

Project report for Health Analytics

Topic-

Understanding new zealand's cancer data of over 60 years

Submitted by-

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Understanding new zealand's cancer data of over 60 years

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1. Abstract

This study looks at cancer data of over 60 years from 1948 to 2010, to find patterns and linkages among number of cases registered for cancer and number of deaths that occurred due to cancer in new zealand during this time. The data has been obtained from ministry of health's open datasets available on health.govt.nz. The data was cleansed and formatted from xls to csv and the analysis was done using microsoft excel. The data for number of patients registered and number of patients that died was merged and compared to find patterns on how the delivery of health services to cancer patients resulted in increase or decrease of number of deaths due to cancer in the past years.

2. Introduction

Cancer is the abnormal growth of cells in the human body, usually involving bleeding, new lump, sudden weight loss, or protracted cough. Cancer could be detected using observing symptoms. Medical imaging and biopsy could also be used to further investigate the presence of cancer. Treatment of cancer could be undertaken using surgery, radiation therapy, targeted therapy and chemotherapy. In 2012, new 14.1 million cancer were registered globally, and out of those, it caused 8.2 million deaths. [1]

More deaths in new zealand are now occurring of people suffering with cancer. The new zealand cancer control strategy and action plan realises the importance of spreading more awareness among the people of new zealand. Dealing with cultural issues has been found to be a next big hurdle. Most common cause of death has been observed due to lung cancer, in new zealand. There were delays in treatment of the patients because of delays occurred during detection and

management of patients. Colorectal cancer is the second most common type of cancer in new zealand. Some patients who were treated had found complications after their treatment by surgery, resulting into 3% of the deaths, and 6% of them were treated again using surgeries. The increasing population and the increase in the amount of older people has resulted into increase in cases of colorectal cancer. People aged from 55 to 70 years old seem to be the worst affected. There are more cases of colonoscopy than those that could be properly treated. Thus, patients are now treated based on how urgent is their condition. The goals of the new zealand cancer control strategy by the new zealand government are mainly described by focusing upon prevention than cure of the disease, improving the efficiency of treatment and the management of disease, improving early stage detection and thus preventing its spread, supporting those who have been affected and taking care of their families, investing more in research, enhancing the cancer control strategies. [2]

There has been more cases of testicular cancer among maoris than non-maoris in new zealand. This was found to be more prevalent in people aged from 15 to 49 years. It is still not evident if the data gathered based on race is genuine, and if the grouping of maori people has been done effectively. In the researched 12 years, 1040 cases of germ cell testicular cancer were registered, out of which 108 were of maoris, eight were islanders and 924 were other races. [3] Recent increase in cases has been linked to dietary changes among adults, like increasing consumption of alcohol [4] . The study that was undertaken to examine the relationship between physical activity and the risk of colorectal cancer among people of new zealand found out that there is an increase in cases of caucasian kiwis and are found to be the highest in the world for both male and females for people in the age range of 35-64 years [5]. A report by the new zealand case control study found out that there is an increasing risk of leukaemia among electrical workers of new zealand. [6]

There has been increased risks found of non-malignant diseases and cancer including lung cancer, bladder cancer, acute leukemia, and the cancer of the oesophagus, biliary system, skin, liver, larynx, and large bowel among painters in new zealand. The cause could be continuous

exposure to complex chemical components including dye products and organic solvents with mutagenic and carcinogenic prospective. A study on 19904 male patients aged around 20 years was done, finding that there were risks of multiple myeloma was higher among car or spray painters and signwriters in comparison to construction and general painters. There was no increased risk for leukaemia or for respiratory, biliary, gastrointestinal, or skin cancer. [7]

This study looks at cancer data of over 60 years from 1948 to 2010, to find patterns and links among number of cases registered for cancer and number of deaths that occurred due to cancer during this time.

3. Dataset

The dataset used is openly available as historical summary of cancer patients from the period 1948 till 2010, provided by the Ministry of health, new zealand on health.govt.nz. The data contains summary of cancer information, including numbers, rates and deaths of cancer registrations and cancer deaths by year and by sex. The data is sourced from the new zealand cancer registry and the ministry of health's mortality collection , as well as the Cancer: New Registrations and Deaths and Mortality and Demographic data publications, and Medical Statistics of New Zealand for data relating to 1948-1960. [8]

4. Method

The datasets for the number of cancer patients registered and number of cancer deaths from 1948 till 2010 in new zealand were merged, compared and graphed to compare and find the improvements in medicine and health care delivery to cancer patients during this time. Data cleaning involved removal of values, not required for the purpose of this research under the column of 'ASR' from the dataset and null values were assumed to be zero, for the purpose of this analysis.

4.1 Tools:

The data was formatted from XLS to CSV format and microsoft excel was used to view the data. Excel's graphing tools were used to compare and plot the graphs.

5. Discussion

The charts below shows the comparison between number of cancer patients registered and the number of cancer patients that died from 1948 till 2010. Figure-1 shows the total cancer patients registered and those died during this time. There seems to be a steady decrease in the number of deaths during this period, which is a good sign on the development of medication and delivery of health services to cancer patients during this time. While the number of cancer patient registration is seemed to be increasing exponentially from 1948, the number of cancer deaths seemed to be increasing linearly. There could be a concern on the increase as well, and one could think that why not the number decreased instead of increasing from 1948. But the increase in population or exposure to unhealthy lifestyle and carcinogenic substances, during this time, could possibly be considered as the cause of this statistics.

As shown in figure-2, while the deaths due to cancer of lip, oral cavity or pharynx has always been low. There seems to be still improvements in the health services for this type of cancer during this time as the number of cases seems to skyrocket near 2010. The number of deaths aren't that high at that time. Increased consumption of tobacco could be a cause of such high number of cancer patient registrations.

As shown in figure-3, Treatment of cancer of the oesophagus seems to be steady and shows no improvements in saving people from dying of this cancer in this period.

In figure-4, Stomach cancer denoted the most unexpected graph, where the number of cases has not increased much during this period, but the it seems that the number of deaths due to this type of cancer and decreased steadily. The number of deaths being higher in 1948 than the number of

cancer registrations at that time, depicts that people used to die of stomach cancer without even finding out that they had that cancer. The possible reason could be improvement in systems that could properly detect and cure stomach cancer in recent years.

