer is controversial. Many years' worth of studies on cellphones and cancer have yielded conflicting results. Currently, there's no consensus about the degree of cancer risk if any posed by cell phone use. The primary concern with cellphones and cancer seems to be the development of brain tumors associated with cell phone use.



The trends of Avg. All Races,Both Sexes and Avg. Values for Year. Color shows details about Avg. All Races,Both Sexes and Avg. Values.

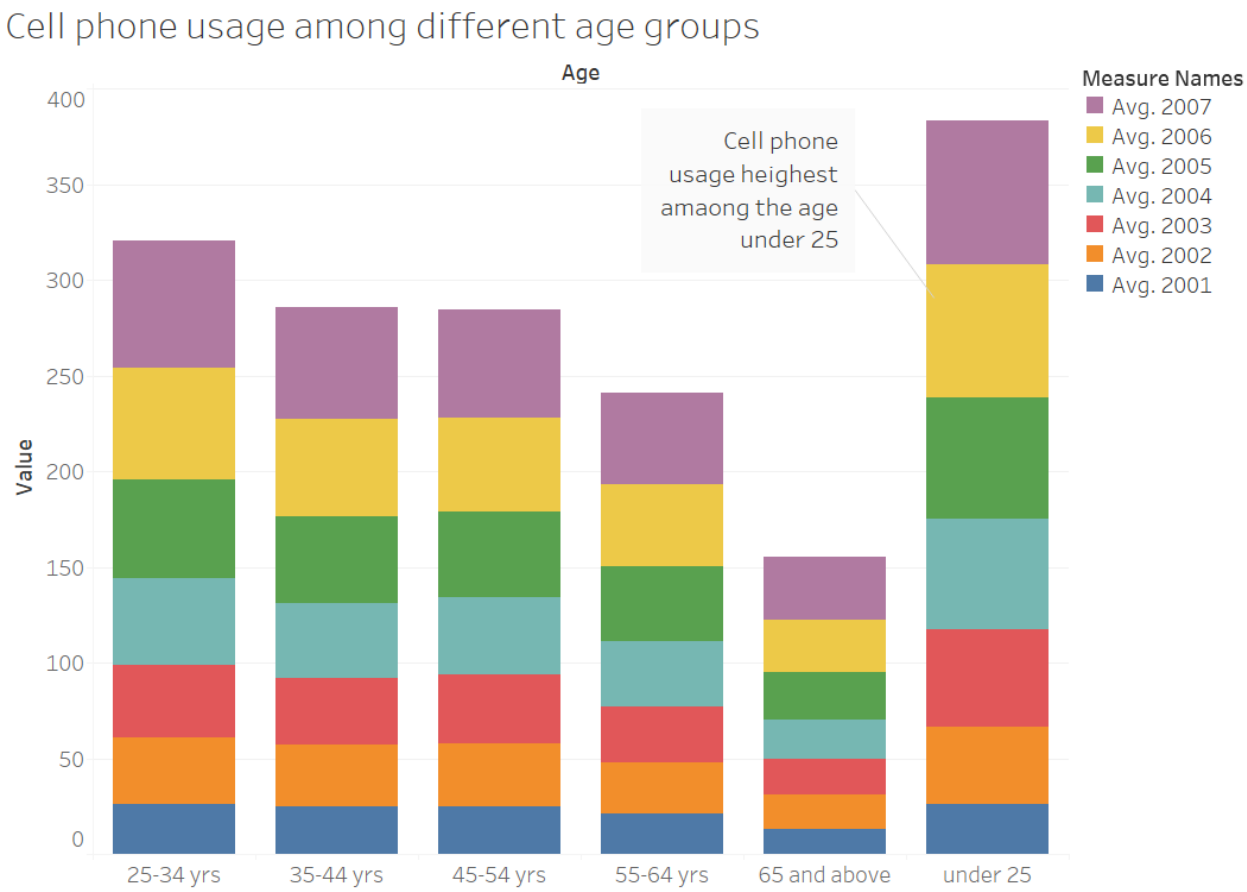
The above graph represents increased **cell phone** use doesn't seem to increase the risk of **brain tumors**.

- The graph represents a comparison between the increase in the number of cell phone users over the years vs the brain cancer cases reposted over the years
- There seems to be no relationship between the two. The number of cancer cases remains to be constant even with the sharp increase in the number of cell phone users.
- Many studies and researchers have found no evidence of link between cellphones and brain cancer.

How I did this:

- Cleaned datasets containing data pertaining to cell phone users and brain cancer cases over the years to contain data for a definite range of years i.e. from 1975 to 2014
- Dataset represented values per 100 users of cell phone data. computed calculated field to determine the values per 100000 users.
- Joined the two on year to compare and contrast values of the two.
- Designed a simple line graph to represent the two data sets.

