Comparison of Life Span and Survivorship for Males and Females in Farmville, VA

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ABSTRACT

Survivorship represents the life expectancy of a given species. Age of death can then be determined from the survivorship curve. These findings are consistent with that of other studies suggesting that female longevity may have to do with genetics. The data represent a Type I and Type II. The results were significant for telling the survivorship curve for all the tomb stones. These finding are consistent with that of other studies suggesting that female longevity may have to do with genetics.

INTRODUCTION

The survivorship of humans is important to understanding the consequences of increasing longevity throughout the year given. They also help to understand the life history of individuals of the given years. Death rates for humans are usually low for younger and middle-aged people, but the rates increase at older ages. The purpose of this study was to determine the survivorship curves for deaths before 1901 and deaths after 1950 to make inquiries about life history traits.

When reading, other factors I found were related to many ecological, economical, and social ramifications, (Freedman et al. 2016), such as the effect of marijuana on the way a person reacts towards a certain situation. The average life expectancy and the patterns of survivorship correlate with life expectancy and help predict the age of death. After collecting all the data, we can properly decide whether he survivorship curve is type I, type II, or type III.

To determine survivorship, we collected data from a local cemetery and calculated the age of death. We hypothesized that the post-1950 group would show superior survivorship over the

pre-1901 group and create a type I survivorship curve. In doing so, we can determine what happened to the people based on that time.

METHODS

Data Collection

Data was collected at Westview Cemetery located in Farmville, VA in early February 2017. As for the age of death at which males and females died prior to 1901, ones between the years of 1901-1950 and after 1950 were recorded. Age of death was calculated by subtracting the birth year from the death year. The cemetery was divided into various sections and data were recorded within the sections to ensure there was not an overlap in the data collection. If the names on the tombstones were illegible, the data was not recorded for that individual. Likewise, if gender was not easily determined by the name, the data was also not recorded for that individual. For infants whose age of death was less than one year after they were born, the ages were recorded in months.

Data analysis

The data was used to create a life table. We used the software Microsoft Excel to construct a life table, bar graph, and survivorship curves. Once the data was entered and calculated into the Excel spreadsheet, we constructed life tables and then survivorship curves were then graphed. From there we could see the life history patterns for all the following years. We then obtained the average, standard deviation, and standard error of life span of birth for females and males from Pre-1901, 1901-1950, and post 1950. We constructed a bar graph and ran a two-sample t-test to find the average mean for male and females. Then we obtained enough information to construct a life table for males and female using the data and plotted the points.

RESULTS

The study found that males did not live nearly as long as females prior to 1901. The

oldest age of death for men before1901 was around 80 years old and the oldest age for

females to live was about 88 years old (Fig. 1). When compared to post-1950, the older men

were around 98 years old and the oldest female was around 103 years old, which supports

the hypothesis that men and women pre-1901 died ten-years prior compared to the men and

women post-1950. Both curves show a type I and type II for pre-1901 survivorship curve,

which is prevalent among humans and to be expected. Type I survivorship curves mean the

species have a high infant mortality rate and low death rate. Therefore, many individuals of

the species live up to old ages. Females are also shown to have a higher survivorship than

males (Fig. 1 and Fig.). When looking at Figure 1, you can see the survivorship curve

between the men and women throughout the given years we collected. The average lifespan

