

Survivorship of Farmville Residents Pre and Post 1950  
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## Abstract

Studying demography of a certain population allows characteristics of a population to be determined. By collecting data of birth and death years in a local cemetery in Farmville, Virginia, survivorship curves were able to be constructed to display the rate of survival at certain ages throughout life. Also, by performing various statistical tests, the average lifespan, age at death, and other factors that help describe the overall human demography. It was found that humans are living longer.

## Introduction

Demography is the statistical study of human populations. Studying human demography allows the measurement of fertility, mortality, and migration of defined populations. Demography of aging, which is focused in this study goes in depth on the older populations. Considering technological advancements have had evidence as a reason why humans are living longer. Scientists are able to investigate changes in social, economic, health, and general well-being of populations. Studying demography examines the life history, specifically birth and death (Eggers 2007).

Survivorship studies the limits of demographic potential. Survivorship of humans can be related to the survivorship of other species, especially when the age curve plateaus. In certain ethnicities it is common to live past 100, specifically Italians whoosh could be a possible factor to consider (Barbi 2018). The survivorship of humans is often represented by survivorship curves in which demonstrate the rate of survival at a specific age. Scientific studies suggested that there is a continuous trend than humans are living longer in general because of technological advancements and better healthcare systems/benefits. Determining reasons, the human population is living longer has been studied to produce the cause of a longer lifespan is natural selection and better precautionary healthcare. Healthcare is a large part of lifespan for humans considering the previous years. Over the past 70 years healthcare has improved significantly with new medicine and vaccinations to prevent major diseases (Weon 2012).

It is projected that the world population will rise to 9.2 billion by 2050. The main cause of the rise in population is higher survival at birth and lower death rates per year because of factors such as healthcare improvements and resistance to diseases (Bongaarts 2009).

This study investigated the main question of was there a difference in survivorship from before 1950 to after 1950? From the main question it was hypothesized that there is a difference between the survivorship from before 1950 and after 1950.

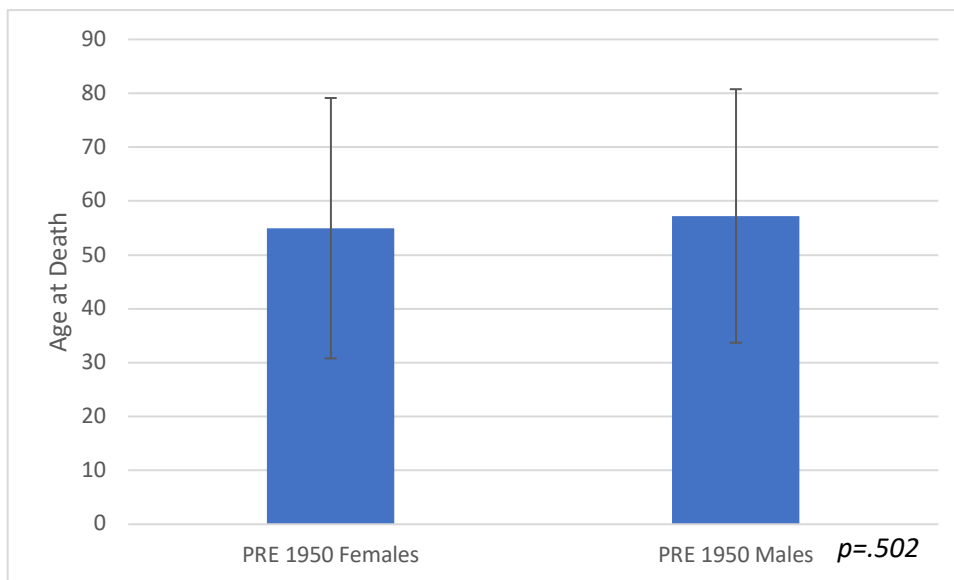
## Methods

At Westview Cemetery in Farmville, Virginia, data was collected from headstones by recording the birth date and death date of each individual. Data was collected for four groups until 100 data points for each section was obtained: females who died before 1950, females who died after 1950, males who died before 1950, and males who died after 1950. A survivorship curve was constructed in Excel by

calculating the number of individuals alive in each age interval that went by 10s. A statistical t-test to determine the p-values for each group was calculated using excel spreadsheets by using the command “=TTEST.” Overall statistics such as mean, standard deviation, and standard error were calculated in excel as well using the data analysis toolpak add-in and selecting descriptive statistics. Bar graphs were constructed using the means for each group being studied and error bars were added using the standard deviation for each group.

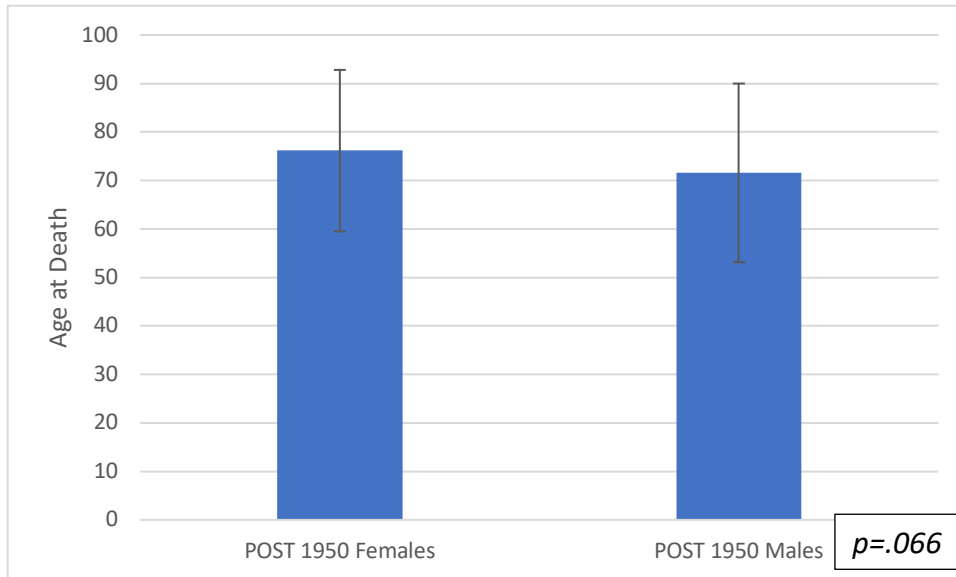
## Results

It was found that the average life span for both males and females were statistically the same before 1950 (Figure 1). After 1950 both the female and male lifespans increased by 22 and 14 years, however there is not statistic difference between the two lifespans (Figure 2). When analyzing the lifespans of females before 1950 and after 1950 it was calculated that the average lifespan increased after 1950 (Figure 3). The average lifespan of males increased. The survivorship curve shows that humans have a type 1 survivorship curve, with having a high survival rate early to middle of life and low survivorship late in life and that has not changed from before 1950 to after 1950, they both have the same trends. However, despite the same overall trend, pre 1950 populations began to decline around age 30 while post 1950 the human population started to die at age 70 (Figure 5).



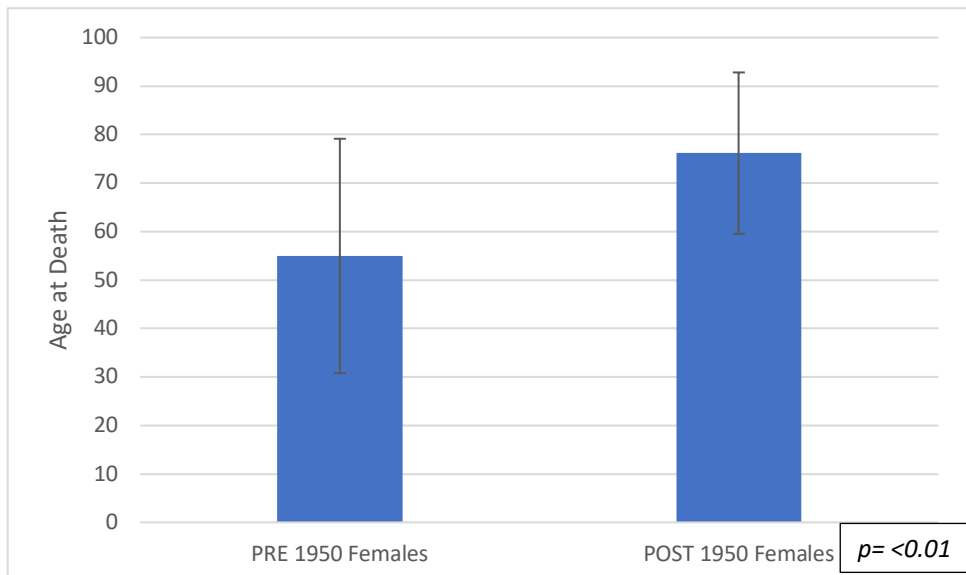
**Figure 1. Average Lifespan of Males and Females Pre 1950.**

The average age of death for both males and females pre 1950 were compared. The error bars overlap therefore there is no significant difference in the age of death for each gender. The p-value is greater than 0.05, the average lifespans are not statistically different.



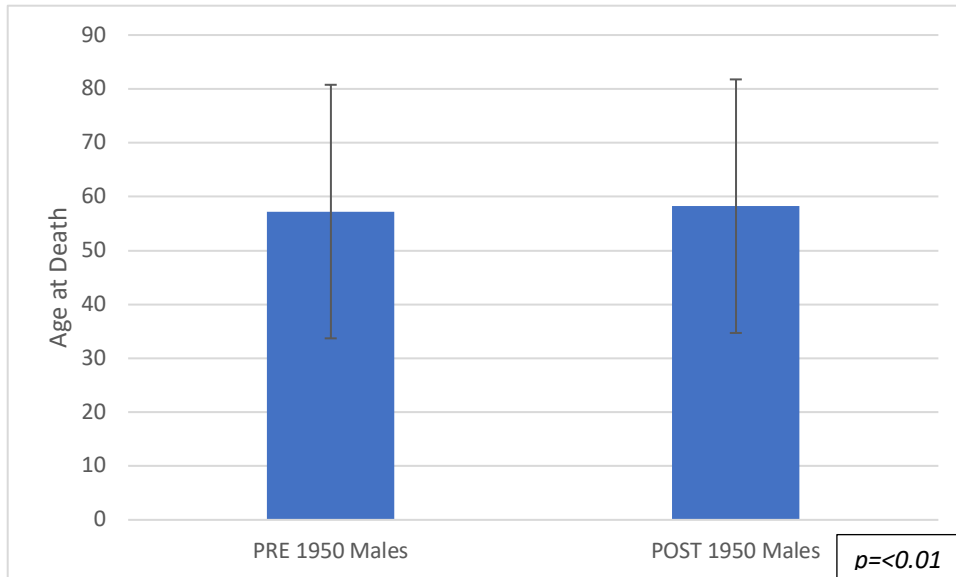
**Figure 2. Average Lifespan of Females and Males Post 1950.**

The average age of death for both males and females post 1950 were compared. The error bars overlap therefore there is no significant difference in the age of death for each gender. The p-value is greater than 0.05, the average lifespans are not statistically different.

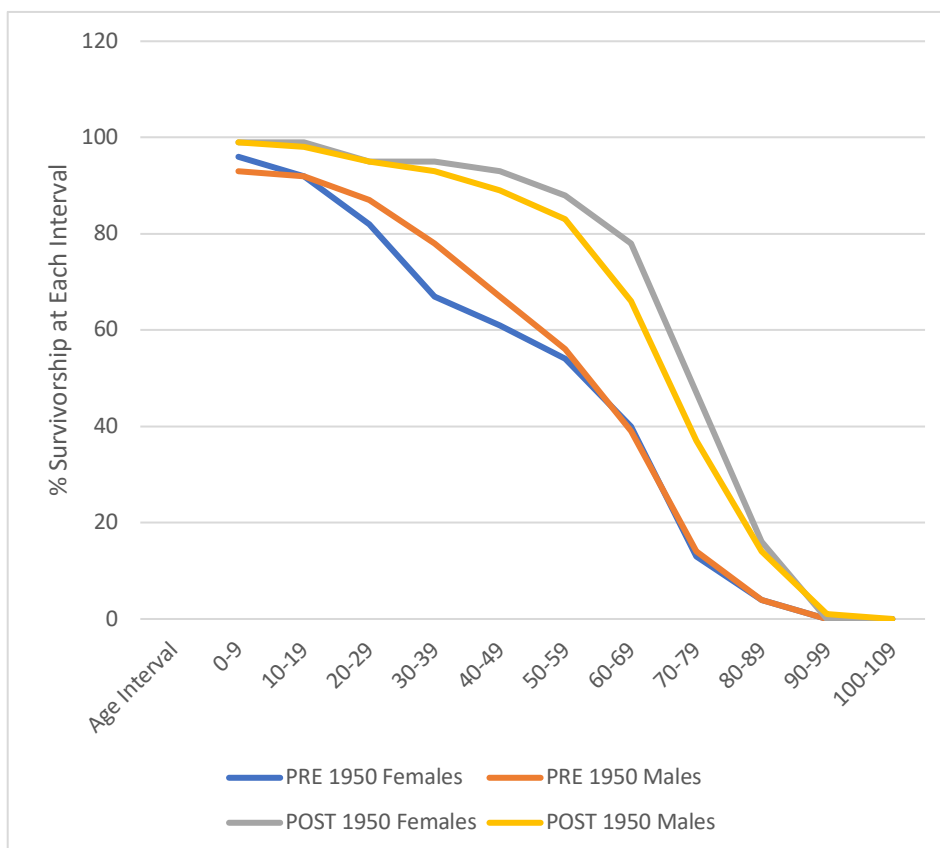


**Figure 3. Average Lifespan of Females Pre and Post 1950.**

The average age of death for females pre and post 1950 were compared. The error bars overlap therefore there is no significant difference in the age of death for each gender. The p-value is less than 0.05, the average lifespans are statistically different.



**Figure 4. Average Lifespan of Males Pre and Post 1950.** The average age of death for males pre and post 1950 were compared. The error bars overlap therefore there is no significant difference in the age of death for each gender. The p-value is less than 0.05, the average lifespans are statistically different.



**Figure 5. Survivorship Curve of Males and Females in Farmville, Virginia Pre 1950 and Post 1950.** The survivorship was calculated and represented in this curve. When comparing the pre 1950 data it is determined that the post 1950 populations have a higher rate of survival than the pre 1950 populations.

## Discussion

Life expectancy showed an increase in survivorship after 1950. From the hypothesis of this study, the survivorship would increase from pre 1950 to post 1950. The results of this study accept the hypothesis, therefore there was a difference in survivorship of males and females pre 1950 and post 1950. In this study genders were compared and examined because in many situations males and females have different life expectancies because of factors such as gender prone diseases, or daily lifestyle actions (Crimmins 2019). Studies have shown throughout the past century people have been increasing in life expectancy. Due to improvements in health, lifestyle, policies, and overall behavior have contributed to longer lives (Crimmins 2015). Results of this study support previous findings that the average lifespan of males and females have increased after 1950.

Potential biases were recognized in this study considering location of the data obtained and the uncertainty of gender when the names and dates were recorded. This study had a restricted data collection of Westview Cemetery in Farmville, Virginia where location often can provide limitations because the sample does not represent the entire population of the world by just examining one cemetery where most of the people who were there were from that county. Also, there were names on the stones in which may not have been recognizable of gender including gender neutral names or the name was not recognizable anymore. Even though it was attempted to avoid those stones, there is still uncertainty.

## Acknowledgements

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