**Gerontology 255**

**Assignment 4**

Prepared by

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July, 2015

**Section 1: Collection**

Prepared below are the data gather for the mortality research project for Assignment 4. For the study I gathered my data from *The Globe and Mail*over the course of 4 weeks. In particular I took note of their name, area of death, date of death, age, gender, cause of deaths and other data points. Collection was not simple, as there was no consistency where in the obituary the data was located. Most of the time you could find the information situated in the top and bottom of the obituary, but this was not always the case.

Since most obituaries tend to be conservative in the details of death I looked for buzzwords or telltale signs. Words such as died suddenly I used to indicate heart attack or heart disease. I also used the charities to donate too as signs. If an individual has the Canadian Cancer Society for a charity I made the assumption that they had died from cancer. I also used charities to confirm eugeric deaths. For example if someone had died peacefully late in life and had UNICEF or a church as a charity I could be confident that they had had a eugeric death.

It is worth noting that some individuals who had died of cancer, heart disease, or another serious illness did not put charities relating to those diseases in their obituaries. Instead they put other unrelated charities. While this doesn’t ruin the validity of the eugeric deaths with generic charities it is something to watch out for. Someone could have died of a serious illness without specifying, and also put a generic charity to donate to in memorandum. However, I believe this number would be low and shouldn’t affect the sample too heavily. There is no way to find out the truth in any case.

The majority of the sample population was situated in and around Toronto. You had a minority of the population in other areas such as Vancouver, Victoria, or Montreal.

I collected the names of the individuals so that I could more easily remove any possible duplicates. All in all, I ended up with 161 obituaries over the course of May. For part two, I removed 39 because of unknown cause of death.

**Section 2: Tables & Graphs**

**Eugeric Cutoff Reasoning**

The eugeric population cutoff age I set differently for both male and females. Any male individual who made it to the age of 87 and died “peacefully” (not a disease) I noted as a eugeric death. Females were the same except I set the their cutoff date to be age 89 or older. For the total population I set the eugeric cutoff date to be the combination of the two, so 87 for males and 89 for females. Note that the life expectancy for males (80) and females (84) in Canada differs by approximately four years (News, 2014). I only used a two-year gap between the eugeric cutoff date for males and females and deliberately set it higher than the life expectancy. For one I believe that the gap between females and males is caused by both biological and social factors. Hence, I assumed two years were taken off male lives due to social factors, and two years due to biological factors. I factored in this two-year biological difference into the eugeric cutoff and is why males and females have a different cutoff point.

As we have seen in the text males have major biological factors that affect their longevity. For example the “Too Much Y and You Die” theory – which on one hand suggests males don’t have a back up of their X chromosome to remove defects. Another possibility is that females have estrogen that possibly protects against cardio vascular diseases. Another interesting point to note is that there are 105 males born for every 100 females (Scientific America, 2004). Males could therefore have a lower life expectancy so that the number of females and males at reproduction time would be equal.

All in all I set the eugeric cutoff age as I did for a couple reasons. For one I wanted it to be higher than the life expectancy for Canada. The life expectancy is in essence a balance between those that died a eugeric death and those that did not. If I had set the eugeric cutoff to be equal to the life expectancy I would have had to assume the standard deviation of population was close to zero. This is not the case (MacQueen, 2014). I also wanted the eugeric cutoff date to be closer to the maximum life span of the population. In the case of out notes it states this is around 120 years. Finally, I also took into account the functional capacity of certain bodily function with age. This I based off the chart on page 21 of the lecture notes. At 80 years many critical functions have already decreased significantly so I made the assumption that this trend would continue. By the ages I set off for the eugeric cutoff date it would be hard to maintain homeostasis by the body. Some illness would eventually set in and the individual would die.

**Part 1: Survival Curves and Calculations**

**Obituary Tables**

**Total Population**

Please see Appendix Table 1

**Female Population**

Please see Appendix Table 2

**Male Population**

Please see Appendix Table 3

**Calculations:** For calculating life expectancy, I realized it is synonymous with mean life span that is in essence the average life span from birth. To calculate this I began to add up the ages of everybody in the specific population (total, male, or female) and then divided by the number of individuals I added up. So for the total population I added 102+99+ …+25/161, where 102 is an age in the population and 161 is the number of ages I have added up. Below are the calculation answers for each population.

**Total Population**

|  |  |
| --- | --- |
| **Mean Life Span** | 82.50632911 |
| **Maximum Life Span (Eldest Individual)** | 102 |
| **Minimum Life Span (Youngest Individual)** | 25 |

**Female Population**

|  |  |
| --- | --- |
| **Mean Life Span** | 85.4556962 |
| **Maximum Life Span (Eldest Individual)** | 102 |
| **Minimum Life Span (Youngest Individual)** | 46 |

**Male Population**

|  |  |
| --- | --- |
| **Mean Life Span** | 82.556962 |
| **Maximum Life Span (Eldest Individual)** | 99 |
| **Minimum Life Span (Youngest Individual)** | 25 |

**Type 1 Survival Curves:**

The following graphs illustrate Type 1 Survival curves for the populations. The analysis on these graphs will be done in sections three.