of Males t-values -7.196 and $p < 0.001$. The average lifespan of Females t-values -9.5058 and
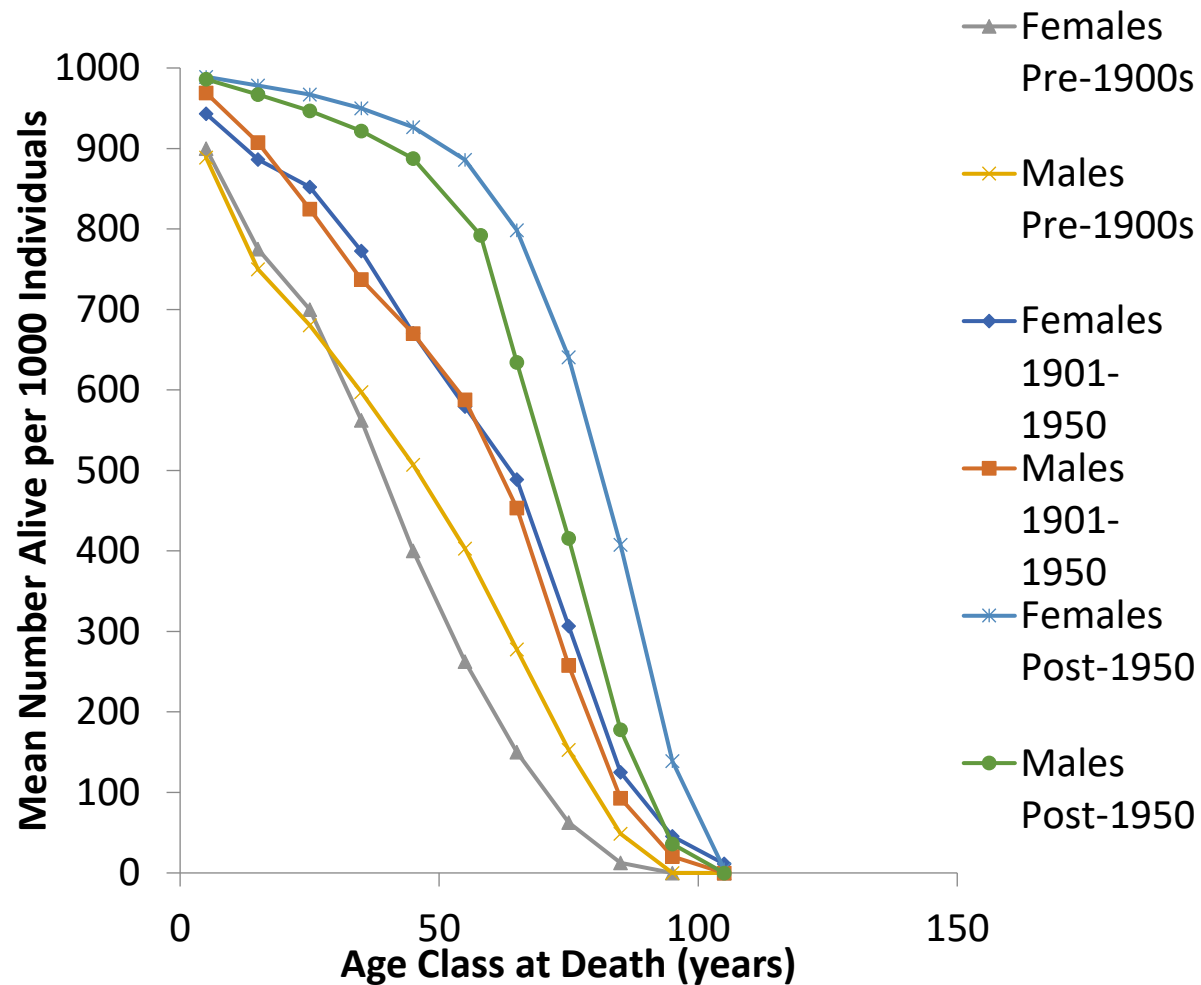
$p < 0.00$.

