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LDS LIFE TABLES: A COMPARISON OF LONG-LIVED POPULATIONS

by

Christopher R. Layton

A thesis submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Science

Department of Statistics

Brigham Young University

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BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

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ABSTRACT

LDS LIFE TABLES: A COMPARISON OF LONG-LIVED POPULATIONS

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Department of Statistics

Master of Science

This research estimates the life expectancy of members of the Church of Jesus Christ of Latter-day Saints (LDS) in Utah. We create gender-specific life tables for four groups: total Utah, active LDS, less-active LDS, and non-LDS. Male life tables are based on data from 1991-1995; female life tables are based on data from 1994-1998. Life expectancy at birth is 75 years for all Utah males, 79.8 years for active LDS Utah males, 71.6 years for less-active LDS Utah males, and 71.5 years for non-LDS Utah males. Female life expectancy at birth is 80.4 years for all Utah females, 83.9 years for active LDS Utah females, 77.7 years for less-active LDS Utah females, and 77.4 years for non-LDS Utah females.

The active LDS male group has a statistically significant 7.7 year gain in life expectancy at birth compared to the average US male in 1991-1995 (p-value < 0.0001).

A two-sided t-test indicates that at birth, Japanese males and active LDS males are significantly different (p-value = 0.01): active LDS males are estimated to live 3.5 years longer than Japanese males. Active LDS males have a significantly (p-value = 0.002) higher life expectancy at birth compared to Swedish males: active LDS males are estimated to live 4.25 years longer than Swedish males.

The active LDS females in 1994-1998 show a statistically significant five year gain in life expectancy at birth over an average US female in 1991-1995 (p-value = 0.0002). Although we estimate that at birth active LDS females live 1.3 years longer than Japanese females, this gain in life expectancy at birth is not statistically significant (p-value = 0.29). A two-sided t-test indicates that active LDS females have a higher life expectancy at birth than Swedish females (p-value = 0.02). Active LDS females live three years longer than Swedish females.

Results from this research can be useful to health policy makers and in the allocation of health resources. If it is indeed true that a large portion of the life expectancy gains in the active LDS group is attributable to adherence to a health code, then this information can be used when designing and evaluating health intervention programs.

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Chapter 1

INTRODUCTION

Over the past century, life expectancy in the US has been steadily increasing. In the year 1900 the average person in the United States lived about 47.5 years. In 1995, that same person would live 75.5 years (Berkeley Mortality Database, 1997). This large increase in life expectancy is predominantly due to technological advances in medical equipment, medical techniques and medical knowledge (Eberstat, 1999). Other factors can increase life expectancy. Within the United States itself, some groups are able to live substantially longer than the average US life span. The purpose of this thesis is to estimate the increase in life expectancy for active members of the Church of Jesus Christ of Latter-day Saints (LDS), also known as Mormons, over the average US life expectancy. We also will compare this group to other long-lived populations.

The LDS church is not unlike many religions with regards to its spiritual activities. Members who are actively involved in the LDS church attend church meetings weekly, participate in projects to benefit their community, and try to live in accordance with spiritual laws found in the Bible. The LDS church keeps accurate records on its members. These records facilitate research on this group. We have chosen to study this group because we have access to their records and because they follow a code of health. This health code, the Word of Wisdom, is required of all members in good standing of the LDS church. It prohibits the use of tobacco, alcohol, illicit drugs, coffee and tea. The Word of Wisdom also encourages the use of grains and fruits, and the moderate consumption of meats. Because of this health code, those members of the LDS church who are following

the tenets of their religion should be in better health and should live longer.

Historically, infant mortality rates and life expectancy have been used to measure the health and mortality experience of a population. Both of these measures depend solely on mortality rates. Recently, several new summary measures have been proposed to assess (measure) the health of a population. These measures propose to incorporate both morbidity and mortality into a single summary measure. Although mortality rates are affected by a population's morbidity (people in ill health or who are disabled tend to die sooner which increases the mortality rate), these new measures attempt to directly incorporate morbidity. Health adjusted life expectancy (HALE) adjusts life expectancy to reflect how much of life is lived in good health (Rosenberg et al., 1999). Disability adjusted life years (DALYs) basically measure the number of years of life spent in disability (Murray, 1994). Quality adjusted life years (QALYs) are quality years added to life for those in different health states (good health, terminal disease, etc.) (Robine et al., 1993). In chapter 2 we will discuss each of these new measures and how they relate to our research.

At the conclusion of this project, we will be able to enumerate the increase in life expectancy for the LDS population in the state of Utah over the US population. We have chosen to study the members of the LDS church in Utah because we have access to their membership records, they follow a health code and the state is almost 70% LDS and is a representative sample of LDS church members in the United States (Jarvis and Northcott, 1987). Because the differences between the LDS population and the US population are mainly those of life style, this study will be useful to decision makers who are trying to increase the life expectancy of shorter lived populations. We will also compare the life

expectancy of the LDS population in Utah to that of Japan and of Sweden, two of the longest-lived nations in the world.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, we review work that has already been done on several topics of great interest to this thesis. First, we look at the impact of religion on mortality and morbidity. In the past, religion has been linked to lower mortality rates and better overall health. Secondly we will review the literature which describes current trends in measuring morbidity and mortality. In the past decade new measures have been created which attempt to combine mortality and morbidity into one measure. In section 2.3 we will discuss more traditional measures such as life expectancy and infant mortality rates along with several newer measures including disability adjusted life years (DALYs), quality adjusted life years (QALYs), and health adjusted life expectancy (HALE) These measures are discussed for completeness We will not be using them in any of our analysis.

2.2 Religion and Mortality

2.2.1 Introduction

The literature on religion and its impact on mortality is vast, but the majority of the literature is older. In 1987 Jarvis and Northcott did a comprehensive review on studies that examine religion and differences in mortality and morbidity (Jarvis and Northcott, 1987). They suggest that "religion may have either beneficial or harmful effects on health and on the risk of death. These effects are a consequence of the behaviors, group contexts and attitudes which religion encourages or discourages" (Jarvis and Northcott, 1987).

Jarvis and Northcott identify six effects that religion can have on health and mortality. The first effect is "the proscription of certain behaviors which are known to be harmful..." (Jarvis and Northcott, 1987). Secondly a religion can prohibit activities which can save lives. Some religions prohibit medical treatments or the use of beneficial drugs. Religions can also encourage beneficial activities such as service to the community or eating healthy foods. On the other hand, some religions encourage activities which are harmful. Examples of this include self-mutilation or ritualistic suicide. Fifth, religious groups often act as support groups to their members. Finally, religion is complex and could have "multi-dimensional...effects on health behavior, health, and mortality risks" (Jarvis and Northcott, 1987). The majority of the research found in the literature focuses on specific religions that proscribe harmful behaviors and promote beneficial activities. In general, other studies done on religion attempt to investigate the effect of a religion as a support group. This literature review focuses on those studies which point out the beneficial effects of religion due to the proscription of harmful activities and/or as a support group for its members.

The next few sections present the literature relating religion to mortality and morbidity. The first four sections review several of the larger religions and the last section discusses religion and mortality in general.

2.2.2 Jews and Mortality

One of the more informative and interesting studies on Jews compares mortality between secular and religious kibbutzim. The study compared 11 secular and 11 religious kibbutz in Israel (Kark et al., 1996). The authors report that the mortality rate ratios for men were 1.67 with 95% confidence interval of (1.17, 2.39) and for women 2.67 with a

95% confidence interval of (1.55, 4.60). These results are similar for all major causes of death. The authors attribute these results to a protective effect of religion. The authors argue that the religious kibbutz is similar to a support group which helps its members cope with stress. In most other ways, the two groups of kibbutz were very similar.

Many of the other studies on the Jewish faith address cancer. Several studies have found that smoking is less prevalent among Jews. Most likely because of this, there are fewer occurrences of lung cancer among Jews compared to Catholics and Protestants in Montreal (Horowitz and Enterline, 1970). This study found that the mean age-adjusted death rate for male Jews was 21.5 per 100,000 as compared to 32.4 for male Protestants and 36 for male Catholics. The Jewish females had a death rate of 9.2 per 100,000 compared to 6.6 for Protestants and 5.0 for Catholics. Similar results were found earlier among Jews in New York (Seidman, 1966).

2.2.3 Religious Clergy

In 1968 King and Bailar followed the mortality of a group of Lutheran clergymen (King and Bailar, 1968). Almost all of these men were white and born in the United States. They compared the mortality rate of these clergy to the white male population of the United States in 1955 and found a much lower mortality rate than expected. They found that as a group the Lutheran clergy had a standardized mortality ratio (SMR) of 73 where 100 is the normal standardized mortality ratio. They feel that the results may have to do with a higher socioeconomic status among the clergymen than for an average US male. As a whole, they felt that the Lutheran clergymen were probably in better health than an average US male. Other than that, they are not sure how to explain the difference in mortality.

Later studies by King have shown similar results with Anglican, Presbyterian and Baptist clergy (King and Bailar, 1969; King, 1971; King et al., 1975; King and Locke, 1980; Locke and King, 1980). These papers also compared the mortality of the clergy to other professions. Teachers had similar mortality rates, but professionals (doctors and lawyers) had higher mortality experience. The teachers ages 20-64 had a SMR of 61 and the Lutheran clergy of the same age group had a SMR of 53. Lawyers and doctors of the same age group had SMRs of 90 and 91 respectively. Again, they are unsure how to interpret these results.

2.2.4 Seventh-day Adventists and Mortality

The Seventh-day Adventists are a group that is commonly studied because they do not drink alcohol or drinks that contain caffeine, do not use tobacco, and do not eat meats. They also avoid sexual contact outside the vows of marriage and generally try to take good care of their bodies. Many studies have found that Seventh-day Adventists have lower than average mortality rates.

In 1980, Phillips et al. studied the mortality of Seventh-day Adventists based on specific cancer sites (Phillips et al., 1980). This study compared the mortality for Seventh-day Adventists to non-Seventh-day Adventists for the years 1960-1972 in California. Both groups filled out a questionnaire at the beginning of the study and mortality information was gathered at the end of the study. The results show that Seventh-day Adventists have lower risks of respiratory and colon cancers. The standardized mortality ratio for all cancers is 51 for male Seventh-day Adventists and 68 for females as compared to the 1970 US white population for each gender. The age-adjusted mortality ratio for male Seventh-day Adventists to the male non-Seventh-day Adventist group was 0.66 and

for females the ratio was 0.88. These findings indicate that Seventh-day Adventists have better mortality experience than both an average person in the US and the non-Seventh-day Adventist group in this study. These results are explained by the healthy life style and higher socioeconomic status of most Seventh-day Adventists.

Several studies on Seventh-day Adventists have shown an increase in life expectancy. In 1981, Waaler and Hjort found an increase of four years in life expectancy for Norwegian Seventh-day Adventist males and an increase of two years for Norwegian Seventh-day Adventist females over average Norwegian expected life for the years 1960-77 (Waaler and Hjort, 1981). In 1978, the average Norwegian male lived 72 years and the average female in Norway lived 79 years (WHO, 1999). Another study on Seventh-day Adventists in the Netherlands in 1968-77 observed a longer than average life expectancy for males (Berkel and Waard 1983). The life expectancy for males was found to be 75.3 years. The average Dutch male lived to 72 years in 1978 (WHO, 1999). Seventh-day Adventist females were found to have a life expectancy of 77.4 years which is lower than the average 79 years Dutch women lived in 1978.

Another study on Norwegian Seventh-day Adventists describes lower standardized mortality ratios among persons converting before the age of 19 relative to the average population for both men and women (Fonnebo, 1992). Those who converted after the age of 35 did not have significantly lower standardized mortality ratios. The SMR for males converting before age 19 was 69, and for those converting after the age of 35, it was 89. Those females converting before age 19 had an SMR of 59, and those converting after 35 had an SMR of 103. The author concludes that it seems important to live a healthy lifestyle early as lifestyle changes later in life might not affect mortality risk as much..

2.2.5 Latter-day Saints (Mormons) and Mortality

Because our population of interest involves members of the Church of Jesus Christ of Latter-day Saints (LDS), we will discuss the mortality of this group in more depth. Members of the LDS church have a health code similar to the Seventh-day Adventists. Specifically, this health code prohibits alcohol, tobacco, coffee, tea, and illicit drugs. The church members are also counseled to care for their bodies and to avoid all sexual contact outside marriage vows. It also recommends the moderate consumption of meats and abundant usage of fruits, vegetables, and grains. Though moderation in meat consumption is recommended, adherence to this recommendation appears low.

Enstrom did several studies which investigated the cancer rates for members of the LDS church (Enstrom, 1975; Enstrom, 1978; Enstrom, 1979; Enstrom, 1980). He found that members of the LDS church had fewer incidences of smoking-related cancers and colon cancer. Male LDS had a respiratory cancer SMR of 57 and a mouth cancer SMR of 54. Females had a low SMR for respiratory cancers at 80, but the SMR for mouth cancers was higher than average at 118. The colon cancer SMR was 72 for males and 80 for LDS females (Enstrom, 1980). In his 1978 study, he was able to stratify the LDS males into active and less-active groups using priesthood office as a surrogate measure of participation. Active members are those who participate in church and are more likely to live the prescribed lifestyle. Less-active members are less likely to do so. He found that active LDS men have lower risks for most cancers than other LDS men. The SMR for smoking cancers among active California LDS men was 26 compared to 58 for all California LDS males. For non-smoking related cancers, active California LDS men had an SMR of 67 and all California LDS men had an SMR of 74. This same study compared

life expectancies for several groups of active LDS to groups which were reported not to smoke (Enstrom, 1978). Table 2.1 summarizes these findings. All of the active LDS groups have higher life expectancies than the other groups, even compared to those groups which did not smoke at all. A more recent follow-up study on active LDS men in California agrees with the previous studies and finds lower than average standardized mortality ratios for cancers (SMR of 50), cardiovascular disease (SMR of 58) and all cause mortality (SMR of 53) (Enstrom, 1989).

Table 2.1: Life Expectancy at Age 35 for Groups of Interest (Enstrom, 1978)

Group of Interest	Life Expectancy at age 35
1945-74 California Muir active Mormon males	42.8
1968-75 California active Mormon males	44.6
1970,75 Utah active Mormon males	44.0
1960-65 ACS Cohort "never smoked regularly" males	42.4
1966-68 NCHS US sample "never smoked cigarettes" white males	39.6
1970 Utah white males	37.9
1970 California white males	37.1
1970 United States white males	36.5

From 1976-1985, Lyon and others took part in at least ten studies on members of the LDS church (Lyon et al., 1976; Lyon et al., 1977; Gardner and Lyon, 1977; Lyon et al., 1978; Lyon and Sorenson, 1978; Lyon et al , 1980A; Lyon, et al., 1980B; Gardner and Lyon, 1982A; Gardner and Lyon, 1982B; Smith et al., 1985). The majority of these studies deal with cancer incidence among LDS church members but one discusses mortality directly. This 1985 study on mortality in New Zealand found that the LDS Maoris had a lower mortality rate than the non-LDS Maoris (Smith et al., 1985). The

majority of the other articles deal with cancer incidence in Utah LDS church members. In general, these studies show that Utah LDS have lower mortality of all cancers (SMR of 75.3 for males and 77.9 for females). Specifically, Mormons tend to have less occurrences of smoking-related cancers. The smoking-related cancer SMR for LDS males is 47 and 42.6 for females. The LDS males did not get stomach cancers (SMR of 86.9) as often as the national average and LDS females had lower rates of breast (SMR of 78.8), cervix (SMR of 54.4) and ovarian (SMR of 82.6) cancers. The same study indicates that male members of the LDS church had higher incidence of prostatic tumors (SMR of 113.9) (Lyon et al., 1977). One of the studies conducted on cardiovascular health found lower rates of cardiovascular mortality among Utah LDS (Lyon et al., 1978). The ischemic heart disease SMR for LDS males in this study was 63.8.

All of these studies report similar findings: members of the LDS church generally have lower incidence of cancer and cardiovascular disease and lower mortality from cancer, cardiovascular disease, and all causes. The studies that have included religiosity (activity or participation in the church) have generally found even lower mortality rates among the most active group. These findings are generally attributed to the LDS health code, conservative behavior pattern among church members, and social structure of the church.

2.2.6 Mortality and Religion in General

Also of interest are those studies which look at religion in general. These studies usually use church attendance as a way to measure how religious a person is. In 1972, Comstock and Partridge found an association between frequent church attendance and lower mortality (Comstock and Partridge, 1972). There was lower mortality for the

frequent church attenders in four diseases. Those who did not attend church or who did so frequently were two times more likely to die from heart disease, pulmonary emphysema, and suicide. They were four times as likely to die from cirrhosis of the liver. The authors of this paper feel that their results may not be entirely accurate "because health can affect church attendance" (Comstock and Partridge, 1972). In fact, a follow-up study by Comstock and Tonascia found that the results were not entirely accurate because the chronically ill were not able to attend church and more likely to die (Comstock and Tonascia, 1977).

A later study by Strawbridge, Cohen, and Shema adjusted for the health of the subjects in their study (Strawbridge et al., 1997). Their study consisted of 6,928 people of ages 16 to 94 in Alameda County, California. These people received four surveys spread out over the course of the study which asked about the subject's health and church attendance, among other things. Even after adjusting for the health of an individual, it was found that those who frequently attended church had lower mortality rates than those who attended less frequently. The relative risk was 0.64 for frequent to infrequent attenders with a 95% confidence interval of (0.53, 0.77). The authors feel that the lower mortality rate is probably explained by "improved health practices, increased social contacts, and more stable marriages" among the frequent church attenders (Strawbridge et al., 1997).

A 1999 study uses religious attendance and mortality data from the 1987 National Health Interview Survey to calculate the life expectancies for groups by religiosity (Hummer et al., 1999). The authors controlled for demographic, socioeconomic, health, behavioral, and social variables in this study. The findings indicate that those who attend church more than once a week have a much longer life expectancy than normal: given a

person survives to age 20, males can expect to live 61.3 more years and females 64. In 1995 the average male in the US had a life expectancy at age 20 of 53.6 additional years and the average US female lives 59.92 years past age 20 (Berkeley Mortality Database, 1997). The authors believe that the decrease in mortality can be explained by the "mediating effects" of religion. Religion may benefit people by allowing them cope with stress and develop healthy behaviors (Hummer et al., 1999).

2.2.7 Conclusion

Most of the literature seems to agree that religion positively impacts mortality. Although there have been no studies which can definitively say why, it appears that the social interaction and support coupled with the encouragement of healthy behaviors are the major reasons religion has this effect.

2.3 Measures of Population Health

2.3.1 Introduction

Traditionally life expectancy and the infant mortality rate have been used to measure the mortality experience of a population. Because these are only mortality measures, separate measures of morbidity are needed in order to obtain a more complete picture of a population's health (Murray and Lopez, 1997). Recently several measures have been created which attempt to incorporate mortality and morbidity into one measure. In this section we will discuss each measure including the traditional measures.

2.3.2 Life Expectancy and Infant Mortality

"The two most widely used measures [of population mortality] are life expectancy at birth and the infant mortality rate" (Hansluwka, 1985). Hansluwka states that infant mortality rates are being "replaced in developed countries by the perinatal mortality ratio."

The reasons this measure is being replaced have to do with advances in medical technology. According to Hansluwka, "the debate about the definition of live birth, stillbirth, fetal death etc. and their impact on the level and comparability of data on infant mortality" affects the interpretation of the infant mortality rate.

Life expectancy still enjoys "acceptance, unparalleled by an other indicator" (Hansluwka, 1985). Life expectancies are easy to compare and are generally easily understood by the general population. Like most estimators, the validity depends on the quality of the data. Life expectancy has good statistical qualities because it is an average. These properties are explored in more detail in section 3.6.3. However, there are some concerns regarding the use of life expectancy as a measure of a population's health. According to Hansluwka, it does not work well for countries with lower mortality because it is of "decreasing policy relevance and information value" (Hansluwka, 1985). Although Hansluwka does not explicitly state the reason life expectancy loses its "relevance and information value" for these countries, it appears to be because it is difficult to realize a meaningful increase in life expectancies when countries already have a low mortality rate. In other words, it is assumed that most health interventions and policy decisions will not make a noticeable difference in a country's life expectancy. Other indicators which directly assess health are possibly a better measure of an increase in population health.

When calculating life expectancy, all years of life are equally counted. There are some that argue years of life should be age-weighted and discounted (Murray and Acharya, 1997). Age-weighting involves counting years differently according to age. For example the years later in life would be weighted less because they are less productive economically. Discounting is similar to the economic principle of discounting. Years of

health in the future are considered less important than years of health today, so they are given less weight.

Another disadvantage of life expectancy is its "neglect of morbidity and disability" (Murray and Lopez, 1997). Life expectancy only measures the length of life and does not incorporate the quality of life or the burdens of disability and disease. Life expectancy is affected by morbidity because those people who have ill health tend to live shorter lives than comparable people in good health. An increase in life expectancy is generally thought to be good, but only if that increase represents quality years of life. For this reason many wish to incorporate morbidity with mortality. Several recently created measures attempt to incorporate morbidity and mortality into a single measure.

2.3.3 Mortality and Morbidity in One Measure

As mentioned in the introduction, there is a group of very similar measures which attempt to incorporate morbidity and mortality into one measure. These measures include health-adjusted life expectancies (HALEs), quality-adjusted life years (QALYs), and disability-adjusted life years (DALYs). Each of these measures attempts to incorporate morbidity and mortality differently, but there are some similarities between the measures. These measures are discussed for completeness. We will not be using them in any of our analysis.

All of these measures have the same potential advantage. They incorporate both morbidity and mortality into one measure. As mentioned in the previous section, although life expectancy is affected by morbidity, there is no direct measure of morbidity in life expectancy.

These measures also share several disadvantages. All three measures use weights

which are applied to years of life in the case of QALYs and DALYs, or to life expectancy in the case of HALEs. The weights themselves are the first disadvantage. The major criticism of the weights is their subjectivity. The weights are based on "the patient's valuation of health states" (Kindig, 1999). Currently when these measures are applied, weights are calculated based upon data gathered from surveys of patients. If gathered this way, the weights are not always objective. Additionally in order to be compared, two sets of DALYs, two sets of QALYs, or two sets of HALEs must use the same weights. Because there is currently no standard for weights, all three measures also suffer from "insufficient availability of good quality data needed by the methodology" (WHO, 1996).

A second problem which all three measures suffer from is a suppression of information. This loss of information occurs "by aggregating healthy life years lost due to mortality with those due to disability" in the case of DALYs (WHO, 1996). Also, it is not uncommon for these measures to combine information across regions of a country which are not necessarily homogenous with respect to the weights used. Each measure is discussed in detail in the following three sections.

2.3.4 Health-Adjusted Life Expectancy (HALE)

The health-adjusted life expectancy is basically a weighted life expectancy. In order to calculate HALEs, a weight is applied to each year of life for an individual. If the life was lived in perfect health, then the weight is 1 Weights of less than one are applied to those years which were lived in ill-health.

The HALE is an attempt to overcome some of the disadvantages of traditional life expectancies. First, it does not consider all years to be equal, instead "years of life are weighted by health status" (Wolfson, 1996). Secondly, it incorporates duration of life,

well-being and probability of survival into one measure (Lind, 1995).

In spite of the problems of suppression of information and a lack of standard weights, HALEs have been suggested as appropriate measures for health policy reforms and intervention programs (Lind, 1995; Kindig, 1999).

2.3.5 Quality-Adjusted Life Years (QALYs)

Quality-adjusted life years attempt to estimate "years of life in different health states" after a specific medical or health intervention (Robine et al., 1993). Basically, QALYs measure the number of quality years an average person can expect to live as a result of a medical or health intervention. It does not measure the total number of years added to life, unless they are considered to be "quality" years. Mathematically, a QALY is "the sum of products of value weights measuring health-related quality of life and quantity of life (measured in years)" (Robine et al., 1993). HALEs are related to QALYs because the latter "can also be used as a unit of measurement for the values taken by health-adjusted life expectancy indicators" (Robine et al., 1993). Basically, this means that the weights used to calculate the QALYs can also be used to weight life expectancy. There is much less written about QALYs compared to both HALEs and DALYs. It appears they are used much less frequently.

2.3.6 Disability-Adjusted Life Years (DALYs)

The DALYs appear to be the most debated of the measures which attempt to incorporate morbidity and mortality into one measure. According to the World Health Organization (WHO) the DALY "is a methodology for aggregating data about health outcomes–specifically, mortality and disability–into a single number, which in principle is a guide for decision-making about cost-effective and priority interventions" (WHO, 1996).

The purpose of DALYs is to measure the 'burden of disease.' Like QALYs and HALEs, DALYs combine morbidity and mortality Specifically, DALYs incorporate "time lived with a disability and the time lost due to premature mortality" (Murray, 1994).

DALYs have disadvantages similar to QALYs and HALEs, but there are additional problems which are also worth discussing. Several issues which are unique to DALYs include age-weighting, co-morbidity and discounting future life. Murray and Acharya suggest that these two weighting techniques be incorporated into DALYs to correctly estimate healthy human life (Murray and Acharya, 1997).

Age-weighting consists of assigning different weights to each year of life based on age Murray and Acharya state that "surveys have found that individuals prefer to save the lives of young adults over young children" (Murray and Acharya, 1997). An economic argument for age-weighting uses productivity as a criteria for assigning the weights. The most economically productive years (middle age) would get the highest weights. Anand and Hanson disagree with the practice of age-weighting. They state that "valuing people's lives in terms of a money metric...is hard to defend ethically" (Anand and Hanson, 1997). Mathematically, age-weighting is "penalizing reduced function twice over" (Anand and Hanson, 1997). They argue that productivity is penalized by disability and discounting it again for age would be a double penalty. Basically they sum up their argument against age-weighting by saying: "a principle of universalism of life claims would argue strongly for a common intrinsic valuation of human life, regardless of the age at (or time period in) which it is lived" (Anand and Hanson, 1997)..

Another problem which occurs with measures that use health weights is co-morbidity. Co-morbidity is defined as "an individual experiencing multiple illnesses"

(Anand and Hanson, 1997). The problem lies with the combination of the weights for each of the illnesses/disabilities. If the weights are simply multiplied together, then this could lead to an overestimation of disability or ill-health.

By discounting for future life, "future years of life lived are valued less than present years" (Anand and Hanson, 1997). Murray and Acharya argue in favor of discounting in the context of health policies. They "are convinced that the only strong arguments for discounting is the disease eradication/health research paradox" (Murray and Acharya, 1997). This paradox states that policy makers wish to minimize the total number of years lost to disease. In the event of a disease epidemic, policy makers would choose to use current technology to fight the disease even though cheaper and more efficient technology in the future would eradicate the disease. The argument is that policy makers would shift more resources to current generations to reduce DALYs, so current lives must have a higher value than future lives. Anand and Hanson disagree with discounting because it implies that "one life saved today will be worth more than five lives saved in 55 years" (Anand and Hanson, 1997). Again, comparing lives in monetary terms, such as discounting is "hard to defend ethically." All lives should be considered equal "regardless of the age at (or the time period in) which it is lived."

The WHO discourages the "use of the DALY in its present form, without full recognition of its limitations" (WHO, 1996). Most of the problems with measures which combine mortality and morbidity deal with lack of "good quality data needed by the methodology" (WHO, 1996). Currently, the WHO and most other organizations use life expectancy to describe mortality experience and other measures to describe morbidity (Sayers and Fliedner, 1997).

Chapter 3

METHODOLOGY

3.1 Introduction

As we mentioned in Chapter 1, the purpose of this thesis is to calculate the life expectancy of members of the LDS church residing in Utah. We will then be able to show the increase in life expectancy of the active LDS group over the US life expectancy. We will also be able to compare this group to other long lived populations. In order to achieve both of these goals, we will create life tables for the LDS population in the state of Utah.

We have chosen to create life tables of the Utah LDS population for several reasons. First, the LDS church has approximately 11 million members in almost all nations of the world (Deseret News, 1998) By limiting this study to those members in Utah, we are able to limit our data to reliable sources. The project is also much more manageable if we only use the Utah population. Secondly, because one of our main goals is to compare the LDS life expectancy to US life expectancy, we have chosen to focus this project on the LDS population in the US. The Utah LDS population is a representative sample of the US LDS population because there are no important differences between members of the LDS church in Utah and anywhere else in the US. Additionally, the state of Utah has a large LDS population. Almost 2 million people live in the state of Utah and almost 70% are members of the LDS church. Finally, we can easily obtain the data required to calculate life tables for the Utah LDS.

Because life expectancy differs across gender, we will create separate life tables for

males and females. For each gender there is a life table for four specific populations of interest: the entire state of Utah, active LDS in Utah, less-active LDS in Utah and non-LDS in Utah. Active and less-active members are discussed later in this chapter, but the distinction between the two classifications is based on adherence to church rules and statutes.

The majority of this chapter discusses the steps necessary to create life tables. Life tables are created from mortality rates estimated from the population(s) of interest. A mortality rate is simply the number of deaths in a specified time period relative to the population at risk for that same time period. We have chosen a five year time period for our life tables. "The purpose of [choosing a period of time greater than a year] is to reduce the effect of abnormalities in the mortality pattern which may exist in a single calendar year" (Chiang, p. 115). The male life tables in this thesis are based on the five year period from 1991 to 1995. The female life tables in this thesis are based on the period from 1994 to 1998. The reason for the different time periods for men and women is discussed later in section 3.4.2. Assumptions necessary for the creation of life tables are also discussed in this chapter.

3.2 Populations of Interest

3.2.1 Introduction

In this section, we discuss our four populations of interest: total Utah, active Utah LDS, less-active Utah LDS, and non-LDS in Utah. In order to calculate the age-specific mortality rates for these groups, we need to determine the age-specific population of each group. This section describes the sources of data used to determine each group's population and the reason for the difference in the five year time periods for men and

women.