While, In figure-5, colorectum and anus cancer shows a steady improvement in its treatment during this period. Same is seen for treatment of melanoma cancer (fig 9), kidney cancer (fig 10), bladder cancer (fig 11), thyroid cancer (fig 13), hodgkin cancer (fig 14), non-hodgkin cancer (fig 15), myeloma cancer (fig 16), and leukaemia cancer (fig 17).

But, there seems to be not much improvements in healthcare research and delivery for brain cancer (fig 12), Trachea cancer (fig 8), Pancreas cancer (fig 7), Liver cancer (fig 6).

5.1 Graphs:

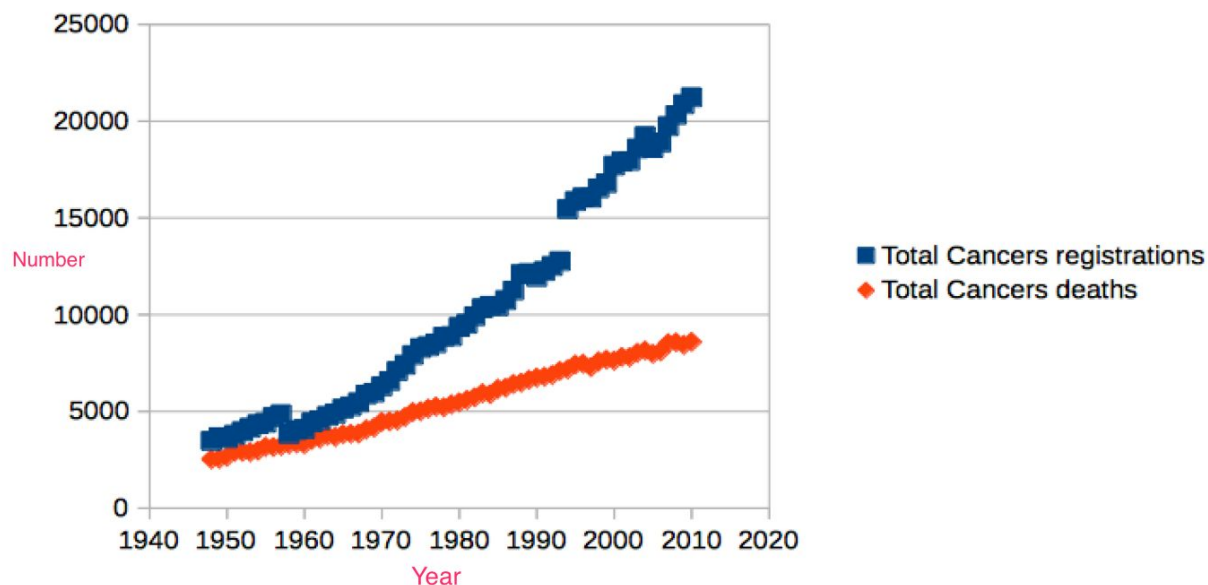


Fig-1: Number of cancer registrations and deaths from 1948 till 2010.

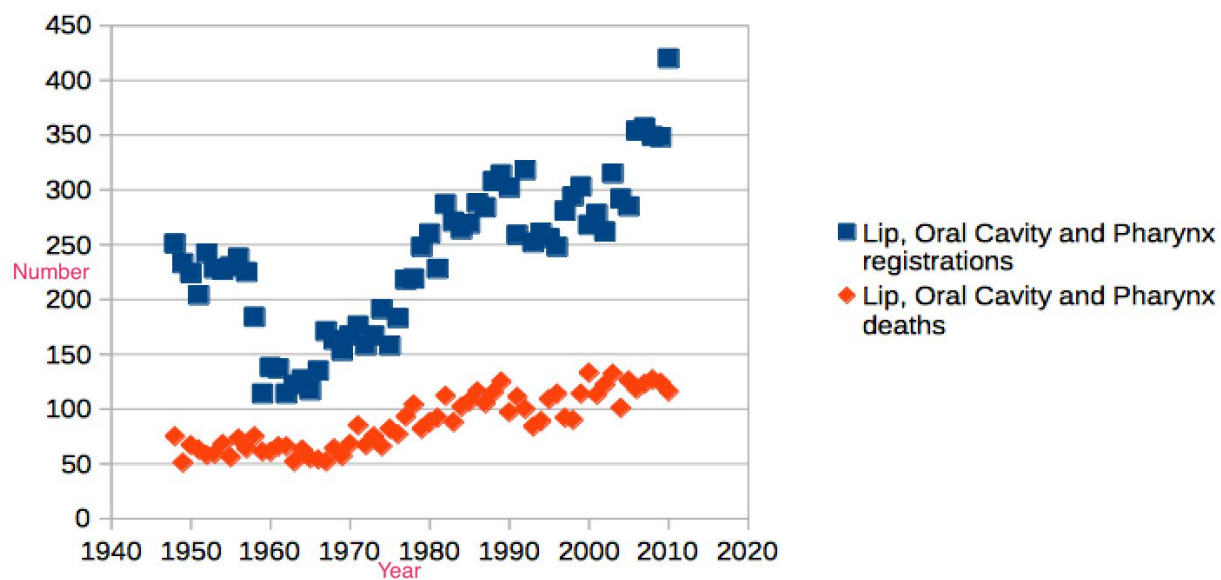


Fig-2: Number of lip, oral cavity, and pharynx cancer registrations and deaths from 1948 till 2010.

