

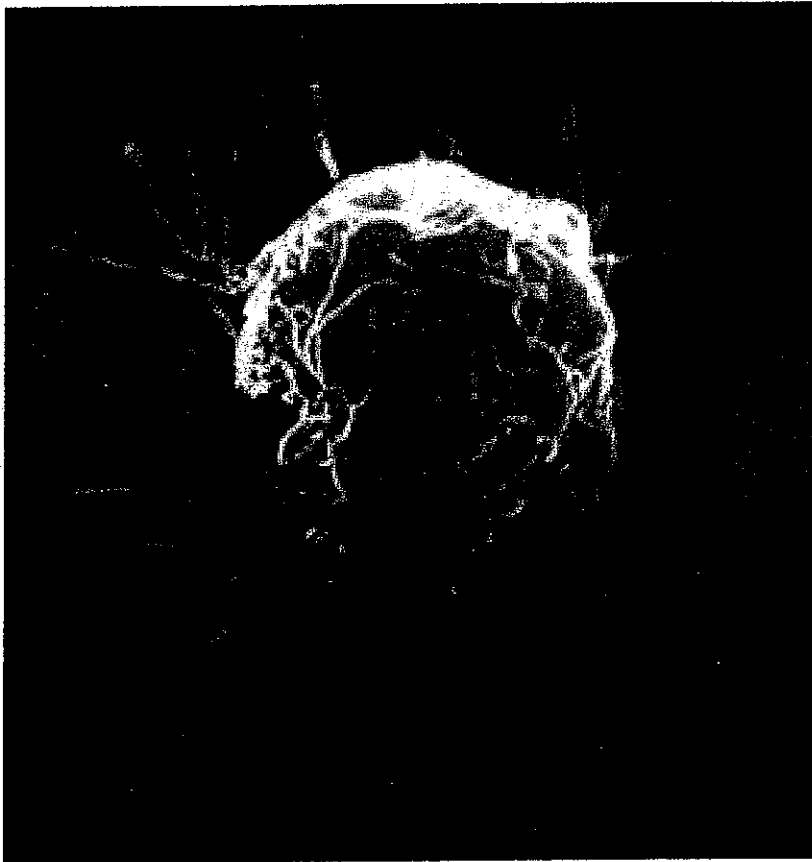
Excellent
Work Jake!

Jake McFadden

12/5/08

149/150

Catching Up With Cancer



<http://www.news-medical.net/images/breast%20cancer%20cell.jpg>

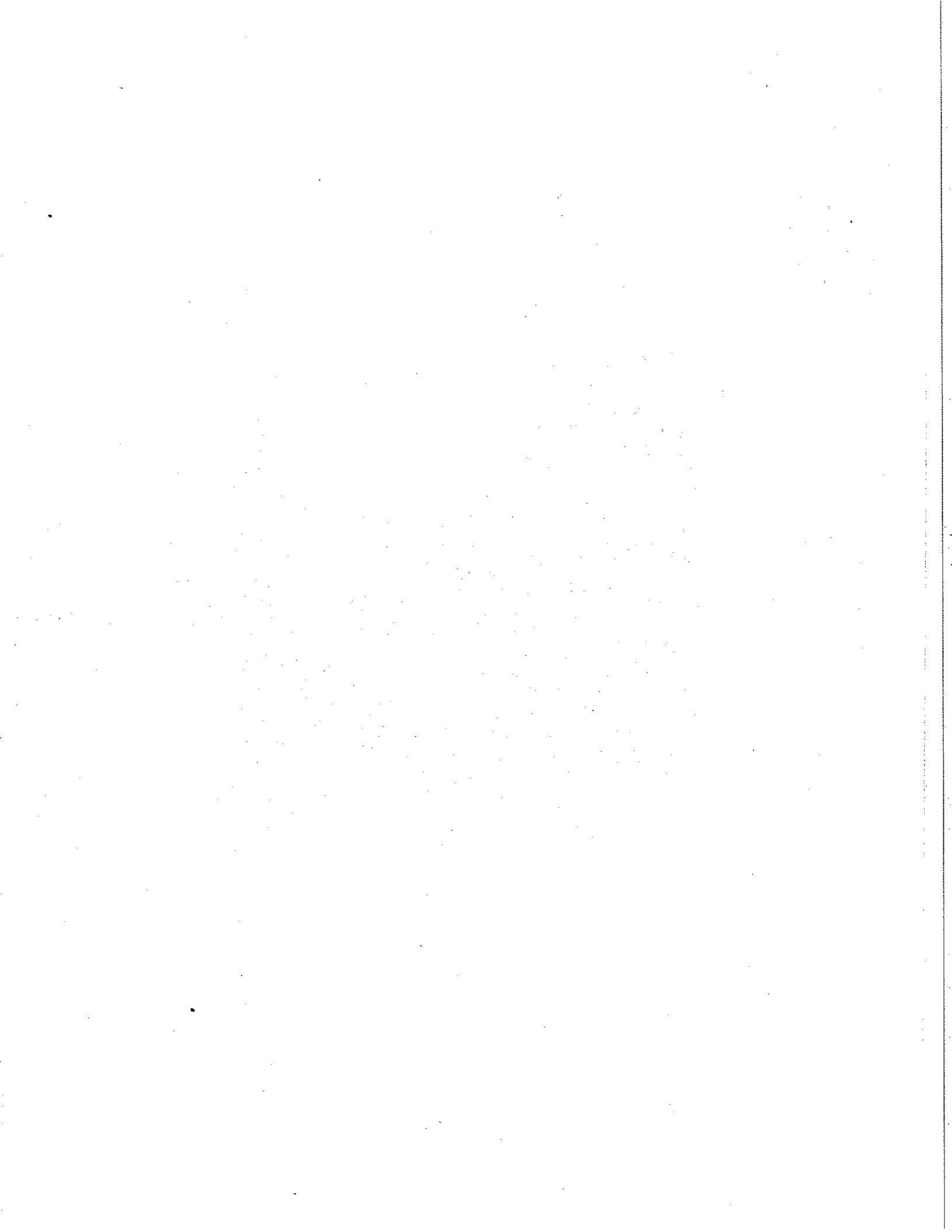
Progress on Cancer, 1950-2008

CALS085, Friday 9:05-11:00am

University of Vermont

Dr. Jonathon Leonard

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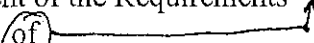
CATCHING UP WITH CANCER

Progress on Cancer from 1950-2008

A Project Presented

by

Jake McFadden

In Partial Fulfillment of the Requirements
of 
CAL5085, Computer Applications and Agriculture
And Life Sciences, University of Vermont