Age is strongly correlated with cell phone usage. Those under the age of 25 have always been the most likely users of Mobile phones by a considerable margin. Today, 90% of young adults use phones, compared with 12% in 2005, a 78-percentage point increase. At the same time, there has been a 69-point bump among those ages 30-49, from 8% in 2005 to 77% today.



Avg. 2007, Avg. 2006, Avg. 2005, Avg. 2004, Avg. 2003, Avg. 2002 and Avg. 2001 for each Age. Color shows details about Avg. 2007, Avg. 2006, Avg. 2005, Avg. 2004, Avg. 2003, Avg. 2002 and Avg. 2001. The view is filtered on Age, which keeps 6 of 6 members.

The above graph represents cell phone usage among different age groups

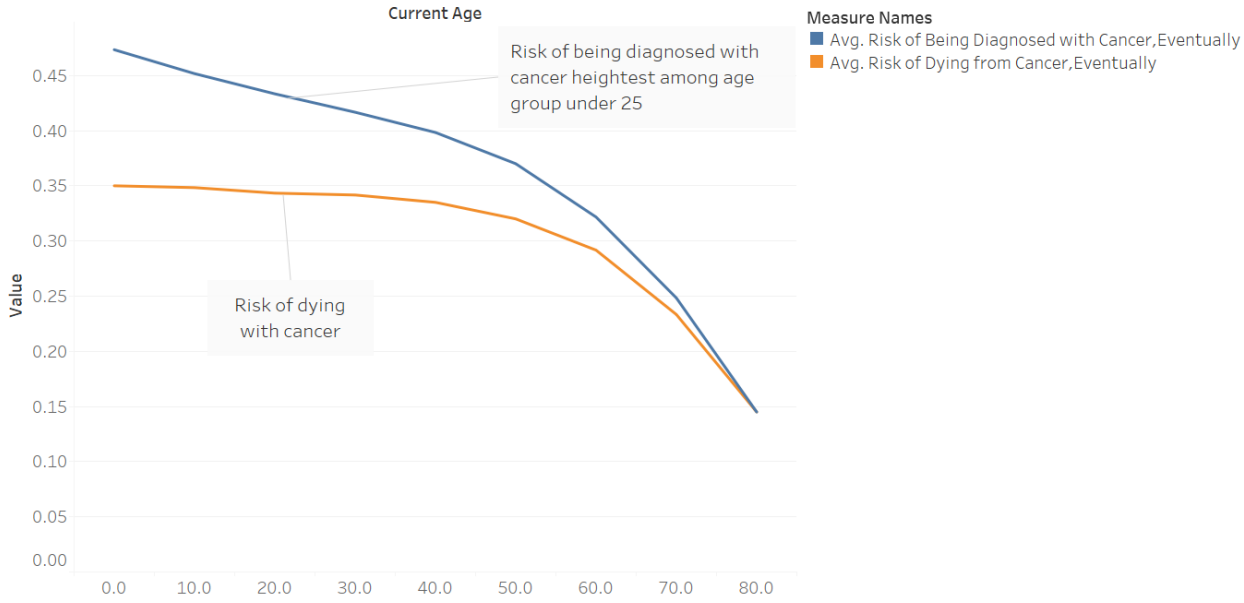
- The usage of cell phones is maximum among the age group of under 25 and seems to decrease eventually.

How I did this:

- Cleaned the data to represent the relevant fields.
- Represented data using bar graph.

Brain cancer are more common in children and older adults, although people of any age can develop a brain cancer.

Risk of being diagnosed with cancer vs risk of dying from cancer



The trends of Avg. Risk of Being Diagnosed with Cancer,Eventually and Avg. Risk of Dying from Cancer,Eventually for Current Age. Color shows details about Avg. Risk of Being Diagnosed with Cancer,Eventually and Avg. Risk of Dying from Cancer,Eventually. The view is filtered on average of Risk of Being Diagnosed with Cancer,Eventually and average of Risk of Dying from Cancer,Eventually. The average of Risk of Being Diagnosed with Cancer,Eventually filter keeps non-Null values only. The average of Risk of Dying from Cancer,Eventually filter keeps non-Null values only.

The graph represents a gradual decrease in the risk of being diagnosed with cancer and dying from cancer eventually.