**Part 2: Causes of Death**

The following graphs and table illustrate the main causes of death for the specific population. The analysis on these graphs will be done in sections three.

**Cause of Death Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Cause of Death** | **Total** | **Female** | **Male** |
| Accident | 3 | 0 | 3 |
| ALS | 2 | 0 | 2 |
| Bone Cancer | 1 | 0 | 1 |
| Brain Cancer | 1 | 1 | 0 |
| Breast Cancer | 3 | 3 | 0 |
| Bronchitis | 1 | 1 | 0 |
| Cancer | 19 | 8 | 11 |
| Cerebral Hemorrhage | 1 | 1 | 0 |
| Eugeric | 54 | 34 | 20 |
| Heart Disease | 11 | 2 | 9 |
| Lung Cancer | 2 | 1 | 1 |
| Lymphoma | 2 | 0 | 2 |
| Melanoma | 1 | 0 | 1 |
| Multiple Sclerosis | 1 | 0 | 1 |
| Ovarian Cancer | 1 | 1 | 0 |
| Pancreatic Cancer | 2 | 2 | 0 |
| Parkinson’s | 4 | 1 | 3 |
| Pneumonia | 1 | 0 | 1 |
| Prostate Cancer | 1 | 0 | 1 |
| Stroke | 2 | 2 | 0 |
| Tumor | 1 | 0 | 1 |

**Cause of Death Histograms**

**Section 3: Analysis**

There are many interesting things to take away from the analysis of this assignment. For one, after collecting up obituaries at random over the course of a month I was left with a male to female ratio of 80:81. I didn’t mean for this to happen, and while this shouldn’t be surprising, it’s was nice to see how the 50:50 ratio of males to females just worked out.

Life expectancy, at approximately 82.5 was higher than the previous 81.24 from 2012 data for Canada (World Bank). Life expectancy has been going up roughly around 0.5 years every 3 years. Adjusting for that we’re still higher by around 0.75 - a significant margin. Possibilities include those who have the wealth to post obituaries in Canada’s leading newspaper, sometime for multiple days, have a better standing of living than those who cannot. Most of the obituaries were from Toronto, a large economic hub. We could also conclude more wealth from this. Better access to health care is a definite possibility too because of the urban setting.

Maximum (102) and minimum (25) life spans, while not conclusive of the general population, made sense for gathering data from obituaries. A person dying before 20 is rare, and even if they do it may be unlikely they get an obituary due to the conservative nature of posting obituaries. For example, rarely do you see obituaries for those children who died a few weeks after birth. So even though Canada has an infant mortality rate of 0.48% we would never garner that from obituaries.

High maximum life spans are also rare to find in obituaries for two reasons. One a single individual has to heavily deviate from mean life expectancy. Secondly, if that individual decided not to post in the paper then the researcher has no way of gathering that data point. Maximum life spans of a population change infrequently and can last for many years without being broken. The maximum life span (102) I received is fair considering of my one-month time span. While it’s not that close to the 120 years dictated by the notes, getting past 100 is still hard to do for a human.  
 Male (79.5) and female (85.5) life expectancies were similar to their Canadian counterparts of 80 and 84 respectively (News, 2014). Females might have had a higher than normal life expectancy due to the wealth and better access to health care factors stated above. It’s also interesting to note the relative small number of deaths due to cancer for females. This probably played a part in the higher female life expectancy. One possibility is that females took advantage of this better health care in and around Toronto, while males did not. Note men are 24% less likely to have visited a doctor in the past year than females (Health Men, 2012).   
 The data from the 1920’s illustrates that the life expectancy for males and females was 59 and 61 respectively. An approximate increase of 22 years over the course of a century! This increase can be attributed to many factors, vaccines or antibiotics to name a couple. I’d also like to note that welfare was introduced in approximately 1940 in Canada, and the Canadian Pension Plan (CPP) in 1965 (Battle, 2013)(Moscovitch, 2014). Finally, the Medical Care Act was passed in 1966 and Canada Health Act was passed in 1984 allowing greater access to healthcare (Dunlop, 2015). All these have facets have contributed to Canada’s increasing life expectancy over the decade by making life and healthcare more affordable for the population.

All three of the survival curves were sporadic, with not enough data points to get a smooth curve. Men did have the earliest death at 25, and had a maximum life span of 99, three years less than their female counterparts. This makes sense considering the 4-year age gap between male and female life expectancies. Also almost all of the examples in the book of extremely elderly individuals featured women – not men. This is not coincidental as we discussed above why females may live longer than males.

Also, in general men had many more deaths at younger ages. While only one of these was an accident, a case can still be made that the different lifestyle led by men may have caused this.

The spike in deaths began around age 79 for men and around 83 for females. There was a spike for females in their early 70s who died of cancer. Breast cancers, one of the major female cancers has a high chance of occurring during age 60-70 and may have caused the jump (Breast Cancer, 2012).

**Appendix**

**References**

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