November 2008

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PROJECT THEME

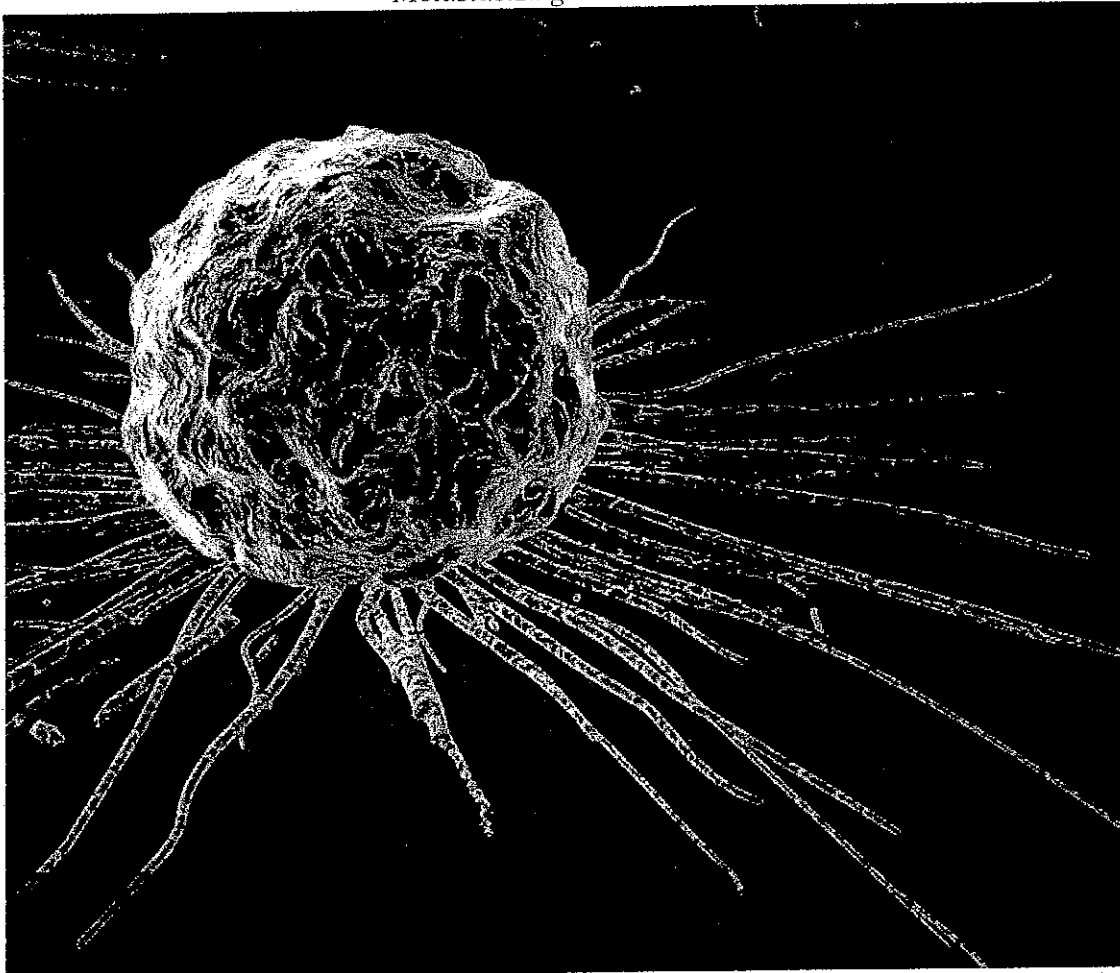
Cancer was the second-leading cause of death for Americans in 2004 and 2005, according to the National Center for Health Statistics. Despite much research to find ways to cure or better treat cancers, and increased efforts to educate the population about the causes of cancer, it is still one of the most prevalent causes of death in this country. Over the past two years I have worked in a research laboratory at UVM with Dr. Uma Wesley, whose major focus is investigating the key molecular components and events that lead to neuroblastoma, a childhood cancer of the developing sympathetic nervous system. This particular cancer is deadly, proving lethal in approximately 50% of cases, depending on factors such as age, molecular status, and site of cancer. (Gao, Tang, and Lin, 2007; American Cancer Society, 2008). From working in Dr. Wesley's laboratory, I have been kept in the loop about new cancer therapies and drug treatments developing around the world. However, I was not entirely sure whether these new efforts were having much of an effect on the American population as a whole.

This report is an analysis of cancer incidence and deaths, with the central theme being whether or not we are progressing against cancer and reducing its effect nationally. To demonstrate the significance of cancer, I first used data from the National Center for Health Statistics to show where cancer ranks in overall causes of death. Next, I examined a sampling of cancers (chosen by prevalence and notoriety) and what the future predictions are for these cancer events, using data from the Surveillance Epidemiology and End Results (SEER) branch of the National Cancer Institute. To determine whether we have been making progress with cancer, I then again used data from the SEER website to look at the mortality rates for cancer cases from 1950-2005. Lastly, I wanted

to examine the effect of a modern cancer treatment, to see if a specific development has resulted in either reduced cancer development or reduced mortality.

IMAGE ONE

Metastasizing Cancer Mass



http://images.google.com/imgres?imgurl=http://www.allthingsbeautiful.com/all_things_beautiful/images/metastasizing_cancer.jpg&imgrefurl=http://www.allthingsbeautiful.com/all_things_beautiful/2005/12/index.html&usq=NBOoVO-YF_k-OUdx7oVDaiKgowE=&h=589&w=700&sz=72&hl=en&start=3&um=1&tbnid=gHZOnMnLqbWxIM:&tbnh=118&tbnw=140&prev=/images%3Fq%3Dcancer%26um%3D1%26hl%3Den%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26hs%3DWxT%26sa%3DG

DATA SOURCES

The data I collected from the internet began with a Google search of “cancer statistics.” I then perused the results from my search and looked for the most reputable websites, including websites that were “.org” or “.gov.” I quickly came across the

statistics page from the National Cancer Institute's Surveillance Epidemiology and End Results (SEER) website (http://seer.cancer.gov/cgi-bin/csr/1975_2005/search.pl#results). I used clicked on the links to the pdfs for "Estimated New Cancer Cases and Deaths for 2008" and "Summary of Changes in Cancer Mortality, 1950-2005 and 5-Year Relative Survival Rates, 1950-2005." I manually selected the data of interest from these pages and entered them into a Microsoft Excel spreadsheet for manipulation. I also compared the data I used against the American Cancer Society's "Statistics for 2008" page to make sure the estimates were close (http://www.cancer.org/downloads/stt/CFF2008M&F_Sites.pdf). I also used the Center for Disease Control's National Center for Health Statistics page on Deaths/Mortality (<http://www.cdc.gov/nchs/fastats/deaths.htm>) to examine cancer as a cause of death in the U.S. I used the NCBI Pubmed search engine to search "neuroblastoma prognosis," and used an article by Gao, Tang, and Lin, (2007; <http://www.ncbi.nlm.nih.gov/pubmed/17706038>) to support information presented in the Project Theme section. Data collected from the American Cancer Society's Cancer Reference Information page on Neuroblastoma (http://www.cancer.org/docroot/CRI/content/CRI_2_4_3X_How_is_neuroblastoma_staged_31.asp) was also used to support the aforementioned information in the Project Theme section.

Data ^{were} ~~was~~ also collected by searching the UVM libraries for "cancer treatments." The Dana Medical Library had the best results as I scanned through the listings, so I headed over to Dana Medical Library to do a bit more scanning. I found the reference section on cancer, treatments, and statistics, and took information from a few of them, including Cancer Facts and Figures 2003 (ACS), Cancer Rates and Risks (Page, 1985), and Cancer Surveys (Sidebottom, 1994).

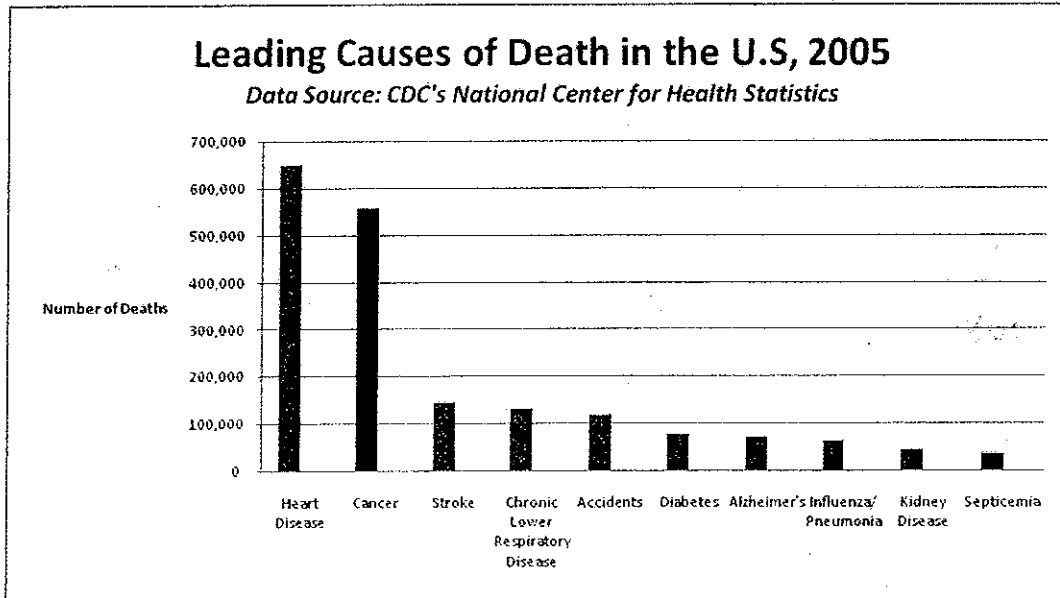
DATA TABLE 1

Leading Causes of Death in the U.S, 2005

Data Source: CDC's National Center for Health Statistics

<i>Cause of Death</i>	<i>Number of Deaths</i>
Heart Disease	652,091
Cancer	559,312
Stroke	143,579
Chronic Lower Respiratory Disease	130,933
Accidents	117,809
Diabetes	75,119
Alzheimer's	71,599
Influenza/Pneumonia	63,001
Kidney Disease	43,901
Septicemia	34,136

GRAPH 1



DISCUSSION 1

Graph One is a bar graph of the top ten leading causes of death for 2005, the most recent year for which the CDC has tabulated data. The causes of death are listed on the X-axis, while the number of deaths are given on the Y-axis. This graph demonstrates what sort of an impact cancer has on the American population. As demonstrated, cancer is the second leading cause of death in the U.S. However, it is responsible for 22.8% of deaths, versus 5.9% for the next highest cause of death (stroke), making it proportionally a much more dangerous condition than any other cause of death, with the exception of heart disease. In fact, cancer killed more people in 2004 than the next five most common causes of death – stroke, chronic lower respiratory disease, accidents, diabetes, and Alzheimer's – combined. This graph demonstrates how important and prevalent cancer is in the U.S, and would seem to indicate that perhaps not enough progress is being made on cancer as its effect is still quite profound.