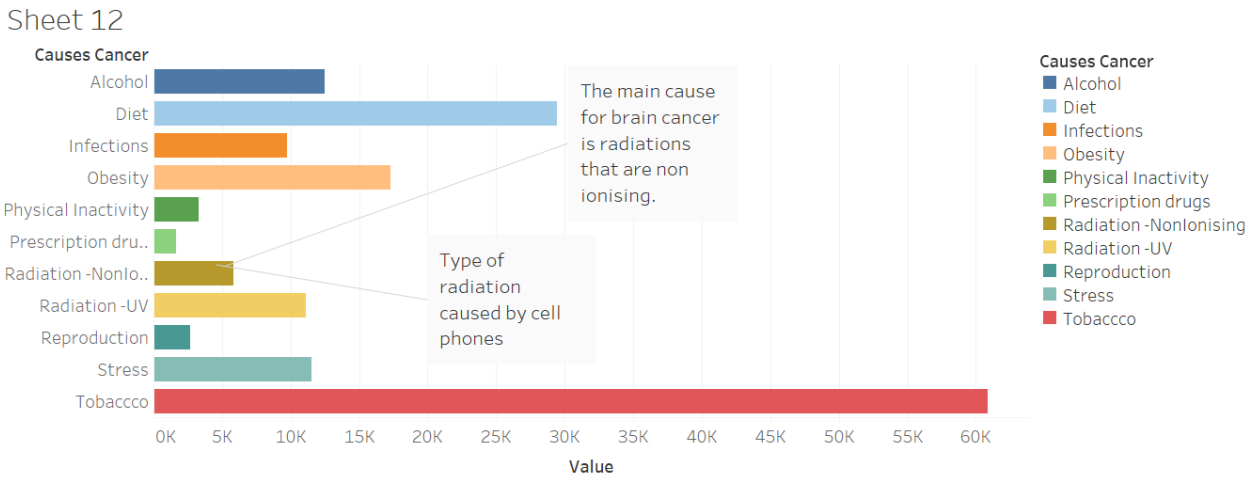
- the sheet represents risk of being diagnosed with cancer to be the highest when age is under 25.

There seems to be some connection between the previous two graphs but there is no study that has been able to prove the results.

The “do cell phones cause cancer” debate is still not settled and will likely take years to play out. Here’s what we do know, though:

The latest evidence suggesting wireless radiation poses a huge public health risk comes from partially released data from a large, $25 million well-designed U.S.

National Toxicology Program study. Researchers found exposure to very high signal cell phone radiation led to a slightly increased risk of malignant gliomas in the brain and schwannomas of the heart in male rats.



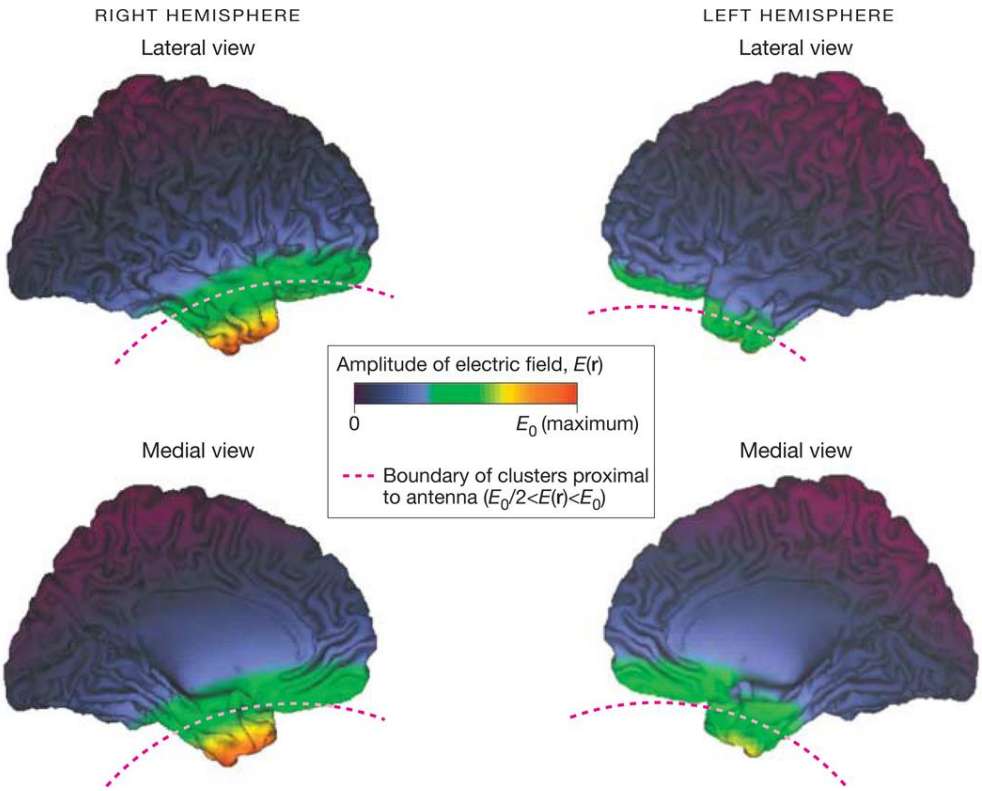
Number of Records and Numberofcases for each Causes Cancer. Color shows details about Causes Cancer.

The Visualization above represents the factors responsible for the cause of brain cancer.