3.2.2 Data Sources

The population data come from two sources. The LDS church provided the total number of male members in Utah for the years 1985-1995. This data is stratified by year and broken down into one year age groups. The data for LDS males is also further divided by priesthood office for the years 1985-1993. This is essential because it allows us to determine the populations at risk for active and less-active members. Section 3.4 discusses the methodology used to separate the Utah LDS population into active LDS and less-active LDS groups. We received the LDS male population data in 1997. We did not request the LDS female population data from the LDS church until 1999. At that time we were informed, that all of the data prior to 1994 had been archived and was no longer accessible. For this reason, we have chosen to use the 1994-1998 time period for the women

The second source of data is the US Census Bureau. We obtained annual population estimates for the state of Utah stratified by gender in one year age groups. These estimates, the Annual Time Series of State Population Estimates by Age and Sex, are midyear population estimates available for 1990 to 1999. They are found on the Census Bureau's web site at:

http://www.census.gov/population/www/estimates/statepop.html. We obtained the male population estimates in October of 1999 and the female estimates in March of 2000.

These two sources of data allow us to determine the populations at risk for three of our groups: the state of Utah, active LDS, and less-active LDS. The fourth group, non-LDS in Utah, needs to be estimated. We do this by subtracting the LDS population at

each age from the state of Utah population. This result gives us an estimate of our non-LDS population in Utah.

3.3 Deaths

3.3.1 Introduction

The data we have used in determining the number of deaths for the life tables comes from two sources. The LDS church has given us access to records for all of its members who died in the state of Utah from 1985 to 1998. We also have death records from the state of Utah for all people who died from 1985 to 1998.

The data from the LDS church contains basic demographic data such as full name, birth date, death date, marital status, and Utah county of residence. It also contains important church membership information which allows us to distinguish between active and less-active members.

The data from the state of Utah contains the same demographic data as the LDS church data. One important step in determining the number of deaths for the four groups is linking the LDS church data to the state of Utah data. By linking these two sets of data, we are able to determine which deaths are attributed to members of the LDS church and those attributed to non-LDS.

We have used a program called LinkPro to link our two data sets. LinkPro is a software program that works with the statistical software program SAS. LinkPro allows both exact and probabilistic matching. Two of the advantages of LinkPro are its speed and integration with SAS. Because LinkPro uses SAS, all of the database capabilities of SAS are available (Wajda and Roos 1987). Because we are manipulating large data sets, LinkPro's speed and SAS's flexibility are important.

We have chosen to link our sets of data using 11 basic demographic variables. The records from the two data sets can link on last name, first name, middle name, birthday, birth month, birth year, marital status, and county of residence. The other three variables are a SOUNDEX code of the last, first, and middle names. The SOUNDEX routine is included with LinkPro. SOUNDEX is a program which creates phonetic codes for words. Words which sound the same but which are spelled differently have the same phonetic code. To avoid records not linking because of name misspellings, we compare the SOUNDEX codes for each of the names.

We chose not to use the death date for the purpose of linking the two data sets. We made this decision because we were uncertain about the accuracy of the death date in the LDS data. There are two reasons to question the accuracy of death date. First, in order to record the death of a member of the LDS church, the date must be communicated to the clerk of the deceased's local church unit (ward). This may or may not occur in a timely fashion. If the death is not reported for several months, then the exact death date may not be known. Secondly, the accuracy of the date is not checked. When a person dies in the state of Utah, an official death certificate is created. The LDS church does not verify the accuracy of the death dates on its records with the state death date. For these reasons, we will not use death date to link the data sets. However, if there is some question whether two records match, we do compare death dates in order to make a judgement. The specific details on the linking of the records of men and women follow in the next sections.

3.3.2 Male Record Linkage

There are 16,498 male records in the LDS data set for the years 1991-1995. For

this same time period, there are 27,738 records in the state of Utah data. In order to assure good linkage, we ran LinkPro several different times using different criteria.

Our first and most "strict" criteria required that the SOUNDEX code for the last name match and that seven of the remaining ten variables match. Of the 16,498 records in the LDS church data 15,210 or 92.2% matched on this criteria. Because we are reasonably sure that any records fitting this criteria are matches, this became our base data set of matches. Any other records we felt were a match would be added to this data set of matches.

The second matching criteria we used required eight variables to match. In other words, we did not require the SOUNDEX code for the last name to match. An additional 31 records matched on eight variables but not on the SOUNDEX code for the last name. We went through these records by hand and determined that 23 were actually matches. These were added to our base data set of matches.

Our third matching criteria was the same as the first, but instead of matching the males in the LDS data set to the males in the state data set, we matched the males in the LDS data set to the females in the state of Utah data set. Sex is coded either a '1' or a '2' in the state data set. Because the state uses '1' or '2' instead of 'M' or 'F', it is easier to make a coding error in the state data. There were 22 matches in this third linkage. Again we looked at these records by hand to determine whether they should be counted as matches. We added eight to the base data set of matches.

The fourth criteria was also identical to the first criteria. Instead of matching those males in the LDS data set who died between 1991-1995 to the males in the state data set who died in the same time period, we matched the LDS males who died outside of the

1991-1995 time period to males in the state data set who died from 1991-1995. We matched these records because of our concern about the accuracy of the death date given by the LDS church. There were 49 records in this fourth criteria that matched. After comparing the records by hand, we found that 34 were actual matches and added these to the base data set of matches.

Our fifth and final criteria required that the records match on the SOUNDEX code of the last name and six of the remaining ten variables. This criteria is similar to the first criteria, but requires one less variable to match for the records to be considered the same. There were 284 additional records that matched on this criteria.

After looking at each of these records, we determined that 280 were actual matches and added them to the base data set of matches. After all of our additions to the base data set of matches, the total number of records matched was 15,555 or 94.3% of the total male LDS deaths for 1991-1995. Those records in the state data set which did not match with LDS records were classified non-LDS.

3.3.3 Female Record Linkage

The record linkage procedure for the female records is very similar to the male linkage. We attempted to match the 17,859 female deaths from the LDS data set for the 1994-1998 period to the 28,074 female deaths from the state data set for the same period of time. We used the same matching criteria as in the male linkage, but with one additional linkage.

The first and most 'strict' criteria required that the SOUNDEX code for the last name match and that seven of the remaining ten variables match. Of the 17,859 records in the LDS church data 16,059 or 89.9% matched on this criteria. This became our base

data set of matches. Any other records we felt were a match would be added to this data set.

The second matching criteria required eight variables to match. In other words, we did not require the SOUNDEX code for the last name to match. There were an additional 81 records which matched on eight variables but not on the SOUNDEX code for the last name. We went through these records by hand and determined that 79 were actually matches. These were added to our base data set of matches.

Our third matching criteria was the same as the first, but instead of matching the females in the LDS data set to the females in the state data set, we matched the females in the LDS data set to the males in the state of Utah data set. There were 10 matches in this third linkage. Again we looked at these records by hand to determine whether they should be counted as matches. We added all 10 to the base data set of matches.

The fourth criteria was also identical to the first criteria; however, instead of matching those females in the LDS data set who died between 1994-1998 to the females in the state data set who died in the same time period, we matched the LDS females who died outside of the 1994-1998 time period to females in the state data set who died from 1994-1998. We matched these records because of our concern about the accuracy of the death date given by the LDS church. 118 records in this fourth criteria matched. After comparing the records by hand, we found that 100 were actual matches and added these to the base data set of matches.

Our fifth criteria required that the records match on the SOUNDEX code of the last name and six of the remaining ten variables. This criteria is similar to the first criteria, but requires one less variable to match for the records to be considered the same. There

were 908 additional records that matched on this criteria. Of these, 902 were considered matches and added to the base data set.

The final matching required that the records match on seven of the variables. This is similar to the fifth criteria, but does not require a match on the SOUNDEX code of the last name. There were an additional 175 records which matched on seven variables but not on the SOUNDEX of the last name. After reviewing each of these by hand, we added 86 to the base data set of matches.

After all of our additions to the base data set of matches, the total number of records matched is 17,236 or 96.5% of the total female LDS deaths for 1994-1998. Those records in the state data set which did not match with LDS records were classified non-LDS.

3.3.4 Misclassification of Deaths

In both the male and female linkages, we considered those who did not match with LDS death records to be non-LDS. It is possible that some of those deaths classified as non-LDS are actually LDS. There are several ways this could occur. About 94.25% of the male LDS deaths matched to state records and about 96.5% of female LDS deaths matched to state records. This leaves 5.75% and 3.5% of male and female LDS records respectively which could actually be counted as non-LDS because they did not match to state records for some reason or another. Another possibility is that the death of a member was not reported to the LDS church. This could occur if the member had not attended church in a long time or had no relative who could report the death to the church. A third possibility arises if a member of the LDS church moves to Utah and does not notify the Church of the move. The LDS church records would show them living elsewhere and

their record would not have been given to us to match with the state of Utah deaths.

3.3.5 Estimation of the Misclassification of Deaths

Because of the possibility of misclassification, we took a sample of those records classified as non-LDS in order to estimate the magnitude of the misclassification. We sent this sample to the LDS church and asked them to match the sample to their entire US database. When we took the sample, the only LDS data available to us was data for the years 1991-1995. Because of this, the women's misclassification estimates are based on 1991-1995 instead of 1994-1998. We do not feel that our estimate of the misclassification of non-LDS deaths for women would greatly change if we were to sample from the 1994-1998 time period. Thus, we have applied the misclassifications estimates found in the 1991-1995 women's sample to the 1994-1998 data. The next few paragraphs describe how we estimated the number of LDS deaths misclassified as non-LDS deaths.

As previously mentioned, we took a sample of the non-LDS group. The women's sample consists of 745 deaths. About 150 deaths were taken from each year for 1991-1995. There were 750 records randomly selected, but 5 records did not have enough information to match on, so they were removed. The sample was selected randomly within ten year age groups. We have broken the sample down into 10 year age groups because we feel that there may be a difference in misclassification by age. The male sample is very similar to the female sample. The male sample consists of 1028 deaths from the male non-LDS group. There are more records in the male sample because 278 of these needed to be checked for another study on suicide. These 278 deaths all resulted from suicide and come from men ages 15 to 34. Table 3.1 and Table 3.2 give information about the samples of men and women respectively. The second column of both tables

gives the number of deaths sampled from each age group. We will use both of these tables extensively to describe the estimation of the misclassified LDS deaths.

Table 3.1: Procedure for Estimating the Number of LDS Male Members Classified as Non-LDS

1. Age Group	2. Sample Size	3. Number Matched to LDS Records	4. Number not Matched to LDS Records	5. % of Matches Matching 5 Basic Variables	6. Estimated Number of Matches	7. Percent Misclassified
0	1	0	1	-	-	-
1-9	32	1	31	91.72%	1.09	3.41%
10-19	131	21	110	95.10%	22.08	16.86%
20-29	296	46	250	94.62%	48.62	16.42%
30-39	218	43	175	93.81%	45.84	21.03%
40-49	125	25	100	94.97%	26.32	21.06%
50-59	75	10	65	93.05%	10.75	14.33%
60-69	50	10	40	90.87%	11.01	22.01%
70-79	50	6	44	90.61%	5.52	11.04%
80+	50	9	41	90.43%	8.85	17.69%

Table 3.2: Procedure for Estimating the Number of LDS Female Members Classified as Non-LDS

1. Age Group	2. Sample Size	3. Number Matched to LDS Records	4. Number not Matched to LDS Records	5. % of Matches Matching 5 Basic Variables	6. Estimated Number of Matches	7. Percent Misclassified
0	58	2	56	-	-	-
1-9	22	5	17	93.65%	5.34	24.27%
10-19	20	3	17	95.36%	2.10	10.49%
20-29	131	27	104	88.00%	17.05	13.01%
30-39	149	36	113	90.82%	18.72	12.56%
40-49	126	32	94	87.86%	21.63	17.16%
50-59	75	19	56	90.16%	12.20	16.27%
60-69	53	9	44	88.42%	9.05	17.07%
70-79	46	10	36	87.46%	9.15	19.89%
80+	65	15	50	86.56%	12.71	19.55%

After selecting the samples, we had the LDS church match them to their entire US database of baptized members. This includes live and dead members and those living outside of Utah. Because the LDS church does not have access to a program which links records such as LinkPro, they were limited to matching our sample to their database using exact matches. We asked them to match on first name, last name and birth date. The third and fourth columns of the tables show the number of deaths that did and did not match to LDS church records respectively.

Because we were concerned that some of the records that should match would not match exactly because of inaccuracies and clerical errors in the data sets, we computed the percentage of our linked records that matched exactly on first name, last name and birth date. This allows us to estimate those records from our sample which would have matched to the LDS database had we been able to use our linkage criteria found in

sections 3.2.2 and 3.2.3 of this chapter. The fifth column of Tables 3.1 and 3.2 give the percentages of matches which match exactly on last name, first name, and birth date from the linked data set.

To estimate the number of deaths that would have matched to the LDS database had we been able to use LinkPro and our linkage criteria, we divide the number of exact matches (column 3) by the percentage of matches which matched exactly on last name, first name and birth date (column 5). The result is column six.

The final step in estimating the misclassification is to divide the estimated number of matches (column 6) by the sample size for each age group (column 2). This percentage is found in column seven and represents the percentage of LDS misclassified as non-LDS.

We have not calculated a misclassification percentage for those infant (less than 1 year old) deaths. One of the assumptions that is discussed further in section 3.6.3 of this chapter deals with the infant mortality rate We will be using the same gender-specific infant mortality rate for all four of our groups. Because of this, there is no need to distinguish between LDS and non-LDS for those infants which died. This accounts for the small number of infants sampled in the male sample. An error was made in the female sampling which allowed a large number of infants to be sampled. This does not affect our estimation of misclassifications in the other age groups.

After calculating the misclassification rate, it is applied to the number of non-LDS deaths for the five year time periods. This number of estimated misclassifications is subtracted from the non-LDS total and added to the total number of LDS deaths. The tables showing these calculations are included in the Tables B.1 and B.2 of the appendix.

3.4 Activity Measures

3.4.1 Introduction

As mentioned previously, we are interested in creating life tables for four different groups for both males and females. Using the total number of deaths in the state of Utah and the population total for the state of Utah, we can easily calculate a Utah life table. We can also create the non-LDS life table having already estimated its population size (section 3.2) and the number of Utah non-LDS deaths (section 3.3). The purpose of this section is to describe the methodology for stratifying the Utah LDS population and Utah LDS deaths into two activity groups: active and less-active LDS. The word "activity" describes the LDS church member's commitment to and fulfilment of church rules and statutes.

An active member of the LDS church tends to follow the church rules. They generally attend church weekly, avoid taking risks that will endanger their lives, avoid all sexual contact outside of marriage, and follow the church's health code, the Word of Wisdom. The Word of Wisdom prohibits the use of tobacco, alcohol, illicit drugs, tea, and coffee. It seems reasonable that these active members will live longer because of their adherence to church rules.

A less-active member of the LDS church is one who has been baptized, but does not attend church or participate in church-sponsored activities. They may or may not be following the other church rules, but many are not. Often the reason a member does not attend church is his lack of compliance with the Word of Wisdom.

The following two sections describe how we determine whether a member of the LDS church was active during his/her lifetime. Section 3.4.2 discusses male activity and section 3.4.3 female activity.

3.4.2 Male Activity Measures

As with many religions, progress in the LDS church is marked by events. These events are similar to other religions. When a baby is born, it is 'blessed'. This is similar to christening in other faiths. Baptism in the LDS church usually occurs at age eight. It will not occur before this age, but anyone older than eight can be baptized. Baptism is a commitment to become a member of the LDS church and obey God's commandments. Men are also ordained into a lay priesthood starting at age 12. There are two types of priesthood: Aaronic and Melchizedek, and there are various offices within each priesthood. Advancement to the different priesthood offices usually occurs at a specific age We will be using these events to determine how active a person was during his life.

Up until this point, we have considered any person who has a record in the LDS church to be a member of the church. The LDS church creates a record for individuals after they are 'blessed.' Those babies that have been blessed do not always end up getting baptized at age eight. If they do not make the commitment of baptism, then we do not consider them members of the LDS church. If a person with a record in the LDS church did not get baptized before the age of 12, then we consider them in the non-LDS group. Until age 12, all children with records in the LDS church (whether or not they are baptized) are considered members of the LDS church. We make no distinction between active and less-active for those children who died at ages 1-11 because their activity is largely based on their parents' activity, and we do not have information on parents.

At the age of 12, we can begin to differentiate between active and less-active members of the LDS church using a surrogate measure. As male members of the LDS church age and gain more responsibilities, they are ordained to different offices in the LDS

priesthood. Most of the priesthood ordinations occur at specific ages, so we use these offices as a surrogate measure for activity. We will consider a deceased male member of the LDS church to be active based upon his age and priesthood office at the time of his death. Table 3.3 shows the criteria we have used to determine the activity of the LDS males. This criteria is applied to all state of Utah records which linked to a record in the LDS data.

Table 3.3: Activity Determination for LDS Males

Age of Deceased	Active if ordained a ...	Less-active if ...
12-14	Deacon	Not ordained
15-16	Teacher	Not ordained, Deacon
17-19	Priest, Elder	Not ordained, Deacon, Teacher
20-54	Elder, High Priest, Seventy	Not ordained, Deacon, Teacher, Priest
55+	High Priest, Seventy	Not ordained, Deacon, Teacher, Priest, Elder

We use the same activity criteria in Table 3.3 to stratify the male LDS population in Utah. There is one problem which we must deal with before applying the activity criteria to the male LDS population. Section 3.2.2 mentions that the male data is stratified by priesthood office for 1985-1993. For 1994-1995, the male population data is not stratified by Melchizedek priesthood office. This presents a problem for obtaining population numbers for LDS males older than 55.

To estimate these numbers for 1994-1995, we use the percentage of elders, seventies, and high priests for each age 55 and above from the years 1991-1993. These percentages are multiplied by the total number of Melchizedek priesthood holders in the years 1994 and 1995 to obtain estimates of the population at risk for each of these

priesthood offices.

3.4.3 Female Activity Measures

As with male deaths, those female LDS records not baptized by the age of 12 are considered to be non-LDS and those ages 1-11 are considered LDS, but we cannot distinguish between active and less-active LDS.

LDS women are not ordained to the priesthood, so we cannot use priesthood office as a surrogate measure for activity. Nor is there an adequate surrogate measure of activity on the church records; therefore, we have to estimate the number of less-active and active LDS women. Our criteria in section 3.4.2 allows us to stratify the LDS men into active and less-active. At each age group'we calculate the ratio of active to less-active males and apply this ratio to the number of LDS female deaths. This method of estimation assumes that the death rate ratio for active to less-active LDS females is the same as the death rate ratio for active to less-active males. There are no studies to verify this assumption, but it seems to be reasonable.

In order to stratify the Utah LDS female population into active and less-active groups, we follow a similar procedure as we did with the Utah LDS female deaths (previous paragraph). We apply the proportion of active male and less-active male populations to the total female LDS population. In so doing, we are making the assumption that the ratio of active LDS to less-active LDS is the same for female LDS as it is for male LDS. We have no way to assess the validity of this assumption, but we expect that it underestimates the activity level of women. .

3.4.4 Misclassification and Activity Measures

Section 3.3.4 discusses the estimation of the misclassification of LDS deaths as

non-LDS deaths. Because we are adding misclassified deaths to the LDS deaths, we need to determine which deaths should be included in the active and less-active groups. We can do this by applying the activity criteria in section 3.4.2 to the male sample discussed in section 3.3.4. Using the activity criteria, those deaths which matched to LDS records can be classified as active or less-active. The percentage of active LDS deaths of the total deaths can be calculated. This percentage is applied to the estimated matches (column six of Table 3.1). This estimated number of misclassified active deaths is then added to the total number of active deaths. This process is repeated for the less-active LDS group. The results of applying the activity criteria to the male sample is found in Table 3.4.

Table 3.4: Stratification of Misclassified LDS Males into Active and Less-Active Groups

Age Group	Sample Size	Number Matched to LDS records	Number of Active LDS	Number of Less-active LDS	% Active	% Less-active
10-19	131	21	7	14	33.33%	66.67%
20-29	296	46	8	38	17.39%	82.61%
30-39	218	43	7	36	16.28%	83.72%
40-49	125	25	8	17	32.00%	68.00%
50-59	75	10	1	9	10.00%	90.00%
60-69	50	10	1	9	10.00%	90.00%
70-79	50	5	2	3	40.00%	60.00%
80+	50	8	5	3	62.50%	37.50%

3.5 Mortality Experience

3.5.1 Introduction

All of the previous sections in this chapter have described the methods we have used in order to determine the number of deaths and populations at risk for each of the

four groups of interest. These two elements, number of deaths and population, are used to calculate the mortality rate of a population.

The next two sections describe the calculation of mortality rates and several important assumptions we have made concerning the mortality rates of our populations. In section 3.6 we use the mortality rates from this section to construct life tables. The rest of this chapter relies heavily on the life table construction methods found in Chiang's 1984 book: *The Life Table and Its Applications*.

3.5.2 Calculation of Mortality Rates

Chiang defines the age-specific mortality rate as

$$M_x = \frac{D_x}{P_x} \qquad \text{(Chiang, p. 119)}$$

Where D_x is the number of deaths at age x and P_x is the midyear population of the group at age x. From the age-specific mortality rate, we can calculate the probability of death at age x which is essential in the construction of a life table. The formula for the probability of death at age x is

$$\hat{q}_x = \frac{M_x}{1 + (1 - a_x) M_x} \qquad \text{(Chiang, p. 119)}$$

This equation is for those intervals of one year (x, $x+1$). In order to calculate the probability of death, we need to make an assumption about the distribution of deaths within each year. In other words, are more people dying during the first few months of the year or near the end? Infants generally die during the first weeks of life, so the value for a_0 tends to be small. If a_x is .5 then the construction of the above formula for probability of death assumes that the deaths occur uniformly over the year or in other

words, a uniform distribution of deaths.

Although there are other distributional assumptions regarding deaths, the uniform distribution of deaths assumption is widely used (Chiang, p. 73). The actual values of a_x vary with country. Chiang includes tables with values listed for various countries including the United States. We have taken our values for a_x from Table 24 in his book (Chiang, p. 287).

3.5.3 Age-Specific Mortality Rate Assumptions

We have mentioned before that we have made several assumptions regarding the age-specific mortality rates of our four groups. The first assumption is that the mortality rate for infants is the same for all groups. We have made this assumption primarily because it is difficult, if not impossible, to distinguish between LDS and non-LDS for infants.

The second assumption involves the active and less-active LDS groups. Both of these groups are assumed to have the same mortality rate until the age of 12. Since we cannot realistically distinguish between active and less-active LDS before the age of 12, we use the same rate for both groups.

3.6 Complete Current Life Tables

3.6.1 Introduction

The methodology of this section will be take from Chapter 6 of Chiang's *The Life Table and Its Applications*. According to Chiang there are two common forms of the life table. Cohort life tables "record the actual mortality experience of a particular group of individuals (the cohort) from the birth of the first to the death of the last member of the group" (Chiang, p. 114). The current life table "gives a cross-sectional view of the

mortality and survival experience of a population during a current year" (Chiang, p. 114). Although the life tables are similar in appearance, their construction is different so it is important to know which table can be constructed.

The type of life table created is determined by the data available. Current life tables are much easier to construct because the data are easier to obtain. As Chiang has stated, in order to construct a cohort life table, we must follow the group until the last member dies and then we can construct the table. Cohort life tables are more time consuming and more expensive.

Chiang also describes one more distinction that can be made between life tables. They can be complete or abridged (Chiang, p.115) The distinction between abridged and complete is the length of the age interval. A complete life table has one year intervals. Abridged life tables have intervals larger than one year; typically five year age intervals are used. We will create complete, current life tables.

3.6.2 Elements of a Complete Current Life Table

Although we use the same methodology to calculate our life tables as Chiang describes in his book, our tables are organized a little differently (Chiang, p. 115). They contain all of the same elements, but the columns are ordered differently. The first few years of a sample life table are included as Table 3.5.

The first column lists the age interval. The interval begins with age x and ends at the beginning of age $x+1$. The interval notation that Chiang uses is $(x, x+1)$ and we will adopt the same notation (Chiang, p. 116). The final age interval, the $85+$ group, contains the information on all of those who live past the age 84. Because this age group is open ended, it requires special calculations.

The next three columns are the age-specific mortality rate (M_x), distribution of deaths in the interval (a_x), and the probability of dying within the interval (q_x) respectively. Each of these quantities and their relationships with one another is discussed in section 3.5.2 of this thesis.

The fifth column is the number of people alive at age x. Chiang says that "the first number in this column, l_0, is an arbitrary figure called the 'radix,' while each successive figure represents the number of survivors at the exact age x from a group of size l_0" (Chiang, p. 116). Commonly l_0 is chose to be 100,000. Because l_x is an arbitrary number, it has no meaning outside of its specific life table.

The sixth column is the number of people dying in the interval (d_x). This value is calculated using the number alive at age x and the probability of dying in the interval (x, $x+1$). The formula is

$$d_x = l_x \hat{q}_x \qquad \text{(Chiang, p. 116)}$$

By calculating d_x, we also have the information necessary to compute l_{x+1}, the number of people that will be alive at age $x+1$.

$$l_{x+1} = l_x - d_x \qquad \text{(Chiang, p. 116)}$$

In the final interval, $85+$ in our life tables, the number of deaths (d_{85}) will equal the number of people alive at the beginning of the interval (l_{85}). Because the interval does not have an upper bound, all of the people alive during this interval must eventually die within the interval.

The seventh column contains the number of years lived by the group in the interval (x, $x+1$). Those members of the group who live through the whole interval add one year each to this total. Those who die during the interval contribute the fraction of the year

they lived to the total. The formula is given as

$$L_x = (l_x - d_x) + a_x d_x \qquad \text{(Chiang, p. 117)}$$

The *85+* interval requires a special formula to estimate the number of years lived in the interval because it is an infinite interval. The subscript denoting the final interval is *w* instead of *x*.

$$L_w = \frac{l_w}{M_w} \qquad \text{(Chiang, p. 125)}$$

The eighth column is the total number of years lived beyond the age *x*. This is simply the sum of all of the remaining L_x's.

$$T_x = \sum_{i=x}^{w} L_i \qquad \text{(Chiang, p. 117)}$$

The ninth and final column is the expectation of future life or life expectancy (e_x). Life expectancy is the number of years a person that has survived to age *x* can expect to live. This value, unlike many elements of the life table, has meaning when compared to other life expectancies calculated using the same methods. In other words, it does not depend on the choice of l_0. The formula for the expectation of life is

$$\hat{e}_x = \frac{T_x}{l_x} \qquad \text{(Chiang, p. 118)}$$

An example of each of the elements discussed in this section is found in Table 3.5 below. The next section discusses important properties of the expectation of live which allow statistical comparisons between expected lifetimes of different populations.

Table 3.5: Sample Life Table

Age (x)	M_x	a_x	q_x	l_x	d_x	L_x	T_x	e_x
0	0.00572	0.09	0.00569	100000	569	99482	8390908	83.91
1	0.00058	0.39	0.00058	99431	58	99396	8291426	83.39
2	0.00031	0.39	0.00031	99373	31	99355	8192030	82.44
3	0.00031	0.39	0.00031	99343	31	99323	8092675	81.46
4	0.00027	0.39	0.00027	99311	27	99295	7993352	80.49
5	0.00009	0.39	0.00009	99285	9	99279	7894057	79.51
6	0.00014	0.45	0.00014	99276	14	99268	7794778	78.52
7	0.00014	0.45	0.00014	99262	14	99254	7695509	77.53
8	0.00009	0.45	0.00009	99248	9	99243	7596255	76.54
9	0.00021	0.45	0.00021	99239	21	99227	7497012	75.55
10	0.00019	0.45	0.00019	99218	19	99208	7397784	74.56

3.6.3 Properties of e_x

In chapter eight of his book, Chiang discusses statistical inference regarding elements of life tables. One of our goals is to compare life expectancy for active LDS members to the life expectancy of other long-lived populations, so it is important to know the properties of our observed expectation of life.

In order to calculate a variance for the observed expectation of life, we need to look first at the probability of death at age x (q_x). Because the observed expectation of life is a function of q_x, if we can calculate a variance for it then we can derive the variance of the observed expectation of life. Chiang assumes a binomial distribution for q_x and by so doing is able to calculate the variance,

$$\sigma^2_{\hat{q}_x} = \frac{\hat{q}_x^2(1-\hat{q}_x)}{N_x} \qquad \text{(Chiang, p. 79)}$$

The quantity N_x represents the population of risk at age x. Using this information, Chiang is able to calculate the variance of the observed expectation of life

$$S^2_{\hat{e}_x} = \sum_{t=x}^{w-1} \hat{p}_t^2[(1-a_t)\,N_t + \hat{e}_{t+1}]^2\, S^2_{\hat{p}_t} \qquad \text{(Chiang, p.163)}$$

where $\hat{p}_i = 1 - \hat{q}_i$ and its variance is $S^2_{\hat{p}_i} = \dfrac{\hat{q}_i^2(1-\hat{q}_i)}{d_i}$ (Chiang, p. 163)

Now that we have an unbiased estimator of the true expectation of life and its variance, we need to investigate the distribution properties of the observed expectation of life.

Because the observed expectation of life is a sample mean and because "life tables are usually based on large populations, the central limit theorem and methods of statistical inference" apply to it (Chiang, p. 153). This means that we can use the normal distribution to approximate the distribution for the observed expectation of life.

3.7 Conclusion

In this chapter we have discussed the methodologies used to create the life tables which are presented in chapter 4 and discussed in chapter 5. We have also noted several of the assumptions used to create these life tables. The implications of these assumptions are discussed in chapter 5. The life tables themselves are created using techniques discussed in *The Life Table and Its Applications* by Chin Long Chiang. We have also investigated the properties of the expectation of life in order to develop statistical tools which allow us to compare the life expectancies of different populations. The next chapter presents our finished life tables and compares them to published life tables.

Chapter 4

RESULTS

4.1 Introduction

This chapter describes the life tables we have constructed using the methodologies from chapter 3. The tables are not included in their entirety in this chapter, instead the entire tables are included in Appendix A. Two summary tables, one for each gender, are included in this chapter which give observed life expectancy and 95% confidence intervals for each of the groups at four ages: birth, age 20, age 35, and age 65. The summary table for males is Table 4.2 and is found in section 4.2.1. Table 4.4 describes the female life expectancies and is found in section 4.3.1.

The next section gives the results for the male life tables we have created. It shows the increase in active LDS life expectancy over the average US male and also compares the life expectancy to published tables of long-lived populations. Section 4.3 makes the same comparison using the female life tables.