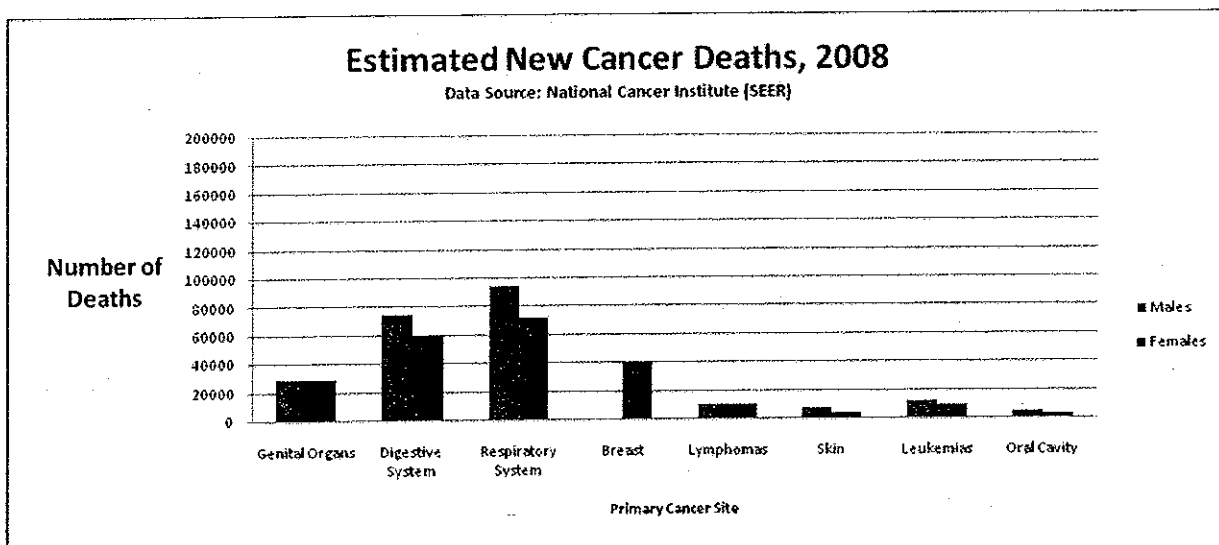
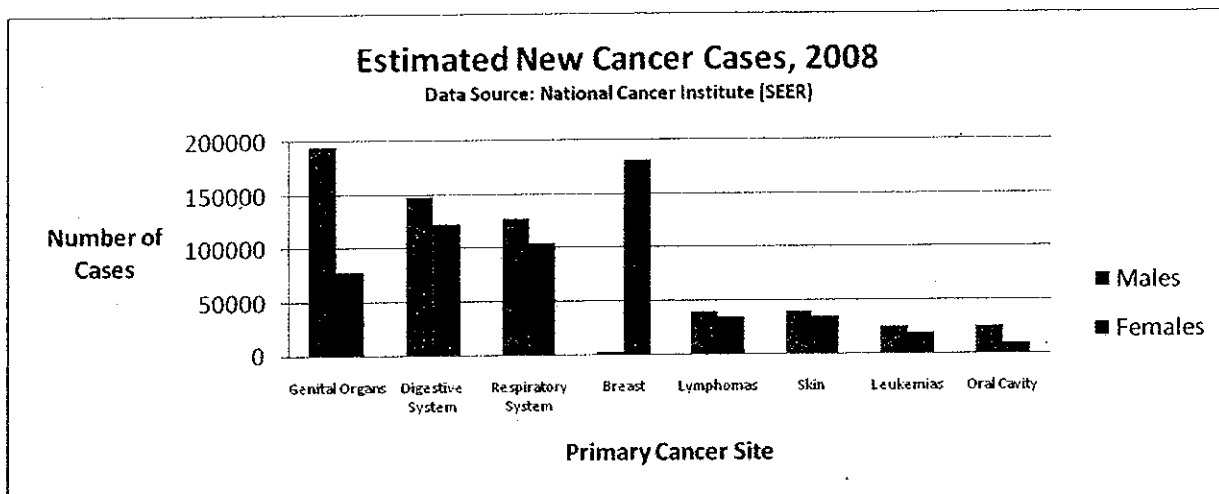
DATA TABLE 2

Estimated New Cancer Cases and Deaths for the U.S, 2008

National Cancer Institute: Surveillance Epidemiology and End Results

<i>Primary Cancer Site</i>	<i>Estimated New Cases</i>			<i>Estimated Deaths</i>		
	Males	Females	Total	Males	Females	Total
Genital Organs	195660	78490	274150	29330	28490	57820
Digestive System	148560	122730	271290	74850	60280	135130
Respiratory System	127880	104390	232270	94210	72070	166280
Breast	1990	182460	184450	450	40480	40930
Lymphomas	39850	34490	74340	10490	10020	20510
Skin	39850	34490	67720	7360	3840	11200
Leukemias	25180	19090	44270	12460	9250	21710
Oral Cavity	25310	10000	35310	5210	2380	7590
All Sites	745180	692000	1437180	294120	271530	565650

GRAPH 2



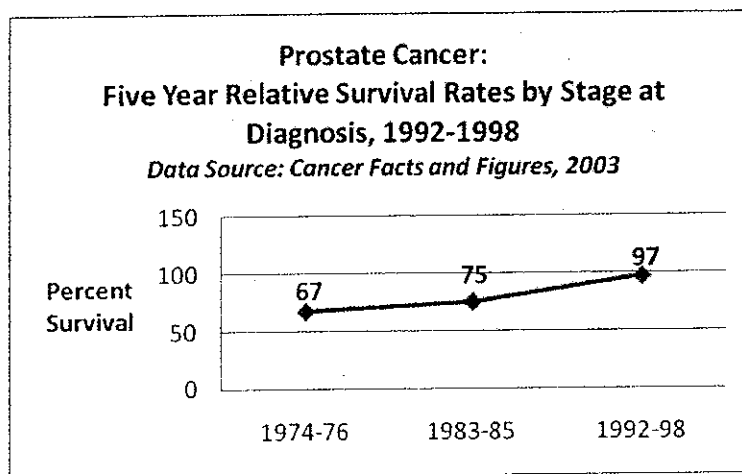
DISCUSSION 2

The graphs depicted for Graph 2 contain a considerable amount of information; they were added under the same heading because some important points can be taken from comparing them. The top graph shows the estimated new cancer cases for 2008, as given by the Surveillance Epidemiology and End Results (SEER) branch of the National Cancer Institute. The X-axis shows a selection of the primary cancer sites. The primary cancer sites were selected based on their prevalence and relative notoriety; the only top

cancer site omitted from these graphs was urinary cancers (due to low notoriety). Values for primary cancer sites are the sum of specific cancers within the region; for example, respiratory system includes cancers of the larynx, lungs and bronchi, and other respiratory sites. The Y-axis shows the number of predicted cases for 2008. The graph itself is a paired bar graph, separating cancer cases for males and females. The data ^{are} ~~is~~ ordered, arranged from highest number of total cases to lowest. Notably, while cancer of the genital organs is predicted to be the most common overall, men are more than twice as likely to obtain this cancer. This can partially be explained by the fact that men are susceptible to prostate cancer, which women are not. Prostate cancer causes are undefined, but have been attributed to a whole range of factors, including age (the best indicator of risk), diet, genetics, race, exercise, and previous disease or treatments of the prostate (http://www.cancer.org/docroot/CRI/content/CRI_2_2_2X_What_causes_prostate_cancer_36.asp). Prostate cancer is one of the most common site-specific cancers in men; overall, the American Cancer Society estimates that 1 in 6 men will likely contract prostate cancer over their lifetime (http://www.cancer.org/docroot/CRI/content/CRI_2_4_1X_What_are_the_key_statistics_for_prostate_cancer_36.asp). The digestive system is the next most common site of cancer appearance, led specifically by colon cancer, which occurs at near equal frequencies in men and women. The respiratory system is the third most common cancer site overall, with lung cancer being the most common specific site. Near equal in both men and women, this can partially be attributed to cigarette smoking, as well as inhalation of carcinogenic compounds like asbestos or radon (http://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm). The fourth most common cancer site as predicted for 2008 is breast cancer, though it is nearly entirely

attributed to women. The greater mass (and consequently number of cells) in a woman's breast increases the chances of mutation; however, there are numerous risk factors for women also, including certain copies of genes, diet, and family history (http://www.cancer.org/docroot/CRI/content/CRI_2_4_2X_What_are_the_risk_factors_for_breast_cancer_5.asp). The next four cancer types: lymphomas, skin, leukemias, and oral cavity cancers, all exhibit much lower predicted incidence, and have roughly equal estimates for men and women.