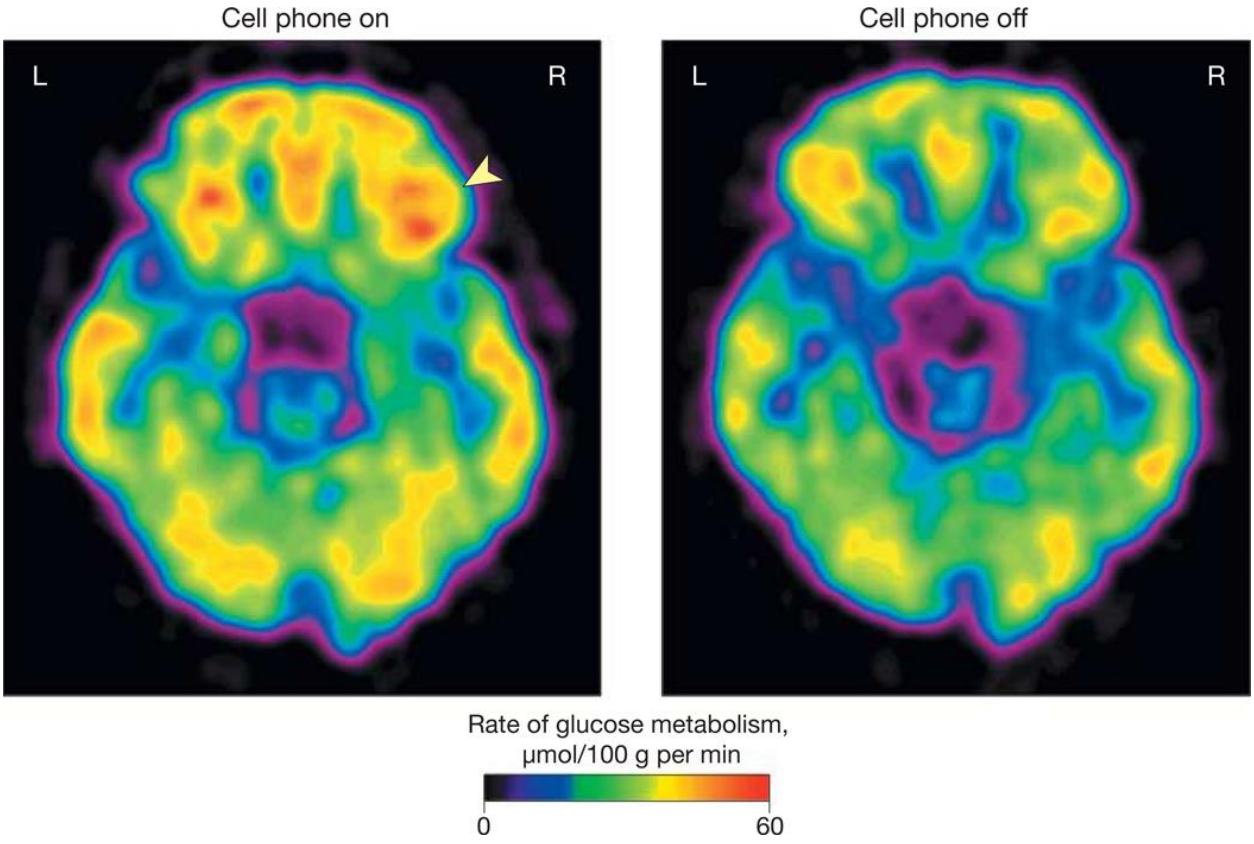
- Tobacco is a highly influencing factor for cancer.
- Cell phone radiation is radiofrequency energy and a type of electromagnetic radiation classified as non-ionizing radiation, similar to microwaves and radar.
- Non-Ionizing radiation is known to cause cancer.

Many studies have examined the potential health effects of non-ionizing radiation from radar, microwave ovens, cell phones, and other sources, there is currently no consistent evidence that non-ionizing radiation increases cancer risk. Radiofrequency exposure from cell phone use does cause heating to the area of the body where a cell phone or other device is held

Warrants:



Effects of radiation on different parts of the brain



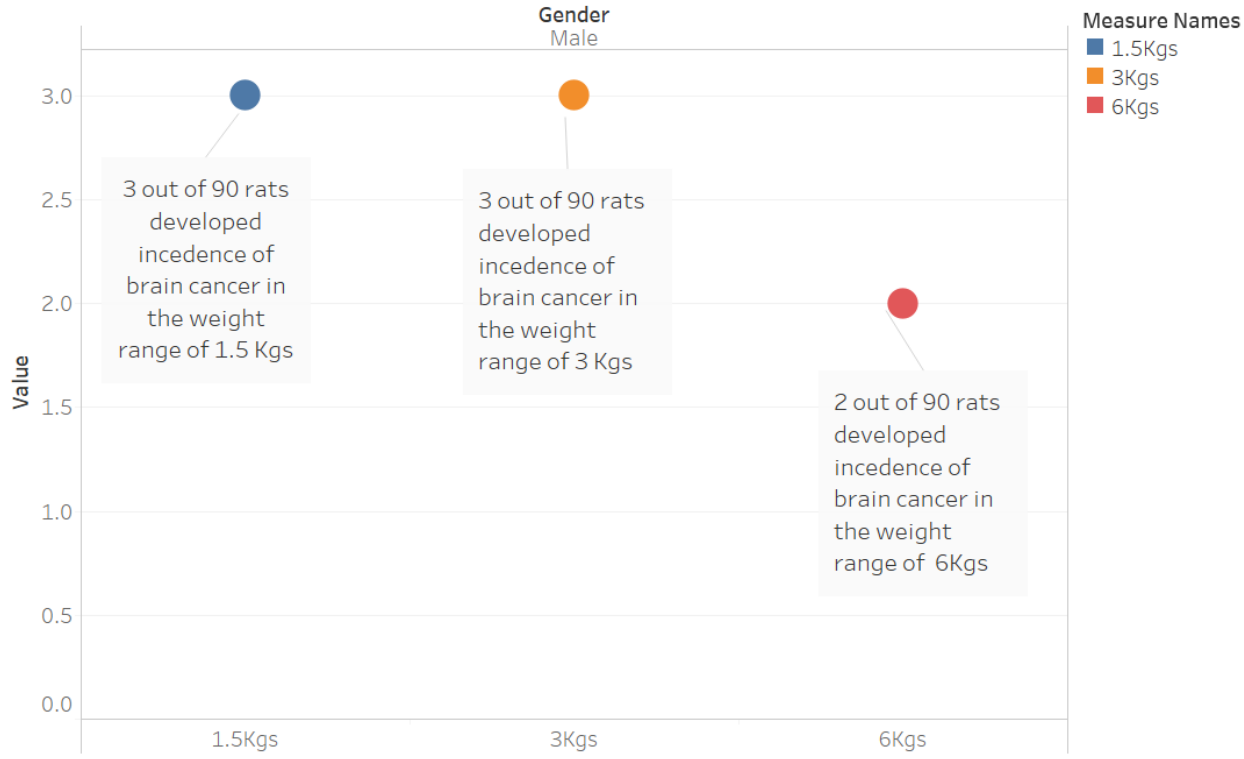
Radiations from cell phone effecting the glucose metabolism in the brain

The results of a new study by the National Toxicology Program—the largest and most expensive study of its kind show a link between cell phone radiation and cancer in rats.

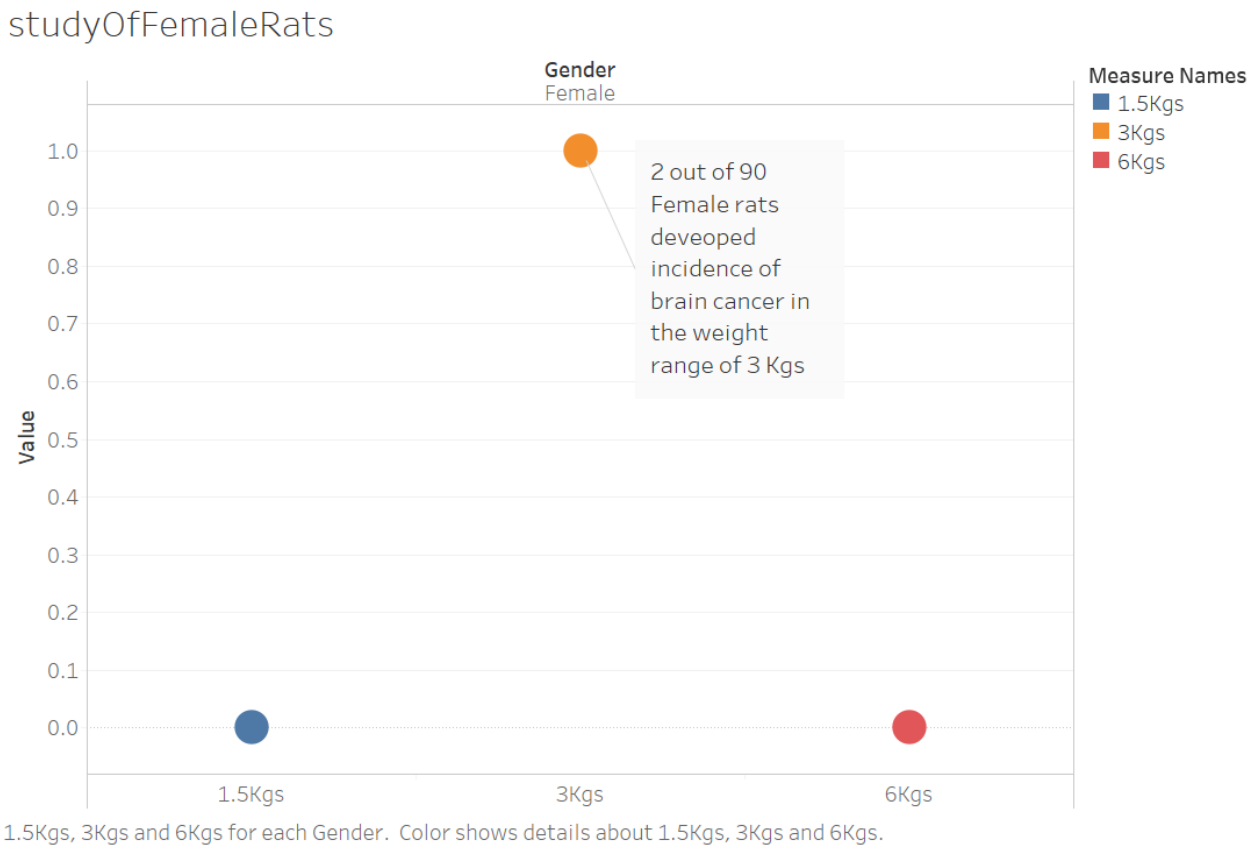
The National Toxicology Program (NTP) just concluded a massive 2-year study investigating the potential health hazards of cellphone use on rats and mice – most notably including the specific radio frequencies and modulations (RF-EMF) currently used in our U.S. telecommunications industry.