Most of the comparisons will be done with the active LDS groups in each gender because those are the groups which we expect to have the high life expectancy. There are basic comparisons with the other three groups, but these comparisons are mostly done with point estimates and not confidence intervals.

4.2 Male Life Tables

4.2.1 Introduction

This section summarizes the data used to create the life tables for the four groups of interest. This summary is intended to give the reader a basic idea of the number of

deaths and the sizes of each population. This information is found in Table 4.1. Table 4.2 describes the male life expectancies for each of our groups of interest at several ages.

Table 4.1: State of Utah Deaths and Population Sizes for Males 1991-1995

Age Group	Group of Interest	Deaths	Population at Risk
0-1	All	739	95,748
1-12	LDS	177	710,196
	Non-LDS	157	301,108
12+	Active LDS	9,453	1,681,144
	Less-active LDS	7,645	822,781
	Non-LDS	9,593	1,058,006
All	Total Utah	27,764	4,668,983

Table 4.2: Male Utah Life Expectancies for Groups of Interest, 1991-1995

Group of Interest	Life Expectancy (95% CI)			
	Birth	Age 20	Age 35	Age 65
Total Utah	75.0 (73.0, 77.1)	56.3 (54.3, 58.3)	42.4 (40.5, 44.3)	16.8 (15.1, 18.5)
Non-LDS	71.5 (69.3, 73.7)	53.1 (51.0, 55.2)	39.7 (37.7, 41.7)	15.0 (13.3, 16.8)
Less-active LDS	71.6 (69.4, 73.8)	52.9 (50.8, 55.0)	39.3 (37.3, 41.4)	15.3 (13.4, 17.2)
Active LDS	79.8 (78.0, 81.7)	61.0 (59.2, 62.7)	46.4 (44.7, 48.1)	18.9 (17.4, 20.5)

4.2.2 Utah Male Life Table

The first group we will look at is the overall Utah life table. We can check the validity of our life table by comparing it to the tables published by the National Center for Health Statistics (NCHS) for the years 1989-1991. Summary values for the male Utah group can be found in Table 4.2. The complete male Utah life table is included in the appendix as Table A.1.1.

The life expectancy at birth for males in our life table is 75 years. The NCHS life tables published for 1989-1991, give the life expectancy for Utah males as 74.9 years (NCHS p.9). There is no meaningful difference between our life table and the NCHS life table.

4.2.3 Utah Non-LDS Male Life Table

There are several comparisons we can make with the Utah non-LDS male life table. We can compare it to the life expectancy of the average US male. Table 4.2 shows the non-LDS male life expectancy at birth to be 71.5 years. According to the NCHS, the life expectancy of the average US male at birth is 71.8 for the years 1989-1991 (NCHS p. 9). The difference of about one third of a year is not substantial, so Utah males who are not members of the LDS church appear to have similar life expectancies to an average US male.

It is also interesting to see how the Utah non-LDS male life expectancy compares to the active LDS and the less-active LDS, but these comparisons will be made in later sections. The entire non-LDS life table is found in the appendix as Table A.1.2.

4.2.4 Utah Less-Active LDS Male Life Table

The only comparisons we are interested in making with Utah less-active LDS males is to the non-LDS group and eventually to the active LDS group. Table 4.2 shows the expected life for non-LDS Utahns at birth to be 71.5 years. The same table shows less-active LDS male life expectancy in Utah to be 71.6 years at birth. Again, there is very little difference between these two life expectancies. The non-LDS and less-active LDS have very similar life expectancies to an average US male. The entire less-active LDS male life table is in the appendix as Table A.1.3.

4.2.5 Utah Active LDS Male Life Table

As expected, the active LDS males have a long life expectancy. The full life table can be found in the appendix as Table A.1.4. Table 4.2 shows the life expectancy at birth for this group to be 79.8 years. This value is substantially larger than the 1989-1991 NCHS value of 71.8 years for the average US male. It appears that the increase in life expectancy for active LDS males over the average US male is about eight years at birth.

Dr. John R. Wilmoth of the University of California at Berkeley has created a set of life tables for various nations. We will compare three of these life tables to our Utah active LDS male life table. The life tables can be found at http://demog.berkeley.edu/wilmoth/mortality/. The first comparison will be to a five year US male life table of the same time period as our active LDS life table. Although we have done a basic comparison between the active LDS life table and the NCHS life table at the beginning of this section, it is beneficial to do an in depth comparison using statistical inference. Because the active LDS Utah population is a subset of the US male population, a comparison can enumerate the increase in life expectancy for the active LDS group. Dr. Wilmoth's life table for US men can be found in the appendix as Table A.2.1. His life tables did not include an estimate of the variance for the observed life expectancy, so we have calculated this value, as well as a 95% confidence interval and included them with the life table.

Figure 4.1 graphically represents the life expectancies and confidence intervals of the US men and the active LDS men. The confidence intervals of the two groups do not overlap until age 68. In other words, until age 68, the active LDS men have a statistically higher life expectancy than an average US male.

A second comparison of interest involves the Japanese population. The Japanese have the longest life expectancy of any nation in the world (WHO, 1999). Dr. Wilmoth's male Japanese life table for 1991-1995 can be found in the appendix as Table A.2.2. We have estimated the variance of the observed life expectancy and the confidence limits for each age group to his life table.

The Japanese life table for males has the life expectancy at birth of the 1991-1995 group at 76.3 years. The complete Japanese male life table can be found in Table A.2.2 in the appendix. The active LDS life expectancy for males is about 3.5 years higher at 79.8. Although three and a half years may seem like a significant amount, figure 4.2, shows no overlap in the confidence intervals of the two life expectancies at age 0. The confidence intervals do overlap at age 0, but do not overlap again until age 51. This is not easily visible in the graph since there is so little difference between the lower confidence limit of the active LDS men and the upper confidence limit of the Japanese men. Although the confidence intervals appear to overlap in the figure at every age group, they actually do not overlap at ages 1 to 51. At those ages the active LDS males have a higher life expectancy. After age 51 both life expectancies are statistically equivalent.

Although we cannot verify this assumption, it is percieved that a large number of the original immigrants to Utah were of Scandinavian descent. For this reason, we have decided to compare the active LDS males to Swedish males. We have chosen to use just Swedish life tables because at present those are the only life tables available on the Berkeley demography website. Swedish males have the 3rd highest national life expectancy for males (WHO, 1999). The life table for Swedish males can be found in the appendix as Table A.2.3.

At birth, Swedish males have a life expectancy of 75.6 years. Active LDS males for the same time period have a life expectancy 4.25 years higher. This difference is statistically significant; in fact, life expectancies for these two populations are statistically different until age 63. At age 64 the 95% confidence intervals begin to overlap. Figure 4.3 shows each group's life expectancy with 95% confidence intervals.

In chapter 2, we present the results of a 1978 study by Enstrom which compares the life expectancies at age 35 for three active LDS groups to two non-smoking groups and to the 1970 US male population (Enstrom, 1978). Enstrom finds a 7.5 year increase in life expectancy for Utah active LDS males over the average 1970 US male. Our results are very similar for Utah active LDS males in 1991-1995 compared to the 1991-1995 life table for US males during 1991-1995. At age 35, the active LDS males live 6.7 years longer.

There is one final comparison we can make with the active LDS male group. In 1999, Hummer, Rogers, Nam and Ellison published a study on religion and adult mortality in the United States (Hummer et al., 1999). The study estimates adult mortality for a sample based on the number of times they attend church each week. The details of this study are discussed in greater detail in chapter 2. Regrettably a complete life table is not furnished, but the article does contain life expectancy estimates for males at age 20. They report that those males who attend church more than once a week have a life expectancy of 61.3 years at age 20 (Hummer et al., 1999). At age 20, active LDS males have a life expectancy of 61 years with an upper confidence limit of 62.7 years. There is no statistical difference between the active LDS male life expectancy at age 20 and the estimate published by Hummer, Rogers, Nam and Ellison.

Figure 4.1 Expected Life of Active LDS & US Males 1991-1995

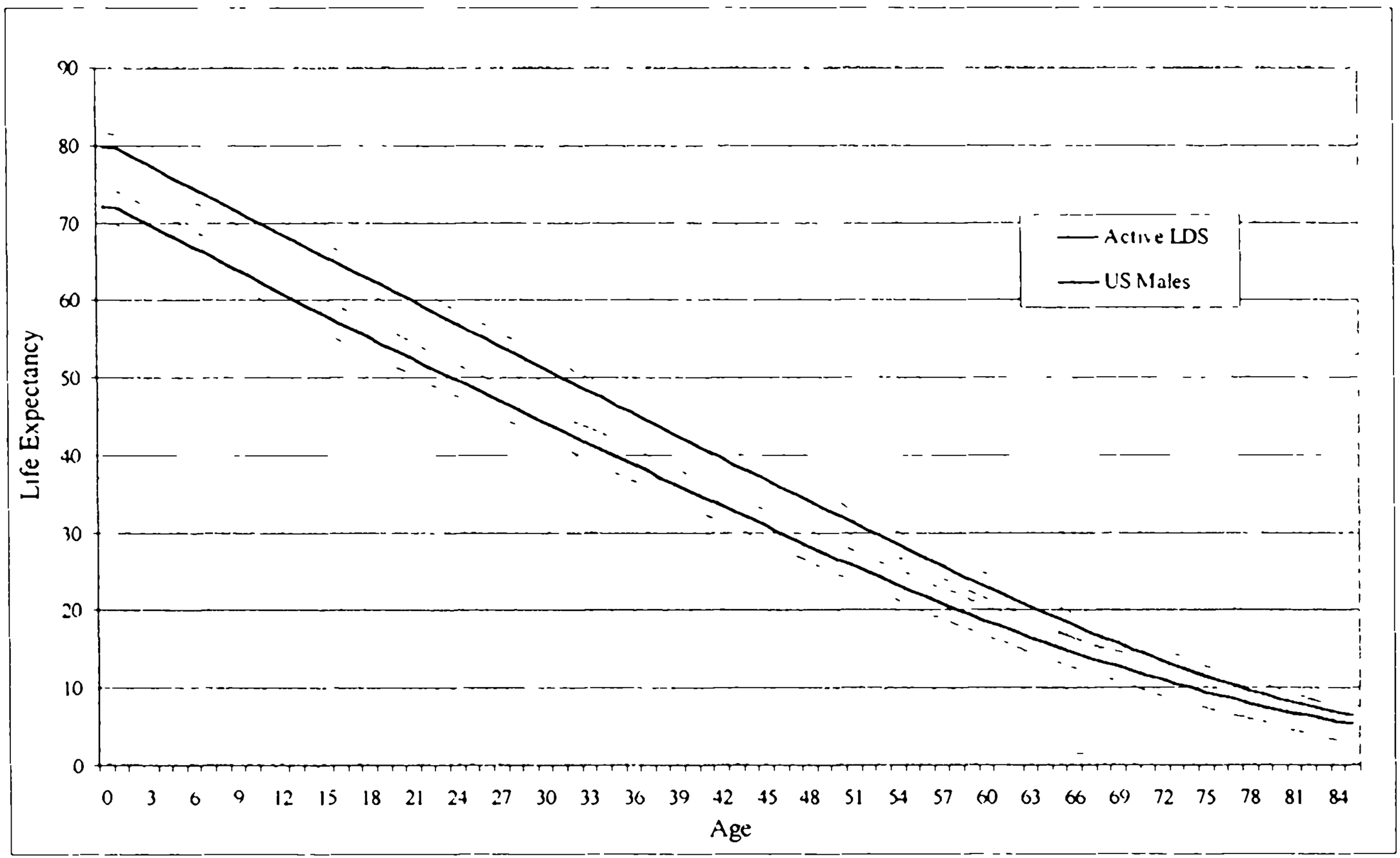


Figure 4 2 Expected Life of Active LDS & Japanese Males 1991-1995

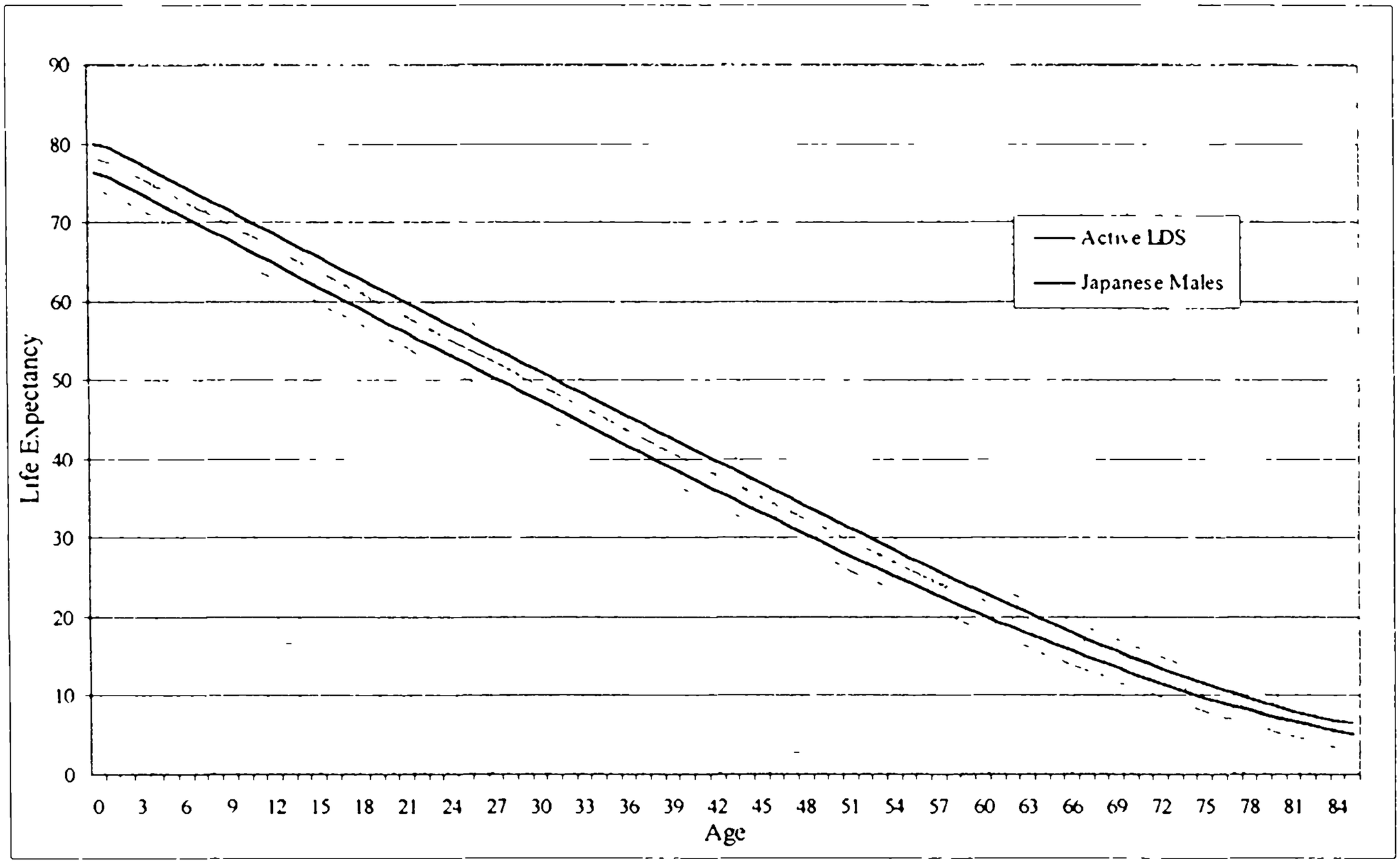
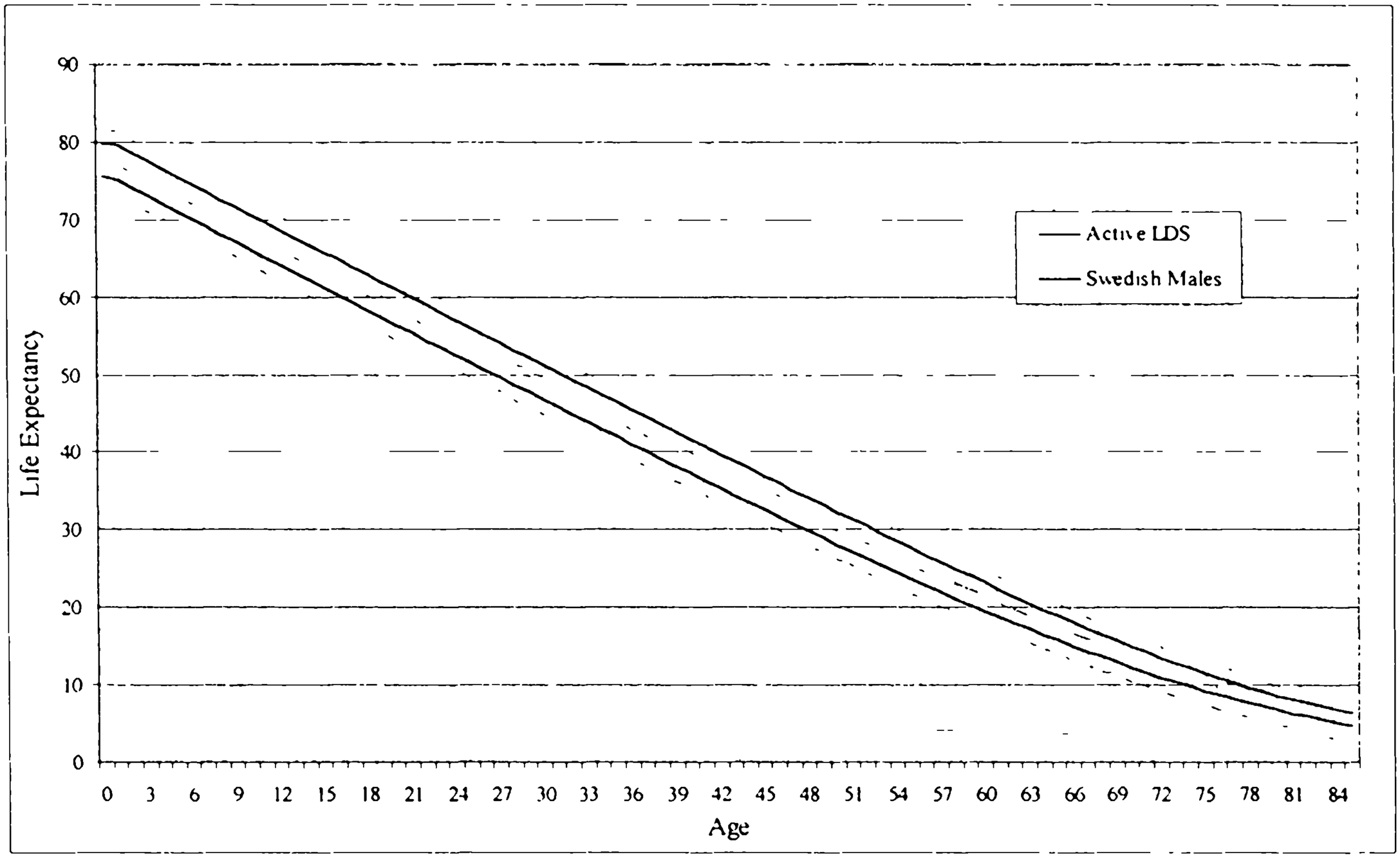


Figure 4 3 Expected Life of Active LDS & Swedish Males 1991-1995



4.3 Female Life Tables

4.3.1 Introduction

This section summarizes the data used to create the life tables for the four groups of interest. This summary is intended to give the reader a basic idea of the number of deaths and the sizes of each population. This information is found in Table 4.3. Table 4.2 describes the male life expectancies for each of our groups of interest at several ages.

Table 4.3: State of Utah Deaths and Population Sizes for Females 1994-1998

Age Group	Group of Interest	Deaths	Population at Risk
0-1	All	562	98,243
1-12	LDS	150	657,594
	Non-LDS	104	330,360
12+	Active LDS	11,602	1,926,882
	Less-active LDS	7,187	943,092
	Non-LDS	8,475	1,121,858
All	Total Utah	28,080	5,078,029

Table 4.4: Female Utah Life Expectancies for Groups of Interest, 1994-1998

Group of Interest	Life Expectancy (95% CI)			
	Birth	Age 20	Age 35	Age 65
Total Utah	80.4 (78.6, 82.3)	61.3 (59.5, 63.1)	46.8 (45.0, 48.5)	19.7 (18.2, 21.3)
Non-LDS	77.4 (75.5, 79.3)	58.4 (56.6, 60.3)	44.2 (42.4, 46.0)	17.8 (16.2, 19.4)
Less-active LDS	77.7 (75.7, 79.7)	58.6 (56.6, 60.5)	44.2 (42.3, 46.1)	18.4 (16.7, 20.1)
Active LDS	83.9 (82.3, 85.6)	64.7 (63.2, 66.3)	49.9 (48.4, 51.5)	21.6 (20.2, 23.0)

4.3.2 Utah Female Life Table

As with the male Utah life table, the female Utah life table can be compared to the

NCHS 1989-1991 Utah life table. This comparison allows us to check our Utah female life table to see if our results are reasonable. The complete female Utah life table is found in the appendix in Table A.3.1.

The NCHS calculates the life expectancy of the average Utah female in 1989-1991 to be 80.4 years at birth (NCHS, p. 9). Table 4.4 gives the female Utah life expectancy to be 80.4 years at birth. The life expectancies are the same, so we feel confident with our life table results.

4.3.3 Utah Non-LDS Female Life Table

It is expected that the Utah non-LDS females will have a similar life expectancy to an average US female. The non-LDS life expectancy at birth is 77.4 years according to Table 4.4. The full non-LDS life table can be found in the appendix in Table A.3.2. The average US female expected to live 78.8 years in 1989-1991 according to the NCHS (NCHS, p. 9). Although the difference of 1.4 years seems notable, the 95% confidence interval for observed life expectancy at birth for the non-LDS females has an upper limit of 79.3 years which is greater than the average US female life expectancy.

Other meaningful comparisons involve comparing the non-LDS females to less-active LDS females and to active LDS females. The results of these comparisons are presented in sections 4.3.4 and 4.3.5.

4.3.4 Utah Less-active LDS Female Life Table

The full Utah less-active LDS life table can be found in Table A.3.3 of the appendix. At birth, Utah less-active females can expect to live 77.7 years according to Table 4.4. This is similar to the observed life expectancy of 77.4 years for non-LDS females presented in the same table. The average expected life of a female in the US

during 1989-1991 was 78.81 years (NCHS, p. 9). Although this is more than a year higher than the estimate for less-active LDS women, it still falls within the confidence bands of the less-active LDS female life expectancy. There is no statistical difference in the life expectancy at birth for less-active LDS females, non-LDS females, and US females.

4.3.5 Active LDS Female Life Table

As with active LDS males, we will be making several comparisons to the active LDS female life expectancy. Like their male counterparts, this group of active LDS females exhibits a large increase over the US female life expectancy. The full life table can be found in the appendix in Table A.3.4. Table 4.4 gives the life expectancy for active LDS females at birth to be 83.9 years. This is more than 6 years longer than less-active LDS females and non-LDS females of the same time period. The average US female was expected to live 78.8 years in 1989-1991 (NCHS, p. 9). An average active LDS female lives more than 5 years longer than that. A more in-depth comparison between active LDS females and US females follows.

As with males, we will be comparing the life expectancy of an active LDS female to several long-lived populations. The Berkeley Mortality Database contains several life tables which we intend to use in our comparisons. This is the same database which has provided us with male life tables used in the comparisons in section 4.2 of this chapter. The database can be found at http://demog.berkeley.edu/wilmoth/mortality/. Because the most recent five year life table for women in the Berkeley database is 1991-1995, we will use that five year time period as a comparison to the active LDS women life tables for 1994-1998. For each of the Berkeley life tables used in this section, we have calculated a

standard error and 95% confidence interval using the methods discussed in section 3.6.3.

The first comparison is a more in-depth analysis of the difference between US females and active LDS females. The life table for US women from the Berkeley database can be found in the appendix in Table A.4.1. This is an important comparison, because it demonstrates the increase in life expectancy of the active LDS females over the average US female. Figure 4.4 contains a graph of the life expectancy for both active LDS females and US females with 95% confidence intervals.

At birth, active LDS women have a life expectancy of 4.9 years longer than the average US female as compared to the Berkeley database life tables. The 95% confidence intervals in figure 4 4 do not overlap until age 58. Statistically, the active LDS females have a longer life expectancy than US females until age 58.

A second important comparison is with Japanese women. Of all the nations, Japanese females live longer than any other female group (WHO, 1999). It is for this reason that we compare active LDS women to Japanese women. The complete life table for Japanese women can be found in the appendix in Table A.4.2. Figure 4.5 compares the life expectancy for Japanese women to the active LDS women. At birth, active LDS women are expected to live about 1.3 years longer than the average Japanese women. From the graph we can see that the 95% confidence intervals always overlap. There is no statistical difference between the life expectancy for these two groups.

The third and last comparison using the Berkeley database life tables is with Swedish women. Swedish females have the 6th highest national life expectancy for females (WHO, 1999). Again, we believe that many of the original LDS church members to immigrate to Utah were of Scandinavian descent. This comparison is meaningful because

both groups have similar genetic makeup and heritage. Because the Swedish life tables are the only Scandinavian life tables available, they are compared to the active LDS women. The entire life table for Swedish women is found in the appendix in Table A.4.3. Figure 4.6 shows the expected life of each group at each age. Confidence intervals are also included for each group. At birth, the expected life time for a Swedish female is about 81 years. An average active LDS female expects to live almost three years longer than that. Although this seems like a large difference, the 95% confidence intervals for both groups always overlap. The confidence intervals do not show a statistical difference between the two groups. A two-sided t-test indicates that active LDS females have a higher life expectancy at birth than Swedish females (p-value = 0.02).

The final comparison will be a comparison to the study presented by Hummer, Rogers, Nam and Ellison in 1999. The study estimates adult mortality for a sample based on the number of times they attend church each week. The particulars are discussed more in depth in chapter 2. Although they do not include complete life tables, there are expected life estimates at age 20 for several groups. The paper estimates the life expectancy of a religious woman at age 20 who attends church more than once a week to be 64 years (Hummer et al., 1999). Because they do not include a full life table, we cannot create a 95% confidence interval. The expected life future lifetime of a 20 year-old active LDS female is 64.7 years. The 95% confidence interval for this estimate does include 64 years, so we cannot say there is a difference in life expectancy for the two groups.

Figure 4.4 Expected Life of Active LDS Females 1994-1998 & US Females 1991-1995

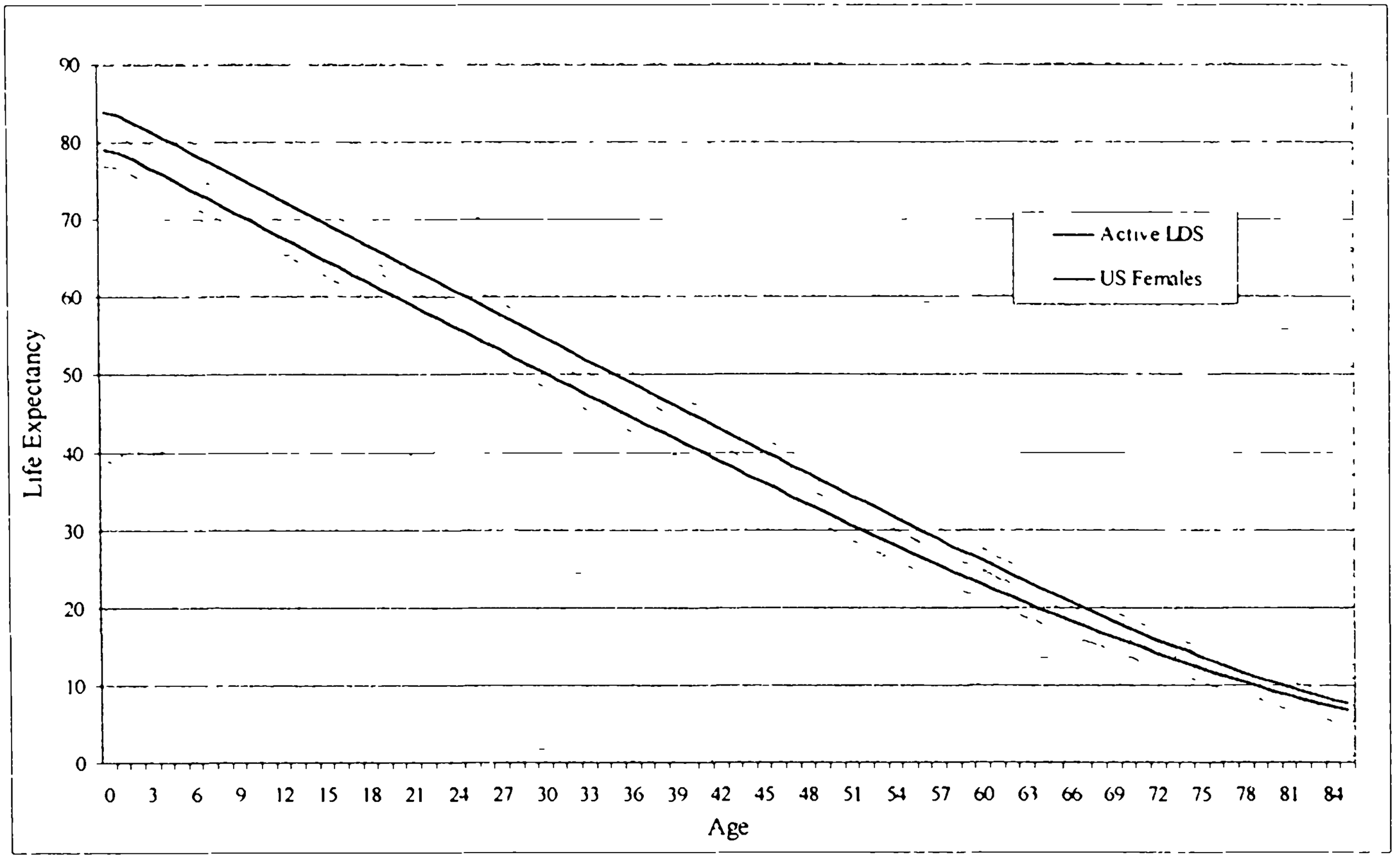


Figure 4 5 Expected Life of Active LDS Females 1994-1998 & Japanese Females 1991-1995

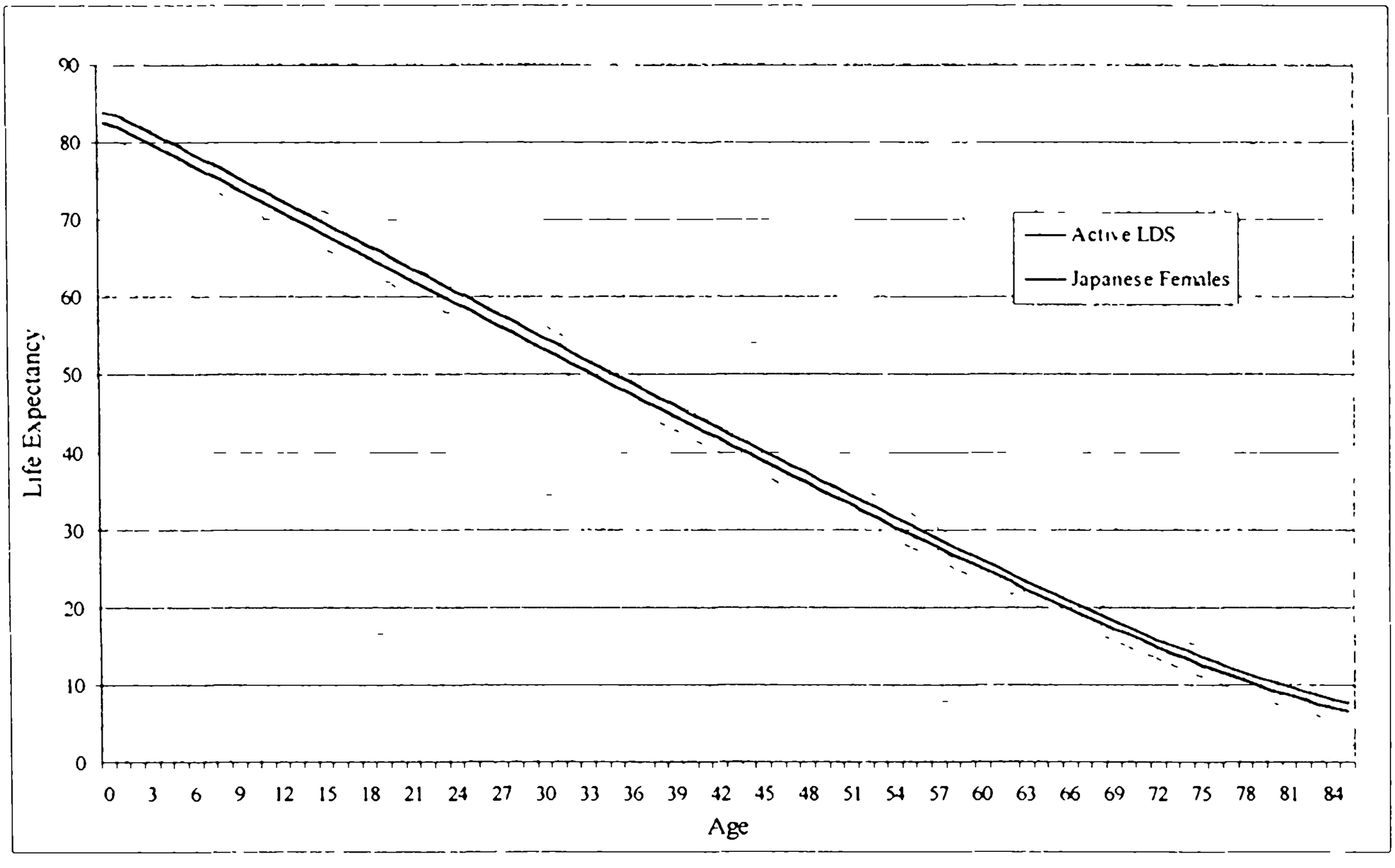
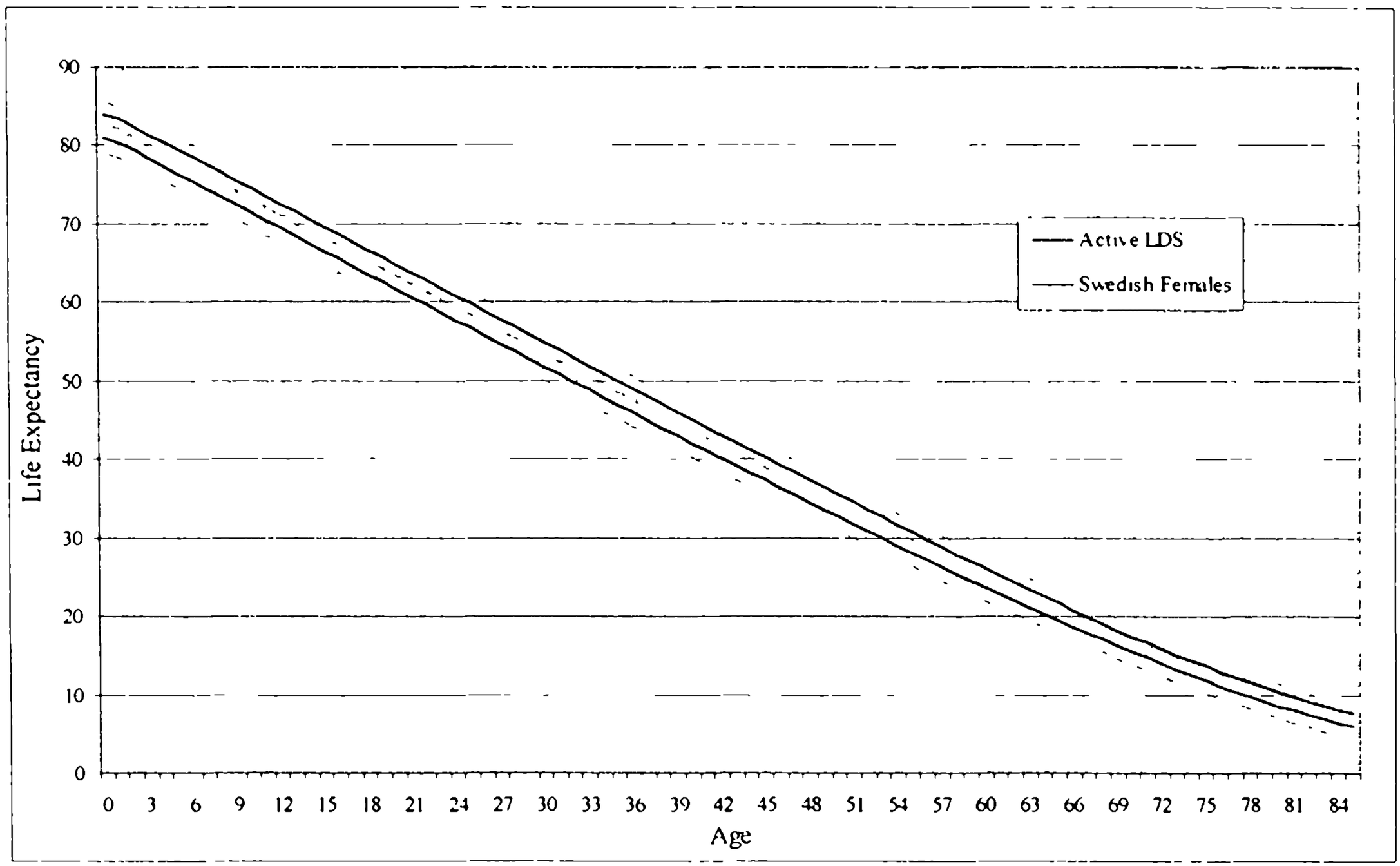


Figure 4 6 Expected Life of Active LDS Females 1994-1998 & Swedish Females 1991-1995



4.4 Conclusion

This chapter contains all of the important comparisons we wish to make to the life tables we have created Our Utah life tables for both male and female are almost identical to those created by the NCHS. The non-LDS and less-active LDS populations show no statistical difference in life expectancy from each other and from an average person in the United States. For the most part, the active LDS groups have a life expectancy which is higher than the group they are being compared with. The exception to this finding is the active LDS women. Their life expectancy at birth is not statistically different from the Japanese women, but is statistically different from the Swedish women. Active LDS men have a statistically higher life expectancy at birth than both Japanese and Swedish men.

The next chapter discusses the implications of the comparisons made in this chapter. It also addresses the effects of assumptions on the calculated observed life expectancies. Finally, it examines the importance of our findings.

Chapter 5

DISCUSSION

5.1 Effect of Assumptions on Life Expectancies

5.1.1 Measures of LDS Church Activity

We believe that the surrogate measures used for LDS church activity are conservative in that they most likely over estimate the number of active LDS deaths. If these measures are conservative, we are probably underestimating the life expectancy for active LDS men and women. There are several decisions (assumptions) that we made that might result in underestimation.

First, we used the same infant mortality rate for the three sub-populations (active LDS, less-active LDS and non-LDS) of the state of Utah in each gender. This decision was made because our data does not allow us to differentiate between these groups at birth. However, there may be an important difference between the mortality rates at birth and in the first year of life for active LDS, less-active LDS and non-LDS. In one of the few studies comparing birth rates comparing LDS to non-LDS, Woolley et al., found that babies born to active LDS mothers had much lower rates of neonatal mortality (Woolley, et al., 1982). Non-LDS babies had a risk ratio twice that of active LDS babies. Less-active LDS babies had a risk ratio about five times higher than babies born to active LDS mothers. This study adjusted for a number of variables including maternal age and education, but the results did not differ greatly after adjusting. The authors feel that these findings are a result of the low use of tobacco and alcohol among the active LDS mothers.

Based upon Woolley's findings, the active LDS groups could have a substantially lower infant mortality rate than either the less-active LDS or the non-LDS which in turn impacts life expectancy estimates. For example, if we cut the infant mortality rate in half for active LDS, life expectancy increases by about one third of a year in males and one quarter of a year in females. By using the same infant mortality rate for all of our groups, we may be underestimating life expectancy for both active LDS males and females.

Since we are unable to differentiate between active and less-active LDS for ages 1-11, both groups have the same mortality rates for these ages. This assumption appears to have very little impact on life expectancy because the mortality rates for ages 1-11 are so small. Even if we cut the mortality rates in half for the active LDS group, the life expectancy at birth does not increase by more than one tenth of a year. There are no studies which discuss the mortality of active and less-active LDS children between the ages of 1-11. If there is a difference in the mortality of these two groups at age 1-11, we have no information on the magnitude of the difference.

Table 3.3 gives the activity criteria for determining the active and less-active LDS groups for males 12 years and older. We feel that these criteria are conservative for two reasons. First, the Aaronic priesthood offices (Deacon, Teacher, and Priest) are usually given to a boy at specific ages. If the boys do not receive the office by that specific age, then they are most likely not active in the LDS church. The criteria in Table 3.3 does not use the age that a boy should receive the priesthood, it uses an age one year later. For example, active LDS boys are usually ordained to the office of a Teacher at age 14; however, we classify a boy as active who is still a deacon at age 14. It isn't until a boy turns 15 and is still a deacon that he is classified as less-active.

After creating our life tables, we found that this one year buffer does not appear to have an impact on the life expectancy for active LDS males. If we change the criteria to allow only those boys ordained at the first possible age to be considered active, life expectancy actually drops by 0.03. This difference is immaterial. Because female activity is based on male activity, there is a similar change in female life expectancy if we use the more strict activity criteria.

A second reason that our activity measures for males are conservative is the age 55+ group in Table 3.3. This criteria counts those LDS males active if they are ordained a high priest or a seventy by the age of 55. Although there is no specific age requirements to be ordained a high priest, most active males are likely to be ordained to this office by the age of 50. Since October 1986, men have not been ordained to the office of Seventy. Our criteria in Table 3.3 is conservative because it assumes active LDS males will be ordained to these two offices by the age of 55 when they are probably ordained to high priest or seventy before the age of 55. There is not a substantial impact on life expectancy, but it is noticeable. If we change the age for this last activity criterion from 55 to 45, life expectancy for active LDS males increases by one tenth of a year. Because the female active LDS stratification depends on the male criteria (see section 3.4.3), the impact is similar to the female active LDS life expectancy.

There is an additional reason for suspecting that we are underestimating life expectancy estimates for females. Section 3.4.3 describes the methodology we use to stratify the female LDS deaths and population into active and less-active groups. In order to estimate this group, we have assumed that the ratio of active LDS male population to less-active LDS male population is the same as the ratio for active to less-active LDS

female population. However, we believe that the female LDS have a higher percentage of activity than do the male LDS. While we have no empirical evidence to support this, our experience suggests that this is the case. If this is true, we are underestimating the population size for the female active LDS group. This underestimation would result in an overestimate of mortality rates which in turn leads to shorter life expectancy. Thus, the life expectancy for active LDS females may be too small.

Overall, we have been conservative with our estimates of the active LDS life expectancies. The next section describes how we may have overestimated the number of LDS deaths which were classified as non-LDS. If this is true, this over-estimation would lead to inflated mortality rates for the active and less-active LDS groups for both genders.

5.1.2 Misclassification of LDS Deaths as Non-LDS Deaths

In section 3.3.4 we discuss the misclassification of LDS deaths as non-LDS. We were concerned that misclassification might occur for three reasons: 1) all of the LDS records did not match to a state death record (see sections 3.3.2 and 3.3.3), 2) all of the LDS deaths may not have been reported to the church, and 3) LDS formerly living out of Utah may have died in Utah without notifying the LDS church of their move to Utah. Section 3.3.5 shows the procedure we used in order to estimate the number of deaths incorrectly classified as non-LDS.

When we finished linking the male records, we found that 15,555 of 16,498 or 94.3% of the male LDS death records linked to the state death records. The remaining 5.7% is probably attributed to two causes: 1) records did not match because of clerical errors which occurred while entering the data, and 2) members of the LDS church who died outside of Utah, but whose LDS church records indicate they still live in Utah. We

are confident in our matching procedure and that clerical errors probably do not prevent a large number of records from matching, so a large portion of the 5.7% of LDS male death records which did not match to state death records are probably a result of LDS church members dying outside of Utah even though their LDS church records still indicates they are living in Utah. If this is true, then the actual percentage of LDS males dying in Utah which do not match to state of Utah death records is much smaller than 5.7% probably about 1% or 2%.

Besides those records not matching due to clerical errors, there are two other reasons, mentioned above, that LDS records may be misclassified as non-LDS. Because the estimates of misclassification (section 3.5.5) do account for the LDS deaths which were not reported to the LDS church and LDS members who died in Utah, but the church did not have their most recent residence in Utah, it is possible to add more than the 1% or 2% which is attributed to clerical errors. Anything greater than this would be attributed to these two causes. In fact, we added 1,954 misclassified male deaths to the total number of male LDS deaths (15,555) for our time period. This number of misclassified deaths accounts for 11.8% of the LDS male deaths for 1991-1995 reported by the LDS church. It is possible that the additional 10% is attributable to deaths not reported and LDS dying in Utah, but whose LDS church records indicate they live elsewhere. This 10%, about 1,650 deaths, seems to be a large number of deaths to attribute to these two causes. This suggests we might have overestimated the number of misclassified LDS for males.

The same problem of possible overestimation of the misclassified LDS is present in the female LDS population also. After the final linkage, 17,236 of 17,859 or 96.5% of female LDS deaths were linked with state records. There were 1,948 misclassified deaths

added to this total, which accounts for 10.9% of the 17,859 LDS female deaths for 1994-1998. So, about 9% or 10% of the misclassified LDS female deaths would be attributed to deaths not reported to the LDS church and to LDS females dying in Utah, but whose church records indicate they live outside of Utah.

If in fact the estimates for the number of misclassified LDS deaths are high, then this leads to inflated mortality rates. High mortality rates would lower life expectancy. If we have overestimated the number of misclassified LDS, we have underestimated the life expectancy for active and less-active LDS groups.

5.1.3 Life Table Assumptions

The choice of a_x, described in section 3.6.2, could impact the life expectancies for all three groups in each gender. We have chosen to use the values given in Table 24 of Chiang's book (Chiang, p. 287). Before using the values in Chiang's book, we used values from life tables produced by the state of Utah (Utah, 2000). For the most part, the values of a_x are similar. After the age of 10, both sets of a_x are about .5. At birth, Chiang gives a value of .09, but the state of Utah uses .2724 (Chiang, p. 287). For ages 1-10, Chiang's values slowly increase from .4 to about .5. The state of Utah immediately uses .5 after age 1. These differences have very little impact on the life expectancies. In fact, the state of Utah's values only increase the total number of years lived by the group (T_0) at birth by about 80 years for the active LDS male group. This may seem like a lot, but because T_0 is on the order of eight million years, it has no effect on the life expectancy. Changing a_x does not appear to have a large impact on the life expectancy, so we will continue to use Chiang's values.

5.1.4 Conclusions

For the most part, all of the assumptions either had little or no effect on the life expectancy or were conservative in that they likely underestimated the life expectancy for the active LDS group. We feel we have a conservative estimate for the life expectancies of active male and female members of the LDS church. Whenever we were required to make an assumption which might affect the life expectancy of these groups, we made the choice that would give the lower life expectancy. Because of this, any increase in life expectancy realized by these conservative estimates are probably lower than the true increase.

5.2 Discussion of the Results

5.2.1 The Increase in Life Expectancy

Chapter 4 details the increase in life expectancy for our Utah active LDS male and female populations over the male and female US populations. Active LDS males in Utah can expect to live eight years longer than the average US male and active LDS females in Utah can expect to live five years longer than US females on average. In chapter 2, we noted that Jarvis and Northcott have identified six ways that religion can affect mortality. Of these six effects, three could explain the increase in life expectancy in the Utah active LDS population: a proscription of harmful behaviors, encouragement of beneficial activities, and the church can act as a support group. It is of interest to determine how each of the three effects that apply to active LDS, contributed to the increase in life expectancy for active LDS males and females in Utah. It is likely that all three effects are confounded with one another and that we will be unable to partition the increase in life expectancy among them. The literature does give some indication of how the increase

might be partitioned.

In 1999, Hummer et al. found an increase in life expectancy of five years at age 20 for males who attended church regularly compared to the entire male sample who was supposedly representative of the US population (Hummer et al., 1999). The authors feel that "at least part of the linkage between religious involvement and mortality is due to [social ties and behavioral variables]" (Hummer et al., 1999). In other words, they attribute the increase in life expectancy to all three of the effects which we believe lead to the increase in life expectancy for Utah active LDS. The authors are unable to determine exactly how each of the effects impacts life expectancy.

A study by Enstrom might give us a better idea how to partition the increase in life expectancy (Enstrom, 1978). Enstrom compared three active LDS groups to several other groups including non-smokers and the 1970 US white male population. At age 35, the male active LDS groups were expected to live six to eight years longer than the average US white male in 1970. Those male groups which did not smoke had a life expectancy of between three and six years higher than the average US male at age 35. It is possible that about three to six years of the increase in life expectancy for active LDS males can be attributed to a proscription of harmful behaviors. Enstrom found that active LDS males lived about half a year to as much as five years longer than the non-smoking group. This increase can likely be attributed to the two remaining effects: encouragement of beneficial activities and the church acting as social support.

Although these two studies by Hummer and Enstrom give a basic idea of how to allocate the increase in life expectancy, they are unable to do so definitively. It appears that more than half of the increase can be attributed to proscription of harmful activities,

such as smoking, drinking alcohol, coffee, and tea. The rest of the increase is divided among the encouragement of beneficial activities and the support group effect of a religion. At best, we know little about how to allocate the increase in life expectancy.

The increase we have realized in this thesis can be useful to health policy makers and in the allocation of health resources. If it is indeed true that a large portion of the life expectancy increase in the active LDS group is attributable to the proscription of alcohol, tobacco, tea, and coffee then this information can be used when designing health programs. Although it may be difficult to implement the social or support structure of a religion into a health program, it could be useful to study the structure of the LDS Church to see how it is associated with the increase in life expectancy.

5.2.2 Comparisons with Long-lived Male Populations

Before comparing the active LDS male life expectancy to long lived populations, we compared our estimates of the Utah life expectancy to the NCHS 1989-1991 estimates for Utah life expectancy. We found that these two estimates are very similar. We also compared the Utah less-active and non-LDS populations to the NCHS 1989-1991 life expectancy for males. We found these to be very similar. This was expected because the non-LDS and the less-active LDS populations of Utah are similar to the average male in most respects.

Our comparison of active LDS life expectancy to Hummer's results found no significant difference between the two life expectancies at age 20. In his study, Hummer compared life expectancies between groups based on church attendance, his surrogate measure for religiosity. Our study looks at an actively religious group that also abstains from tobacco, alcohol, coffee, and tea. Because the Utah active LDS follow a health

code, we would expect their life expectancies to be statistically larger than Hummer's groups. At $\alpha = 0.05$, there is no statistical difference. This can be explained by the fact that Hummer's life expectancy estimates are biased upwards. Hummer admits that their estimates for life expectancy at age 20 are about three years higher than the published NCHS estimates (Hummer et al., 1999). They attribute the higher estimates to a very healthy sample because it is noninstitutionalized. They also attribute the lower mortality rate to an imperfect linking procedure. Because their study required the linkage of records, they feel that some deaths may have been missed which accounts for a lower mortality rate.

Given this bias in the point estimates, a better comparison of our results and Hummer's study may be the increase in life expectancy. Hummer argues that although their life expectancies may be biased, they "have no reason to suspect that differential life expectancy estimates by religious attendance are systematically biased" (Hummer et al., 1999). In the previous section we mentioned that the increase in Hummer's study is about five years for males. The Utah active LDS males show an increase of about eight years over the NCHS 1989-1991 life tables at age 20. Besides this three year increase in life expectancy of the active LDS males over Hummer's most religious group, there are some differences in our study and Hummer's study which recommend the use of the Utah active LDS life expectancy estimates for policy purposes.

First of all, they are population-based estimates which eliminates the non-response bias due to sampling which may be found in Hummer's study. In addition, Hummer's study is much smaller. His entire study consisted of 2,016 deaths whereas the number of male deaths in our study is 27,764. Our large sample size helps to stabilize the observed

life expectancy. The active LDS life expectancies are averaged over a five year time period which "reduce[s] the effect of abnormalities in the mortality pattern which may exist in a single calendar year" (Chiang, p. 115). Hummer uses religious attendance as his surrogate measure for religiosity. This measure can be influenced by the health of an individual. For example, a person can be devoutly religious but unable to attend church because of health problems. People in ill-health are also more likely to die. Our measure of religiosity, priesthood office, is not affected by a persons inability to attend church for health reasons. For this reason, it is probably a better surrogate measure of religiosity than church attendance alone.

The US male life expectancy at birth is much lower (almost four years) than the Japanese male life expectancy. Why is there such a large difference in life expectancy in these two first world nations? Both nations have access to good health care and living conditions. Additionally, Japanese males have a high incidence of smoking which could negate any positive effect a healthy diet might have. According to the Japanese Information Network, in 1990 about 60% of all Japanese males smoked (Japanese Information Network, 1999). During that same year, only 28% of US males smoked (Center for Disease Control, 2000). Even so, the Japanese males still live longer than US males on average.

It is possible that the Japanese have a better diet than the US, and it is also possible that the Japanese have a genetic advantage over the US population which allows them to live longer. Although the confidence intervals overlap, Utah active LDS life expectancy at birth for males was found to be 3.5 years longer than the life expectancy at birth for Japanese males. A two-sided t-test of the life expectancies at birth gives a p-value of

about 0.01. This is evidence that active LDS have a significantly higher life expectancy than the Japanese. Since the active LDS male group is a more genetically diverse population than the Japanese male population, our results suggest it is possible to attain or even surpass the Japanese life expectancy even without experiencing a genetic advantage.

Although the Utah active LDS male population is more genetically diverse than the Japanese male, we believe a large number of active LDS immigrants to Utah were of Scandinavian descent. Scandinavians tend to have long life expectancies at birth, so we compared the Utah active LDS males to Swedish males. We made this comparison because the Swedish males rank 3rd among long-lived national populations (WHO, 1999) and they share a similar heritage with some Utah LDS males. Since the active LDS males have a statistically higher life expectancy than Swedish males at birth of about 4.25 years, so the increase in life expectancy of Utah active LDS men is not solely due to their Scandinavian heritage.

5.2.3 Comparisons with Long-lived Female Populations

All of the same comparisons were made for the female life expectancies. Our first comparison looked at the NCHS life expectancy for Utah females in 1989-1991 and our observed life expectancy for Utah females. Again, we found these to be similar. This gives us confidence in the validity of our results. We also compared the life expectancies of the female less-active LDS and the female non-LDS to the 1989-1991 NCHS life expectancies for average US females. All of these life expectancies are similar.

We also compared the results from Hummer's 1999 study to the Utah active LDS females. The results for females are very similar to those for males. We cannot say that the life expectancy for active LDS women in Utah is statistically higher than Hummer's

estimate for religious women. Again, Hummer admits that his life expectancies at age 20 for all groups are high, especially those which do not take religiosity into account. We can compare the increase for his religious women over his total female sample to our increase for active LDS females over the average US female. At age 20, Hummer's most religious group of women experience a 2.1 year increase in life expectancy over his average female group. Utah active LDS females show a 4.75 year increase in life expectancy at age 20 over the average US female. So, the active LDS females show a increase of more than twice the increase found for the females in Hummer's study.

Although the confidence intervals for the Utah active LDS female population overlaps both the confidence intervals of the female Japanese population (1st in national life expectancy for women) and the female Swedish population (6th in national life expectancy for women) (WHO, 1999), the LDS females do have higher point estimates than both these populations. On average, Utah active LDS females live one and one third years longer than the average Japanese female and three years longer than the average Swedish female at birth. A two-sided t-test on life expectancy at birth between Japanese females and active LDS females gives a p-value of almost .3, indicating no statistical difference. A similar two-sided t-test on life expectancy at birth between Swedish females and active LDS females gives a p-value of 0.02. At birth, active LDS females have a statistically higher life expectancy than Swedish females. The similar results between Japanese and active LDS females might be explained by the low incidence of smoking among Japanese women. We have hypothesized that active LDS women have a longer life expectancy in part because they do not smoke. This same effect could be present among Japanese women. According to the Japanese Information Network, about 13-15%

of Japanese females smoke (Japanese Information Network, 1999). Because so few Japanese females smoke, we would expect the life expectancy of Japanese females to be more similar to active LDS females. Although the life expectancy for active LDS females is not statistically higher, Utah active LDS females do achieve a life expectancy similar to some of the longest populations in the world. This longevity is most likely due to good health habits and social support and interaction in their religious group. It is important to recognize that these increases are attainable.

5.3 Conclusion

For the most part, the LDS activity and misclassification assumptions which most affect life expectancy do so in the two LDS groups for each gender. Because these assumptions are conservative, we are probably underestimating the life expectancy for the active LDS groups. The life table assumptions, which affect all groups, do not appear to have a large effect on estimates of life expectancy.

This study has found substantial increases in life expectancy for the active LDS groups. For the most part, it seems likely that these increases are due to: a proscription of harmful behaviors, encouragement of beneficial activities and the church acting as a support group. Although we are unable to accurately determine how each of these effects contributes to the total increase, the effects can be useful to policy makers and in health interventions because they show that it is possible to attain or even exceed the life expectancy of many long-lived populations.

Appendix A

LIFE TABLES

A.1 Complete, Current Male Utah Life Tables

This section contains the full life tables for males in Utah during 1991-1995 which we created using the methodologies in chapter 3. The last two columns contain a 95% confidence interval for the observed life expectancy. The other columns are commonly found in life tables and are explained in section 3.6.

A.2 Berkeley Mortality Database Complete, Current Male Life Tables

This section contains the life tables from the Berkeley Mortality Database for US, Japanese and Swedish males for the five year period 1991-1995. We have included the full tables here and included a 95% confidence interval for the observed life expectancy. This confidence interval is included in the table until the interval contains zero.

A.3 Complete, Current Female Utah Life Tables

This section contains the full life tables for females in Utah during 1994-1998 which we created using the methodologies in chapter 3. The last two columns contain a 95% confidence interval for the observed life expectancy. The other columns are commonly found in life tables and are explained in section 3.6.

A.4 Berkeley Mortality Database Complete, Current Female Life Tables

This section contains the life tables from the Berkeley Mortality Database for US, Japanese and Swedish females for the five year period 1991-1995. We have included the full tables here and included a 95% confidence interval for the observed life expectancy. This confidence interval is included in the table until the interval contains zero.

Table A.1.1: Male Life Table, Utah 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00766	100000	766	0.09	99303	7504370	75.0	73.0	77.1
1	0.00077	99234	76	0.40	99188	7405067	74.6	72.6	76.7
2	0.00047	99158	47	0.40	99130	7305879	73.7	71.7	75.7
3	0.00033	99111	33	0.40	99091	7206750	72.7	70.7	74.7
4	0.00034	99078	34	0.40	99058	7107658	71.7	69.7	73.8
5	0.00021	99044	21	0.40	99031	7008601	70.8	68.7	72.8
6	0.00027	99023	27	0.47	99009	6909569	69.8	67.8	71.8
7	0.00035	98996	34	0.47	98978	6810560	68.8	66.8	70.8
8	0.00025	98962	25	0.47	98949	6711582	67.8	65.8	69.8
9	0.00019	98937	19	0.47	98927	6612633	66.8	64.8	68.9
10	0.00027	98918	26	0.47	98904	6513706	65.8	63.8	67.9
11	0.00019	98892	19	0.56	98884	6414802	64.9	62.9	66.9
12	0.00035	98873	35	0.56	98858	6315918	63.9	61.9	65.9
13	0.00045	98838	45	0.56	98818	6217061	62.9	60.9	64.9
14	0.00058	98793	58	0.56	98768	6118242	61.9	59.9	63.9
15	0.00075	98736	74	0.56	98703	6019475	61.0	59.0	63.0
16	0.00112	98661	110	0.55	98612	5920772	60.0	58.0	62.0
17	0.00102	98551	100	0.55	98506	5822160	59.1	57.1	61.1
18	0.00157	98451	155	0.55	98381	5723654	58.1	56.1	60.1
19	0.00151	98296	148	0.55	98229	5625273	57.2	55.2	59.2
20	0.00134	98148	131	0.55	98089	5527044	56.3	54.3	58.3
21	0.00135	98017	132	0.51	97952	5428955	55.4	53.4	57.4
22	0.00117	97884	115	0.51	97828	5331003	54.5	52.5	56.4
23	0.00126	97769	124	0.51	97709	5233175	53.5	51.6	55.5
24	0.00142	97646	138	0.51	97578	5135467	52.6	50.6	54.6
25	0.00107	97507	105	0.51	97456	5037889	51.7	49.7	53.6
26	0.00126	97403	122	0.50	97341	4940433	50.7	48.8	52.7
27	0.00158	97280	154	0.50	97203	4843091	49.8	47.8	51.7
28	0.00151	97126	147	0.50	97053	4745888	48.9	46.9	50.8
29	0.00154	96980	150	0.50	96905	4648835	47.9	46.0	49.9
30	0.00144	96830	139	0.50	96760	4551930	47.0	45.1	49.0
31	0.00157	96690	152	0.52	96617	4455170	46.1	44.1	48.0
32	0.00185	96538	179	0.52	96453	4358553	45.1	43.2	47.1
33	0.00196	96360	189	0.52	96269	4262100	44.2	42.3	46.2
34	0.00192	96171	184	0.52	96082	4165831	43.3	41.4	45.2
35	0.00206	95986	198	0.52	95891	4069749	42.4	40.5	44.3
36	0.00197	95788	189	0.53	95700	3973857	41.5	39.6	43.4
37	0.00239	95599	228	0.53	95492	3878158	40.6	38.7	42.5
38	0.00256	95371	244	0.53	95256	3782666	39.7	37.8	41.6
39	0.00205	95127	195	0.53	95035	3687409	38.8	36.9	40.7
40	0.00280	94932	266	0.53	94807	3592374	37.8	35.9	39.7
41	0.00256	94667	243	0.54	94555	3497567	36.9	35.1	38.8
42	0.00303	94424	286	0.54	94292	3403012	36.0	34.2	37.9

Table A.1.1: Male Life Table, Utah 1991-1995 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00327	94138	308	0.54	93996	3308719	35.1	33.3	37.0
44	0.00292	93830	274	0.54	93704	3214723	34.3	32.4	36.1
45	0.00303	93556	283	0.54	93426	3121019	33.4	31.5	35.2
46	0.00315	93273	294	0.54	93137	3027594	32.5	30.6	34.3
47	0.00368	92979	342	0.54	92821	2934456	31.6	29.7	33.4
48	0.00473	92636	438	0.54	92435	2841635	30.7	28.8	32.5
49	0.00389	92198	358	0.54	92034	2749200	29.8	28.0	31.7
50	0.00425	91840	391	0.54	91660	2657167	28.9	27.1	30.8
51	0.00499	91449	457	0.53	91235	2565506	28.1	26.2	29.9
52	0.00484	90993	441	0.53	90786	2474271	27.2	25.4	29.0
53	0.00571	90552	517	0.53	90309	2383485	26.3	24.5	28.1
54	0.00632	90035	569	0.53	89768	2293176	25.5	23.7	27.3
55	0.00623	89466	557	0.53	89204	2203409	24.6	22.8	26.4
56	0.00716	88909	637	0.53	88610	2114204	23.8	22.0	25.6
57	0.00796	88272	703	0.53	87942	2025595	22.9	21.2	24.7
58	0.00926	87569	811	0.53	87188	1937653	22.1	20.3	23.9
59	0.01040	86758	902	0.53	86334	1850465	21.3	19.6	23.1
60	0.01181	85856	1014	0.53	85379	1764131	20.5	18.8	22.3
61	0.01240	84842	1052	0.52	84337	1678751	19.8	18.0	21.5
62	0.01309	83790	1097	0.52	83264	1594414	19.0	17.3	20.8
63	0.01415	82693	1170	0.52	82132	1511150	18.3	16.5	20.0
64	0.01545	81523	1259	0.52	80919	1429019	17.5	15.8	19.3
65	0.01760	80264	1412	0.52	79586	1348100	16.8	15.1	18.5
66	0.01765	78851	1391	0.51	78170	1268514	16.1	14.4	17.8
67	0.02225	77460	1723	0.51	76616	1190344	15.4	13.7	17.1
68	0.02330	75737	1764	0.51	74872	1113729	14.7	13.0	16.4
69	0.02590	73972	1916	0.51	73034	1038857	14.0	12.4	15.7
70	0.02744	72057	1977	0.51	71088	965823	13.4	11.7	15.1
71	0.03116	70080	2184	0.51	69009	894736	12.8	11.1	14.4
72	0.03352	67896	2276	0.51	66781	825726	12.2	10.5	13.8
73	0.03836	65620	2517	0.51	64387	758946	11.6	9.9	13.2
74	0.04042	63103	2551	0.51	61853	694559	11.0	9.4	12.6
75	0.04785	60553	2898	0.51	59133	632705	10.4	8.9	12.0
76	0.04834	57655	2787	0.50	56261	573573	9.9	8.4	11.5
77	0.05135	54868	2818	0.50	53459	517311	9.4	7.9	11.0
78	0.05646	52050	2939	0.50	50581	463852	8.9	7.4	10.4
79	0.06161	49111	3026	0.50	47598	413272	8.4	6.9	9.9
80	0.06757	46085	3114	0.50	44528	365673	7.9	6.5	9.4
81	0.08161	42971	3507	0.48	41148	321145	7.5	6.1	8.8
82	0.08702	39464	3434	0.48	37678	279997	7.1	5.8	8.3
83	0.09122	36030	3287	0.48	34321	242319	6.7	5.6	7.8
84	0.10477	32743	3431	0.48	30959	207998	6.4	5.5	7.2
85+	1.00000	29313	29313	0.48	177038	177038	6.0		

Table A.1.2: Non-LDS Male Life Table, Utah 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00766	100000	766	0.09	99303	7148370	71.5	69.3	73.7
1	0.00114	99234	113	0.40	99165	7049068	71.0	68.9	73.2
2	0.00067	99120	66	0.40	99080	6949902	70.1	68.0	72.3
3	0.00049	99054	49	0.40	99024	6850822	69.2	67.0	71.3
4	0.00043	99005	43	0.40	98979	6751797	68.2	66.1	70.3
5	0.00028	98962	28	0.40	98945	6652818	67.2	65.1	69.4
6	0.00042	98934	41	0.47	98912	6553873	66.2	64.1	68.4
7	0.00064	98893	63	0.47	98859	6454961	65.3	63.1	67.4
8	0.00045	98830	45	0.47	98806	6356101	64.3	62.2	66.4
9	0.00024	98785	24	0.47	98773	6257295	63.3	61.2	65.5
10	0.00038	98761	37	0.47	98742	6158523	62.4	60.2	64.5
11	0.00036	98724	35	0.56	98709	6059781	61.4	59.3	63.5
12	0.00067	98689	66	0.56	98660	5961072	60.4	58.3	62.5
13	0.00074	98623	73	0.56	98590	5862413	59.4	57.3	61.6
14	0.00097	98549	96	0.56	98507	5763822	58.5	56.4	60.6
15	0.00113	98454	111	0.56	98405	5665315	57.5	55.4	59.7
16	0.00229	98343	225	0.55	98241	5566910	56.6	54.5	58.7
17	0.00139	98118	136	0.55	98056	5468669	55.7	53.6	57.8
18	0.00296	97981	290	0.55	97851	5370613	54.8	52.7	56.9
19	0.00256	97692	250	0.55	97579	5272762	54.0	51.9	56.1
20	0.00254	97441	247	0.55	97330	5175183	53.1	51.0	55.2
21	0.00238	97194	231	0.51	97081	5077853	52.2	50.2	54.3
22	0.00204	96963	197	0.51	96866	4980772	51.4	49.3	53.4
23	0.00260	96766	252	0.51	96642	4883905	50.5	48.4	52.5
24	0.00258	96514	249	0.51	96392	4787263	49.6	47.5	51.7
25	0.00175	96265	169	0.51	96182	4690871	48.7	46.7	50.8
26	0.00181	96096	173	0.50	96010	4594689	47.8	45.8	49.9
27	0.00224	95923	215	0.50	95815	4498679	46.9	44.9	48.9
28	0.00229	95708	219	0.50	95598	4402864	46.0	44.0	48.0
29	0.00184	95489	176	0.50	95401	4307265	45.1	43.1	47.1
30	0.00189	95313	180	0.50	95223	4211865	44.2	42.2	46.2
31	0.00209	95133	199	0.52	95037	4116642	43.3	41.3	45.3
32	0.00253	94934	241	0.52	94818	4021604	42.4	40.4	44.4
33	0.00265	94693	250	0.52	94573	3926786	41.5	39.5	43.5
34	0.00255	94443	241	0.52	94327	3832213	40.6	38.6	42.6
35	0.00282	94202	265	0.52	94074	3737886	39.7	37.7	41.7
36	0.00301	93936	283	0.53	93803	3643812	38.8	36.8	40.8
37	0.00288	93654	270	0.53	93527	3550008	37.9	35.9	39.9
38	0.00363	93384	339	0.53	93225	3456481	37.0	35.0	39.0
39	0.00242	93045	225	0.53	92939	3363256	36.1	34.2	38.1
40	0.00360	92820	334	0.53	92663	3270317	35.2	33.3	37.2
41	0.00377	92486	348	0.54	92325	3177654	34.4	32.4	36.3
42	0.00385	92137	355	0.54	91974	3085329	33.5	31.5	35.4

Table A.1.2: Non-LDS Male Life Table, Utah 1991-1995 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00493	91782	453	0.54	91574	2993355	32.6	30.7	34.6
44	0.00338	91329	309	0.54	91187	2901781	31.8	29.8	33.7
45	0.00391	91021	356	0.54	90857	2810594	30.9	28.9	32.8
46	0.00415	90665	376	0.54	90492	2719737	30.0	28.1	31.9
47	0.00504	90288	455	0.54	90079	2629245	29.1	27.2	31.0
48	0.00806	89834	724	0.54	89501	2539166	28.3	26.3	30.2
49	0.00542	89110	483	0.54	88888	2449665	27.5	25.6	29.4
50	0.00567	88627	503	0.54	88395	2360777	26.6	24.7	28.5
51	0.00763	88124	672	0.53	87808	2272382	25.8	23.9	27.7
52	0.00756	87452	661	0.53	87141	2184574	25.0	23.1	26.9
53	0.00887	86791	770	0.53	86429	2097433	24.2	22.3	26.0
54	0.00862	86021	741	0.53	85673	2011004	23.4	21.5	25.3
55	0.00825	85280	704	0.53	84949	1925332	22.6	20.7	24.4
56	0.00956	84576	809	0.53	84196	1840383	21.8	19.9	23.6
57	0.01033	83767	865	0.53	83360	1756187	21.0	19.1	22.8
58	0.01459	82902	1209	0.53	82334	1672827	20.2	18.3	22.0
59	0.01337	81693	1092	0.53	81179	1590493	19.5	17.6	21.3
60	0.01532	80600	1235	0.53	80020	1509314	18.7	16.9	20.6
61	0.01533	79365	1216	0.52	78781	1429294	18.0	16.2	19.8
62	0.01571	78149	1228	0.52	77560	1350513	17.3	15.5	19.1
63	0.01411	76921	1086	0.52	76400	1272953	16.5	14.7	18.3
64	0.01707	75835	1294	0.52	75214	1196553	15.8	14.0	17.6
65	0.02212	74541	1649	0.52	73750	1121339	15.0	13.3	16.8
66	0.02308	72892	1682	0.51	72068	1047589	14.4	12.6	16.2
67	0.02677	71210	1906	0.51	70276	975521	13.7	11.9	15.5
68	0.03002	69304	2081	0.51	68285	905245	13.1	11.3	14.8
69	0.02987	67224	2008	0.51	66240	836960	12.5	10.7	14.2
70	0.03619	65216	2360	0.51	64059	770720	11.8	10.1	13.6
71	0.04250	62856	2672	0.51	61547	706661	11.2	9.5	13.0
72	0.04331	60184	2607	0.51	58907	645114	10.7	9.0	12.5
73	0.04765	57578	2744	0.51	56233	586207	10.2	8.5	11.9
74	0.05899	54834	3235	0.51	53249	529974	9.7	7.9	11.4
75	0.06007	51599	3100	0.51	50080	476725	9.2	7.5	10.9
76	0.06331	48500	3070	0.50	46965	426645	8.8	7.1	10.5
77	0.06433	45429	2922	0.50	43968	379680	8.4	6.7	10.0
78	0.06073	42507	2581	0.50	41216	335712	7.9	6.3	9.5
79	0.06747	39926	2694	0.50	38579	294496	7.4	5.8	9.0
80	0.08283	37232	3084	0.50	35690	255917	6.9	5.3	8.4
81	0.09828	34148	3356	0.48	32403	220227	6.4	4.9	8.0
82	0.10512	30792	3237	0.48	29109	187824	6.1	4.7	7.5
83	0.10395	27555	2864	0.48	26066	158715	5.8	4.5	7.0
84	0.12822	24691	3166	0.48	23044	132649	5.4	4.4	6.4
85+	1.00000	21525	21525	0.48	109605	109605	5.1		

Table A.1.3: Less-Active LDS Male Life Table, Utah 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00766	100000	766	0.09	99303	7158723	71.6	69.4	73.8
1	0.00053	99234	53	0.40	99202	7059421	71.1	69.0	73.3
2	0.00036	99181	35	0.40	99160	6960219	70.2	68.0	72.3
3	0.00025	99145	25	0.40	99130	6861059	69.2	67.0	71.4
4	0.00030	99120	30	0.40	99102	6761929	68.2	66.1	70.4
5	0.00018	99090	18	0.40	99080	6662827	67.2	65.1	69.4
6	0.00021	99073	21	0.47	99062	6563747	66.3	64.1	68.4
7	0.00024	99052	24	0.47	99039	6464686	65.3	63.1	67.4
8	0.00020	99028	20	0.47	99018	6365646	64.3	62.1	66.4
9	0.00017	99009	17	0.47	99000	6266629	63.3	61.1	65.4
10	0.00022	98992	22	0.47	98980	6167629	62.3	60.2	64.5
11	0.00014	98970	14	0.56	98964	6068649	61.3	59.2	63.5
12	0.00034	98956	33	0.56	98941	5969685	60.3	58.2	62.5
13	0.00066	98922	66	0.56	98894	5870744	59.3	57.2	61.5
14	0.00089	98857	88	0.56	98818	5771851	58.4	56.2	60.5
15	0.00078	98769	77	0.56	98735	5673033	57.4	55.3	59.6
16	0.00177	98692	175	0.55	98613	5574298	56.5	54.3	58.6
17	0.00126	98517	124	0.55	98461	5475684	55.6	53.4	57.7
18	0.00240	98393	236	0.55	98287	5377223	54.7	52.5	56.8
19	0.00179	98157	176	0.55	98078	5278936	53.8	51.7	55.9
20	0.00164	97981	160	0.55	97909	5180858	52.9	50.8	55.0
21	0.00178	97820	174	0.51	97735	5082950	52.0	49.8	54.1
22	0.00168	97646	165	0.51	97565	4985215	51.1	48.9	53.2
23	0.00155	97481	151	0.51	97407	4887649	50.1	48.0	52.2
24	0.00172	97330	167	0.51	97249	4790242	49.2	47.1	51.3
25	0.00144	97164	140	0.51	97095	4692993	48.3	46.2	50.4
26	0.00180	97024	175	0.50	96936	4595898	47.4	45.3	49.5
27	0.00233	96849	226	0.50	96736	4498962	46.5	44.4	48.5
28	0.00199	96623	192	0.50	96527	4402226	45.6	43.5	47.6
29	0.00256	96431	247	0.50	96308	4305698	44.7	42.6	46.7
30	0.00193	96185	185	0.50	96092	4209391	43.8	41.7	45.8
31	0.00238	95999	229	0.52	95890	4113299	42.8	40.8	44.9
32	0.00304	95771	292	0.52	95631	4017409	41.9	39.9	44.0
33	0.00301	95479	287	0.52	95341	3921778	41.1	39.0	43.1
34	0.00266	95192	253	0.52	95070	3826437	40.2	38.1	42.3
35	0.00353	94939	335	0.52	94778	3731367	39.3	37.3	41.4
36	0.00271	94603	256	0.53	94483	3636589	38.4	36.4	40.5
37	0.00426	94347	402	0.53	94158	3542106	37.5	35.5	39.6
38	0.00377	93946	354	0.53	93779	3447947	36.7	34.7	38.7
39	0.00329	93591	308	0.53	93446	3354168	35.8	33.8	37.9
40	0.00447	93283	417	0.53	93087	3260722	35.0	32.9	37.0
41	0.00381	92866	353	0.54	92703	3167635	34.1	32.1	36.1
42	0.00483	92513	446	0.54	92307	3074931	33.2	31.2	35.2

Table A.1.3: Less-Active LDS Male Life Table, Utah 1991-1995 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00445	92066	409	0.54	91878	2982624	32.4	30.4	34.4
44	0.00454	91657	416	0.54	91466	2890746	31.5	29.5	33.5
45	0.00532	91241	486	0.54	91018	2799281	30.7	28.7	32.7
46	0.00559	90756	507	0.54	90522	2708263	29.8	27.9	31.8
47	0.00551	90249	497	0.54	90020	2617740	29.0	27.0	31.0
48	0.00719	89752	645	0.54	89455	2527720	28.2	26.2	30.1
49	0.00573	89107	511	0.54	88872	2438266	27.4	25.4	29.3
50	0.00714	88596	633	0.54	88305	2349394	26.5	24.6	28.5
51	0.00788	87963	693	0.53	87638	2261089	25.7	23.8	27.7
52	0.00740	87271	646	0.53	86967	2173451	24.9	23.0	26.9
53	0.01003	86625	869	0.53	86216	2086484	24.1	22.1	26.0
54	0.01038	85756	890	0.53	85337	2000268	23.3	21.4	25.3
55	0.00831	84866	706	0.53	84534	1914930	22.6	20.6	24.5
56	0.00951	84160	800	0.53	83784	1830396	21.7	19.8	23.7
57	0.01038	83360	865	0.53	82953	1746613	21.0	19.0	22.9
58	0.01013	82495	835	0.53	82102	1663659	20.2	18.3	22.1
59	0.01342	81659	1096	0.53	81144	1581557	19.4	17.5	21.3
60	0.01654	80563	1333	0.53	79937	1500413	18.6	16.7	20.5
61	0.01737	79230	1376	0.52	78570	1420477	17.9	16.0	19.8
62	0.01955	77854	1522	0.52	77123	1341907	17.2	15.4	19.1
63	0.02438	76332	1861	0.52	75439	1264784	16.6	14.7	18.4
64	0.02107	74471	1569	0.52	73718	1189345	16.0	14.1	17.8
65	0.02583	72902	1883	0.52	71998	1115627	15.3	13.4	17.2
66	0.02371	71019	1684	0.51	70194	1043629	14.7	12.8	16.6
67	0.03111	69335	2157	0.51	68278	973435	14.0	12.2	15.9
68	0.03114	67178	2092	0.51	66153	905157	13.5	11.6	15.3
69	0.03804	65087	2476	0.51	63874	839003	12.9	11.1	14.7
70	0.03141	62611	1967	0.51	61647	775130	12.4	10.6	14.2
71	0.03614	60644	2192	0.51	59570	713483	11.8	9.9	13.6
72	0.04202	58453	2456	0.51	57249	653912	11.2	9.4	13.0
73	0.04501	55996	2520	0.51	54761	596663	10.7	8.8	12.5
74	0.04358	53476	2330	0.51	52334	541902	10.1	8.3	11.9
75	0.06231	51146	3187	0.51	49584	489568	9.6	7.8	11.4
76	0.06049	47959	2901	0.50	46508	439984	9.2	7.4	11.0
77	0.06555	45058	2953	0.50	43581	393475	8.7	7.0	10.5
78	0.07114	42104	2995	0.50	40607	349894	8.3	6.6	10.1
79	0.07691	39109	3008	0.50	37605	309287	7.9	6.2	9.6
80	0.08914	36101	3218	0.50	34492	271682	7.5	5.9	9.2
81	0.09264	32883	3046	0.48	31299	237190	7.2	5.6	8.8
82	0.09531	29837	2844	0.48	28358	205891	6.9	5.4	8.4
83	0.10064	26993	2717	0.48	25580	177533	6.6	5.3	7.9
84	0.11953	24276	2902	0.48	22767	151953	6.3	5.2	7.3
85+	1.00000	21375	21375	0.48	129185	129185	6.0		

Table A.1.4: Active LDS Male Life Table, Utah 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00766	100000	766	0.09	99303	7983855	79.8	78.0	81.7
1	0.00053	99234	53	0.40	99202	7884553	79.5	77.7	81.2
2	0.00036	99181	35	0.40	99160	7785351	78.5	76.7	80.3
3	0.00025	99145	25	0.40	99130	7686191	77.5	75.7	79.3
4	0.00030	99120	30	0.40	99102	7587061	76.5	74.8	78.3
5	0.00018	99090	18	0.40	99080	7487959	75.6	73.8	77.3
6	0.00021	99073	21	0.47	99062	7388879	74.6	72.8	76.4
7	0.00024	99052	24	0.47	99039	7289817	73.6	71.8	75.4
8	0.00020	99028	20	0.47	99018	7190778	72.6	70.8	74.4
9	0.00017	99009	17	0.47	99000	7091760	71.6	69.9	73.4
10	0.00022	98992	22	0.47	98980	6992761	70.6	68.9	72.4
11	0.00014	98970	14	0.56	98964	6893780	69.7	67.9	71.4
12	0.00022	98956	22	0.56	98946	6794817	68.7	66.9	70.4
13	0.00028	98934	28	0.56	98922	6695871	67.7	65.9	69.4
14	0.00040	98906	40	0.56	98888	6596949	66.7	64.9	68.5
15	0.00061	98866	61	0.56	98839	6498061	65.7	64.0	67.5
16	0.00056	98805	55	0.55	98781	6399221	64.8	63.0	66.5
17	0.00072	98750	71	0.55	98718	6300441	63.8	62.0	65.6
18	0.00081	98679	80	0.55	98644	6201722	62.8	61.1	64.6
19	0.00084	98600	83	0.55	98562	6103079	61.9	60.2	63.6
20	0.00036	98517	35	0.55	98501	6004516	60.9	59.2	62.7
21	0.00043	98482	43	0.51	98461	5906015	60.0	58.2	61.7
22	0.00041	98439	40	0.51	98419	5807555	59.0	57.3	60.7
23	0.00043	98399	43	0.51	98378	5709135	58.0	56.3	59.8
24	0.00058	98356	57	0.51	98328	5610757	57.0	55.3	58.8
25	0.00044	98299	44	0.51	98278	5512428	56.1	54.3	57.8
26	0.00053	98256	52	0.50	98229	5414151	55.1	53.4	56.8
27	0.00055	98203	54	0.50	98176	5315921	54.1	52.4	55.9
28	0.00060	98149	59	0.50	98120	5217745	53.2	51.4	54.9
29	0.00064	98091	63	0.50	98059	5119625	52.2	50.5	53.9
30	0.00072	98028	70	0.50	97993	5021565	51.2	49.5	52.9
31	0.00067	97958	65	0.52	97926	4923573	50.3	48.5	52.0
32	0.00060	97892	59	0.52	97864	4825646	49.3	47.6	51.0
33	0.00086	97834	84	0.52	97793	4727782	48.3	46.6	50.0
34	0.00098	97750	96	0.52	97704	4629989	47.4	45.7	49.1
35	0.00069	97654	67	0.52	97622	4532285	46.4	44.7	48.1
36	0.00081	97587	80	0.53	97549	4434663	45.4	43.7	47.1
37	0.00111	97507	108	0.53	97456	4337114	44.5	42.8	46.2
38	0.00129	97399	126	0.53	97340	4239658	43.5	41.8	45.2
39	0.00116	97273	113	0.53	97220	4142318	42.6	40.9	44.3
40	0.00141	97160	137	0.53	97096	4045098	41.6	39.9	43.3
41	0.00110	97023	106	0.54	96974	3948002	40.7	39.0	42.4
42	0.00164	96917	158	0.54	96844	3851028	39.7	38.1	41.4

Table A.1.4: Active LDS Male Life Table, Utah 1991-1995 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00161	96758	156	0.54	96686	3754184	38.8	37.1	40.5
44	0.00189	96602	182	0.54	96518	3657498	37.9	36.2	39.5
45	0.00149	96420	143	0.54	96354	3560979	36.9	35.3	38.6
46	0.00157	96277	151	0.54	96207	3464625	36.0	34.3	37.6
47	0.00207	96125	199	0.54	96034	3368418	35.0	33.4	36.7
48	0.00198	95927	190	0.54	95839	3272385	34.1	32.5	35.8
49	0.00220	95737	210	0.54	95640	3176545	33.2	31.5	34.8
50	0.00229	95527	218	0.54	95426	3080905	32.3	30.6	33.9
51	0.00237	95308	226	0.53	95202	2985479	31.3	29.7	33.0
52	0.00243	95082	231	0.53	94973	2890277	30.4	28.8	32.0
53	0.00248	94851	235	0.53	94740	2795304	29.5	27.8	31.1
54	0.00356	94616	337	0.53	94458	2700563	28.5	26.9	30.2
55	0.00266	94279	251	0.53	94161	2606106	27.6	26.0	29.3
56	0.00311	94028	293	0.53	93891	2511945	26.7	25.1	28.3
57	0.00398	93735	373	0.53	93560	2418054	25.8	24.2	27.4
58	0.00465	93362	434	0.53	93158	2324494	24.9	23.3	26.5
59	0.00567	92928	527	0.53	92680	2231336	24.0	22.4	25.6
60	0.00581	92401	537	0.53	92149	2138655	23.1	21.6	24.7
61	0.00688	91864	632	0.52	91561	2046506	22.3	20.7	23.9
62	0.00678	91233	619	0.52	90936	1954945	21.4	19.9	23.0
63	0.00749	90614	679	0.52	90288	1864010	20.6	19.0	22.1
64	0.01045	89935	940	0.52	89484	1773721	19.7	18.2	21.3
65	0.00883	88996	786	0.52	88618	1684237	18.9	17.4	20.5
66	0.00993	88210	876	0.51	87780	1595619	18.1	16.6	19.6
67	0.01371	87334	1197	0.51	86747	1507839	17.3	15.7	18.8
68	0.01434	86136	1235	0.51	85531	1421092	16.5	15.0	18.0
69	0.01576	84901	1338	0.51	84245	1335560	15.7	14.2	17.2
70	0.01899	83563	1587	0.51	82785	1251315	15.0	13.5	16.5
71	0.02023	81976	1658	0.51	81163	1168530	14.3	12.8	15.7
72	0.02195	80318	1763	0.51	79454	1087366	13.5	12.1	15.0
73	0.02895	78554	2274	0.51	77440	1007913	12.8	11.4	14.3
74	0.02913	76280	2222	0.51	75191	930473	12.2	10.8	13.6
75	0.03332	74058	2468	0.51	72849	855281	11.5	10.2	12.9
76	0.03381	71590	2421	0.50	70380	782432	10.9	9.6	12.3
77	0.03799	69169	2628	0.50	67856	712052	10.3	9.0	11.6
78	0.04719	66542	3140	0.50	64972	644197	9.7	8.4	11.0
79	0.05164	63402	3274	0.50	61764	579225	9.1	7.9	10.4
80	0.05201	60127	3127	0.50	58564	517461	8.6	7.4	9.8
81	0.07074	57000	4032	0.48	54904	458897	8.1	6.9	9.2
82	0.07684	52968	4070	0.48	50852	403993	7.6	6.6	8.7
83	0.08240	48898	4029	0.48	46803	353142	7.2	6.3	8.1
84	0.09112	44869	4088	0.48	42743	306339	6.8	6.1	7.5
85+	1.00000	40781	40781	0.48	263596	263596	6.5		

Table A.2.1: Berkeley Mortality Database Male Life Table, US 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00914	100000	913	0.13	99208	7213394	72.1	69.9	74.3
1	0.00070	99086	69	0.49	99051	7114186	71.8	69.6	74.0
2	0.00049	99016	49	0.51	98992	7015135	70.9	68.7	73.0
3	0.00038	98967	37	0.51	98949	6916142	69.9	67.7	72.0
4	0.00031	98930	30	0.50	98915	6817193	68.9	66.7	71.1
5	0.00027	98899	26	0.50	98886	6718278	67.9	65.8	70.1
6	0.00026	98872	25	0.52	98860	6619392	67.0	64.8	69.1
7	0.00024	98847	24	0.50	98835	6520532	66.0	63.8	68.1
8	0.00022	98823	21	0.48	98812	6421697	65.0	62.8	67.1
9	0.00018	98802	18	0.50	98793	6322884	64.0	61.8	66.2
10	0.00016	98784	15	0.47	98776	6224092	63.0	60.9	65.2
11	0.00016	98768	16	0.50	98760	6125315	62.0	59.9	64.2
12	0.00024	98752	23	0.48	98740	6026555	61.0	58.9	63.2
13	0.00041	98728	40	0.50	98708	5927815	60.0	57.9	62.2
14	0.00063	98688	61	0.49	98657	5829107	59.1	56.9	61.2
15	0.00088	98626	86	0.50	98583	5730449	58.1	55.9	60.3
16	0.00111	98539	109	0.50	98484	5631866	57.2	55.0	59.3
17	0.00130	98430	128	0.50	98366	5533381	56.2	54.1	58.4
18	0.00141	98302	138	0.49	98232	5435015	55.3	53.1	57.4
19	0.00147	98163	144	0.50	98091	5336782	54.4	52.2	56.5
20	0.00153	98018	150	0.50	97943	5238691	53.5	51.3	55.6
21	0.00159	97868	155	0.50	97791	5140748	52.5	50.4	54.7
22	0.00164	97713	160	0.50	97633	5042957	51.6	49.5	53.7
23	0.00166	97553	162	0.50	97472	4945323	50.7	48.6	52.8
24	0.00168	97391	164	0.50	97309	4847850	49.8	47.7	51.9
25	0.00169	97227	164	0.50	97145	4750541	48.9	46.7	51.0
26	0.00171	97063	165	0.50	96980	4653395	47.9	45.8	50.0
27	0.00175	96897	169	0.50	96813	4556414	47.0	44.9	49.1
28	0.00183	96728	177	0.50	96640	4459601	46.1	44.0	48.2
29	0.00194	96551	187	0.50	96458	4362961	45.2	43.1	47.3
30	0.00207	96364	199	0.50	96265	4266503	44.3	42.2	46.4
31	0.00218	96165	209	0.50	96061	4170238	43.4	41.3	45.5
32	0.00230	95955	220	0.50	95845	4074177	42.5	40.4	44.5
33	0.00241	95735	231	0.50	95619	3978332	41.6	39.5	43.6
34	0.00251	95504	239	0.50	95384	3882712	40.7	38.6	42.7
35	0.00262	95264	249	0.50	95139	3787328	39.8	37.7	41.8
36	0.00274	95014	260	0.50	94884	3692188	38.9	36.8	40.9
37	0.00287	94754	271	0.50	94618	3597303	38.0	35.9	40.0
38	0.00300	94482	283	0.50	94340	3502685	37.1	35.0	39.1
39	0.00314	94198	295	0.50	94051	3408345	36.2	34.1	38.2
40	0.00329	93903	309	0.50	93748	3314294	35.3	33.2	37.3
41	0.00346	93594	324	0.50	93431	3220545	34.4	32.4	36.5
42	0.00365	93269	340	0.50	93099	3127114	33.5	31.5	35.6

Table A.2.1: Berkeley Mortality Database Male Life Table, US 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00384	92929	357	0.50	92751	3034014	32.7	30.6	34.7
44	0.00405	92572	375	0.50	92385	2941263	31.8	29.7	33.8
45	0.00429	92197	395	0.50	91999	2848878	30.9	28.9	32.9
46	0.00457	91801	419	0.50	91592	2756878	30.0	28.0	32.0
47	0.00489	91382	447	0.50	91159	2665286	29.2	27.2	31.2
48	0.00526	90935	478	0.50	90696	2574127	28.3	26.3	30.3
49	0.00568	90457	514	0.50	90200	2483430	27.5	25.4	29.5
50	0.00616	89943	554	0.50	89666	2393230	26.6	24.6	28.6
51	0.00670	89389	598	0.50	89089	2303564	25.8	23.8	27.8
52	0.00729	88790	647	0.50	88467	2214474	24.9	23.0	26.9
53	0.00795	88143	700	0.50	87792	2126007	24.1	22.1	26.1
54	0.00866	87442	757	0.50	87063	2038214	23.3	21.3	25.3
55	0.00948	86685	821	0.50	86274	1951150	22.5	20.5	24.5
56	0.01039	85863	891	0.50	85417	1864876	21.7	19.8	23.7
57	0.01136	84971	965	0.50	84489	1779458	20.9	19.0	22.9
58	0.01242	84006	1043	0.50	83485	1694969	20.2	18.2	22.1
59	0.01356	82963	1124	0.50	82401	1611484	19.4	17.5	21.4
60	0.01479	81839	1210	0.50	81234	1529082	18.7	16.7	20.6
61	0.01616	80629	1302	0.50	79977	1447848	18.0	16.0	19.9
62	0.01774	79326	1407	0.50	78622	1367870	17.2	15.3	19.2
63	0.01955	77919	1523	0.50	77157	1289247	16.6	14.6	18.5
64	0.02158	76395	1648	0.50	75571	1212090	15.9	13.9	17.8
65	0.02384	74747	1781	0.50	73856	1136518	15.2	13.3	17.1
66	0.02622	72965	1912	0.50	72008	1062662	14.6	12.6	16.5
67	0.02853	71052	2027	0.50	70038	990653	13.9	12.0	15.9
68	0.03075	69025	2122	0.50	67963	920614	13.3	11.4	15.3
69	0.03297	66902	2205	0.50	65799	852650	12.7	10.8	14.7
70	0.03539	64696	2289	0.50	63551	786850	12.2	10.2	14.1
71	0.03817	62407	2381	0.50	61216	723299	11.6	9.6	13.5
72	0.04128	60025	2477	0.50	58786	662083	11.0	9.1	13.0
73	0.04479	57547	2577	0.50	56258	603296	10.5	8.5	12.4
74	0.04872	54970	2678	0.50	53631	547037	10.0	8.0	11.9
75	0.05305	52292	2774	0.50	50905	493406	9.4	7.5	11.4
76	0.05783	49518	2863	0.50	48086	442501	8.9	6.9	10.9
77	0.06308	46654	2942	0.50	45182	394415	8.5	6.4	10.5
78	0.06881	43711	3007	0.50	42207	349232	8.0	6.0	10.0
79	0.07507	40703	3055	0.50	39175	307025	7.5	5.5	9.6
80	0.08190	37647	3083	0.50	36106	267849	7.1	5.0	9.2
81	0.08936	34564	3088	0.50	33020	231743	6.7	4.6	8.8
82	0.09743	31475	3066	0.50	29942	198723	6.3	4.1	8.5
83	0.10614	28408	3015	0.50	26901	168781	5.9	3.7	8.2
84	0.11551	25393	2933	0.50	23926	141879	5.6	3.3	7.9
85	0.12558	22460	2820	0.50	21050	117953	5.3	2.9	7.6

Table A.2.1: Berkeley Mortality Database Male Life Table, US 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
86	0.13637	19639	2678	0.50	18300	96902	4.9	2.5	7.4
87	0.14791	16961	2508	0.50	15707	78602	4.6	2.1	7.2
88	0.16018	14452	2315	0.50	13295	62894	4.4	1.7	7.0
89	0.17319	12137	2102	0.50	11086	49599	4.1	1.4	6.8
90	0.18699	10035	1876	0.50	9097	38513	3.8	1.0	6.7
91	0.20147	8159	1643	0.50	7337	29415	3.6	0.7	6.5
92	0.21669	6515	1411	0.50	5809	22078	3.4	0.4	6.4
93	0.23263	5103	1187	0.50	4509	16269	3.2	0.3	6.1
94	0.24922	3916	976	0.50	3428	11759	3.0	0.5	5.5
95	0.26590	2940	781	0.50	2549	8332	2.8	-	-
96	0.28262	2158	610	0.50	1853	5782	2.7	-	-
97	0.29902	1548	463	0.50	1316	3929	2.5	-	-
98	0.31509	1085	342	0.50	914	2612	2.4	-	-
99	0.33091	743	246	0.50	620	1698	2.3	-	-
100	0.34781	497	173	0.50	411	1077	2.2	-	-
101	0.36436	324	118	0.50	265	666	2.1	-	-
102	0.38312	206	79	0.51	167	401	1.9	-	-
103	0.40252	127	51	0.49	101	234	1.8	-	-
104	0.41579	76	31	0.48	60	132	1.7	-	-
105	0.44595	44	19	0.47	34	72	1.6	-	-
106	0.47154	24	11	0.45	18	38	1.5	-	-
107	0.47692	13	6	0.50	10	19	1.5	-	-
108	0.52941	6	3	0.50	5	9	1.4	-	-
109	0.56250	3	1	0.50	2	4	1.3	-	-
110+	0.42857	1	0	0.50	1	1	1.3	-	-

Table A.2.2: Berkeley Mortality Database Male Life Table, Japan 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00474	100000	474	0.08	99563	7628937	76.3	74.3	78.3
1	0.00076	99526	75	0.51	99489	7529374	75.7	73.7	77.6
2	0.00045	99451	44	0.50	99429	7429886	74.7	72.7	76.7
3	0.00036	99406	36	0.50	99388	7330457	73.7	71.8	75.7
4	0.00028	99370	28	0.54	99357	7231069	72.8	70.8	74.7
5	0.00026	99343	26	0.50	99330	7131712	71.8	69.8	73.8
6	0.00025	99317	25	0.52	99305	7032382	70.8	68.8	72.8
7	0.00022	99292	21	0.48	99281	6933078	69.8	67.9	71.8
8	0.00017	99271	17	0.47	99262	6833796	68.8	66.9	70.8
9	0.00017	99254	17	0.53	99246	6734534	67.9	65.9	69.8
10	0.00015	99237	15	0.53	99230	6635288	66.9	64.9	68.8
11	0.00015	99223	15	0.47	99215	6536058	65.9	63.9	67.8
12	0.00016	99208	16	0.50	99200	6436843	64.9	62.9	66.8
13	0.00019	99192	18	0.50	99183	6337643	63.9	61.9	65.9
14	0.00022	99174	22	0.50	99163	6238460	62.9	60.9	64.9
15	0.00027	99152	26	0.50	99139	6139297	61.9	60.0	63.9
16	0.00047	99126	46	0.48	99102	6040158	60.9	59.0	62.9
17	0.00060	99079	59	0.51	99050	5941056	60.0	58.0	61.9
18	0.00071	99020	70	0.50	98985	5842006	59.0	57.0	61.0
19	0.00078	98950	77	0.49	98911	5743021	58.0	56.1	60.0
20	0.00077	98872	76	0.51	98835	5644110	57.1	55.1	59.0
21	0.00074	98797	73	0.49	98760	5545276	56.1	54.2	58.1
22	0.00074	98724	73	0.51	98688	5446515	55.2	53.2	57.1
23	0.00073	98651	72	0.50	98615	5347828	54.2	52.3	56.2
24	0.00072	98580	70	0.49	98544	5249212	53.3	51.3	55.2
25	0.00071	98509	70	0.50	98474	5150668	52.3	50.4	54.2
26	0.00071	98439	70	0.50	98404	5052194	51.3	49.4	53.3
27	0.00068	98369	67	0.49	98335	4953791	50.4	48.4	52.3
28	0.00073	98302	71	0.49	98266	4855455	49.4	47.5	51.3
29	0.00076	98230	74	0.50	98193	4757189	48.4	46.5	50.4
30	0.00076	98156	74	0.50	98119	4658996	47.5	45.5	49.4
31	0.00076	98082	75	0.51	98045	4560877	46.5	44.6	48.4
32	0.00080	98007	79	0.51	97968	4462832	45.5	43.6	47.5
33	0.00082	97928	81	0.51	97888	4364864	44.6	42.6	46.5
34	0.00090	97848	88	0.50	97804	4266976	43.6	41.7	45.5
35	0.00096	97760	93	0.49	97713	4169172	42.7	40.7	44.6
36	0.00106	97666	104	0.51	97615	4071459	41.7	39.8	43.6
37	0.00113	97563	110	0.50	97508	3973844	40.7	38.8	42.6
38	0.00123	97453	119	0.50	97393	3876337	39.8	37.9	41.7
39	0.00132	97333	128	0.50	97269	3778944	38.8	36.9	40.7
40	0.00151	97205	147	0.50	97132	3681674	37.9	36.0	39.8
41	0.00162	97058	157	0.50	96980	3584542	36.9	35.0	38.8
42	0.00181	96902	176	0.50	96814	3487562	36.0	34.1	37.9

Table A.2.2: Berkeley Mortality Database Male Life Table, Japan 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00202	96726	195	0.50	96628	3390749	35.1	33.2	37.0
44	0.00228	96531	220	0.50	96421	3294120	34.1	32.2	36.0
45	0.00250	96311	240	0.50	96191	3197699	33.2	31.3	35.1
46	0.00277	96071	266	0.50	95938	3101508	32.3	30.4	34.2
47	0.00311	95805	298	0.50	95656	3005570	31.4	29.5	33.2
48	0.00339	95507	324	0.50	95345	2909914	30.5	28.6	32.3
49	0.00369	95183	351	0.50	95008	2814569	29.6	27.7	31.4
50	0.00410	94832	389	0.50	94637	2719561	28.7	26.8	30.5
51	0.00450	94443	425	0.50	94230	2624924	27.8	25.9	29.7
52	0.00489	94018	460	0.50	93788	2530694	26.9	25.1	28.8
53	0.00531	93558	497	0.50	93310	2436906	26.1	24.2	27.9
54	0.00584	93062	543	0.50	92790	2343596	25.2	23.3	27.0
55	0.00656	92519	607	0.50	92215	2250806	24.3	22.5	26.2
56	0.00720	91912	662	0.50	91580	2158591	23.5	21.7	25.3
57	0.00806	91250	735	0.50	90882	2067011	22.7	20.8	24.5
58	0.00896	90515	811	0.50	90108	1976129	21.8	20.0	23.7
59	0.01001	89703	898	0.50	89254	1886021	21.0	19.2	22.8
60	0.01104	88806	981	0.50	88314	1796767	20.2	18.4	22.0
61	0.01213	87825	1065	0.50	87291	1708452	19.5	17.6	21.3
62	0.01335	86760	1158	0.50	86179	1621161	18.7	16.9	20.5
63	0.01445	85602	1237	0.50	84982	1534982	17.9	16.1	19.7
64	0.01566	84365	1321	0.50	83703	1450000	17.2	15.4	19.0
65	0.01690	83044	1403	0 50	82340	1366297	16.5	14.7	18.2
66	0.01836	81641	1499	0.50	80889	1283957	15.7	14.0	17.5
67	0.01980	80142	1587	0.50	79345	1203068	15.0	13.2	16.8
68	0.02179	78555	1712	0.50	77696	1123723	14.3	12.5	16.1
69	0.02381	76843	1830	0.50	75925	1046027	13.6	11.8	15.4
70	0.02618	75013	1964	0.50	74027	970103	12.9	11.2	14.7
71	0.02872	73050	2098	0.50	71996	896075	12.3	10.5	14.0
72	0.03179	70952	2256	0.50	69818	824079	11.6	9.9	13.4
73	0.03527	68696	2423	0.50	67478	754261	11.0	9.2	12.7
74	0.03931	66273	2605	0.50	64962	686784	10.4	8.6	12.1
75	0.04387	63668	2793	0.50	62261	621822	9.8	8.0	11.5
76	0.04866	60875	2962	0.50	59381	559561	9.2	7.4	11.0
77	0.05435	57912	3148	0.50	56324	500180	8.6	6.9	10.4
78	0.06062	54765	3320	0.49	53088	443856	8.1	6.3	9.9
79	0.06782	51445	3489	0.49	49680	390768	7.6	5.8	9.4
80	0.07570	47956	3630	0.49	46117	341088	7.1	5.3	8.9
81	0.08375	44326	3712	0.49	42443	294971	6.7	4.8	8.5
82	0.09398	40613	3817	0.49	38674	252528	6.2	4.3	8.1
83	0.10485	36796	3858	0.49	34832	213855	5.8	3.9	7.7
84	0.11565	32938	3809	0.49	30995	179023	5.4	3.5	7.4
85	0.12682	29129	3694	0.49	27240	148028	5.1	3.0	7.1

Table A.2.2: Berkeley Mortality Database Male Life Table, Japan 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
86	0.14078	25435	3581	0.49	23599	120788	4.8	2.6	6.9
87	0.15255	21854	3334	0.49	20141	97189	4.5	2.3	6.6
88	0.16753	18520	3103	0.49	16922	77048	4.2	1.9	6.4
89	0.17908	15418	2761	0.48	13992	60127	3.9	1.5	6.3
90	0.19411	12657	2457	0.48	11384	46135	3.7	1.2	6.1
91	0.21207	10200	2163	0.48	9075	34751	3.4	0.8	6.0
92	0.22951	8037	1845	0.48	7074	25675	3.2	0.6	5.8
93	0.24273	6192	1503	0.48	5406	18601	3.0	0.4	5.6
94	0.25951	4689	1217	0.47	4050	13195	2.8	0.6	5.0
95	0.27812	3472	966	0.47	2963	9145	2.6	-	-
96	0.28829	2507	723	0.47	2125	6181	2.5	-	-
97	0.31748	1784	566	0.47	1483	4056	2.3	-	-
98	0.33789	1218	411	0.46	998	2574	2.1	-	-
99	0.37133	806	299	0.46	645	1576	2.0	-	-
100	0.38918	507	197	0.46	400	931	1.8	-	-
101	0.41253	310	128	0.45	240	531	1.7	-	-
102	0.45193	182	82	0.45	137	291	1.6	-	-
103	0.45070	100	45	0.44	75	154	1.6	-	-
104	0.47450	55	26	0.42	40	79	1.4	-	-
105	0.46674	29	13	0.38	21	39	1.3	-	-
106	0.52035	15	8	0.50	11	17	1.1	-	-
107	0.59791	7	4	0.50	5	6	0.9	-	-
108	0.82084	3	2	0.50	1	2	0.5	-	-
109	1.00000	1	1	0.50	0	0	0.3	-	-
110+	1.00000	0	0	0.50	0	0	0.0	-	-

Table A.2.3: Berkeley Mortality Database Male Life Table, Sweden 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00558	100000	558	0.08	99487	7558985	75.6	73.6	77.6
1	0.00035	99442	35	0.51	99425	7459498	75.0	73.0	77.0
2	0.00023	99408	23	0.48	99396	7360073	74.0	72.1	76.0
3	0.00021	99384	21	0.52	99374	7260677	73.1	71.1	75.0
4	0.00021	99363	21	0.52	99353	7161303	72.1	70.1	74.0
5	0.00013	99342	13	0.54	99336	7061951	71.1	69.1	73.0
6	0.00014	99329	14	0.50	99322	6962615	70.1	68.1	72.1
7	0.00020	99315	20	0.50	99305	6863293	69.1	67.2	71.1
8	0.00015	99296	14	0.43	99288	6763988	68.1	66.2	70.1
9	0.00009	99281	9	0.56	99277	6664699	67.1	65.2	69.1
10	0.00015	99272	15	0.53	99265	6565423	66.1	64.2	68.1
11	0.00013	99257	13	0.54	99251	6466158	65.2	63.2	67.1
12	0.00013	99245	13	0.46	99238	6366907	64.2	62.2	66.1
13	0.00017	99232	17	0.47	99223	6267669	63.2	61.2	65.1
14	0.00016	99215	16	0.50	99207	6168445	62.2	60.2	64.1
15	0.00027	99198	27	0.52	99185	6069239	61.2	59.2	63.1
16	0.00037	99171	36	0.50	99153	5970054	60.2	58.3	62.1
17	0.00047	99135	47	0.49	99111	5870901	59.2	57.3	61.2
18	0.00065	99088	64	0.50	99056	5771789	58.3	56.3	60.2
19	0.00067	99024	66	0.50	98991	5672733	57.3	55.3	59.2
20	0.00068	98958	67	0.49	98924	5573742	56.3	54.4	58.3
21	0.00070	98891	69	0.49	98856	5474818	55.4	53.4	57.3
22	0.00064	98822	63	0.49	98790	5375962	54.4	52.5	56.3
23	0.00082	98759	81	0.49	98718	5277172	53.4	51.5	55.4
24	0.00075	98677	74	0.50	98640	5178454	52.5	50.5	54.4
25	0.00068	98603	67	0.51	98570	5079814	51.5	49.6	53.4
26	0.00074	98536	72	0.50	98500	4981244	50.6	48.6	52.5
27	0.00090	98464	88	0.49	98419	4882744	49.6	47.7	51.5
28	0.00084	98375	82	0.50	98334	4784325	48.6	46.7	50.6
29	0.00088	98293	87	0.51	98250	4685990	47.7	45.8	49.6
30	0.00098	98206	96	0.50	98158	4587741	46.7	44.8	48.6
31	0.00098	98110	97	0.49	98061	4489583	45.8	43.8	47.7
32	0.00096	98013	94	0.50	97966	4391521	44.8	42.9	46.7
33	0.00103	97919	100	0.50	97869	4293555	43.9	41.9	45.8
34	0.00115	97819	113	0.50	97763	4195686	42.9	41.0	44.8
35	0.00124	97706	121	0.50	97646	4097923	41.9	40.0	43.8
36	0.00126	97585	123	0.50	97524	4000278	41.0	39.1	42.9
37	0.00145	97462	141	0.50	97392	3902754	40.0	38.1	41.9
38	0.00152	97321	148	0.50	97247	3805362	39.1	37.2	41.0
39	0.00150	97173	145	0.50	97101	3708115	38.2	36.3	40.1
40	0.00176	97028	171	0.50	96943	3611014	37.2	35.3	39.1
41	0.00182	96857	176	0.50	96769	3514071	36.3	34.4	38.2
42	0.00206	96681	199	0.50	96582	3417302	35.4	33.5	37.2

Table A.2.3: Berkeley Mortality Database Male Life Table, Sweden 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00221	96483	214	0.50	96376	3320720	34.4	32.5	36.3
44	0.00223	96269	215	0.50	96162	3224344	33.5	31.6	35.4
45	0.00266	96054	255	0.50	95927	3128183	32.6	30.7	34.4
46	0.00266	95799	255	0.50	95671	3032256	31.7	29.8	33.5
47	0.00311	95544	298	0.50	95395	2936585	30.7	28.9	32.6
48	0.00317	95246	302	0.50	95095	2841190	29.8	28.0	31.7
49	0.00352	94944	334	0.50	94777	2746095	28.9	27.1	30.8
50	0.00384	94610	363	0.50	94428	2651318	28.0	26.2	29.9
51	0.00429	94247	404	0.50	94044	2556890	27.1	25.3	29.0
52	0.00492	93842	461	0.50	93612	2462846	26.2	24.4	28.1
53	0.00515	93381	481	0.50	93141	2369234	25.4	23.5	27.2
54	0.00567	92900	527	0.50	92637	2276094	24.5	22.7	26.3
55	0.00656	92373	606	0.50	92070	2183457	23.6	21.8	25.5
56	0.00736	91767	675	0.50	91429	2091387	22.8	21.0	24.6
57	0.00806	91092	734	0.50	90725	1999958	22.0	20.1	23.8
58	0.00885	90358	800	0.50	89958	1909233	21.1	19.3	22.9
59	0.00978	89558	876	0.50	89120	1819275	20.3	18.5	22.1
60	0.01067	88683	946	0.50	88209	1730156	19.5	17.7	21.3
61	0.01193	87737	1046	0.50	87213	1641947	18.7	16.9	20.5
62	0.01349	86690	1170	0.50	86104	1554734	17.9	16.1	19.7
63	0.01497	85521	1281	0.50	84879	1468630	17.2	15.4	18.9
64	0.01627	84240	1371	0.50	83553	1383751	16.4	14.7	18.2
65	0.01812	82869	1502	0.50	82116	1300198	15.7	13.9	17.5
66	0.02031	81368	1653	0.50	80538	1218082	15.0	13.2	16.7
67	0.02185	79715	1742	0.50	78841	1137544	14.3	12.5	16.0
68	0.02442	77973	1904	0.50	77018	1058703	13.6	11.8	15.3
69	0.02647	76070	2014	0.50	75058	981685	12.9	11.2	14.7
70	0.02955	74056	2189	0.50	72956	906627	12.2	10.5	14.0
71	0.03223	71867	2316	0.50	70703	833671	11.6	9.8	13.4
72	0.03588	69551	2495	0.50	68296	762968	11.0	9.2	12.7
73	0.04070	67056	2729	0.50	65682	694672	10.4	8.6	12.1
74	0.04514	64327	2904	0.50	62864	628991	9.8	8.0	11.5
75	0.04931	61423	3029	0.50	59896	566127	9.2	7.5	11.0
76	0.05411	58394	3159	0.50	56800	506231	8.7	6.9	10.4
77	0.06350	55235	3507	0.49	53462	449432	8.1	6.3	9.9
78	0.06882	51727	3560	0.49	49926	395970	7.7	5.8	9.5
79	0.07509	48167	3617	0.49	46335	346044	7.2	5.3	9.0
80	0.08333	44550	3712	0.49	42667	299709	6.7	4.9	8.6
81	0.09183	40838	3750	0.49	38933	257041	6.3	4.4	8.2
82	0.10223	37088	3791	0.49	35158	218108	5.9	3.9	7.8
83	0.11151	33297	3713	0.49	31404	182950	5.5	3.5	7.5
84	0.12393	29584	3666	0.49	27710	151546	5.1	3.1	7.2
85	0.13633	25918	3533	0.49	24108	123835	4.8	2.7	6.9

Table A.2.3: Berkeley Mortality Database Male Life Table, Sweden 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
86	0.15037	22384	3366	0.49	20656	99727	4.5	2.3	6.6
87	0.16069	19019	3056	0.49	17446	79072	4.2	1.9	6.4
88	0.17821	15962	2845	0.48	14494	61626	3.9	1.5	6.2
89	0.19213	13118	2520	0.48	11813	47132	3.6	1.1	6.1
90	0.21077	10598	2234	0.48	9437	35319	3.3	0.7	6.0
91	0.23114	8364	1933	0.48	7355	25883	3.1	0.3	5.8
92	0.25025	6431	1609	0.48	5587	18528	2.9	-	-
93	0.27212	4821	1312	0.47	4131	12940	2.7	-	-
94	0.28577	3509	1003	0.47	2980	8810	2.5	-	-
95	0.31557	2506	791	0.47	2086	5830	2.3	-	-
96	0.33734	1716	579	0.46	1406	3744	2.2	-	-
97	0.37098	1137	422	0.46	910	2337	2.1	-	-
98	0.35684	715	255	0.46	578	1428	2.0	-	-
99	0.39838	460	183	0.46	361	849	1.9	-	-
100	0.40152	277	111	0.45	216	489	1.8	-	-
101	0.43942	166	73	0.45	126	272	1.7	-	-
102	0.42042	93	39	0.46	72	147	1.6	-	-
103	0.49154	54	26	0.42	39	75	1.4	-	-
104	0.53969	27	15	0.47	19	36	1.3	-	-
105	0.49768	13	6	0.33	9	17	1.4	-	-
106	0.49627	6	3	0.67	5	8	1.3	-	-
107	0.51325	3	2	0.50	2	3	1.1	-	-
108	0.63212	2	1	0.50	1	1	0.7	-	-
109	1.00000	1	1	0.50	0	0	0.2	-	-
110+	1.00000	0	0	0.50	0	0	0.0	-	-

Table A.3.1: Female Life Table, Utah 1994-1998

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00569	100000	569	0.09	99482	8040532	80.4	78.6	82.3
1	0.00057	99431	56	0.39	99397	7941050	79.9	78.1	81.7
2	0.00035	99375	35	0.39	99353	7841653	78.9	77.1	80.7
3	0.00038	99340	38	0.39	99317	7742300	77.9	76.1	79.7
4	0.00024	99302	24	0.39	99287	7642983	77.0	75.2	78.8
5	0.00013	99278	13	0.39	99270	7543696	76.0	74.2	77.8
6	0.00018	99264	18	0.45	99255	7444426	75.0	73.2	76.8
7	0.00016	99247	16	0.45	99238	7345172	74.0	72.2	75.8
8	0.00014	99231	14	0.45	99223	7245934	73.0	71.2	74.8
9	0.00022	99216	22	0.45	99204	7146711	72.0	70.2	73.8
10	0.00020	99194	20	0.45	99183	7047507	71.0	69.3	72.8
11	0.00020	99174	20	0.53	99165	6948324	70.1	68.3	71.9
12	0.00018	99154	18	0.53	99145	6849160	69.1	67.3	70.9
13	0.00030	99136	29	0.53	99122	6750014	68.1	66.3	69.9
14	0.00032	99106	32	0.53	99091	6650892	67.1	65.3	68.9
15	0.00036	99075	36	0.53	99058	6551801	66.1	64.3	67.9
16	0.00058	99039	57	0.53	99012	6452743	65.2	63.4	66.9
17	0.00053	98982	53	0.53	98957	6353731	64.2	62.4	66.0
18	0.00055	98929	55	0.53	98903	6254775	63.2	61.4	65.0
19	0.00044	98874	43	0.53	98854	6155872	62.3	60.5	64.0
20	0.00052	98831	52	0.53	98806	6057018	61.3	59.5	63.1
21	0.00037	98779	37	0.52	98761	5958211	60.3	58.5	62.1
22	0.00034	98742	34	0.52	98726	5859450	59.3	57.6	61.1
23	0.00039	98709	39	0.52	98690	5760724	58.4	56.6	60.1
24	0.00044	98670	43	0.52	98649	5662034	57.4	55.6	59.2
25	0.00046	98627	45	0.52	98605	5563385	56.4	54.6	58.2
26	0.00044	98581	43	0.52	98561	5464780	55.4	53.7	57.2
27	0.00060	98539	59	0.52	98510	5366219	54.5	52.7	56.2
28	0.00056	98479	56	0.52	98453	5267709	53.5	51.7	55.3
29	0.00070	98424	69	0.52	98391	5169256	52.5	50.8	54.3
30	0.00087	98355	86	0.52	98314	5070865	51.6	49.8	53.3
31	0.00063	98270	62	0.53	98240	4972551	50.6	48.9	52.4
32	0.00072	98207	70	0.53	98174	4874311	49.6	47.9	51.4
33	0.00105	98137	103	0.53	98088	4776136	48.7	46.9	50.4
34	0.00104	98034	102	0.53	97986	4678048	47.7	46.0	49.5
35	0.00092	97932	90	0.53	97889	4580062	46.8	45.0	48.5
36	0.00118	97841	115	0.53	97787	4482173	45.8	44.1	47.6
37	0.00097	97726	95	0.53	97681	4384386	44.9	43.1	46.6
38	0.00102	97631	100	0.53	97584	4286705	43.9	42.2	45.6
39	0.00128	97531	125	0.53	97472	4189121	43.0	41.2	44.7
40	0.00134	97406	131	0.53	97344	4091649	42.0	40.3	43.7
41	0.00140	97275	136	0.53	97211	3994304	41.1	39.3	42.8
42	0.00154	97139	150	0.53	97069	3897093	40.1	38.4	41.8

Table A.3.1: Female Life Table, Utah 1994-1998 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00195	96989	189	0.53	96900	3800024	39.2	37.5	40.9
44	0.00166	96800	161	0.53	96724	3703124	38.3	36.6	40.0
45	0.00210	96639	203	0.53	96544	3606399	37.3	35.6	39.0
46	0.00170	96436	164	0.53	96359	3509856	36.4	34.7	38.1
47	0.00219	96272	211	0.53	96173	3413497	35.5	33.8	37.1
48	0.00242	96061	232	0.53	95952	3317324	34.5	32.9	36.2
49	0.00203	95829	195	0.53	95737	3221372	33.6	31.9	35.3
50	0.00245	95634	234	0.53	95524	3125635	32.7	31.0	34.4
51	0.00308	95400	294	0.53	95262	3030111	31.8	30.1	33.4
52	0.00308	95106	292	0.53	94968	2934849	30.9	29.2	32.5
53	0.00319	94813	302	0.53	94671	2839881	30.0	28.3	31.6
54	0.00436	94511	412	0.53	94317	2745209	29.0	27.4	30.7
55	0.00389	94099	366	0.53	93927	2650892	28.2	26.5	29.8
56	0.00505	93732	473	0.53	93510	2556966	27.3	25.6	28.9
57	0.00444	93259	414	0.53	93065	2463455	26.4	24.8	28.0
58	0.00608	92845	564	0.53	92580	2370391	25.5	23.9	27.2
59	0.00662	92281	611	0.53	91994	2277810	24.7	23.1	26.3
60	0.00658	91671	603	0.53	91387	2185816	23.8	22.2	25.4
61	0.00657	91068	598	0.53	90787	2094429	23.0	21.4	24.6
62	0.00853	90469	772	0.53	90107	2003642	22.1	20.6	23.7
63	0.00825	89698	740	0.53	89350	1913535	21.3	19.8	22.9
64	0.00991	88958	881	0.53	88544	1824185	20.5	19.0	22.1
65	0.01133	88077	998	0.53	87608	1735641	19.7	18.2	21.3
66	0.01272	87079	1107	0.53	86559	1648033	18.9	17.4	20.5
67	0.01327	85972	1141	0.53	85436	1561474	18.2	16.6	19.7
68	0.01510	84831	1281	0.53	84229	1476038	17.4	15.9	18.9
69	0.01571	83550	1313	0.53	82933	1391809	16.7	15.2	18.1
70	0.01656	82237	1362	0.53	81597	1308876	15.9	14.5	17.4
71	0.01992	80876	1611	0.53	80118	1227279	15.2	13.7	16.6
72	0.02151	79265	1705	0.53	78463	1147160	14.5	13.0	15.9
73	0.02473	77560	1918	0.53	76658	1068697	13.8	12.4	15.2
74	0.02703	75642	2044	0.53	74681	992038	13.1	11.7	14.5
75	0.02720	73597	2002	0.53	72657	917357	12.5	11.1	13.8
76	0.03132	71596	2242	0.52	70520	844701	11.8	10.5	13.1
77	0.03699	69354	2566	0.52	68122	774181	11.2	9.9	12.5
78	0.03804	66788	2540	0.52	65569	706059	10.6	9.3	11.8
79	0.04292	64248	2758	0.52	62924	640490	10.0	8.8	11.2
80	0.04933	61490	3034	0.52	60034	577566	9.4	8.2	10.5
81	0.05306	58457	3101	0.50	56906	517532	8.9	7.8	9.9
82	0.06176	55355	3419	0.50	53646	460626	8.3	7.3	9.3
83	0.06722	51937	3491	0.50	50191	406980	7.8	7.0	8.7
84	0.07518	48446	3642	0.50	46625	356789	7.4	6.7	8.0
85+	1.00000	44804	44804	0.50	310164	310164	6.9		

Table A.3.2: Non-LDS Female Life Table, Utah 1994-1998

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00569	100000	569	0.09	99482	7742076	77.4	75.5	79.3
1	0.00055	99431	54	0.39	99398	7642593	76.9	75.0	78.7
2	0.00042	99377	42	0.39	99351	7543196	75.9	74.0	77.8
3	0.00050	99335	50	0.39	99305	7443844	74.9	73.1	76.8
4	0.00019	99285	19	0.39	99274	7344540	74.0	72.1	75.9
5	0.00023	99267	23	0.39	99253	7245266	73.0	71.1	74.9
6	0.00027	99244	27	0.45	99229	7146013	72.0	70.1	73.9
7	0.00021	99217	21	0.45	99205	7046784	71.0	69.2	72.9
8	0.00030	99196	29	0.45	99180	6947579	70.0	68.2	71.9
9	0.00025	99167	25	0.45	99153	6848399	69.1	67.2	70.9
10	0.00022	99142	22	0.45	99129	6749246	68.1	66.2	69.9
11	0.00017	99120	17	0.53	99111	6650116	67.1	65.2	69.0
12	0.00032	99102	32	0.53	99087	6551005	66.1	64.2	68.0
13	0.00058	99070	58	0.53	99043	6451918	65.1	63.3	67.0
14	0.00040	99013	40	0.53	98994	6352875	64.2	62.3	66.0
15	0.00057	98973	56	0.53	98947	6253880	63.2	61.3	65.0
16	0.00093	98917	92	0.53	98873	6154934	62.2	60.4	64.1
17	0.00056	98825	55	0.53	98799	6056061	61.3	59.4	63.1
18	0.00148	98770	146	0.53	98701	5957262	60.3	58.5	62.2
19	0.00051	98624	50	0.53	98600	5858561	59.4	57.6	61.2
20	0.00088	98574	87	0.53	98533	5759961	58.4	56.6	60.3
21	0.00064	98487	63	0.52	98456	5661428	57.5	55.6	59.3
22	0.00114	98423	112	0.52	98370	5562971	56.5	54.7	58.4
23	0.00095	98311	94	0.52	98266	5464602	55.6	53.8	57.4
24	0.00081	98217	80	0.52	98179	5366335	54.6	52.8	56.5
25	0.00057	98138	56	0.52	98111	5268156	53.7	51.9	55.5
26	0.00068	98082	67	0.52	98050	5170046	52.7	50.9	54.5
27	0.00106	98015	104	0.52	97965	5071996	51.7	49.9	53.6
28	0.00093	97911	91	0.52	97868	4974031	50.8	49.0	52.6
29	0.00080	97820	78	0.52	97783	4876163	49.8	48.0	51.7
30	0.00126	97743	123	0.52	97683	4778380	48.9	47.1	50.7
31	0.00110	97619	108	0.53	97569	4680697	47.9	46.1	49.8
32	0.00092	97512	90	0.53	97469	4583128	47.0	45.2	48.8
33	0.00155	97421	151	0.53	97351	4485659	46.0	44.2	47.8
34	0.00166	97271	161	0.53	97195	4388308	45.1	43.3	46.9
35	0.00140	97109	136	0.53	97046	4291113	44.2	42.4	46.0
36	0.00193	96974	187	0.53	96886	4194068	43.2	41.5	45.0
37	0.00149	96787	144	0.53	96719	4097182	42.3	40.6	44.1
38	0.00146	96643	141	0.53	96577	4000463	41.4	39.6	43.2
39	0.00162	96502	156	0.53	96429	3903886	40.5	38.7	42.2
40	0.00192	96346	185	0.53	96259	3807457	39.5	37.8	41.3
41	0.00174	96161	168	0.53	96082	3711198	38.6	36.8	40.4
42	0.00226	95993	217	0.53	95892	3615116	37.7	35.9	39.4

Table A.3.2: Non-LDS Female Life Table, Utah 1994-1998 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00275	95777	263	0.53	95653	3519224	36.7	35.0	38.5
44	0.00171	95514	163	0.53	95437	3423571	35.8	34.1	37.6
45	0.00248	95350	236	0.53	95239	3328134	34.9	33.2	36.6
46	0.00212	95114	202	0.53	95019	3232895	34.0	32.3	35.7
47	0.00274	94912	260	0.53	94790	3137876	33.1	31.3	34.8
48	0.00393	94652	372	0.53	94477	3043086	32.2	30.4	33.9
49	0.00265	94280	250	0.53	94163	2948608	31.3	29.6	33.0
50	0.00314	94030	295	0.53	93892	2854446	30.4	28.6	32.1
51	0.00362	93735	339	0.53	93575	2760554	29.5	27.7	31.2
52	0.00503	93396	470	0.53	93175	2666979	28.6	26.9	30.3
53	0.00444	92926	412	0.53	92732	2573804	27.7	26.0	29.4
54	0.00606	92513	561	0.53	92250	2481072	26.8	25.1	28.5
55	0.00557	91953	512	0.53	91712	2388822	26.0	24.3	27.7
56	0.00682	91440	624	0.53	91147	2297111	25.1	23.5	26.8
57	0.00479	90817	435	0.53	90612	2205963	24.3	22.6	25.9
58	0.00925	90382	836	0.53	89989	2115351	23.4	21.8	25.1
59	0.00878	89546	786	0.53	89176	2025362	22.6	21.0	24.3
60	0.00786	88760	698	0.53	88432	1936186	21.8	20.2	23.4
61	0.00948	88062	835	0.53	87669	1847754	21.0	19.4	22.6
62	0.01076	87227	939	0.53	86786	1760085	20.2	18.6	21.8
63	0.01156	86288	998	0.53	85819	1673299	19.4	17.8	21.0
64	0.01068	85290	911	0.53	84862	1587480	18.6	17.0	20.2
65	0.01499	84380	1265	0.53	83785	1502617	17.8	16.2	19.4
66	0.01557	83115	1294	0.53	82507	1418832	17.1	15.5	18.6
67	0.01753	81821	1435	0.53	81146	1336326	16.3	14.8	17.9
68	0.02193	80386	1763	0.53	79557	1255179	15.6	14.1	17.1
69	0.01888	78623	1485	0.53	77925	1175622	15.0	13.5	16.5
70	0.01965	77138	1516	0.53	76426	1097697	14.2	12.7	15.7
71	0.02356	75622	1782	0.53	74785	1021271	13.5	12.0	15.0
72	0.02333	73840	1723	0.53	73031	946487	12.8	11.4	14.3
73	0.03129	72117	2257	0.53	71057	873456	12.1	10.7	13.5
74	0.03427	69861	2394	0.53	68736	802399	11.5	10.1	12.9
75	0.03075	67467	2075	0.53	66492	733663	10.9	9.5	12.2
76	0.03900	65392	2550	0.52	64168	667171	10.2	8.9	11.5
77	0.04347	62842	2732	0.52	61531	603003	9.6	8.3	10.9
78	0.03900	60110	2344	0.52	58985	541472	9.0	7.7	10.3
79	0.04439	57766	2564	0.52	56535	482487	8.4	7.1	9.6
80	0.06846	55202	3779	0.52	53388	425952	7.7	6.5	8.9
81	0.06223	51423	3200	0.50	49823	372564	7.2	6.1	8.4
82	0.08205	48223	3957	0.50	46244	322741	6.7	5.7	7.7
83	0.08566	44266	3792	0.50	42370	276496	6.2	5.4	7.1
84	0.07856	40474	3180	0.50	38884	234126	5.8	5.2	6.4
85+	1.00000	37294	37294	0.50	195242	195242	5.2		

Table A.3.3: Less-Active LDS Female Life Table, Utah 1994-1998

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00569	100000	569	0.09	99482	7765663	77.7	75.7	79.7
1	0.00058	99431	58	0.39	99396	7666181	77.1	75.1	79.1
2	0.00031	99373	31	0.39	99355	7566785	76.1	74.2	78.1
3	0.00031	99343	31	0.39	99323	7467431	75.2	73.2	77.1
4	0.00027	99311	27	0.39	99295	7368107	74.2	72.2	76.2
5	0.00009	99285	9	0.39	99279	7268812	73.2	71.2	75.2
6	0.00014	99276	14	0.45	99268	7169533	72.2	70.3	74.2
7	0.00014	99262	14	0.45	99254	7070265	71.2	69.3	73.2
8	0.00009	99248	9	0.45	99243	6971010	70.2	68.3	72.2
9	0.00021	99239	21	0.45	99227	6871767	69.2	67.3	71.2
10	0.00019	99218	19	0.45	99208	6772540	68.3	66.3	70.2
11	0.00021	99199	21	0.53	99189	6673332	67.3	65.3	69.2
12	0.00017	99178	17	0.53	99170	6574143	66.3	64.3	68.2
13	0.00035	99161	35	0.53	99145	6474973	65.3	63.3	67.3
14	0.00054	99127	53	0.53	99102	6375828	64.3	62.4	66.3
15	0.00034	99073	34	0.53	99057	6276726	63.4	61.4	65.3
16	0.00102	99039	101	0.53	98992	6177669	62.4	60.4	64.3
17	0.00074	98938	73	0.53	98904	6078677	61.4	59.5	63.4
18	0.00072	98865	71	0.53	98832	5979773	60.5	58.5	62.4
19	0.00067	98794	67	0.53	98763	5880941	59.5	57.6	61.5
20	0.00064	98727	63	0.53	98698	5782179	58.6	56.6	60.5
21	0.00051	98664	50	0.52	98640	5683481	57.6	55.7	59.5
22	0.00029	98614	29	0.52	98601	5584841	56.6	54.7	58.6
23	0.00048	98586	48	0.52	98563	5486240	55.6	53.7	57.6
24	0.00057	98538	56	0.52	98511	5387677	54.7	52.7	56.6
25	0.00075	98482	74	0.52	98446	5289166	53.7	51.8	55.6
26	0.00059	98408	58	0.52	98380	5190720	52.7	50.8	54.7
27	0.00072	98350	71	0.52	98316	5092340	51.8	49.8	53.7
28	0.00073	98279	72	0.52	98244	4994024	50.8	48.9	52.7
29	0.00121	98207	119	0.52	98150	4895780	49.9	47.9	51.8
30	0.00106	98088	104	0.52	98038	4797630	48.9	47.0	50.8
31	0.00069	97984	68	0.53	97952	4699592	48.0	46.0	49.9
32	0.00126	97916	123	0.53	97858	4601640	47.0	45.1	48.9
33	0.00151	97792	148	0.53	97723	4503782	46.1	44.1	48.0
34	0.00127	97645	124	0.53	97586	4406060	45.1	43.2	47.0
35	0.00152	97521	148	0.53	97451	4308473	44.2	42.3	46.1
36	0.00164	97372	159	0.53	97298	4211022	43.2	41.3	45.1
37	0.00150	97213	146	0.53	97145	4113724	42.3	40.4	44.2
38	0.00156	97067	151	0.53	96996	4016580	41.4	39.5	43.3
39	0.00199	96916	193	0.53	96825	3919583	40.4	38.6	42.3
40	0.00201	96723	195	0.53	96632	3822758	39.5	37.6	41.4
41	0.00243	96529	235	0.53	96418	3726126	38.6	36.7	40.5
42	0.00226	96294	218	0.53	96191	3629708	37.7	35.8	39.6

Table A.3.3: Less-Active LDS Female Life Table, Utah 1994-1998 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$ Lower	Upper
43	0.00288	96076	277	0.53	95946	3533517	36.8	34.9	38.6
44	0.00280	95799	268	0.53	95673	3437571	35.9	34.0	37.7
45	0.00396	95531	378	0.53	95354	3341897	35.0	33.1	36.8
46	0.00317	95153	302	0.53	95011	3246543	34.1	32.3	36.0
47	0.00357	94851	339	0.53	94692	3151532	33.2	31.4	35.1
48	0.00403	94512	381	0.53	94333	3056840	32.3	30.5	34.2
49	0.00316	94131	298	0.53	93991	2962507	31.5	29.6	33.3
50	0.00433	93834	406	0.53	93643	2868515	30.6	28.7	32.4
51	0.00601	93427	562	0.53	93164	2774873	29.7	27.9	31.5
52	0.00478	92866	444	0.53	92657	2681709	28.9	27.1	30.7
53	0.00613	92422	567	0.53	92156	2589052	28.0	26.2	29.8
54	0.00729	91855	670	0.53	91540	2496896	27.2	25.4	29.0
55	0.00512	91185	467	0.53	90966	2405355	26.4	24.6	28.2
56	0.00684	90719	620	0.53	90427	2314389	25.5	23.7	27.3
57	0.00658	90098	593	0.53	89820	2223962	24.7	22.9	26.5
58	0.00720	89506	645	0.53	89203	2134143	23.8	22.1	25.6
59	0.00845	88861	751	0.53	88508	2044940	23.0	21.3	24.8
60	0.00975	88110	859	0.53	87707	1956432	22.2	20.5	23.9
61	0.00858	87252	748	0.53	86900	1868725	21.4	19.7	23.2
62	0.01271	86503	1100	0.53	85987	1781825	20.6	18.9	22.3
63	0.01194	85404	1020	0.53	84924	1695839	19.9	18.1	21.6
64	0.01386	84384	1169	0.53	83834	1610914	19.1	17.4	20.8
65	0.01668	83214	1388	0.53	82562	1527080	18.4	16.7	20.0
66	0.01805	81826	1477	0.53	81132	1444518	17.7	16.0	19.3
67	0.01778	80349	1429	0.53	79678	1363386	17.0	15.3	18.6
68	0.01927	78920	1521	0.53	78206	1283709	16.3	14.6	17.9
69	0.02287	77399	1770	0.53	76567	1205503	15.6	13.9	17.2
70	0.02049	75629	1550	0.53	74901	1128936	14.9	13.3	16.6
71	0.02586	74079	1915	0.53	73179	1054035	14.2	12.6	15.8
72	0.03015	72164	2176	0.53	71141	980856	13.6	12.0	15.2
73	0.02928	69988	2049	0.53	69025	909715	13.0	11.4	14.6
74	0.03145	67939	2137	0.53	66935	840690	12.4	10.8	13.9
75	0.03783	65802	2489	0.53	64632	773755	11.8	10.2	13.3
76	0.04107	63313	2600	0.52	62065	709123	11.2	9.7	12.7
77	0.04910	60713	2981	0.52	59282	647058	10.7	9.2	12.1
78	0.04919	57732	2840	0.52	56369	587777	10.2	8.7	11.6
79	0.05527	54892	3034	0.52	53436	531408	9.7	8.3	11.1
80	0.06364	51858	3300	0.52	50274	477972	9.2	7.9	10.5
81	0.06098	48558	2961	0.50	47077	427698	8.8	7.6	10.1
82	0.06588	45597	3004	0.50	44095	380621	8.3	7.2	9.5
83	0.07115	42593	3030	0.50	41078	336526	7.9	6.9	8.9
84	0.09070	39562	3588	0.50	37768	295448	7.5	6.7	8.3
85+	1.00000	35974	35974	0.50	257680	257680	7.2		

Table A.3.4: Active LDS Female Life Table, Utah 1994-1998

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00569	100000	569	0.09	99482	8390908	83.9	82.3	85.6
1	0.00058	99431	58	0.39	99396	8291426	83.4	81.8	85.0
2	0.00031	99373	31	0.39	99355	8192030	82.4	80.8	84.0
3	0.00031	99343	31	0.39	99323	8092675	81.5	79.9	83.1
4	0.00027	99311	27	0.39	99295	7993352	80.5	78.9	82.1
5	0.00009	99285	9	0.39	99279	7894057	79.5	77.9	81.1
6	0.00014	99276	14	0.45	99268	7794778	78.5	76.9	80.1
7	0.00014	99262	14	0.45	99254	7695509	77.5	75.9	79.1
8	0.00009	99248	9	0.45	99243	7596255	76.5	74.9	78.1
9	0.00021	99239	21	0.45	99227	7497012	75.5	74.0	77.1
10	0.00019	99218	19	0.45	99208	7397784	74.6	73.0	76.1
11	0.00021	99199	21	0.53	99189	7298577	73.6	72.0	75.2
12	0.00011	99178	11	0.53	99173	7199388	72.6	71.0	74.2
13	0.00015	99167	15	0.53	99160	7100215	71.6	70.0	73.2
14	0.00024	99152	24	0.53	99141	7001054	70.6	69.0	72.2
15	0.00027	99128	27	0.53	99116	6901913	69.6	68.0	71.2
16	0.00032	99101	32	0.53	99086	6802798	68.6	67.1	70.2
17	0.00042	99069	42	0.53	99050	6703712	67.7	66.1	69.2
18	0.00024	99028	24	0.53	99017	6604662	66.7	65.1	68.3
19	0.00032	99004	31	0.53	98989	6505645	65.7	64.1	67.3
20	0.00014	98972	14	0.53	98966	6406656	64.7	63.2	66.3
21	0.00012	98959	12	0.52	98953	6307690	63.7	62.2	65.3
22	0.00007	98947	7	0.52	98943	6208737	62.7	61.2	64.3
23	0.00014	98940	13	0.52	98933	6109794	61.8	60.2	63.3
24	0.00019	98926	19	0.52	98917	6010861	60.8	59.2	62.3
25	0.00023	98907	23	0.52	98896	5911944	59.8	58.2	61.3
26	0.00017	98884	17	0.52	98876	5813048	58.8	57.2	60.4
27	0.00017	98867	17	0.52	98859	5714172	57.8	56.2	59.4
28	0.00022	98850	22	0.52	98840	5615313	56.8	55.2	58.4
29	0.00030	98828	30	0.52	98814	5516473	55.8	54.3	57.4
30	0.00039	98799	39	0.52	98780	5417659	54.8	53.3	56.4
31	0.00019	98759	19	0.53	98750	5318879	53.9	52.3	55.4
32	0.00025	98740	25	0.53	98729	5220129	52.9	51.3	54.4
33	0.00043	98716	42	0.53	98696	5121400	51.9	50.3	53.4
34	0.00047	98673	46	0.53	98652	5022704	50.9	49.3	52.5
35	0.00030	98627	29	0.53	98613	4924053	49.9	48.4	51.5
36	0.00049	98598	48	0.53	98575	4825439	48.9	47.4	50.5
37	0.00039	98549	39	0.53	98531	4726864	48.0	46.4	49.5
38	0.00053	98511	53	0.53	98486	4628333	47.0	45.4	48.5
39	0.00070	98458	69	0.53	98426	4529846	46.0	44.5	47.6
40	0.00063	98389	62	0.53	98360	4431421	45.0	43.5	46.6
41	0.00070	98327	69	0.53	98295	4333061	44.1	42.5	45.6
42	0.00077	98258	75	0.53	98223	4234766	43.1	41.6	44.6

Table A.3.4: Active LDS Female Life Table, Utah 1994-1998 continued

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00104	98183	103	0.53	98135	4136543	42.1	40.6	43.7
44	0.00116	98080	114	0.53	98027	4038409	41.2	39.6	42.7
45	0.00110	97966	108	0.53	97915	3940382	40.2	38.7	41.7
46	0.00089	97858	87	0.53	97817	3842467	39.3	37.7	40.8
47	0.00134	97771	131	0.53	97709	3744650	38.3	36.8	39.8
48	0.00111	97640	108	0.53	97589	3646941	37.4	35.8	38.9
49	0.00121	97531	118	0.53	97476	3549352	36.4	34.9	37.9
50	0.00139	97413	135	0.53	97350	3451876	35.4	33.9	36.9
51	0.00181	97278	176	0.53	97196	3354527	34.5	33.0	36.0
52	0.00157	97102	152	0.53	97031	3257331	33.5	32.0	35.0
53	0.00151	96950	147	0.53	96881	3160300	32.6	31.1	34.1
54	0.00250	96803	242	0.53	96690	3063419	31.6	30.2	33.1
55	0.00164	96561	158	0.53	96487	2966730	30.7	29.2	32.2
56	0.00224	96403	216	0.53	96302	2870243	29.8	28.3	31.3
57	0.00252	96188	242	0.53	96074	2773941	28.8	27.4	30.3
58	0.00331	95945	317	0.53	95796	2677867	27.9	26.4	29.4
59	0.00356	95628	341	0.53	95468	2582071	27.0	25.5	28.5
60	0.00342	95287	326	0.53	95134	2486603	26.1	24.6	27.5
61	0.00339	94962	321	0.53	94811	2391468	25.2	23.7	26.6
62	0.00440	94640	416	0.53	94445	2296657	24.3	22.8	25.7
63	0.00365	94224	344	0.53	94062	2202212	23.4	21.9	24.8
64	0.00686	93880	644	0.53	93577	2108150	22.5	21.0	23.9
65	0.00569	93236	530	0.53	92987	2014573	21.6	20.2	23.0
66	0.00755	92706	700	0.53	92377	1921586	20.7	19.3	22.1
67	0.00781	92006	718	0.53	91668	1829210	19.9	18.5	21.3
68	0.00885	91288	808	0.53	90908	1737541	19.0	17.7	20.4
69	0.00943	90480	854	0.53	90079	1646633	18.2	16.8	19.6
70	0.01236	89627	1108	0.53	89106	1556554	17.4	16.0	18.7
71	0.01444	88519	1278	0.53	87918	1467448	16.6	15.2	17.9
72	0.01570	87241	1370	0.53	86597	1379530	15.8	14.5	17.1
73	0.01877	85871	1612	0.53	85113	1292933	15.1	13.8	16.3
74	0.02098	84259	1768	0.53	83428	1207820	14.3	13.1	15.6
75	0.02011	82491	1659	0.53	81711	1124392	13.6	12.4	14.9
76	0.02285	80832	1847	0.52	79946	1042680	12.9	11.7	14.1
77	0.02834	78985	2239	0.52	77911	962735	12.2	11.0	13.4
78	0.03250	76747	2494	0.52	75550	884824	11.5	10.4	12.7
79	0.03696	74253	2744	0.52	72935	809274	10.9	9.8	12.0
80	0.03690	71508	2639	0.52	70242	736339	10.3	9.3	11.3
81	0.04636	68869	3193	0.50	67273	666097	9.7	8.7	10.7
82	0.05294	65677	3477	0.50	63938	598824	9.1	8.2	10.0
83	0.05806	62200	3612	0.50	60394	534886	8.6	7.8	9.4
84	0.06885	58588	4034	0.50	56572	474492	8.1	7.5	8.7
85+	1.00000	54555	54555	0.50	417920	417920	7.7		

Table A.4.1: Berkeley Mortality Database Female Life Table, US 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00737	100000	736	0.13	99360	7900774	79.0	76.9	81.1
1	0.00062	99263	61	0.49	99232	7801414	78.6	76.6	80.6
2	0.00039	99202	39	0.49	99182	7702181	77.6	75.6	79.7
3	0.00028	99163	28	0.50	99149	7602998	76.7	74.7	78.7
4	0.00023	99135	23	0.48	99123	7503849	75.7	73.7	77.7
5	0.00021	99112	20	0.45	99101	7404725	74.7	72.7	76.7
6	0.00019	99091	18	0.50	99082	7305624	73.7	71.7	75.7
7	0.00018	99072	17	0.53	99064	7206542	72.7	70.7	74.8
8	0.00016	99055	16	0.50	99047	7107478	71.8	69.7	73.8
9	0.00015	99039	15	0.47	99031	7008431	70.8	68.7	72.8
10	0.00014	99024	14	0.50	99017	6909399	69.8	67.8	71.8
11	0.00014	99010	14	0.50	99003	6810381	68.8	66.8	70.8
12	0.00017	98996	16	0.50	98988	6711377	67.8	65.8	69.8
13	0.00022	98980	21	0.48	98969	6612389	66.8	64.8	68.8
14	0.00028	98958	27	0.48	98944	6513420	65.8	63.8	67.8
15	0.00036	98930	35	0.49	98912	6414475	64.8	62.8	66.8
16	0.00043	98895	42	0.48	98873	6315562	63.9	61.9	65.9
17	0.00048	98852	47	0.51	98829	6216689	62.9	60.9	64.9
18	0.00050	98805	49	0.49	98780	6117860	61.9	59.9	63.9
19	0.00050	98755	49	0.51	98731	6019079	61.0	58.9	63.0
20	0.00049	98706	48	0.48	98681	5920348	60.0	58.0	62.0
21	0.00050	98657	49	0.51	98633	5821667	59.0	57.0	61.0
22	0.00050	98608	49	0.51	98584	5723033	58.0	56.0	60.0
23	0.00052	98559	51	0.49	98533	5624449	57.1	55.1	59.1
24	0.00054	98507	53	0.51	98481	5525916	56.1	54.1	58.1
25	0.00057	98454	56	0.50	98426	5427435	55.1	53.1	57.1
26	0.00060	98397	59	0.51	98368	5329009	54.2	52.2	56.1
27	0.00063	98338	62	0.50	98307	5230641	53.2	51.2	55.2
28	0.00067	98276	65	0.49	98243	5132334	52.2	50.2	54.2
29	0.00071	98210	70	0.50	98175	5034091	51.3	49.3	53.2
30	0.00075	98140	74	0.50	98103	4935916	50.3	48.3	52.3
31	0.00081	98066	79	0.49	98026	4837812	49.3	47.4	51.3
32	0.00086	97987	84	0.49	97944	4739786	48.4	46.4	50.3
33	0.00092	97902	89	0.51	97858	4641841	47.4	45.4	49.4
34	0.00099	97813	96	0.50	97765	4543983	46.5	44.5	48.4
35	0.00105	97716	103	0.50	97665	4446218	45.5	43.5	47.5
36	0.00114	97613	111	0.50	97558	4348553	44.6	42.6	46.5
37	0.00121	97502	118	0.50	97443	4250995	43.6	41.6	45.6
38	0.00129	97384	125	0.50	97321	4153551	42.7	40.7	44.6
39	0.00137	97258	133	0.50	97192	4056230	41.7	39.8	43.7
40	0.00145	97125	141	0.50	97055	3959037	40.8	38.8	42.7
41	0.00156	96984	151	0.50	96909	3861982	39.8	37.9	41.8
42	0.00168	96833	162	0.50	96752	3765073	38.9	36.9	40.8

Table A.4.1: Berkeley Mortality Database Female Life Table, US 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00182	96671	175	0.50	96583	3668320	38.0	36.0	39.9
44	0.00199	96495	191	0.50	96400	3571737	37.0	35.1	38.9
45	0.00217	96304	208	0.50	96199	3475337	36.1	34.2	38.0
46	0.00238	96095	228	0.50	95981	3379137	35.2	33.2	37.1
47	0.00261	95866	249	0.50	95741	3283156	34.3	32.3	36.2
48	0.00286	95616	273	0.50	95480	3187414	33.3	31.4	35.3
49	0.00314	95343	299	0.50	95194	3091934	32.4	30.5	34.3
50	0.00345	95044	327	0.50	94880	2996741	31.5	29.6	33.4
51	0.00379	94716	358	0.50	94536	2901860	30.6	28.7	32.6
52	0.00416	94357	392	0.50	94161	2807323	29.8	27.8	31.7
53	0.00457	93965	429	0.50	93750	2713162	28.9	27.0	30.8
54	0.00501	93535	468	0.50	93301	2619411	28.0	26.1	29.9
55	0.00551	93066	513	0.50	92810	2526110	27.1	25.3	29.0
56	0.00605	92553	559	0.50	92273	2433300	26.3	24.4	28.2
57	0.00663	91994	609	0.50	91689	2341026	25.5	23.6	27.3
58	0.00724	91384	661	0.50	91053	2249337	24.6	22.7	26.5
59	0.00789	90722	716	0.50	90364	2158284	23.8	21.9	25.7
60	0.00861	90006	774	0.50	89619	2067919	23.0	21.1	24.8
61	0.00939	89232	837	0.50	88813	1978299	22.2	20.3	24.0
62	0.01028	88394	908	0.50	87940	1889486	21.4	19.5	23.2
63	0.01128	87485	986	0.50	86992	1801546	20.6	18.8	22.4
64	0.01239	86499	1072	0.50	85963	1714553	19.8	18.0	21.7
65	0.01364	85427	1165	0.50	84844	1628591	19.1	17.2	20.9
66	0.01497	84262	1261	0.50	83631	1543746	18.3	16.5	20.1
67	0.01630	83001	1352	0.50	82324	1460114	17.6	15.8	19.4
68	0.01760	81648	1436	0.50	80930	1377789	16.9	15.1	18.7
69	0.01892	80211	1517	0.50	79453	1296859	16.2	14.4	18.0
70	0.02042	78693	1607	0.50	77890	1217406	15.5	13.7	17.3
71	0.02215	77086	1707	0.50	76232	1139516	14.8	13.0	16.6
72	0.02409	75379	1815	0.50	74471	1063283	14.1	12.3	15.9
73	0.02623	73563	1929	0.50	72598	988812	13.4	11.7	15.2
74	0.02864	71634	2051	0.50	70608	916213	12.8	11.0	14.6
75	0.03142	69582	2186	0.50	68488	845605	12.2	10.4	13.9
76	0.03455	67396	2328	0.50	66231	777116	11.5	9.8	13.3
77	0.03797	65067	2470	0.50	63832	710884	10.9	9.2	12.7
78	0.04166	62597	2608	0.50	61293	647052	10.3	8.6	12.1
79	0.04573	59989	2743	0.50	58617	585759	9.8	8.0	11.5
80	0.05036	57245	2882	0.50	55804	527142	9.2	7.4	11.0
81	0.05561	54363	3023	0.50	52851	471337	8.7	6.9	10.4
82	0.06148	51339	3156	0.50	49761	418486	8.2	6.4	9.9
83	0.06802	48183	3277	0.50	46544	368724	7.7	5.9	9.4
84	0.07530	44905	3381	0.50	43214	322180	7.2	5.4	9.0
85	0.08336	41524	3461	0.50	39793	278965	6.7	4.9	8.5

Table A.4.1: Berkeley Mortality Database Female Life Table, US 1991-1995 cont.

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
86	0.09227	38062	3512	0.50	36307	239172	6.3	4.5	8.1
87	0.10208	34550	3527	0.50	32787	202865	5.9	4.0	7.7
88	0.11284	31023	3500	0.50	29273	170077	5.5	3.6	7.3
89	0.12454	27523	3427	0.50	25809	140804	5.1	3.2	7.0
90	0.13725	24095	3307	0.50	22441	114995	4.8	2.9	6.7
91	0.15090	20788	3137	0.50	19219	92553	4.5	2.6	6.3
92	0.16558	17651	2922	0.50	16190	73333	4.2	2.3	6.0
93	0.18118	14728	2668	0.50	13394	57143	3.9	2.2	5.6
94	0.19781	12060	2385	0.50	10867	43749	3.6	2.2	5.0
95	0.21465	9674	2076	0.50	8636	32882	3.4	1.0	5.8
96	0.23157	7597	1759	0.50	6718	24246	3.2	-	-
97	0.24836	5838	1450	0.50	5113	17528	3.0	-	-
98	0.26483	4388	1162	0.50	3807	12414	2.8	-	-
99	0.28070	3226	905	0.50	2773	8607	2.7	-	-
100	0.29734	2320	690	0.50	1975	5834	2.5	-	-
101	0.31522	1630	514	0.50	1373	3858	2.4	-	-
102	0.33405	1116	373	0.50	930	2484	2.2	-	-
103	0.35342	743	262	0.50	612	1554	2.1	-	-
104	0.37479	480	180	0.50	390	942	2.0	-	-
105	0.39787	300	119	0.50	240	552	1.8	-	-
106	0.42099	181	76	0.49	142	311	1.7	-	-
107	0.44466	104	46	0.50	81	168	1.6	-	-
108	0.47079	58	27	0.48	44	87	1.5	-	-
109	0.50000	30	15	0.53	23	42	1.4	-	-
110+	0.54545	15	8	0.50	11	20	1.3	-	-

Table A.4.2: Berkeley Mortality Database Female Life Table, Japan 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00399	100000	399	0.08	99632	8258001	82.6	80.7	84.4
1	0.00066	99601	65	0.49	99568	8158369	81.9	80.1	83.7
2	0.00035	99536	35	0.49	99518	8058801	81.0	79.1	82.8
3	0.00027	99500	27	0.52	99487	7959283	80.0	78.2	81.8
4	0.00022	99474	22	0.50	99463	7859796	79.0	77.2	80.8
5	0.00019	99452	19	0.53	99443	7760333	78.0	76.2	79.8
6	0.00016	99433	16	0.50	99425	7660890	77.1	75.2	78.9
7	0.00016	99417	16	0.50	99409	7561465	76.1	74.2	77.9
8	0.00012	99401	12	0.58	99396	7462056	75.1	73.3	76.9
9	0.00011	99390	11	0.45	99384	7362660	74.1	72.3	75.9
10	0.00011	99379	11	0.55	99374	7263276	73.1	71.3	74.9
11	0.00011	99368	11	0.55	99363	7163902	72.1	70.3	73.9
12	0.00011	99358	11	0.45	99352	7064539	71.1	69.3	72.9
13	0.00012	99346	12	0.58	99341	6965187	70.1	68.3	71.9
14	0.00013	99335	13	0.46	99328	6865847	69.1	67.3	70.9
15	0.00015	99322	15	0.47	99314	6766518	68.1	66.3	69.9
16	0.00020	99307	20	0.50	99297	6667204	67.1	65.3	69.0
17	0.00020	99287	20	0.50	99277	6567907	66.2	64.3	68.0
18	0.00025	99267	24	0.50	99255	6468630	65.2	63.4	67.0
19	0.00027	99243	27	0.48	99229	6369375	64.2	62.4	66.0
20	0.00029	99216	28	0.46	99201	6270146	63.2	61.4	65.0
21	0.00030	99187	29	0.48	99172	6170945	62.2	60.4	64.0
22	0.00029	99158	28	0.50	99144	6071772	61.2	59.4	63.0
23	0.00029	99129	29	0.52	99115	5972628	60.3	58.4	62.1
24	0.00028	99101	28	0.50	99087	5873513	59.3	57.5	61.1
25	0.00030	99073	29	0.48	99058	5774427	58.3	56.5	60.1
26	0.00031	99043	30	0.50	99028	5675369	57.3	55.5	59.1
27	0.00033	99013	32	0.47	98996	5576341	56.3	54.5	58.1
28	0.00036	98980	35	0.49	98962	5477345	55.3	53.5	57.1
29	0.00036	98945	36	0.50	98927	5378382	54.4	52.6	56.2
30	0.00040	98909	39	0.49	98889	5279455	53.4	51.6	55.2
31	0.00042	98870	42	0.50	98849	5180566	52.4	50.6	54.2
32	0.00044	98828	43	0.49	98806	5081717	51.4	49.6	53.2
33	0.00048	98785	47	0.49	98761	4982911	50.4	48.7	52.2
34	0.00050	98738	49	0.49	98713	4884150	49.5	47.7	51.3
35	0.00055	98688	54	0.50	98661	4785437	48.5	46.7	50.3
36	0.00058	98634	57	0.49	98605	4686776	47.5	45.7	49.3
37	0.00062	98577	61	0.51	98547	4588171	46.5	44.8	48.3
38	0.00071	98516	70	0.50	98481	4489624	45.6	43.8	47.3
39	0.00075	98446	74	0.50	98409	4391143	44.6	42.8	46.4
40	0.00084	98372	82	0.50	98331	4292734	43.6	41.9	45.4
41	0.00089	98290	88	0.50	98246	4194403	42.7	40.9	44.4
42	0.00102	98202	100	0.50	98152	4096157	41.7	39.9	43.5

Table A.4.2: Berkeley Mortality Database Female Life Table, Japan 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00115	98102	113	0.50	98046	3998005	40.8	39.0	42.5
44	0.00125	97989	123	0.50	97928	3899959	39.8	38.0	41.6
45	0.00137	97866	135	0.50	97799	3802031	38.9	37.1	40.6
46	0.00147	97732	144	0.50	97660	3704233	37.9	36.1	39.7
47	0.00163	97588	159	0.50	97508	3606573	37.0	35.2	38.7
48	0.00177	97429	173	0.50	97342	3509065	36.0	34.3	37.8
49	0.00190	97256	185	0.50	97163	3411722	35.1	33.3	36.8
50	0.00207	97071	201	0.50	96971	3314559	34.2	32.4	35.9
51	0.00223	96870	216	0.50	96762	3217588	33.2	31.5	35.0
52	0.00240	96654	232	0.50	96538	3120826	32.3	30.6	34.0
53	0.00265	96422	255	0.50	96294	3024288	31.4	29.6	33.1
54	0.00282	96166	271	0.50	96031	2927994	30.5	28.7	32.2
55	0.00300	95895	288	0.50	95751	2831964	29.5	27.8	31.2
56	0.00332	95607	317	0.50	95448	2736213	28.6	26.9	30.3
57	0.00355	95290	338	0.50	95121	2640764	27.7	26.0	29.4
58	0.00384	94952	364	0.50	94770	2545644	26.8	25.1	28.5
59	0.00429	94587	405	0.50	94385	2450874	25.9	24.2	27.6
60	0.00462	94182	435	0.50	93965	2356489	25.0	23.3	26.7
61	0.00512	93747	480	0.50	93507	2262525	24.1	22.4	25.8
62	0.00555	93267	518	0.50	93008	2169018	23.3	21.6	24.9
63	0.00600	92750	557	0.50	92471	2076009	22.4	20.7	24.1
64	0.00657	92193	606	0.50	91890	1983538	21.5	19.9	23.2
65	0.00717	91587	657	0.50	91259	1891648	20.7	19.0	22.3
66	0.00801	90930	729	0.50	90566	1800390	19.8	18.1	21.5
67	0.00872	90202	787	0.50	89808	1709824	19.0	17.3	20.6
68	0.00984	89415	880	0.50	88974	1620017	18.1	16.5	19.8
69	0.01086	88535	961	0.50	88054	1531042	17.3	15.7	18.9
70	0.01216	87574	1065	0.50	87040	1442989	16.5	14.9	18.1
71	0.01381	86509	1195	0.50	85910	1355948	15.7	14.1	17.3
72	0.01541	85314	1315	0.50	84655	1270038	14.9	13.3	16.5
73	0.01761	84000	1479	0.50	83258	1185383	14.1	12.5	15.7
74	0.01986	82521	1639	0.50	81698	1102125	13.4	11.8	15.0
75	0.02270	80882	1836	0.50	79960	1020426	12.6	11.0	14.2
76	0.02562	79046	2025	0.50	78029	940466	11.9	10.3	13.5
77	0.02933	77021	2259	0.50	75886	862437	11.2	9.6	12.8
78	0.03291	74762	2461	0.50	73525	786551	10.5	8.9	12.1
79	0.03804	72301	2750	0.50	70917	713026	9.9	8.3	11.4
80	0.04297	69551	2989	0.50	68046	642109	9.2	7.7	10.8
81	0.04930	66562	3281	0.50	64908	574063	8.6	7.0	10.2
82	0.05633	63281	3565	0.50	61481	509155	8.1	6.5	9.6
83	0.06460	59716	3857	0.49	57766	447674	7.5	5.9	9.1
84	0.07356	55859	4109	0.49	53778	389908	7.0	5.4	8.6
85	0.08311	51750	4301	0.49	49568	336129	6.5	4.9	8.1

Table A.4.2: Berkeley Mortality Database Female Life Table, Japan 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
86	0.09350	47449	4436	0.49	45194	286561	6.0	4.4	7.7
87	0.10559	43012	4542	0.49	40699	241367	5.6	4.0	7.2
88	0.11727	38471	4511	0.49	36168	200668	5.2	3.6	6.9
89	0.13002	33959	4415	0.49	31700	164500	4.8	3.2	6.5
90	0.14515	29544	4288	0.49	27344	132800	4.5	2.8	6.2
91	0.16154	25255	4080	0.49	23156	105456	4.2	2.5	5.9
92	0.17499	21176	3705	0.48	19264	82300	3.9	2.2	5.5
93	0.19307	17470	3373	0.48	15723	63037	3.6	2.1	5.2
94	0.20951	14097	2954	0.48	12563	47313	3.4	2.1	4.6
95	0.22669	11144	2526	0.48	9827	34751	3.1	1.0	5.3
96	0.24481	8618	2110	0.48	7513	24924	2.9	-	-
97	0.26426	6508	1720	0.47	5604	17411	2.7	-	-
98	0.29230	4788	1400	0.47	4048	11807	2.5	-	-
99	0.31189	3389	1057	0.47	2827	7759	2.3	-	-
100	0.34416	2332	802	0.46	1902	4931	2.1	-	-
101	0.37328	1529	571	0.46	1222	3029	2.0	-	-
102	0.37922	958	363	0.46	762	1807	1.9	-	-
103	0.41894	595	249	0.45	459	1045	1.8	-	-
104	0.45470	346	157	0.45	259	586	1.7	-	-
105	0.45518	189	86	0.44	141	327	1.7	-	-
106	0.43982	103	45	0.44	78	185	1.8	-	-
107	0.46338	58	27	0.44	43	107	1.9	-	-
108	0.39516	31	12	0.42	24	65	2.1	-	-
109	0.25747	19	5	0.40	16	40	2.2	-	-
110+	1.00000	14	14	0.40	24	24	1.8	-	-

Table A.4.3: Berkeley Mortality Database Female Life Table, Sweden 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
0	0.00444	100000	444	0.08	99590	8097360	81.0	79.1	82.9
1	0.00028	99556	28	0.50	99542	7997770	80.3	78.5	82.2
2	0.00019	99528	19	0.47	99518	7898228	79.4	77.5	81.2
3	0.00014	99509	14	0.50	99502	7798709	78.4	76.5	80.2
4	0.00016	99495	16	0.50	99487	7699208	77.4	75.5	79.2
5	0.00012	99479	12	0.50	99473	7599721	76.4	74.5	78.3
6	0.00011	99467	11	0.55	99462	7500248	75.4	73.6	77.2
7	0.00011	99456	11	0.55	99451	7400786	74.4	72.6	76.3
8	0.00007	99445	7	0.57	99442	7301336	73.4	71.6	75.3
9	0.00011	99438	11	0.55	99433	7201894	72.4	70.6	74.3
10	0.00011	99427	11	0.55	99422	7102461	71.4	69.6	73.3
11	0.00013	99416	13	0.46	99409	7003040	70.4	68.6	72.3
12	0.00009	99403	9	0.44	99398	6903630	69.5	67.6	71.3
13	0.00015	99394	15	0.47	99386	6804232	68.5	66.6	70.3
14	0.00018	99379	18	0.50	99370	6704846	67.5	65.6	69.3
15	0.00013	99361	13	0.46	99354	6605476	66.5	64.6	68.3
16	0.00019	99348	19	0.47	99338	6506122	65.5	63.6	67.3
17	0.00025	99329	25	0.48	99316	6406783	64.5	62.7	66.3
18	0.00032	99304	32	0.50	99288	6307467	63.5	61.7	65.4
19	0.00026	99272	26	0.50	99259	6208179	62.5	60.7	64.4
20	0.00026	99246	25	0.48	99233	6108919	61.6	59.7	63.4
21	0.00029	99221	29	0.48	99206	6009686	60.6	58.7	62.4
22	0.00032	99192	31	0.48	99176	5910480	59.6	57.8	61.4
23	0.00025	99160	25	0.52	99148	5811304	58.6	56.8	60.4
24	0.00030	99135	30	0.50	99120	5712156	57.6	55.8	59.5
25	0.00036	99105	36	0.50	99087	5613035	56.6	54.8	58.5
26	0.00033	99069	33	0.52	99053	5513948	55.7	53.8	57.5
27	0.00035	99037	34	0.50	99020	5414895	54.7	52.9	56.5
28	0.00039	99003	39	0.49	98983	5315875	53.7	51.9	55.5
29	0.00036	98964	36	0.50	98946	5216892	52.7	50.9	54.5
30	0.00047	98929	46	0.48	98905	5117945	51.7	49.9	53.6
31	0.00048	98882	47	0.51	98859	5019040	50.8	48.9	52.6
32	0.00044	98835	44	0.50	98813	4920181	49.8	48.0	51.6
33	0.00057	98791	56	0.50	98763	4821368	48.8	47.0	50.6
34	0.00050	98735	49	0.51	98711	4722605	47.8	46.0	49.6
35	0.00063	98686	62	0.50	98655	4623894	46.9	45.0	48.7
36	0.00066	98624	65	0.49	98591	4525239	45.9	44.1	47.7
37	0.00069	98559	68	0.50	98525	4426647	44.9	43.1	46.7
38	0.00079	98491	78	0.50	98452	4328123	43.9	42.1	45.8
39	0.00089	98413	88	0.50	98369	4229671	43.0	41.2	44.8
40	0.00090	98325	89	0.49	98280	4131302	42.0	40.2	43.8
41	0.00111	98236	109	0.50	98182	4033022	41.1	39.2	42.9
42	0.00121	98127	119	0.50	98068	3934840	40.1	38.3	41.9

Table A.4.3: Berkeley Mortality Database Female Life Table, Sweden 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
43	0.00112	98008	109	0.50	97953	3836773	39.2	37.4	40.9
44	0.00141	97899	138	0.49	97829	3738820	38.2	36.4	40.0
45	0.00169	97760	165	0.50	97678	3640990	37.2	35.4	39.0
46	0.00166	97595	162	0.50	97514	3543313	36.3	34.5	38.1
47	0.00189	97433	184	0.50	97341	3445799	35.4	33.6	37.2
48	0.00221	97248	215	0.50	97141	3348458	34.4	32.6	36.2
49	0.00227	97033	220	0.50	96923	3251317	33.5	31.7	35.3
50	0.00256	96813	247	0.50	96689	3154394	32.6	30.8	34.4
51	0.00283	96565	273	0.50	96429	3057705	31.7	29.9	33.4
52	0.00290	96293	279	0.50	96153	2961276	30.8	29.0	32.5
53	0.00314	96014	302	0.50	95863	2865123	29.8	28.1	31.6
54	0.00344	95712	330	0.50	95547	2769261	28.9	27.2	30.7
55	0.00392	95382	374	0.50	95195	2673714	28.0	26.3	29.8
56	0.00425	95008	403	0.50	94806	2578519	27.1	25.4	28.9
57	0.00442	94605	418	0.50	94396	2483712	26.3	24.5	28.0
58	0.00488	94187	459	0.50	93957	2389317	25.4	23.6	27.1
59	0.00538	93727	504	0.50	93475	2295360	24.5	22.8	26.2
60	0.00621	93223	578	0.50	92934	2201885	23.6	21.9	25.3
61	0.00657	92645	609	0.50	92340	2108951	22.8	21.0	24.5
62	0.00736	92036	678	0.50	91697	2016611	21.9	20.2	23.6
63	0.00786	91358	718	0.50	90999	1924914	21.1	19.4	22.8
64	0.00882	90640	799	0.50	90240	1833916	20.2	18.5	21.9
65	0.00965	89841	867	0.50	89407	1743676	19.4	17.7	21.1
66	0.01055	88974	939	0.50	88504	1654269	18.6	16.9	20.3
67	0.01157	88035	1019	0.50	87525	1565765	17.8	16.1	19.5
68	0.01245	87017	1083	0.50	86474	1478240	17.0	15.3	18.7
69	0.01422	85933	1222	0.50	85321	1391766	16.2	14.5	17.9
70	0.01537	84711	1302	0.50	84059	1306445	15.4	13.8	17.1
71	0.01704	83410	1421	0.50	82697	1222386	14.7	13.0	16.3
72	0.01928	81988	1580	0.50	81196	1139689	13.9	12.3	15.5
73	0.02143	80408	1723	0.50	79543	1058494	13.2	11.5	14.8
74	0.02451	78685	1929	0.50	77716	978951	12.4	10.8	14.1
75	0.02650	76756	2034	0.50	75734	901235	11.7	10.1	13.4
76	0.03095	74722	2312	0.50	73560	825500	11.1	9.4	12.7
77	0.03493	72410	2530	0.50	71137	751941	10.4	8.8	12.0
78	0.03977	69880	2779	0.50	68481	680803	9.7	8.1	11.3
79	0.04502	67101	3021	0.50	65579	612322	9.1	7.5	10.7
80	0.05115	64081	3278	0.50	62427	546743	8.5	6.9	10.1
81	0.05734	60803	3486	0.49	59042	484316	8.0	6.4	9.6
82	0.06519	57316	3736	0.49	55427	425274	7.4	5.8	9.0
83	0.07470	53580	4002	0.49	51553	369847	6.9	5.3	8.5
84	0.08436	49577	4182	0.49	47456	318294	6.4	4.8	8.1
85	0.09169	45395	4162	0.49	43281	270838	6.0	4.3	7.6

Table A.4.3: Berkeley Mortality Database Female Life Table, Sweden 1991-1995

Age (x)	$\hat{q}_x$	l_x	d_x	a_x	L_x	T_x	$\hat{e}_x$	95% CI for $\hat{e}_x$	
								Lower	Upper
86	0.10380	41233	4280	0.49	39054	227558	5.5	3.8	7.2
87	0.11781	36953	4353	0.49	34731	188504	5.1	3.4	6.8
88	0.13093	32599	4268	0.49	30415	153773	4.7	3.0	6.5
89	0.14753	28331	4180	0.49	26186	123358	4.4	2.6	6.1
90	0.16640	24151	4019	0.48	22081	97172	4.0	2.2	5.8
91	0.18232	20133	3671	0.48	18236	75091	3.7	1.9	5.6
92	0.20369	16462	3353	0.48	14722	56855	3.5	1.6	5.3
93	0.22005	13109	2885	0.48	11607	42134	3.2	1.4	5.0
94	0.24050	10224	2459	0.48	8938	30527	3.0	1.5	4.5
95	0.26621	7765	2067	0.47	6678	21588	2.8	0.1	5.4
96	0.27698	5698	1578	0.47	4866	14910	2.6	-	-
97	0.29742	4120	1225	0.47	3471	10044	2.4	-	-
98	0.31977	2894	926	0.47	2402	6572	2.3	-	-
99	0.34803	1969	685	0.46	1602	4170	2.1	-	-
100	0.37929	1284	487	0.46	1021	2568	2.0	-	-
101	0.40087	797	319	0.46	624	1547	1.9	-	-
102	0.38604	477	184	0.46	378	924	1.9	-	-
103	0.43129	293	126	0.45	224	546	1.9	-	-
104	0.39305	167	66	0.45	131	322	1.9	-	-
105	0.35465	101	36	0.47	82	191	1.9	-	-
106	0.39695	65	26	0.46	51	109	1.7	-	-
107	0.43022	39	17	0.47	30	58	1.5	-	-
108	0.52763	22	12	0.50	16	28	1.2	-	-
109	0.73640	11	8	0.50	6	12	1.1	-	
110+	1.00000	3	3	0.50	6	6	2.2	-	-

Appendix B

MISCELLANEOUS TABLES

B.1 LDS Misclassification Tables

Tables B.1 and B.2 show the estimated percentage of misclassification of LDS as non-LDS for males and females respectively. These tables also show the number of deaths added to the LDS totals from the non-LDS because of misclassification.

Table B.1: Male LDS Misclassification Estimation

Age Group	Non-LDS Deaths	% LDS Misclassified	Misclassified LDS	Age Group	Non-LDS Deaths	% LDS Misclassified	Misclassified LDS
1-2	42	3.41%	1.43	44-45	91	21.06%	19.16
2-3	23	3.41%	0.78	45-46	88	21.06%	18.53
3-4	15	3.41%	0.51	46-47	81	21.06%	17.06
4-5	13	3.41%	0.44	47-48	100	21.06%	21.06
5-6	8	3.41%	0.27	48-49	126	21.06%	26.53
6-7	11	3.41%	0.37	49-50	96	21.06%	20.22
7-8	16	3.41%	0.55	50-51	90	14.33%	12.90
8-9	9	3.41%	0.31	51-52	106	14.33%	15.19
9-10	7	3.41%	0.24	52-53	94	14.33%	13.47
10-11	12	16.86%	2.02	53-54	105	14.33%	15.05
11-12	10	16.86%	1.69	54-55	110	14.33%	15.76
12-13	17	16.86%	2.87	55-56	96	14.33%	13.76
13-14	19	16.86%	3.20	56-57	114	14.33%	16.34
14-15	24	16.86%	4.05	57-58	124	14.33%	17.77
15-16	26	16.86%	4.38	58-59	141	14.33%	20.21
16-17	53	16.86%	8.93	59-60	147	14.33%	21.06
17-18	39	16.86%	6.57	60-61	164	22.01%	36.10
18-19	60	16.86%	10.11	61-62	160	22.01%	35.22
19-20	69	16.86%	11.63	62-63	173	22.01%	38.08
20-21	50	16.42%	8.21	63-64	160	22.01%	35.22
21-22	54	16.42%	8.87	64-65	212	22.01%	46.66
22-23	47	16.42%	7.72	65-66	237	22.01%	52.16
23-24	60	16.42%	9.85	66-67	226	22.01%	49.74
24-25	67	16.42%	11.00	67-68	237	22.01%	52.16
25-26	46	16.42%	7.56	68-69	238	22.01%	52.38
26-27	51	16.42%	8.38	69-70	259	22.01%	57.01
27-28	70	16.42%	11.50	70-71	277	11.04%	30.57
28-29	63	16.42%	10.35	71-72	325	11.04%	35.87
29-30	65	16.42%	10.68	72-73	314	11.04%	34.65
30-31	66	21.03%	13.88	73-74	303	11.04%	33.44
31-32	65	21.03%	13.67	74-75	296	11.04%	32.67
32-33	79	21.03%	16.61	75-76	334	11.04%	36.86
33-34	78	21.03%	16.40	76-77	309	11.04%	34.10
34-35	84	21.03%	17.66	77-78	273	11.04%	30.13
35-36	91	21.03%	19.13	78-79	283	11.04%	31.23
36-37	90	21.03%	18.92	79-80	275	11.04%	30.35
37-38	89	21.03%	18.71	80-81	274	17.69%	48.48
38-39	92	21.03%	19.35	81-82	264	17.69%	46.71
39-40	81	21.03%	17.03	82-83	249	17.69%	44.05
40-41	107	21.06%	22.53	83-84	243	17.69%	42.99
41-42	102	21.06%	21.48	84-85	232	17.69%	41.05
42-43	100	21.06%	21.06	85+	1,392	17.69%	246.28
43-44	116	21.06%	24.43	Total	11,704		1,953.56

Table B.2: Female LDS Misclassification Estimation

Age Group	Non LDS Deaths	% LDS Misclassified	Misclassified LDS	Age Group	Non-LDS Deaths	% LDS Misclassified	Misclassified LDS
1-2	28	24.27%	6.80	44-45	44	17.16%	7.55
2-3	20	24.27%	4.85	45-46	60	17.16%	10.30
3-4	22	24.27%	5.34	46-47	45	17.16%	7.72
4-5	8	24.27%	1.94	47-48	58	17.16%	9.95
5-6	9	24.27%	2.18	48-49	63	17.16%	10.81
6-7	10	24.27%	2.43	49-50	57	17.16%	9.78
7-8	7	24.27%	1.70	50-51	57	16.27%	9.27
8-9	8	24.27%	1.94	51-52	54	16.27%	8.78
9-10	11	24.27%	2.67	52-53	66	16.27%	10.74
10-11	7	10.49%	0.73	53-54	66	16.27%	10.74
11-12	5	10.49%	0.52	54-55	88	16.27%	14.32
12-13	9	10.49%	0.94	55-56	70	16.27%	11.39
13-14	16	10.49%	1.68	56-57	88	16.27%	14.32
14-15	11	10.49%	1.15	57-58	61	16.27%	9.92
15-16	16	10.49%	1.68	58-59	90	16.27%	14.64
16-17	24	10.49%	2.52	59-60	111	16.27%	18.06
17-18	17	10.49%	1.78	60-61	91	17.07%	15.54
18-19	27	10.49%	2.83	61-62	95	17.07%	16.22
19-20	17	10.49%	1.78	62-63	105	17.07%	17.93
20-21	31	13.01%	4.03	63-64	119	17.07%	20.32
21-22	16	13.01%	2.08	64-65	116	17.07%	19.80
22-23	21	13.01%	2.73	65-66	139	17.07%	23.73
23-24	17	13.01%	2.21	66-67	150	17.07%	25.61
24-25	17	13.01%	2.21	67-68	162	17.07%	27.66
25-26	14	13.01%	1.82	68-69	174	17.07%	29.70
26-27	19	13.01%	2.47	69-70	167	17.07%	28.51
27-28	31	13.01%	4.03	70-71	181	19.89%	35.99
28-29	22	13.01%	2.86	71-72	207	19.89%	41.16
29-30	26	13.01%	3.38	72-73	205	19.89%	40.76
30-31	38	12.56%	4.77	73-74	250	19.89%	49.71
31-32	31	12.56%	3.89	74-75	256	19.89%	50.91
32-33	24	12.56%	3.02	75-76	229	19.89%	45.54
33-34	39	12.56%	4.90	76-77	260	19.89%	51.70
34-35	44	12.56%	5.53	77-78	271	19.89%	53.89
35-36	35	12.56%	4.40	78-79	275	19.89%	54.68
36-37	45	12.56%	5.65	79-80	259	19.89%	51.50
37-38	37	12.56%	4.65	80-81	293	19.55%	57.29
38-39	30	12.56%	3.77	81-82	284	19.55%	55.53
39-40	48	12.56%	6.03	82-83	313	19.55%	61.20
40-41	55	17.16%	9.44	83-84	357	19.55%	69.80
41-42	46	17.16%	7.89	84-85	308	19.55%	60.22
42-43	57	17.16%	9.78	85+	3,100	19.55%	606.10
43-44	68	17.16%	11.67	Total	10,527		1,947.99

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