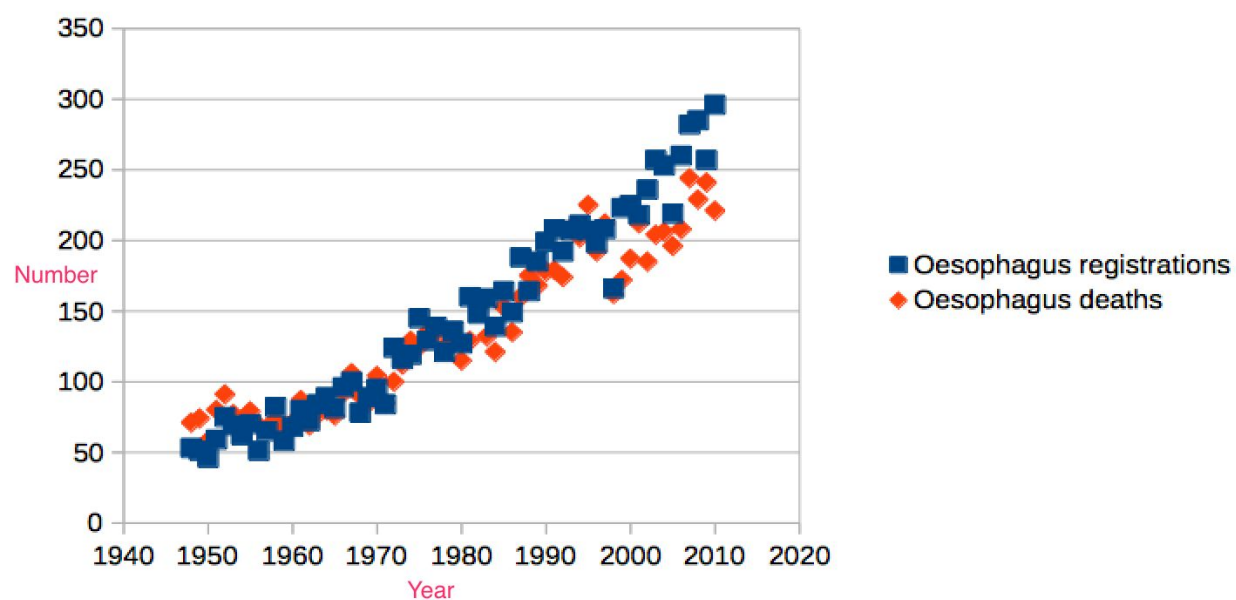


Fig-3: Number of oesophagus cancer registrations and deaths from 1948 till 2010.

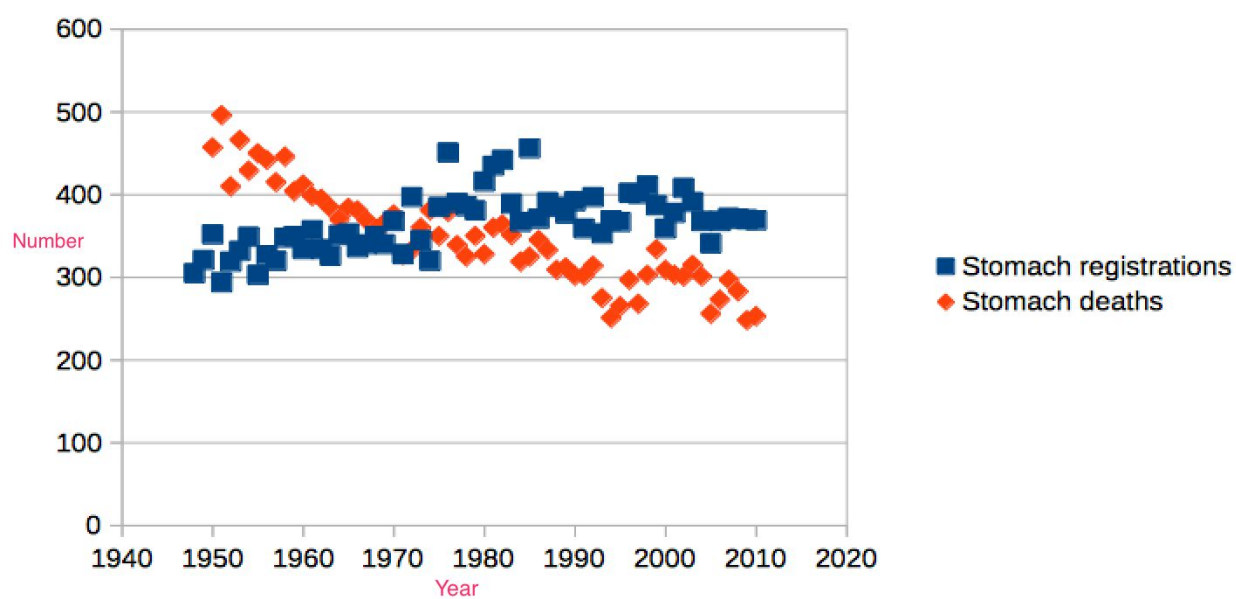


Fig-4: Number of stomach cancer registrations and deaths from 1948 till 2010.

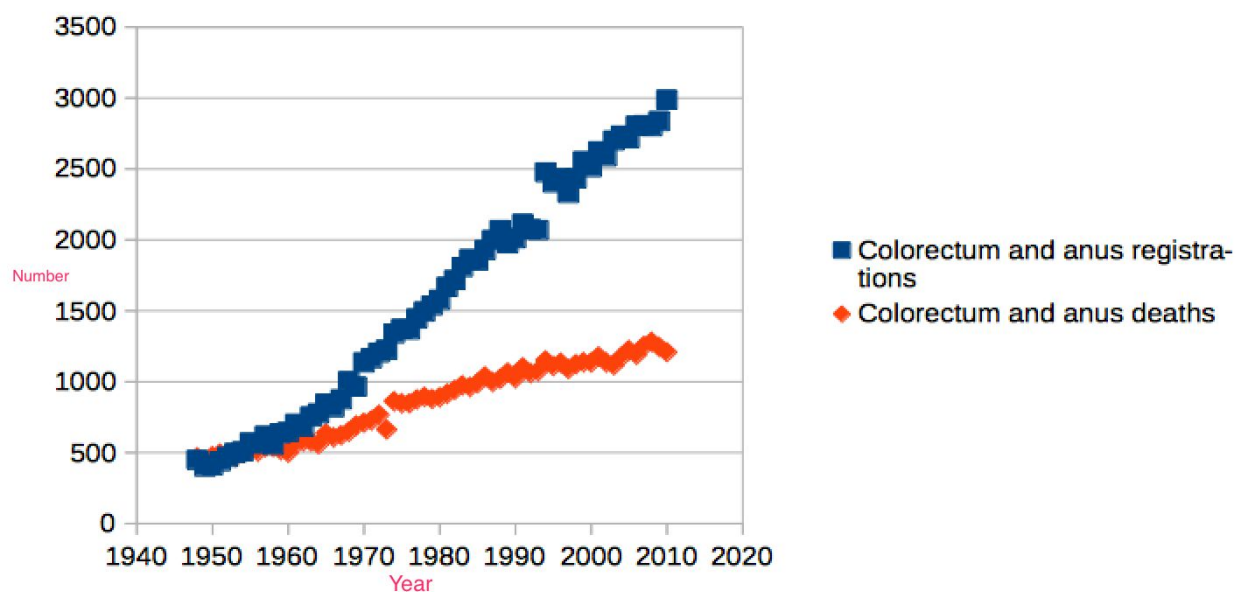


Fig-5: Number of colorectum and anus cancer registrations and deaths from 1948 till 2010.