The increases were small (3-4 percent over controls), but since these are rare tumors, the findings are still significant. What make these studies even more significant are the *findings of similar tumors in humans.*

studyOfMaleRats



1.5Kgs, 3Kgs and 6Kgs for each Gender. Color shows details about 1.5Kgs, 3Kgs and 6Kgs.



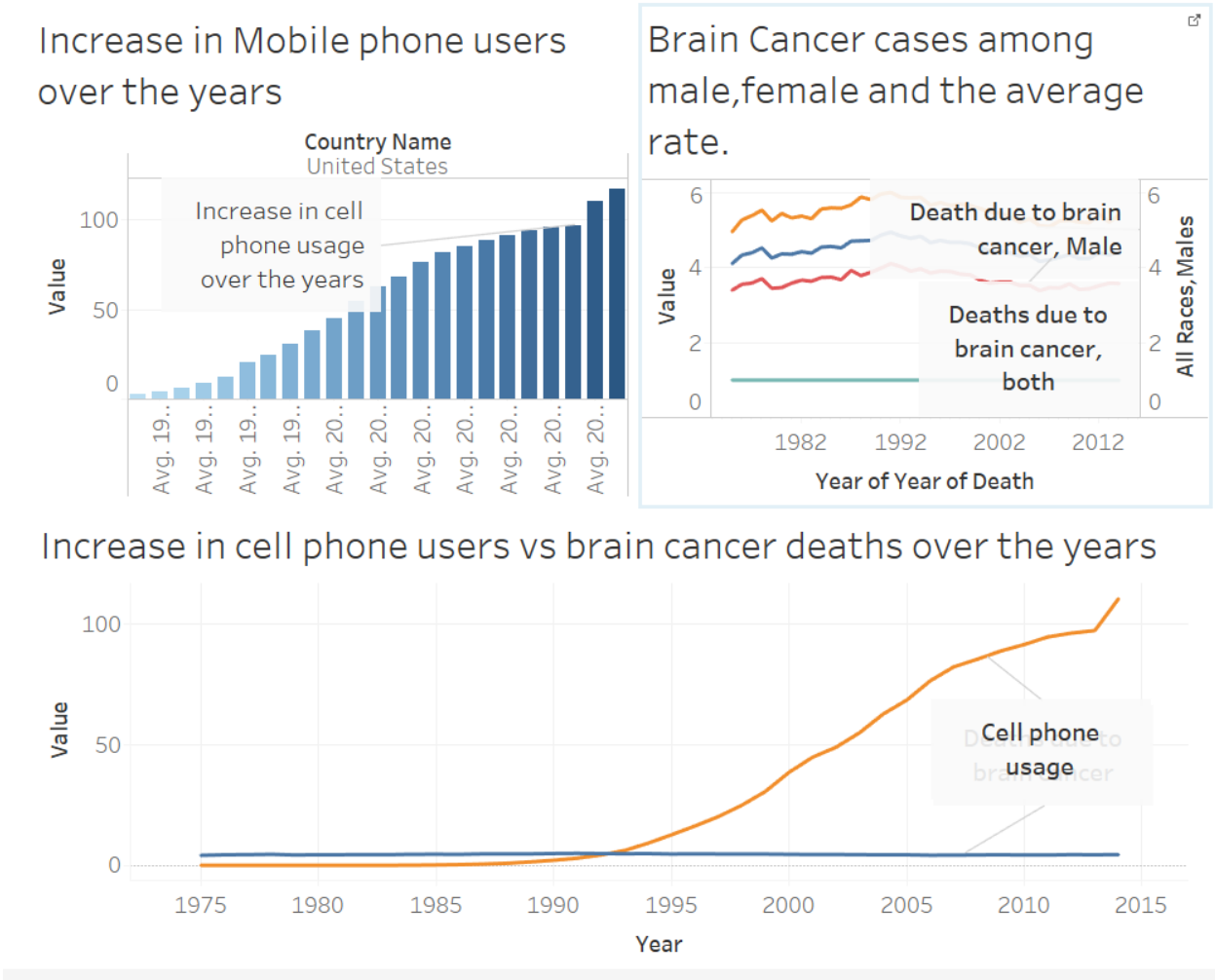
The above graph represents the results of the study conducted on rats to determine the chances of developing brain tumors

- The graph shows that male rats had a higher incidence of tumors when exposed to the same type of radiation emitted by cell phones.
- There were no tumors in the control (unexposed) animals.
- Represented by simple graph to compare and contrast the occurrences of tumor at different body weight matrix.