The lower graph, predicting numbers of deaths due to the predicted cancer cases, shows some similar interesting results. First, while men are twice as likely to develop cancer of the genital organs, the number of predicted deaths between men and women is roughly equal. As alluded to earlier, prostate cancer is a major contributor to cancer of the genital organs, and is exclusive to males. However, prostate cancer treatment and detection methods have improved drastically, driving the 5-year percent survival rates for prostate cancer cases up to 97% during 1992-1998.



Reasons for the sharp increase in percent survival in prostate cancer cases can be explained by the development of growth-controlling hormone treatment for the prostate, as well as early detection methods and increased awareness, according to the American

Cancer Society (Cancer Facts and Figures, 2003; American Cancer Society). The remaining death rate for genital organs for both men and women is rather low, compared with the number of predicted cases. It appears that genital organ cancers are rather controllable currently. Digestive system cancer, the next most common predicted cancer site, shows a percent of death (total, both men and women) of 49.81%. This may not be indicative of how successful treatment with digestive system cancers is progressing.

Digestive cancers, as classified by NCI's SEER, includes 10 specific cancer types within the digestive grouping. The list includes esophagus, liver, pancreas, and colon among others, indicating that there may be progress with some digestive system cancers but not others. Additionally, epithelial cells along the digestive tract divide with a very high frequency, making them more susceptible to mutation propagation, and cells in the digestive system can be exposed to a wide range of carcinogens. (Cancer Research UK, <http://www.cancerhelp.org.uk/help/default.asp?page=98#epith>).

The most deadly cancer displayed in Graph 2 is cancer of the respiratory system. The majority of men and women that contract respiratory system cancer die from it. It can be caused by a variety of airborne carcinogens, but smoking is the greatest cause of lung cancer by far, earning special sections in reference journals for its effect (Cancer Facts and Figures, 2003; American Cancer Society). Treatment options include radiation therapy, surgery, and chemotherapy; however, the difficulty with respiratory cancers is early detection, as the cancer can already be malignant and deadly by the time the treatment begins (<http://www.mayoclinic.org/lung-cancer/>). I will investigate respiratory system cancer in more depth later in this report.

Breast cancer, while still being a dangerous cancer, has seen reduced deaths by improving programs for early detection, awareness, as well as treatment packages that allow high specificity (<http://www.breastcancer.org/treatment/>). The remaining cancers all demonstrate fairly even death rates between men and women, and death projections are much lower for oral, skin, leukemia, and lymphoma cancers.

DATA TABLE 3

Summary of Changes in Cancer Mortality and 5-Year Relative Survival Rates 1950-2005

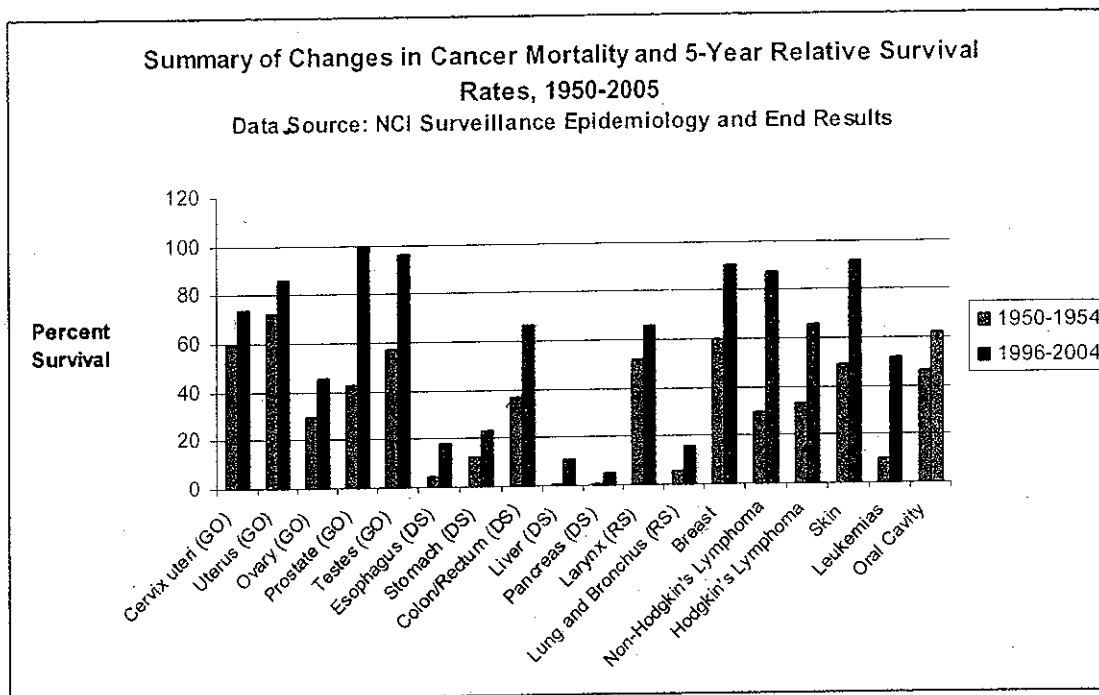
Data Source: NCI Surveillance Epidemiology and End Results

	1950-1954 →	1996-2004 →
Cervix uteri (GO)	59	73.7
Uterus (GO)	72	86.2
Ovary (GO)	30	45.3
Prostate (GO)	43	99.4
Testes (GO)	57	96.4
Esophagus (DS)	4	18.1
Stomach (DS)	12	23.1
Colon/Rectum (DS)	37	66.3
Liver (DS)	1	10.8
Pancreas (DS)	1	4.9
Larynx (RS)	52	65.8
Lung and Bronchus (RS)	6	15.9
Breast	60	90.5
Non-Hodgkin's Lymphoma	30	87.2
Hodgkin's Lymphoma	33	65.9
Skin	49	92.1
Leukemias	10	52.2
Oral Cavity	46	62.4
All Sites	35	67.5

Note: () indicates which cancer site grouping these specific cancers fall under.

“GO”=genital organs, “DS”=digestive system, “RS”=respiratory system.

GRAPH 3



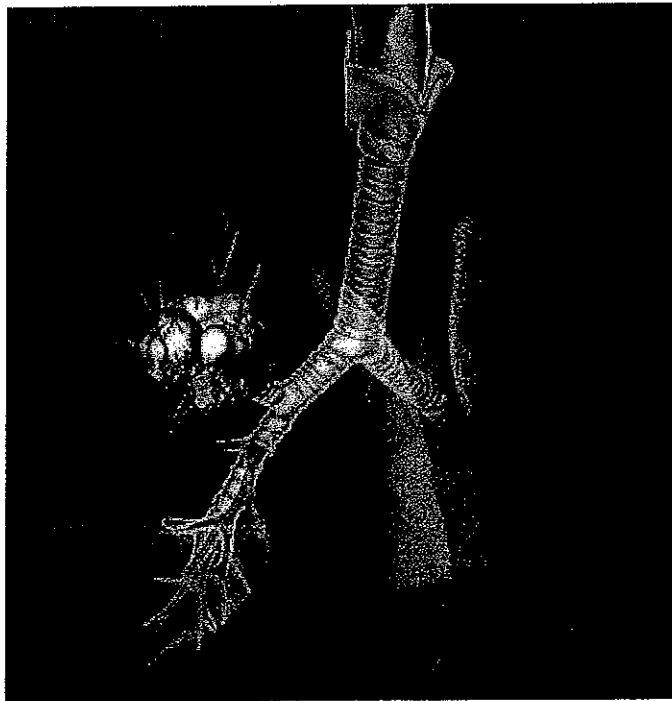
DISCUSSION 3

To address the major question of this investigation – whether progress is being made on cancer – Graph 3 gives the best broad, immediate answer. While the previous graphs show that cancer is still a leading cause of death and major concern in this country, Graph 3 effectively shows the positive increase in 5-year percent survival for every single cancer grouping being examined in this report. Graph 3 is a paired bar graph, with the specific cancer site on the X-axis and the percent survival on the Y-axis. Each pair of bars shows the 5-year percent survival for individual cancers for 1950-1954 in grey. The 5-year percent survival for individual cancers for 1996-2004 are color coded according to their regional grouping. For example, the laryngeal and lung and bronchus cancer are classified in this report as respiratory system cancers, and thus are both colored red in Graph 3. Some cancer groupings (genital organs, digestive system) have as many as five distinct cancer types within their grouping, while other groupings are singular and

specific by nature (for example skin, which counts melanomas all over the body). The groupings were ordered based on predicted group cancer cases in 2008, the same order as presented in Graph 2, top graph.