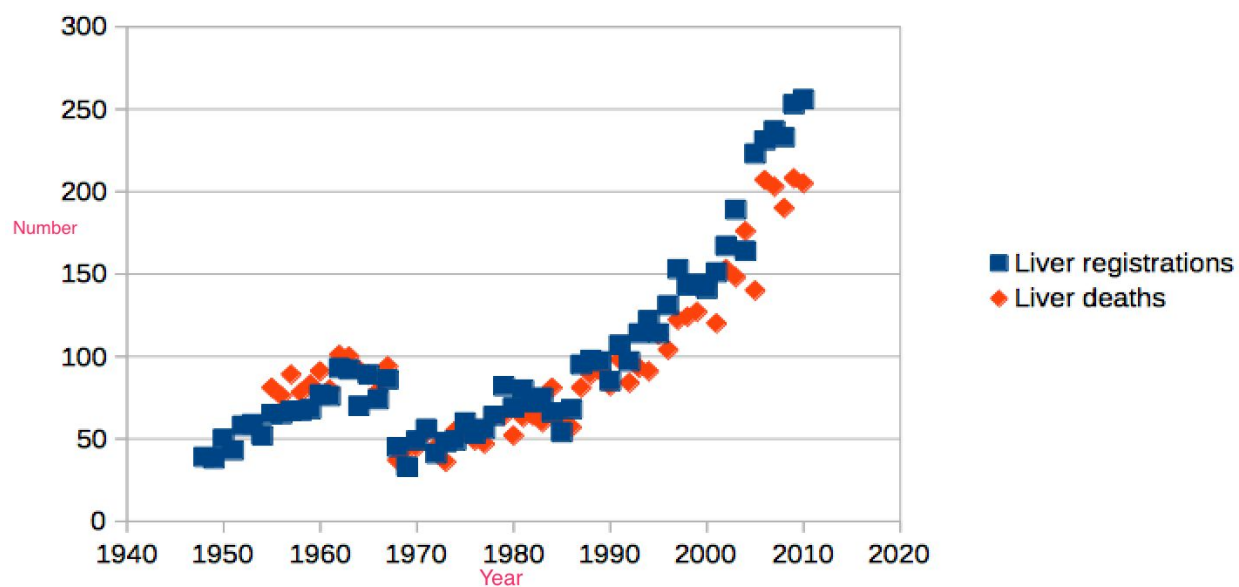


Fig-6: Number of liver cancer registrations and deaths from 1948 till 2010.

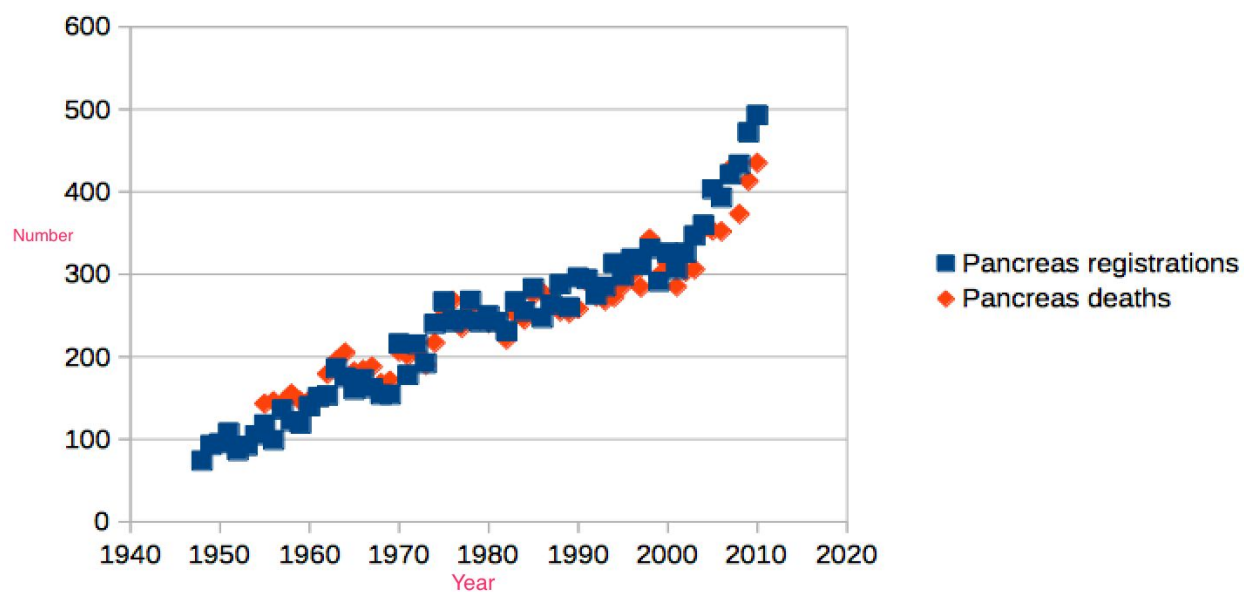


Fig-7: Number of pancreas cancer registrations and deaths from 1948 till 2010.