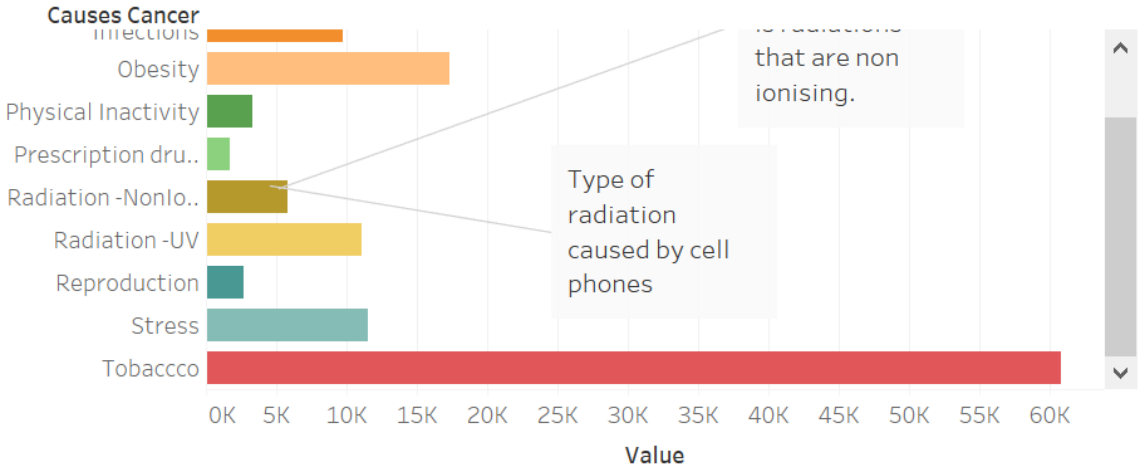
How I did it:

- Cleaned data to remove irrelevant fields
- Combined the two data sets on the type of tumor
- Represented using a line chart the cases where in cancer causing tumors were identified for various weight categories of the rat.

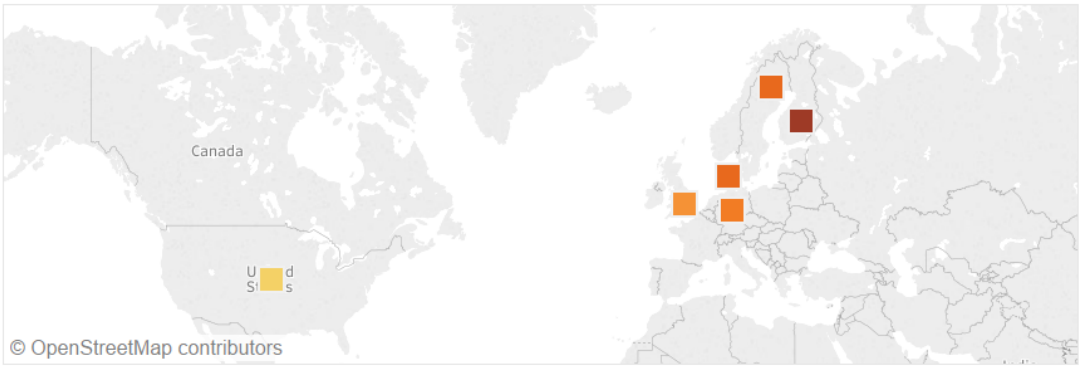
Dashboards:

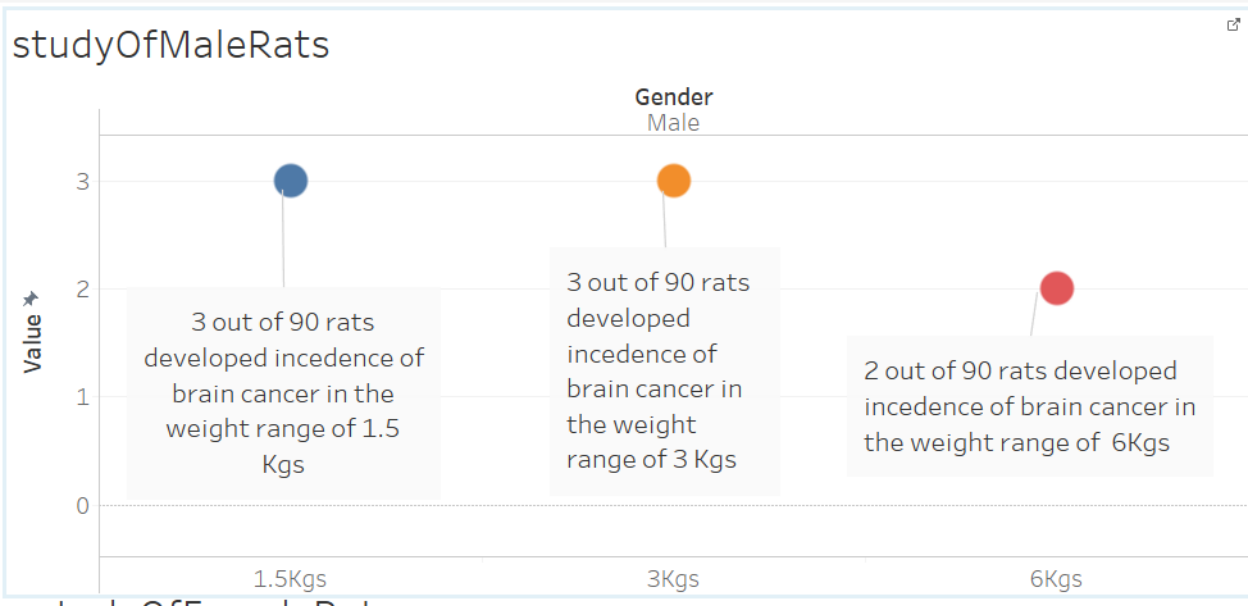

Increase in Mobile phone users over the years
Country Name
United States
Increase in cell phone usage over the years
Value
100
50
0
Avg. 19..
Avg. 19..
Avg. 19..
Avg. 19..
Avg. 20..
Avg. 20..
Avg. 20..
Avg. 20..
Avg. 20..
Avg. 20..
Avg. 20..
Brain Cancer cases among male,female and the average rate.
Death due to brain cancer, Male
Deaths due to brain cancer, both
Value
All Races,Males
6
4
2
0
1982
1992
2002
2012
Year of Year of Death
Increase in cell phone users vs brain cancer deaths over the years
Cell phone usage
Value
100
50
0
1975
1980
1985
1990
1995
2000
2005
2010
2015
Year

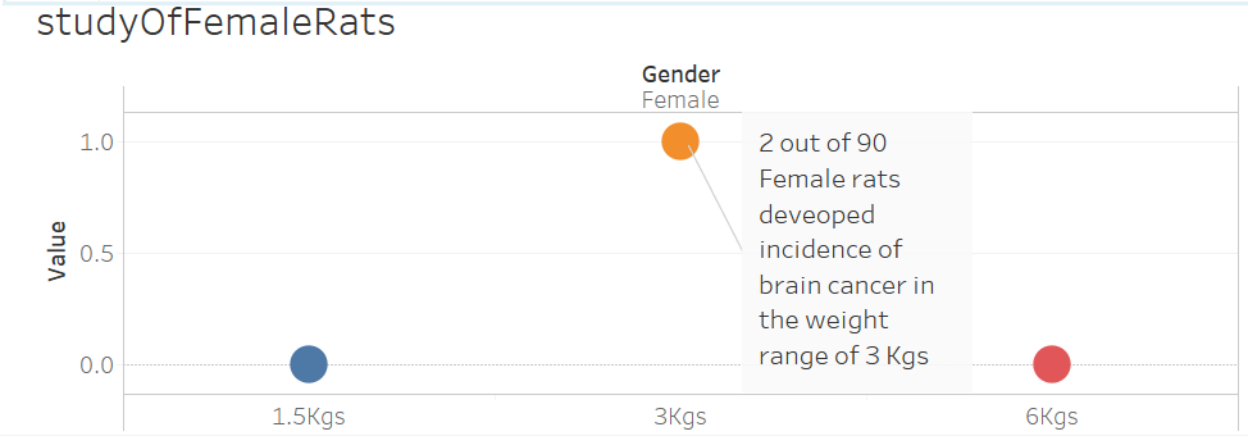
Cancer Causes



Studies on brain cancer







Conclusion:

Final Thoughts: do cell phones cause cancer?

Merging independent studies suggest cell phone radiation could increase your risk of certain cancers, including malignant gliomas in the brain. It took decades to prove cigarette smoking caused lung cancer.so could this. Since there is evidence cell phones impair sleep and glucose metabolism and increase your risk of cancer, I suggest using the precautionary principle

Prevention is better than cure..

Consider limiting your use of cellphones — or use a speaker or hands-free device that places the cellphone antenna, which is typically in the cellphone itself, away from your head.

References:

https://www.cancer.gov/about-cancer/understanding/statistics

https://www.cancer.org/cancer/cancer-causes/radiation-exposure/cellular-phones.html

https://www.bls.gov/cex/cellphones2007.htm

http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/

Github link:

https://github.com/Sapthami/Workbooks