While techniques and programs in prevention, detection, treatment, and therapy have all made significant improvements over the past 50+ years, they are really validated well in Graph 3. Some cancers are now virtually curable; testicular, breast, and skin cancers all show 5-year survival rates of greater than 90%, while prostate cancer comes in at 99.4%. Many cancers have more than doubled the 5-year survival rates over the past 50 years, though some of those cancers started at significantly low levels (liver, pancreas – 1% 5-year survival in 1950-1954). While some cancers still have dangerously low 5-year survival rates, including liver, lung and bronchus, pancreatic, and esophageal cancers, if the trend of progression on cancer continues for the next 50 years, the outlook on all cancers will be much less bleak.

IMAGE 2



Lung Cancer Tumor Development.
<http://mv.clevelandclinic.org/PublishingImages/Thoracic/lung-cancer2.jpg>

DATA TABLE 4

Lung Cancer: Five Year Relative Survival Rates

Data Source: National Cancer Institute/American Cancer Society

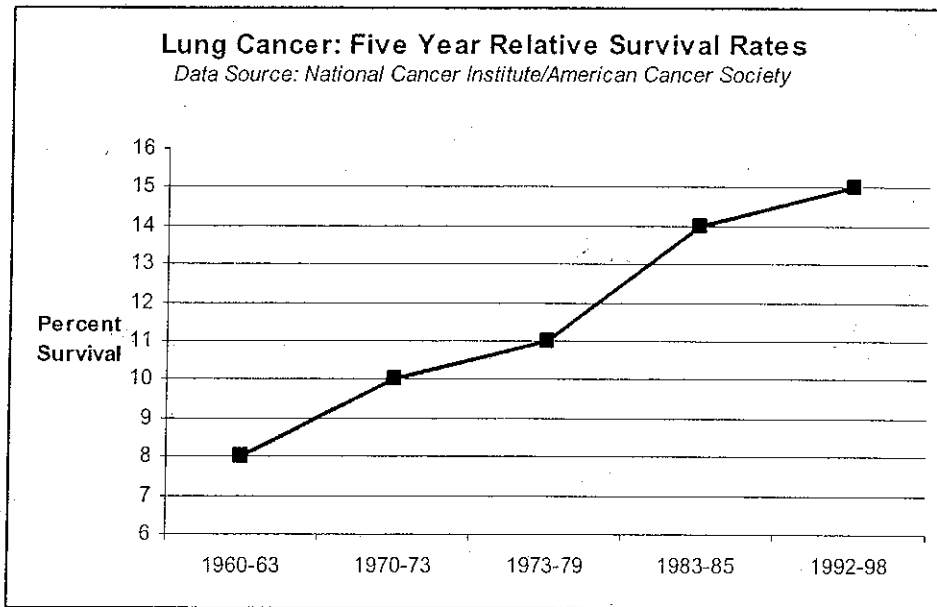
	1960-63	1970-73	1973-79	1983-85	1992-98
% Survival	8	10	11	14	15

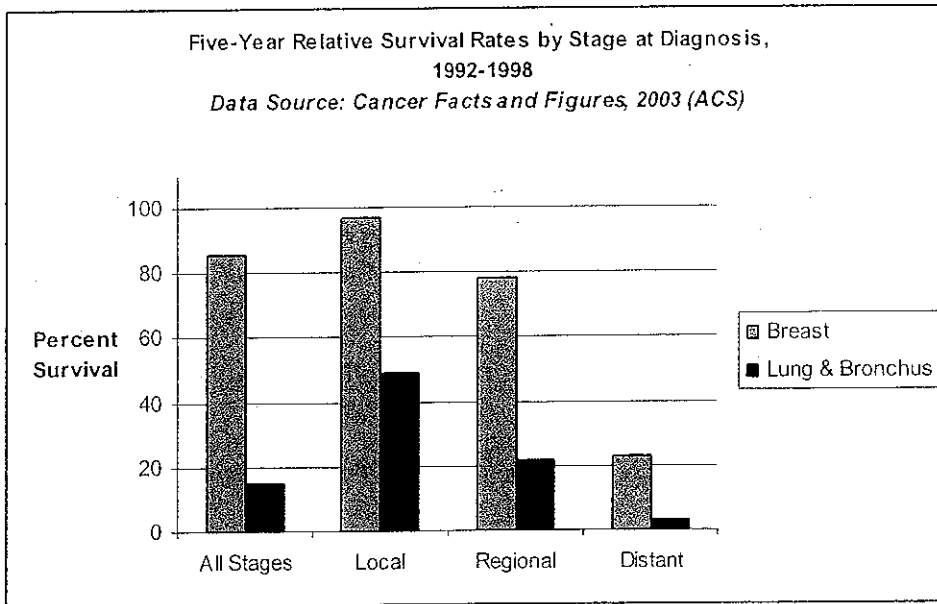
Five Year Relative Survival Rates by Stage at Diagnosis, 1992-1998

Data Source: Cancer Facts and Figures, 2003 (ACS)

(% Survival)	All Stages	Local	Regional	Distant
Breast	86	97	78	23
Lung & Bronchus	15	49	22	3

GRAPH 4





DISCUSSION 4

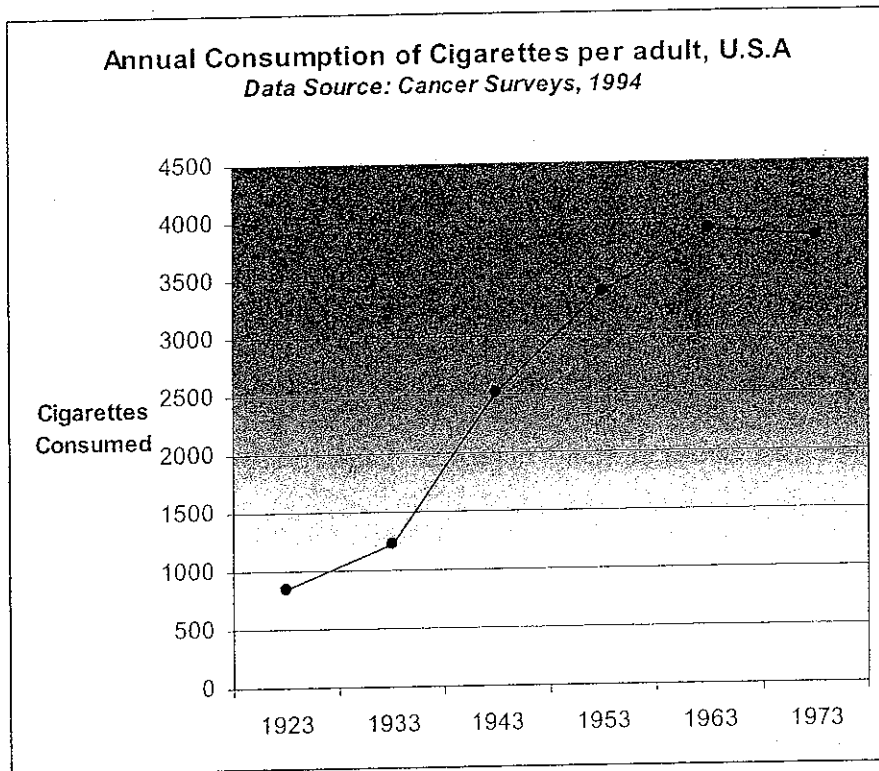
?
Graph 2 uses two graphs to illustrate the difficulty and decidedly low increase in 5-year survival rates for lung cancer. The top graph shows the slight increase in 5-year survival rates for lung cancer from 1960 to 1998. This line graph is a pairing of two data sets; the data from 1960 to 1979 ~~was~~ ^{were} taken from Cancer Rates and Risks, 3rd edition, 1985, by Harriet S. Page of the National Cancer Institute. 1983 to 1998 ~~was~~ ^{were} data taken from Cancer Facts and Figures 2003, published by the American Cancer Society. The X-axis shows the year ranges of measurement for lung cancer cases, and the Y-axis shows the percent survival. The bottom graph is a bar graph that shows the 5-year percent survival for both lung and breast cancer cases from 1992-1998. This graph has the stage of the cancer on the X-axis, and the percent survival on the Y-axis. ~~This data was taken~~ ^{These were} from Cancer Facts and Figures, 2003, by the American Cancer Society.