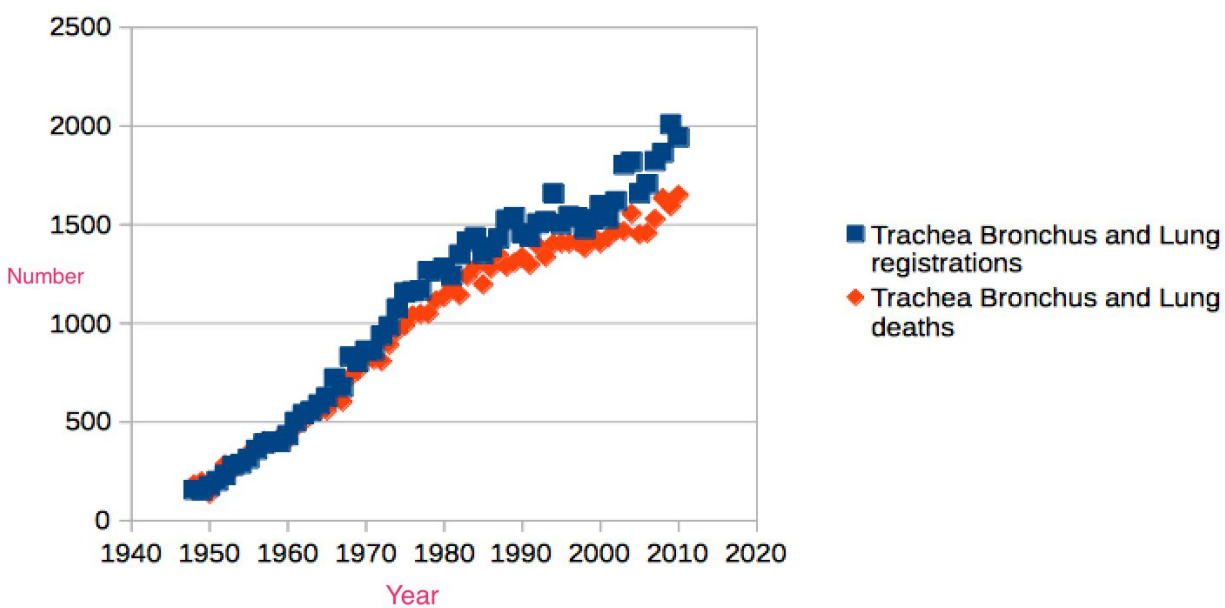


Fig-8: Number of trachea cancer registrations and deaths from 1948 till 2010.

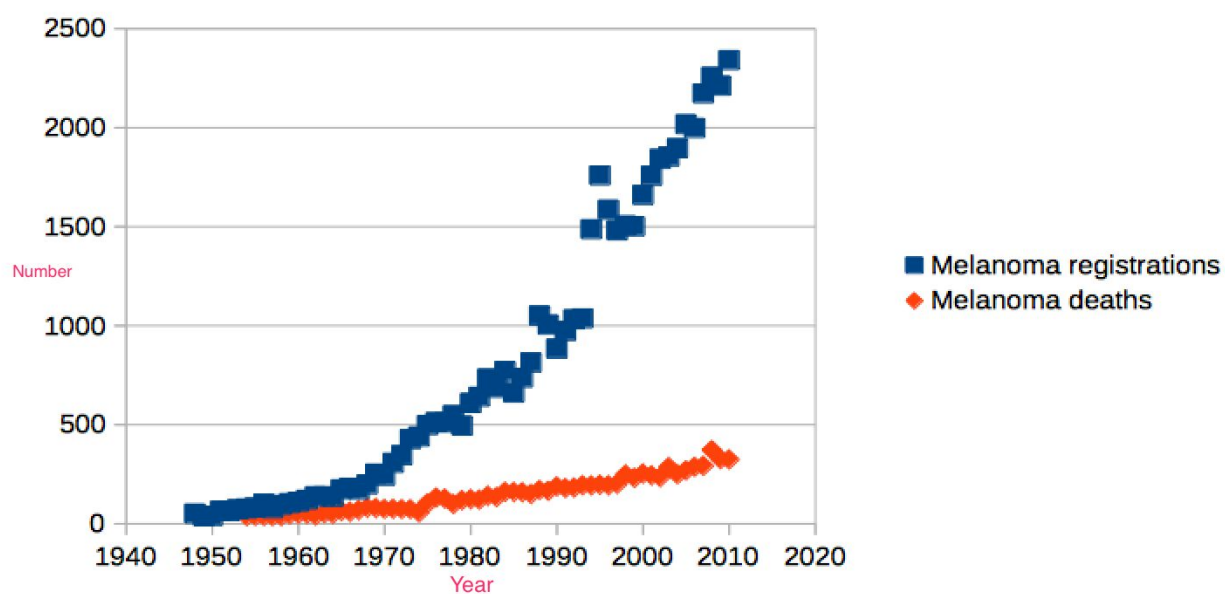


Fig-9: Number of melanoma cancer registrations and deaths from 1948 till 2010.

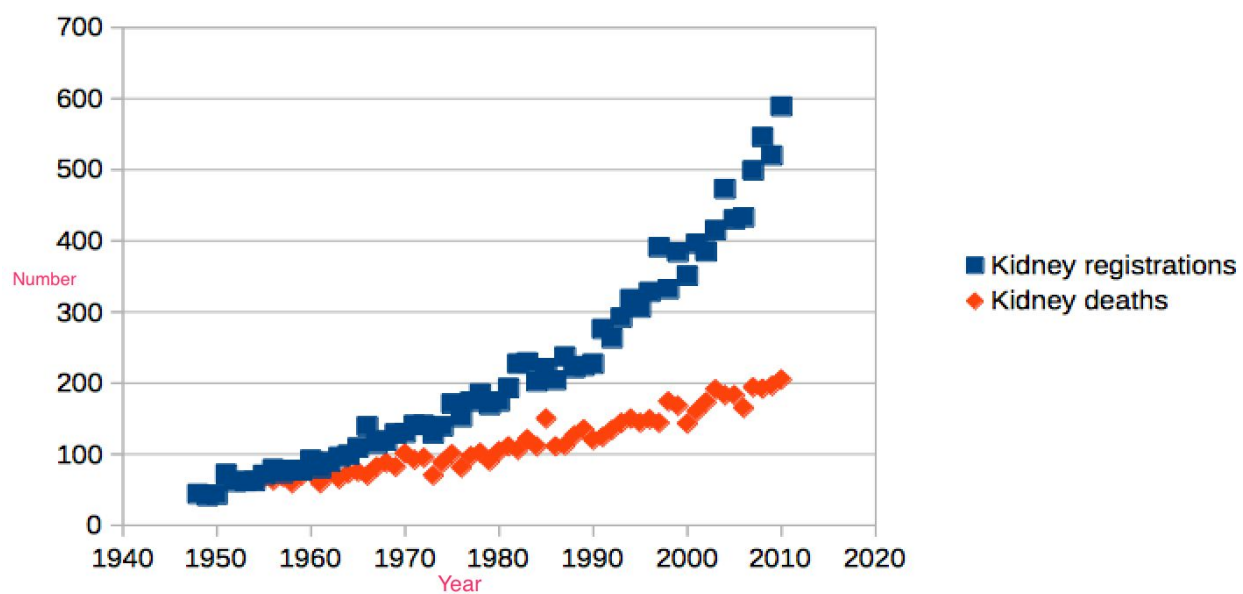


Fig-10: Number of kidney cancer registrations and deaths from 1948 till 2010.