FIG. 1. Survivorship curve for males and females who died throughout Pre-1901, 1901-1950 Post-1950. Data was collected at Westview Cemetery in Farmville, VA. The graph shows a Type I for females and males post-1950 and Type II survivorship curve for pre-1901 for female and males.
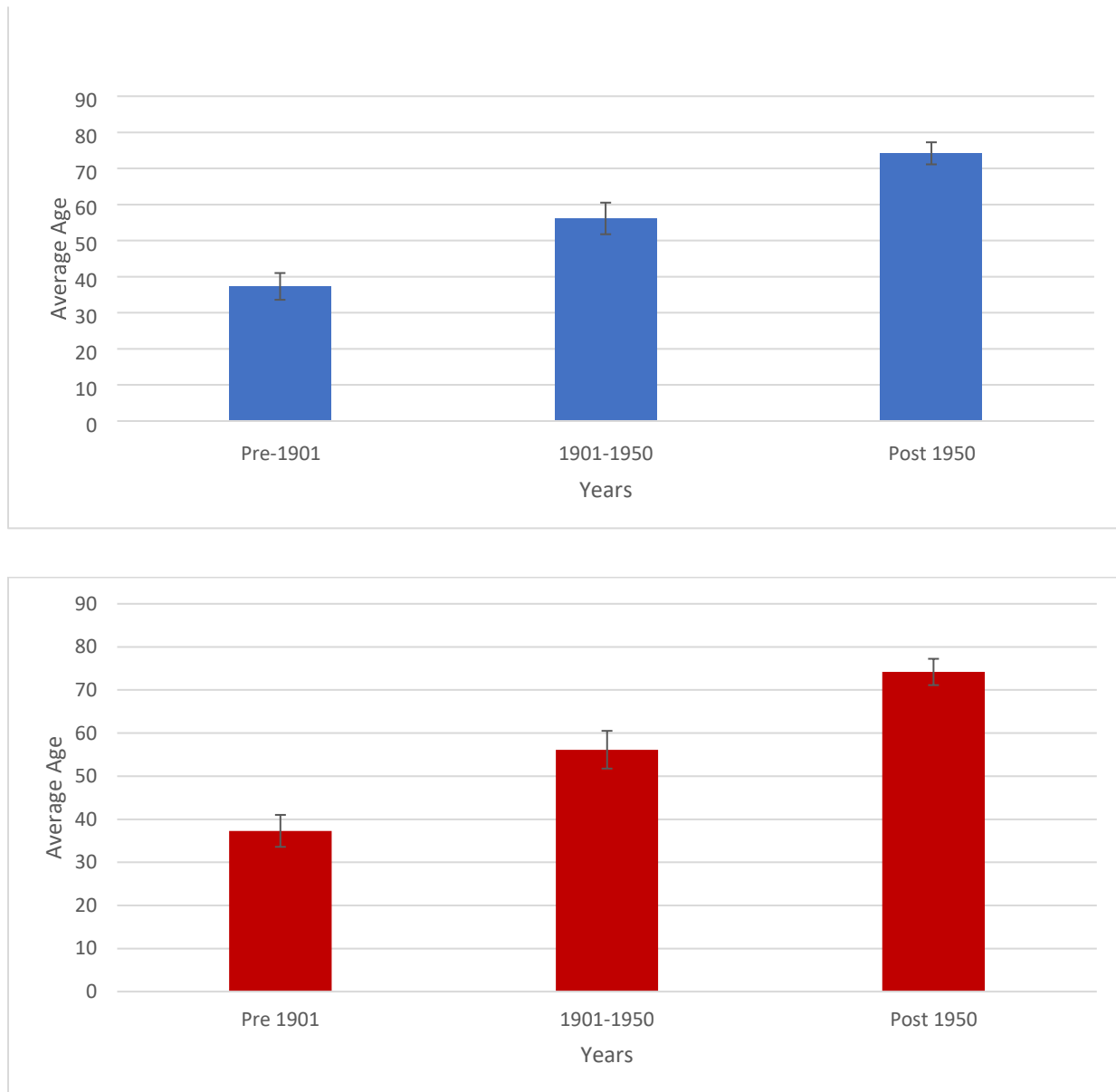
FIG. 2. Bar graph comparing the average ages between the males and females at Westview Cemetery.

DISCUSSION

The survivorship curves between the males and females for pre-1900 show a substantial difference in the age of death. They lived longer pre-1901, this can be due to the men who fought and died during World War I and/or had a fatal disease (Glei and Horiuchi 2007). This trend is similar to

the results of another study (Moller et al. 2009). The shape of the female survivorship curve extends farther out than the male's survivorship curve pre-1900. This indicates males are more likely to have an earlier age of death due to the hard labor experienced from day to day. In the early 1900's, women were mostly stay-at-home mothers, who cooked and cleaned due to society's standards and were no allowed to work as hard as a man. Therefore, they were not as prone to death by being around heavy machinery at work or other fatal situations. However, the longer life expectancy may also have to do with genetics because men usually die before women, especially black males.

Males and females in the post-1950 group showed superior survivorship over the pre-1901 group. The gradual change in survivorship for both genders in the later years can lead to new implications arising and life history curve changes, meaning everything is skewed right. Overcrowding, resource depletion, and the error bars showed there was a significant difference between the years. They are most likely consequences for the human population having a longer average life expectancy represented by Fig. 2. There will be too much demand and not enough resources to supply the wants or needs to sustain human life. In terms of the ecological impact, overcrowding will result in more pollution and that will create the need for cleaner environments and drinking water. Economically, people living longer means health care must last longer which can become expensive (Spillman and Lubitz 2000).

Westview Cemetery is a predominately white cemetery due to the location. It also contains mostly middle-upper class families. These factors present some bias in the study due to a lack of variety in data. After collecting all the data, we would have believed the graph would create a Type I survivorship curve because humans unusually fit in the survivorship curve, but when looking at the graph it creates a Type II survivorship curve. After creating that experiment I still do not understand why it showed a Type II curve. I believe if we could read the names and birth and death

dates off the ones we cannot read our graph would change. If this was the case, the age of death

was not recorded. The overall experiment was very successful and helpful.

LITERATURE CITED

Freedman, V. A., D. A. Wolf, and B. C. Spillman. 2016. Disability-free life expectancy over 30
years: a growing female disadvantage in the US population. American Journal of Public
Health 106: 1079-1085.

Glei, D. A. and S. Horiuchi. 2007. The narrowing sex differential in life expectancy in high- income
populations: effects of differences in the age pattern of mortality. Population Studies 61:
141-159.

Moller, A. P., C. L. Fincher, and R. Thornhill. 2009. Why men have shorter lives than women:
effects of resource availability, infectious disease, and senescence. American Journal of
Human Biology 21: 357-364.