The top graph shows how little the increase in percent survival for cases of breast cancer has been over the past 50 years – the change has been very little compared to some of the changes observed in Table/Graph 3. The bottom graph begins to give a

preview as to the real question the top graph elicits – why is lung cancer so difficult to make progress on? The bottom graph compares the percent survival rates of lung cancer with breast cancer, one of the more treatable cancers studied in this report. The graph shows that lung cancer has some chance of being treated if it is detected locally, a result that is magnified in breast cancer, where local cancer can be treated with great results. However, the percent survival sharply declines once the cancer has migrated regionally (become malignant) or moved through the bloodstream to distant sites (metastatic). This observation corresponds with the decreases seen with breast cancer, though on a much more dangerous scale. Again, the information begs the question why.

The answer lies in cigarettes. According to *Cancer Rates and Risks*, 3rd edition, 1985, ✓
by Harriet S. Page of the National Cancer Institute, "Cigarette smoking is the major cause of lung cancer and is estimated to cause 85% of lung cancer deaths." (p96) The report goes on to describe the trend in increasing cigarette consumption: "In the US, lung cancer incidence has risen more sharply...reflecting the growing popularity of cigarette smoking...lung cancer death rate for women in this country is expected to surpass that of breast cancer in a few years." That passage was an excerpt in the report taken from Horn and Asire in 1982, and the breast cancer reference was especially shocking considering how prevalent breast cancer mortality once was. Cigarette smoke introduces over 60 carcinogens to the lungs (<http://www.cancer.gov/cancertopics/factsheet/tobacco/cancer>), and is especially dangerous due to the fact that cigarette smoke can increase the likelihood of pancreatic, esophageal, laryngeal, and mouth cancer dramatically (*Cancer Rates and Risks*, 3rd edition, 1985, by Harriet S. Page of the National Cancer Institute). Lung cancer can be difficult to detect early, as it is not visible on the exterior. Because of

this, by the time symptoms have flared enough for a check-up, doctors are relatively powerless as the cancer is already spreading. It would take a tremendous effort to regularly check all smokers, so doctors are left relatively powerless, as there is really no good treatment for advanced lung cancer. The "Truth" campaign on smoking awareness and prevention has made great efforts to publicize the adverse effects of cigarette smoking, and the percent of smokers in the U.S has recently begun to decline. Nevertheless, it was more than 50 years ago that the medical community began to describe lung cancer as an "epidemic," a dangerous cancer caused overwhelmingly by the cultural explosion of cigarette smoking. While advances in treatment may be needed, certainly advances on the social front would help decrease the number of lung cancer deaths by simple prevention.



CONCLUSION

The question of this report – are we making progress on cancer in the U.S. – was answered clearly in this report. Over the past 50+ years, the U.S. has made dramatic progress on cancer, with every cancer investigated in Graph 3 showing an increase in the 5-year percent survival of patients. Cancer still remains a major cause of death in the U.S. (Graph 1), as the second-leading killer behind heart disease, indicating that there is still room for improvement on the cancer front. Improvements in awareness and prevention programs, as well as novel treatment and therapy strategies, will no doubt improve the survival rates further; and if they increase to the same degree that they did over the past 50 years, then both cancer cases and deaths should demonstrate a marked reduction. ✓

Additionally, the atypically low increase in the percent survival of respiratory system cancers over the past 50+ years was investigated. The report attributes the anomalous respiratory cancer difficulties to cigarette smoking, the major cause of lung cancer. Difficulties in lung cancer detection and its ability to spread to other parts of the body account for the high numbers of predicted deaths (Graph 2) and low percent of 5-year survivors (Graph 4) currently. Exploration into the efficacy of current trial treatments for lung cancer would be interesting, and would help predict whether or not lung cancer will remain as one of the most lethal cancers. ✓

REFERENCES CITED

Books/Journals:

Page, Harriet S.; Asire, Ardyce J. 1985. *Cancer Rates and Risks*, 3rd edition. National Cancer Institute.

Sidebottom, E. 1994. *Cancer Surveys*, v19/20. Trends in Cancer Incidence and Mortality.

Cancer Facts and Figures 2003, American Cancer Society.

Web Sources:

Gao, XN; Tang, SQ; Lin J. (August 2007). Clinical features and prognosis of advanced neuroblastoma in children. <http://www.ncbi.nlm.nih.gov/pubmed/17706038>.

Journal article taken from a Chinese cancer journal and translated; presented some statistics about neuroblastoma. From the NCBI Pubmed search engine. Visited November 23, 2008.

<http://www.breastcancer.org/treatment/>

The Breast Cancer Homepage was useful in giving concise answers for treatment options regarding breast cancer. The page is full of other useful links concerning breast cancer, and the page was last modified July 16, 2008. This page was visited December 2, 2008.

<http://www.mayoclinic.org/lung-cancer/>

The Mayo Clinic is an incredibly reputable source of health information, as a leading clinic is treatment and research in this country. Similar in style, completeness, and wealth of links to the Breast Cancer Homepage. The lung cancer treatment info was very readable. The site claims current updates; it was visited December 2, 2008.

<http://www.cancerhelp.org.uk/help/default.asp?page=98#epith>

The British Cancer Research page was used to qualify remarks made about epithelial cell cancer prevalence. Last updated June 25, 2007. Nice simple overview of body sites with respect to cancer. Viewed November 30, 2008.

http://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm. (December 3, 2008)

<http://www.cdc.gov/nchs/fastats/deaths.htm> (April 28, 2008)

http://seer.cancer.gov/cgi-bin/csr/1975_2005/search.pl#results (2005 data compilation)

These websites were grouped together because they were from the government's Center for Disease Control website, in the Surveillance Epidemiology and End Results branch of cancer statistics. Great links to a variety of collected data presented in .pdfs and charts, and similarly good information about lung cancer risk factors.

I used the SEER links to the pdfs for "Estimated New Cancer Cases and Deaths for 2008" and "Summary of Changes in Cancer Mortality, 1950-2005 and 5-Year Relative Survival Rates, 1950-2005." Visited these sites between November 24-December 3, 2008.

http://www.cancer.org/docroot/CRI/content/CRI_2_4_2X_What_are_the_risk_factors_for_breast_cancer_5.asp (Updated September 9, 2008)
http://www.cancer.org/docroot/CRI/content/CRI_2_4_1X_What_are_the_key_statistics_for_prostate_cancer_36.asp?sitearea= (October 29, 2008)
http://www.cancer.org/downloads/stt/CFF2008M&F_Sites.pdf (2008)
http://www.cancer.org/docroot/CRI/content/CRI_2_4_3X_How_is_neuroblastoma_staged_31.asp?sitearea= (October 22, 2008)

The URLs were grouped together because they all come from the American Cancer Society website. They were all very recently updated, and this was the best site for information that was visited. Detailed descriptions of cancer progressions, as well as a fact sheet, were used from this website. Highly recommended for further cancer reading. Visited all pages November 23-December , 2008.

CREDIBILITY OF WEB SOURCES

Each of the URLs that was used for information or data purposes in this report is highly credible. All of the URLs used in this report are either “.org” or “.gov.” The NCBI’s Pubmed website is a premier search engine for scholarly journal articles in science, and the results displayed here are often by Ph.D or M.D scientists. The NCBI is government-run, and their standards are very high. Similarly, the government is a reliable and credible source to obtain data from, and the CDC and its SEER branch have had their data used in studies worldwide; the UK’s government sponsored cancer research page also is likely held to high standards. The remaining “.org” websites are well-funded, well organized websites that have very serious motives and are well regarded. The American Cancer Society, the Breast Cancer Foundation, and the Mayo Clinic are all benchmark health science organizations.

All of the websites used were updated since 2007, save the SEER census data regarding predicted cancer case and death rates, which were taken in 2005. Many were authorless, as there were likely many contributors at the government and private organizations. Nevertheless, all had links for questions or general contact sources. The authors of the Chinese journal article on NCBI could easily be reached via email. Most of the data and information used is generalized versions of information found in peer-reviewed journals.

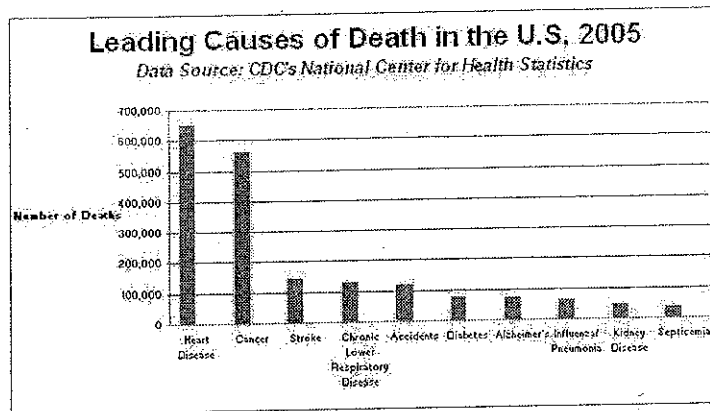
No sense of bias could be felt on these webpages, even though the private organizations likely are trying to push to appear the well-organized to impress potential donors. The credibility of these web sources is very high.