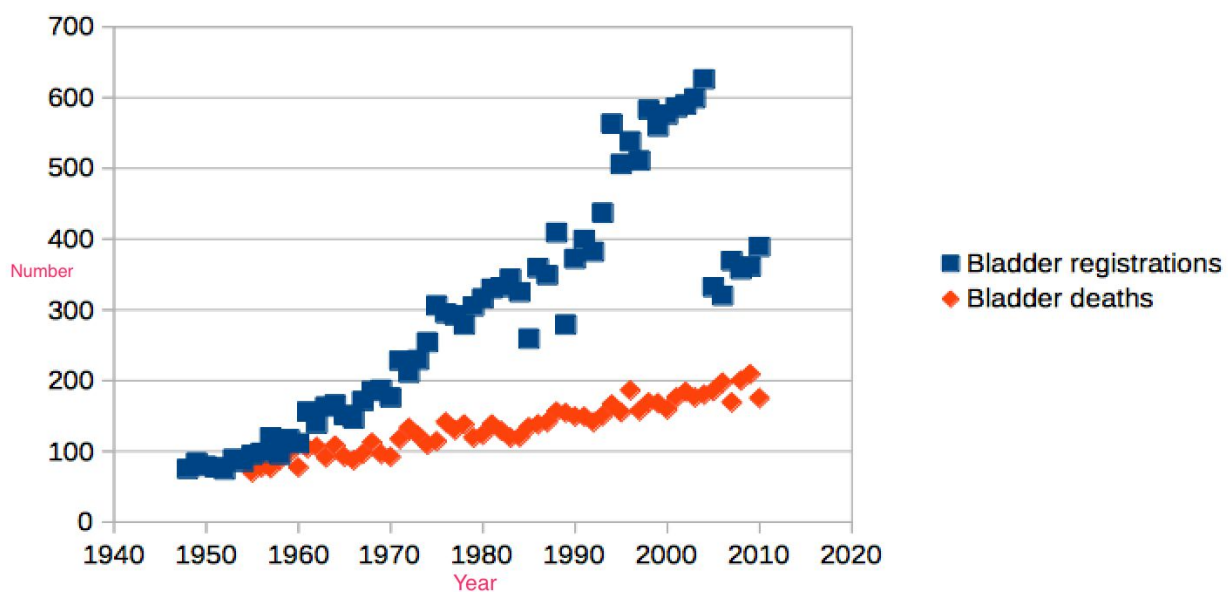


Fig-11: Number of bladder cancer registrations and deaths from 1948 till 2010.

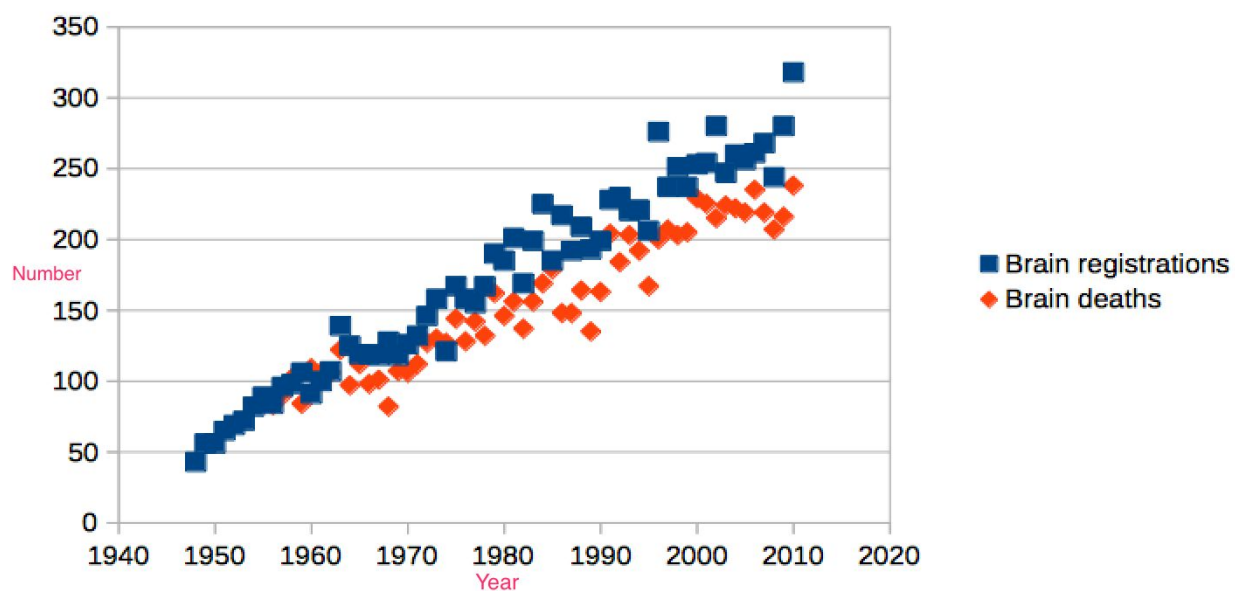


Fig-12: Number of brain cancer registrations and deaths from 1948 till 2010.

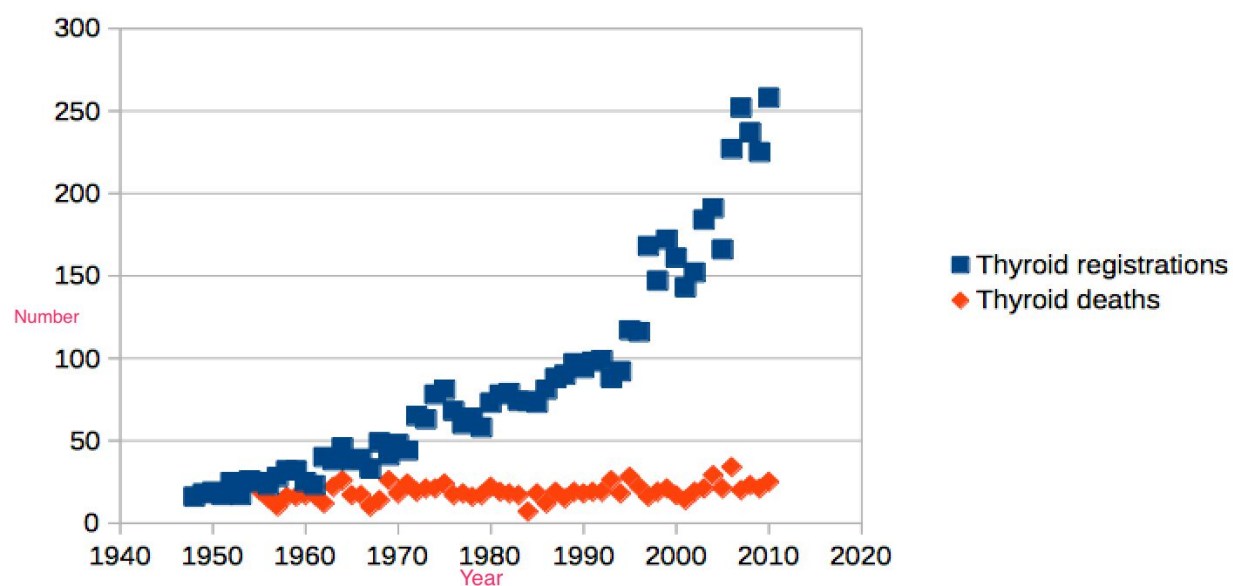


Fig-13: Number of thyroid cancer registrations and deaths from 1948 till 2010.

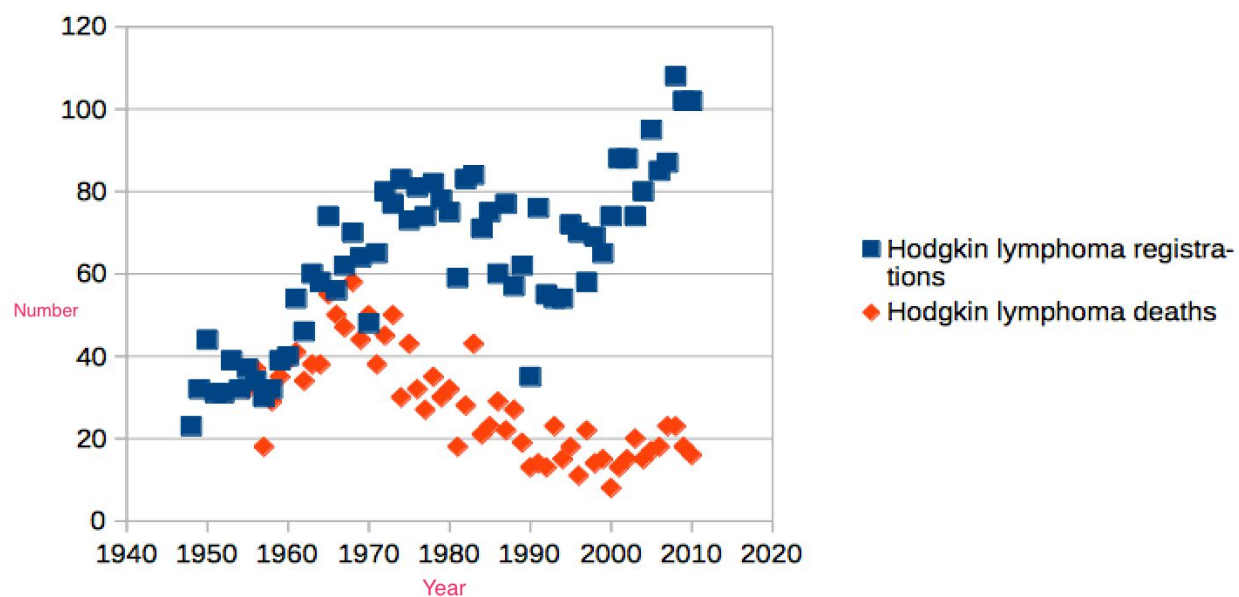


Fig-14: Number of hodgkin cancer registrations and deaths from 1948 till 2010.

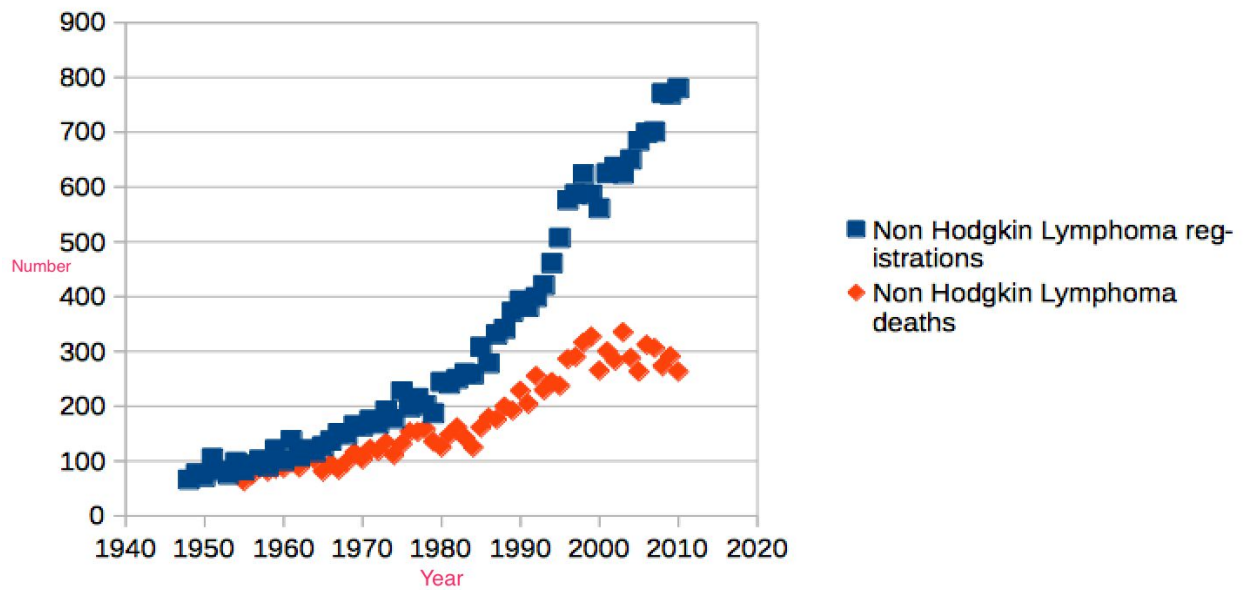


Fig-15: Number of non-hodgkin cancer registrations and deaths from 1948 till 2010.

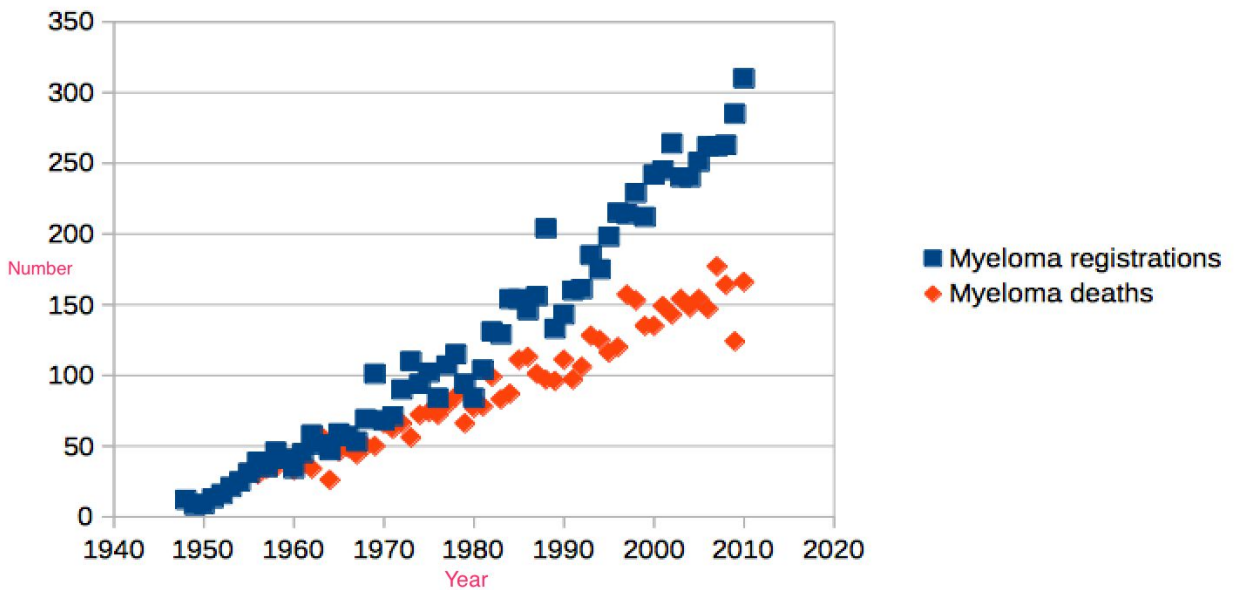


Fig-16: Number of myeloma cancer registrations and deaths from 1948 till 2010.

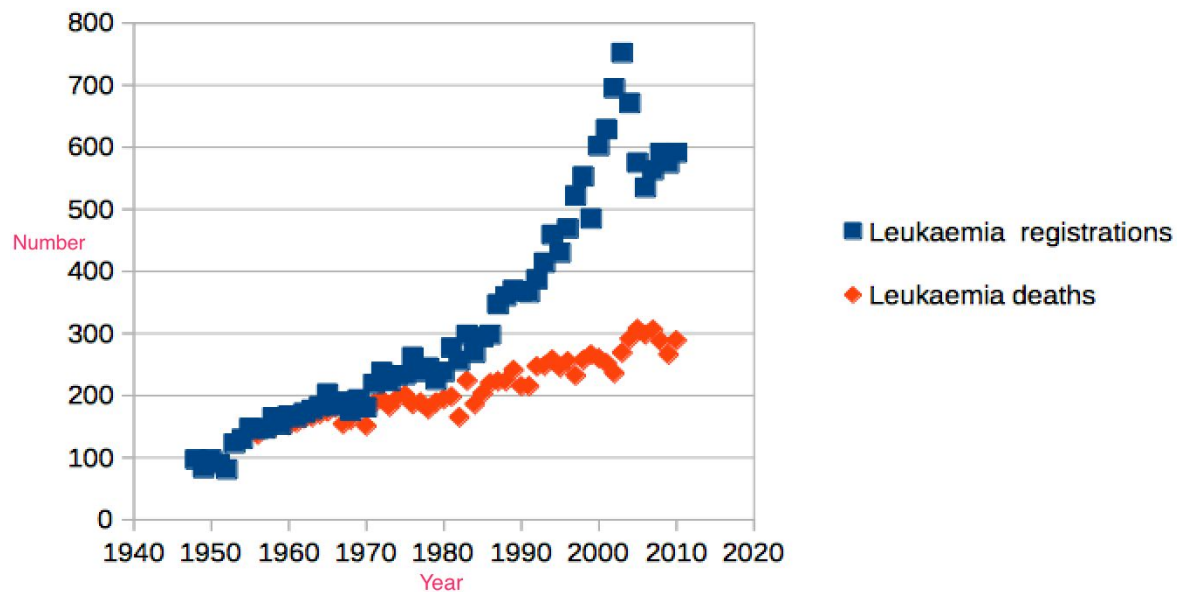


Fig-17: Number of leukaemia cancer registrations and deaths from 1948 till 2010.

6. Conclusion

In this research we looked at the cancer data provided by the ministry of health, new zealand from 1948 to 2010, to find patterns and linkages among number of cases registered for cancer and number of of deaths that occurred due to cancer in new zealand during this time. The data was compared, analyzed and plotted using microsoft excel. The aim of the research was to analyse the improvements in health care research and delivery to treat people with cancer and reduce the number of deaths in the past years. The research does shows a great reduction in the number of deaths during this time, but there seems to be some cancer like that of the brain that requires to be did research on and requires improvements in its treatment in the coming years, so that more people dying of this cancer could be saved, in new zealand.

7. References

[1] Wikipedia,. (2015). *Cancer*. Retrieved 15 November 2015, from <https://en.wikipedia.org/wiki/Cancer>

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- [8] Ministry of Health NZ,. (2013). *Cancer: Historical summary 1948–2010*. Retrieved 14 November 2015, from <http://www.health.govt.nz/publication/cancer-historical-summary-1948-2010>

7.1 Appendix:

[a] Dataset:

https://docs.google.com/spreadsheets/d/1_KjHLjb5xj1pbb2X2fd5JdoWi_zKLriPYMAqwN42XLo/edit?usp=sharing

[b] Ministry of health's historical cancer summary:

<http://www.health.govt.nz/publication/cancer-historical-summary-1948-2010>