Catching Up To Cancer

Progress on Cancer, 1950-2008

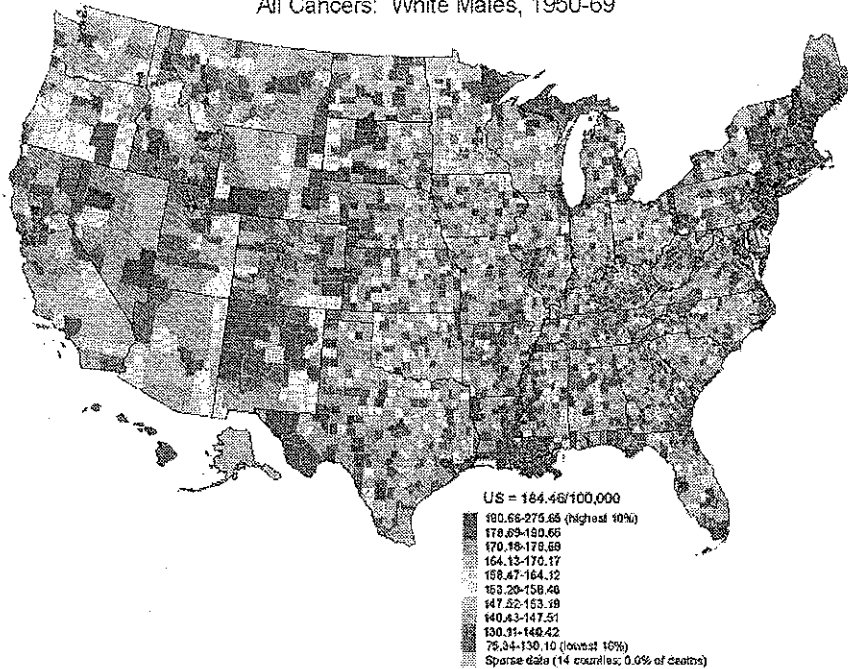
The aim of this project was to collect and analyze data concerning cancer cases and deaths. The report evaluates the progress being made on cancer from 1950-2008 in the United States, emphasizing patterns and significant information graphically. Investigation into specific cancers provides history and explanation of the results presented, as well as future outlooks for some of the cancers studied.

WHY THIS MATTERS



- Cancer is the second-leading cause of death in the U.S.
- Health science professionals are dedicating their lives to helping cure this disease; even here at UVM, there are oncologists doing terrific work. For an example, check out [Dr. Uma Wesley's current research](#).
- Chance of an American male developing cancer is 1 in 2; for women, it is 1 in 3.

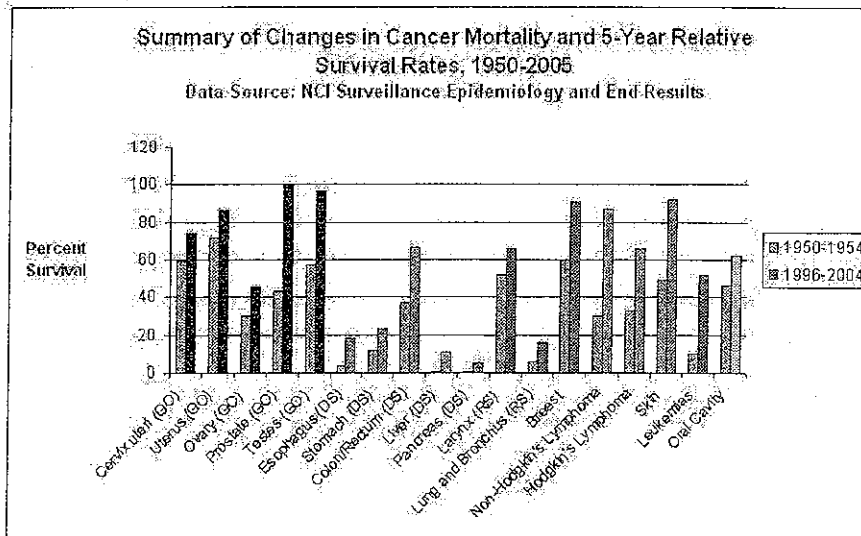
Cancer Mortality Rates by County (Age-adjusted 1970 US Population)
All Cancers: White Males, 1950-69



<http://www.lewrockwell.com/sardi/cancer-rates.gif>

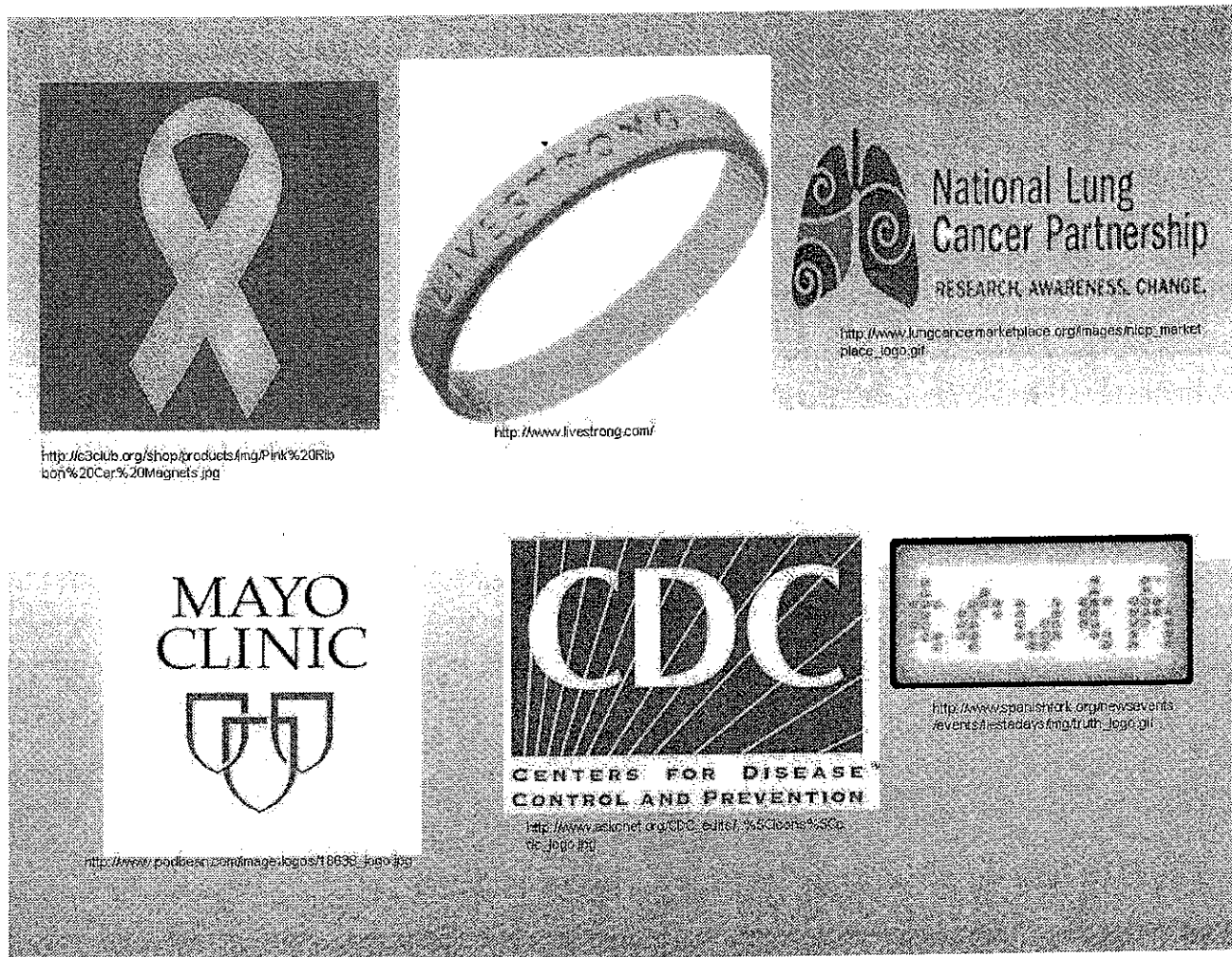
RESULTS

- From 1950, every single cancer studied has shown an increase in 5-year relative survival rates.



- So much progress has been made on some cancers that they are now essentially curable. Prostate cancer, for example, has a 5-year relative survival rate of 99.2%; [click here](#) to learn more about prostate cancer and why its prognosis is so much better now.
- Other cancers, such as lung cancer, have been tremendously difficult to make progress on, and developing lung cancer remains very dangerous. Here is a link to [my full report](#); the reasons behind lung cancer difficulty, and much more, are inside.

Links to Cancer Sites

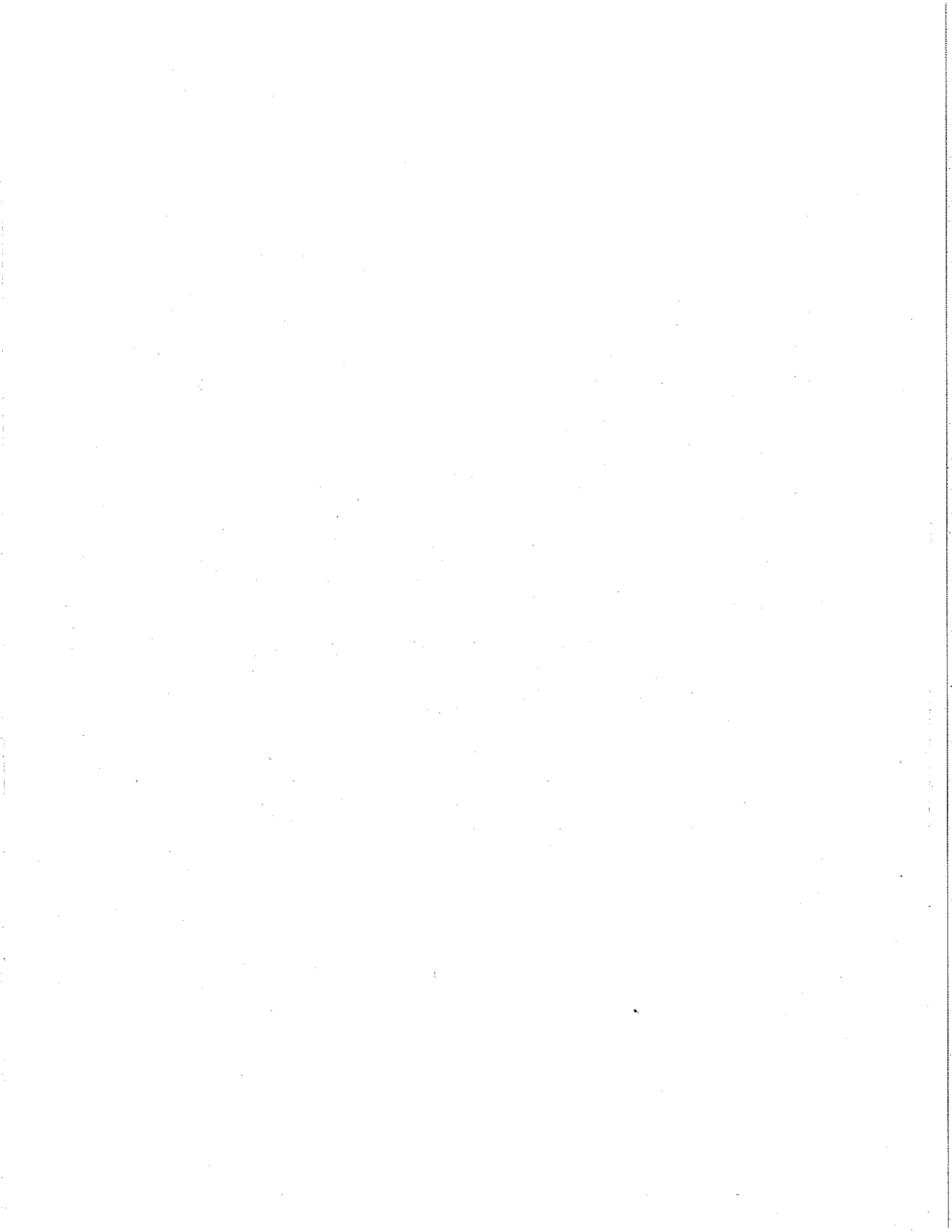


- [Breast Cancer Homepage](#)
- [CDC's Cancer Homepage](#)
 - ["Truth" Homepage](#)
 - [Livestrong Homepage](#)
- [Lung Cancer Research Foundation Homepage](#)
 - [Mayo Clinic Homepage](#)

This project was constructed by [Jake McFadden](#), University of Vermont, in partial fulfillment of the requirements for CALS085.

[Shoot me an email](#)

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CHECKLIST FOR GRADING FINAL LAB PROJECTS

NAME: JAKE M.

PROJECT IN A POCKET FOLDER WITH YOUR NAME, LAB SECTION (DAY & TIME), & LAB INSTRUCTOR'S NAME ON FRONT AND TOP RIGHT CORNER of folder? Yes No

PRESENTATION GRAPHICS PAGE:

- Presentation Graphics (PowerPoint) Cover Sheet present? Yes No
- Title of Project present? Yes No
- Your Name on Presentation graphics page? Yes No
- Graphics page printed in Portrait Orientation? Yes No
- Picture on the page evoking the project theme? Yes No
- Picture with reference citation Yes No
- Name of your lab instructors on page? Yes No

TITLE PAGE & CONTENTS:

- Is the Title Page in the format from the web page example? Yes No *close*
- Table of Contents format from the web page example? Yes No

GENERAL FORMATTING:

- Double-spaced? Yes No
- Spaces in long URLs to prevent wrap-around? Yes No
- Headings of main sections Bold, Caps, & Centered? Yes No
- Computer Generated Page Numbers? Yes No
- Theme pg. 1? Yes No
- Seamless document? Yes No

TABLES:

- Title complete (what where when)? Yes No
- Location boundaries clear (USA, World, VT)? Yes No
- Numbers aligned RIGHT so decimal places line up in a column? Yes No
- Units Present? Yes No
- Sorted by numbers (not alphabetically)? Yes No
- Headings aligned right side of columns? Yes No *p. 10*
- Dates present where appropriate? Yes No
- At least one data set from Library printed source from stacks? Yes No
- Data sources present? Yes No
- Stands alone? Yes No

GRAPHS:

- Title complete (what where when)? Yes No
- Location boundaries clear (USA, World, VT)? Yes No
- Units Present? Yes No
- Sorted by numbers (not alphabetically)? Yes No
- Dates present where appropriate? Yes No
- At least one data set from Library printed source from stacks? Yes No
- Data sources present? Yes No
- Stands alone? Yes No

IMAGES:

- At least two images present? Yes No
- Images have something to do with the project theme? Yes No
- Text wraps around images where appropriate? Yes No
- References cited for source of images next to image in text? Yes No

THEME SECTION:

- Topic stated clearly? Yes No
- Why you were interested in this topic stated clearly? Yes No
- Questions you will answer with Tables & Graphs clear? Yes No
- Boundaries of project clear (what regions, countries & dates)? Yes No
- References in the text for any information that is not common knowledge? Yes No

DATA SOURCES SECTION:

- How you went about finding your data presented in narrative form? Yes No
- Book sources given? Yes No
- Journal or Magazine sources given? Yes No
- Web sources present with URL address? Yes No
- Title of web site given along with URL? Yes No
- Keywords presented? Yes No
- At least one *paper* reference from credible Library source in the stacks (peer-reviewed journal or book) used for table and graph? Yes No

DATA TABLE ONE Comments:

Excellent!

GRAPH ONE Comments:

DISCUSSION ONE Comments:

DATA TABLE TWO Comments:

Excellent!

GRAPH TWO Comments:

DISCUSSION TWO Comments:

ADDITIONAL DATA TABLES, GRAPHS AND DISCUSSIONS?

*yes extra graph (prostate)
#3, #4, cigarette consumption*

CONCLUSION:

Excellent

REFERENCES CITED SECTION:

- On its own page? Yes No
- Present and Format Correct? Yes No
- Two sentence summary of web page URLs? Yes No
- Date accessed URLs? Yes No
- Author and date on URL citations Yes No

CREDIBILITY OF WEB SOURCES USED

- Brief Paragraph explaining credibility of EACH web source? Yes No
- Evidence such as Author Credentials, URL source, Date, Link choices, etc. discussed? Yes No

PROJECT WEB PAGE SECTION:

- Print out of Page including zoo URL address? Yes No
- Web Page works in Mozilla Navigator, Foxfire, and IE? Yes No
- Background color or image working? Yes No
- Summary or take-home message of your project present? Yes No
- At least 1 of the graphs from your spreadsheet? Yes No
- At least 2 pictures relevant to project theme? Yes No
- At least 2 links relevant to project theme? Yes No
- Pictures all come up? Yes No
- Links clearly labeled with text? Yes No
- Links work? Yes No
- Your Name, UVM, and date present? Yes No
- Cross-links to and from your home page work? Yes No
- Your e-mail link present and working? Yes No

- Spell Checked? Yes No
- "Data" treated as a plural word Yes No
- Proof Read? Yes No

OVERALL: Outstanding with "something special" Correct & Complete Fair to average Poor, barely acceptable Failure

Comments: