Utah at the Beginning of the New Millennium:

A Demographic Perspective

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The University of Utah Press
Salt Lake City

Chapter 5

Dyin' in Zion
Longevity and Mortality in Utah

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Few would disagree with the claim that, everything else equal, the living are better off than the dead. It follows that those populations that live longer and die less frequently, such as the people of Utah, are also better off. Utah is among the most advantaged populations in the nation because of its relatively low overall rates of mortality and its long-lived inhabitants.

We provide data in this chapter that illustrate the many differences in mortality patterns between Utah, other states, and the nation at large. Utah's mortality advantage over the nation is comprehensive and applies to both genders and most age groups. These advantages are described here in terms of life expectancy, age-specific mortality, and cause-specific mortality.

Most of this chapter emphasizes differences between Utah and the nation. There are also important differences that exist within the state's borders. We therefore provide comparisons across Utah's counties to reveal variations in mortality risk within the state. Given that we have access to a large high-quality genealogical database for Utah, known as the Utah Population Database, we have an excellent opportunity to use this information to show how longevity is shared among relatives. For example, we show how the odds of living to an advanced age are associated with parental longevity.

Overall, this chapter is a matter of life and death. In many ways, Utah's pattern of mortality is different from the nation's, but in a few other respects Utah is comparable to the rest of the country. Our intention is to show the ways in which Utah is fortunate with respect to death and dying and to consider how the state's advantaged position may be maintained and fortified as the new millennium unfolds.

Life Expectancy in Utah: An Overview

Utah and the United States: Modern and Historical Comparisons

One of the most telling measures of well-being for a population is its life expectancy. Life expectancy tells us how many years of life the average person has left to live for a given age and population. Most commonly, life expectancy is reported relative to birth for a given calendar year. For example, table 5.1 shows that in 2000, the average male in the United States could expect to live to age 74.1 and the average U.S. female to age 79.5.

Before proceeding, it is important to recognize how life expectancy is calculated and how it is directly linked to the chances of death at each age in a given year. Briefly, the calculation of life expectancy begins by measuring the probability of death at every age (measured in years) from birth to 110 for a single calendar year for a defined population. If you take a hypothetical population of 100,000 newborns and imagine that they will have mortality risks at each age of their lives (projecting out to the next 110 years or approximately to the year 2100) that are based on the

Table 5.1. *Life expectancy (years) at birth*

	Males		Females	
Year	Utah	U.S.	Utah	U.S.
1910	54.8	49.9	59.1	53.2
1940	61.7	61.6	67.0	65.9
1970	69.5	67.0	76.6	74.6
1990	74.9	71.8	80.4	78.8
1995	75.4	72.5	80.8	79.3
2000	76.0	74.1	81.2	79.5
	Percentage Increase Per Annum			
Period	Utah	U.S.	Utah	U.S.
1910 to 1940	0.42%	0.78%	0.45%	0.79%
1940 to 1970	0.42%	0.29%	0.48%	0.44%
1970 to 2000	0.26%	0.24%	0.17%	0.19%
1990 to 1995	0.13%	0.19%	0.10%	0.13%
1995 to 2000	0.15%	0.44%	0.09%	0.05%

Source: For data 1940 and earlier, National Office of Vital Statistics 1947. For data from 1970 to 2000, U.S. National Center for Health Statistics.

age-specific mortality risks that exist today, then you can calculate how many total years this group of 100,000 persons will live. Divide this total number of years by the number of people who lived them and you have life expectancy. This calculation can be performed starting at any age so that you have life expectancy at birth, at age 20, and so forth. Life expectancy at birth is a summary measure of the mortality risks faced by a population as a whole.

Table 5.1 gives life expectancy at birth for both Utah and the United States for the year 2000. The main conclusion to be drawn from table 5.1 is that Utahns live longer than other Americans. The longevity advantage is somewhat greater for Utah males than Utah females. For life expectancy at birth, females in Utah live 1.7 years longer than the national female average, whereas Utah males live about 1.9 years longer than their national counterparts.

An historical portrait of Utah and U.S mortality is also shown in table 5.1. In 1910, the first year in which national standards for reporting mortality statistics were established, the differences in life expectancy between Utah and the United States were even larger than they are today. Utah women and men had an advantage of approximately 4 and 5 years, respectively, compared to the nation as a whole. While life expectancy is a function of myriad influences, we highlight two factors that help to explain this historical discrepancy. First, the decades prior to 1910 were periods of heavy immigration to the United States, and immigrants tended to have lower life expectancy than the native-born (Haines 1977). Immigration to Utah among converts to the Church of Jesus Christ of Latter-day Saints (hereafter referred to as the LDS Church) had, conversely, slowed by the late nineteenth century. Furthermore, Utah in 1910 was predominantly rural (today it is predominately urban; see chapters 19 and 20). In 1910, urban living was still a very unhealthy experience, because many public health reforms (such as public sanitation and clean water) were still not fully in effect in many areas of the country.

Over the course of the twentieth century, Utahns—as well as the rest of the country—experienced considerable increases in life expectancy due largely to declines in infant and child mortality, but Utah's pattern differed from the nation's. From 1910 to 1940, the nation's life expectancy grew at a much faster rate than Utah's (see the bottom panel of table 5.1). In fact, by 1940, life expectancy for men in Utah was almost identical to the national average, though Utah women still had an advantage of one year. In the three decades following 1940, the increase in life expectancy was more rapid in Utah than in the rest of the nation. By 1970, Utah men had an advantage of 2.5 years and Utah women had an advantage of 2.0 years. By the start of the millennium, this gap, however, has narrowed again (see table 5.1).

As the U.S. and Utah populations have aged, it has become increasingly difficult for life expectancy to increase at the pace established earlier in the century. For the nation, mortality rates and life expectancy are now greatly affected by death patterns among the elderly. Without a major technological or medical breakthrough, gains in life expectancy are likely to be incremental rather than momentous. This deceleration is consistent with the annual percentage increases in life expectancy for 1990–2000 as shown in table 5.1.

Mortality Patterns Over the Life-cycle

Life expectancy at birth is a convenient summary measure of well-being but it masks variation in mortality risks by age. Table 5.2 provides data on this variation in two ways. First, we show life expectancy at three points in the life cycle: birth, age 20, and age 65. Second, we divide the lifespan into six narrower age groups and compare mortality risks across groups. In this second analysis, mortality risks refer to the percentage of people alive at the beginning of an age interval who died before the end of that interval. Again, these figures assume that the age-specific mortality risks in 2000 will persist when individuals reach later ages years from now. This section ends by describing some provocative variations by age between Utah and the United States that occur within the broader age categories used in table 5.2.

Estimates of life expectancy at birth are particularly sensitive to mortality at younger ages (Mathews et al. 2003). Table 5.2 shows that the proportion of infants who die before their first birthday is lower in Utah for both males and females than in the United States. Utah's 2001 rate of 4.8 infant deaths per 1,000 live births is second only to New Hampshire's rate of 3.8 and substantially lower than the U.S. rate of 6.8 (Arias et al. 2003, table 33). The proportion dying between ages 1–17 and 18–44 are roughly equal between Utah and the United States. After age 45, Utahns resume their survival advantage over the United States in later adulthood and into the retirement years. In the 45–64 and 65–84 age groups, the mortality advantage held by Utahns becomes more pronounced, particularly for men. While we cannot explore here all the causes for the later-life mortality advantage in Utah, behavioral factors such as smoking likely play a key role.

The cumulative effect of lower mortality across the life-cycle is that Utahns are more likely than other Americans to live to old age. Based on 2000 period life tables, the probability of surviving to age 65 in Utah is 82.3% for males and 88.7% for females. The corresponding probabilities for the United States are 76.3% for males and 82.3% for females. Likewise the probability of surviving to age 85 in Utah is 31.5% for men and 48.7% for women, compared to 27.2% for men and 42.1% for women in the United States.

Comparisons in mortality rates between Utah and the United States thus far indicate that Utah is indeed better off. There are, however, some intriguing differences that suggest that Utahns have higher mortality rates for some ages. As we indicated previously, the chances of surviving from age 1 to 17 are almost identical to national averages for both males and females. However, when we examined how Utah and the United States differed in mortality risks between ages 1 and 8, we

TABLE 5.2. *Mortality across the life cycle*

	LIFE EXPECTANCY (2000)			
	MEN		WOMEN	
LIFE EXPECTANCY	UTAH	U.S.	UTAH	U.S.
AT BIRTH	75.95	74.1	81.17	79.5
AT AGE 20	56.93	55.2	61.88	62.2
AT AGE 65	17.02	16.3	20.15	19.2
	PERCENTAGE DYING DURING AGE INTERVAL (2000)			
	MEN		WOMEN	
AGE INTERVAL*	UTAH	U.S.	UTAH	U.S.
Before age 1	0.5%	0.8%	0.4%	0.6%
1–17	0.7%	0.6%	0.4%	0.4%
18–44	4.9%	4.9%	2.1%	2.6%
45–64	12.4%	17.0%	8.5%	10.4%
65–84	61.7%	65.0%	45.2%	47.0%

* Values represent percentage of people who are alive at the beginning of the age interval who will die by the end of the age interval.

Source: Utah Data: Utah Governor's Office of Planning and Budget Demographic and Economic Analysis Section UPED Model System. U.S. Data: Arias 2002.

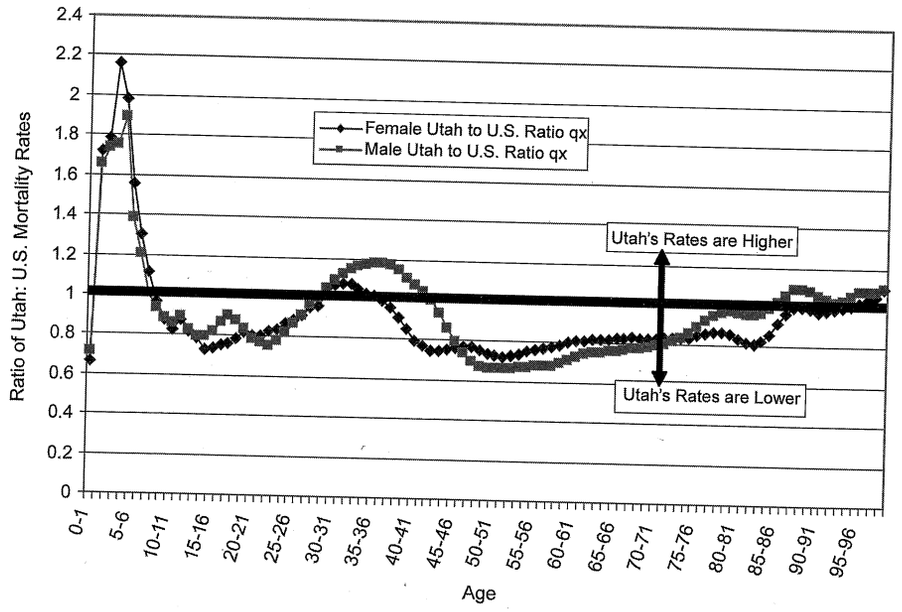

FIGURE 5.1. *Ratio of age-specific mortality rates: Utah and U.S., 2000.*

Source: Governor's Office of Planning and Budget, Demographic and Economic Analysis Section, UPED Model System (Utah data). Arias 2002 (U.S. data).

TABLE 5.3. *Top 10 and bottom 10 longevity states, ordered by 2000 ranking*

	1980	1980 RANK	1990	1990 RANK	2000	2000 RANK
10 STATES WITH LOWEST AGE-ADJUSTED MORTALITY IN 2000						
Hawaii	801	1	752	1	678	1
Minnesota	893	2	825	4	767	2
North Dakota	922	4	818	2	780	3
Connecticut	962	16	858	9	784	4
Utah	925	5	823	3	788	5
California	976	18	911	24	793	6
Iowa	920	3	848	6	795	7
Colorado	941	9	856	7	800	8
South Dakota	942	10	846	5	801	9
Washington	948	11	869	12	809	10
10 STATES WITH HIGHEST AGE-ADJUSTED MORTALITY IN 2000						
Arkansas	1,001	27	996	40	968	41
South Carolina	1,105	48	1,030	45	969	42
Georgia	1,094	46	1,037	47	974	43
Oklahoma	1,026	28	961	30	976	44
Tennessee	1,046	30	1,012	42	987	45
Kentucky	1,089	44	1,025	44	1000	46
Alabama	1,091	45	1,038	48	1005	47
West Virginia	1,100	47	1,032	46	1008	48
Louisiana	1,133	50	1,075	50	1013	49
Mississippi	1,109	49	1,071	49	1041	50

Source: National Center for Health Statistics 2003.

found that Utah actually has substantially higher rates than the United States (see fig. 5.1). While the absolute mortality rates are low for these ages, Utah's rates are approximately 80% to 120% higher than the national mortality rates for ages 1 through 4 while the excess declines somewhat for ages 5–8. The source of this excess mortality is not known but over half of all deaths in the 1–9 age group in Utah are from external causes (38 of 67 total deaths in 2000), where most are accidents primarily involving automobiles (pedestrian/motor vehicle and bike/motor vehicle) and drownings.

Figure 5.1 also reveals that 30- to 39-year-old Utah males have mortality rates higher than those of the United States. While this excess risk peaks at about 20%, it is noteworthy given that after age 40 Utah males have consistently lower rates than the national figures. An examination of the causes of deaths for 30- to 39-year-old men indicates again that accidents are the explanation for the excess risk, mostly motor vehicle deaths and occupational hazards.

How Utah Compares to Other States

In this section we describe differences in mortality rates between Utah and other specific states. To do this, it is necessary to show differences in mortality rates that reflect mortality

TABLE 5.4. *National rankings of life expectancy of Utah counties*

NATIONAL RANK	MEN	E0	NATIONAL RANK	WOMEN	E0
1	Cache, Rich	77.42	27	Cache, Rich	81.83
6	Davis	76.48	56	Washington	81.47
29	Carbon, Utah, Wasatch	75.68	139	Davis	80.92
44	Washington	75.41	189	Morgan, Summit	80.71
58	Morgan, Summit	75.27	192	Iron	80.70
123	Iron	74.66	245	Carbon, Utah, Wasatch	80.43
211	Box Elder	74.19	310	Box Elder	80.24
228	Salt Lake	74.12	414	Salt Lake	80.01
326	Weber	73.76	501	Weber	79.78
383	Sanpete, Sevier	73.55	522	Beaver, Juab, Millard	79.74
403	Beaver, Juab, Millard	73.47	669	Garfield, Kane, San Juan	79.47
533	Garfield, Kane, San Juan	73.15	741	Sanpete, Sevier	79.32
664	Tooele	72.80	1159	Tooele	78.67
924	Emery, Grand, Piute, Wayne	72.17	1179	Daggett, Duchesne, Uintah	78.63
1206	Daggett, Duchesne, Uintah	71.47	1243	Emery, Grand, Piute, Wayne	78.54
2,076 TOTAL COUNTY GROUPS					

Source: Murray etal. 99

rates per se and not the age distribution. Specifically, states that are younger will have lower mortality rates than older states simply because of being younger and not because they are otherwise healthier. Accordingly, we report age-adjusted mortality rates that eliminate these age distribution differences between states. Table 5.3 shows the ten best and ten worst states in terms of age-adjusted mortality in 2000. Utah has the fifth lowest mortality rate with only Hawaii, Minnesota, North Dakota, and Connecticut having lower rates. For 1980, 1990, and 2000, Utah has been among the five states with the lowest mortality. The worst ten states were nearly all located in the South.

UTAH IN DETAIL: COMPARISONS BY COUNTY

We provide county-level comparisons across the nation based on a comprehensive analysis by C.J.L. Murray (Murray et al. 1998). Table 5.4 shows the life expectancy in 1990 that compares 2,076 counties or county groups (in some cases, small counties are grouped together in order to obtain stable estimates). Life expectancy for men in the Cache/Rich county group was higher than any county group in the nation in 1990. Not far behind, in sixth place, is Davis County along with several other Utah counties that were in the top 10% of counties in the United States. For women

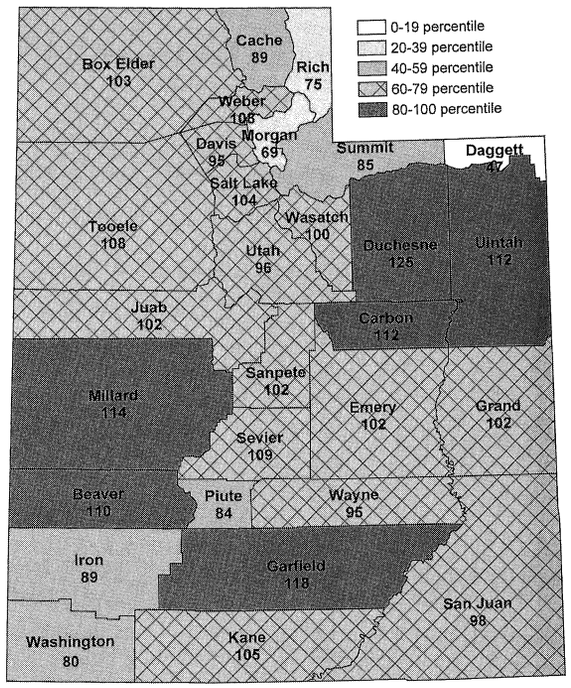

FIGURE 5.2. *Standardized mortality ratios (SMR) for Utah counties, 1999–2000.*
Source: Utah Department of Health 2000, 2001, 2002.

the data are less striking, but female life expectancy is high in Utah counties across the state, with the Cache/Rich group being the highest again. Only three counties fall below the national median.

Another analysis by Wesley L. James and colleagues (2004) reported confirmatory data where death rates have been adjusted for differences in age, sex, and race. Utah again contains a large number of the nation's very low mortality counties.

More recent data at the county level are available for all the Utah counties. A useful way to make comparisons of subgroups within a population is with the standardized mortality ratio (SMR). The SMR is the ratio of actual deaths in the county to the number of deaths that would have occurred if each county had the same age-specific death rates as the state average. Values higher than 100 indicate a county with higher than average mortality and values less than 100 indicate lower than average mortality. The SMR is a means of making mortality comparisons that account for the age differences between populations.

Figure 5.2 shows SMRs for each of Utah's 29 counties in 2000. These county-specific SMRs combine men and women together and are based on data pooled from 1999 to 2001 to help generate stable estimates (Utah Department of Health, 2000, 2001, 2002). SMRs (and life expectancies) are subject to year-to-year variation at the county level, especially for small counties including the 13 of Utah's counties that have fewer than 25,000 inhabitants.

Tiny Daggett County, with its population of 921 in 2000, had the lowest SMR, followed by Morgan, Rich, and Washington counties. These counties also appear as having very high 1990 life expectancy as shown in table 5.4. The top three highest SMRs are Millard, Garfield, and Duchesne counties. Thus small rural counties are at both the high end and low end of the distribution. Because of the way SMRs are calculated, large counties will almost always have SMRs near 100. If we look at the six largest counties, Washington County in southern Utah has the lowest SMR, followed by Cache, Davis, Utah, Salt Lake, and Weber counties.

TABLE 5.5. *Leading causes of death in Utah and the U.S.*

MEN	RANK		RATE (PER 100,000)		NUMBER OF UTAH DEATHS PER 100 U.S. DEATHS
	UTAH	US	UTAH	US	
Heart Disease	1	1	237.4	242.5	97.9
Cancer	2	2	185.4	205.3	90.3
Stroke	3	3	61.7	47.2	130.7
Chronic Lung Diseases	4	4	50.2	45.2	111.1
Accidents	5	5	46.9	42.7	109.8
Diabetes	6	6	31.0	23.5	132.1
Influenza and Pneumonia	7	7	31.0	19.6	158.2
Suicide	8	8	24.8	17.6	140.9
Alzheimer's	9		17.1		NA
Kidney Disease	10	9	15.8	13.8	114.7
Liver Disease		10		12.4	NA
WOMEN					
Heart disease	1	1	157.7	249.0	63.3
Cancer	2	2	118.1	183.9	64.2
Stroke	3	3	57.3	69.2	82.8
Diabetes	4	5	30.6	26.6	114.9
Chronic Lung Disease	5	4	30.5	43.7	69.7
Influenza and Pneumonia	6	8	25.6	23.9	107.0
Accidents	7	7	25.2	24.5	102.8
Alzheimer's	8	6	22.3	26.3	84.8
Kidney Diseases	9	9	9.4	14.2	66.4
Suicide	10		7.7		NA
Septicemia (blood poisoning)		10		12.4	NA

Note: The Utah rates are based on an age-adjusted average of the years 1999–2002, where age-adjustment signifies that the rates have been standardized to match the U.S. population distribution.

Source: Data for Utah are from Utah Department of Health 2000, 2001, 2002. Twenty values for the U.S. come from Anderson 2002.

LEADING CAUSES OF DEATH IN UTAH

The leading causes of death in the nation are heart disease and cancer (Anderson 2002). These specific causes dominate mortality risks among the elderly where most mortality occurs. At young ages, accidents are the dominant cause of death in the United States, although all-cause mortality of youth and young adults is very low. In comparing cause-specific mortality rates in Utah to the national averages, it is therefore important to account for differences in cause-specific mortality rates attributable to age differences between the two populations.

Table 5.5 compares the leading causes of death in Utah and the United States for both men and women. The age-adjusted death rates for Utah men for the two leading killers, heart disease and cancer, are lower than the national rates. Mortality rates for less common but serious conditions, including influenza/pneumonia and suicide, are higher in Utah, with Utah's mortality rates 40% to 60% higher than the nation's. Utah women, on the other hand, have mortality rates that are lower across a range of conditions. For example, the heart disease mortality rate for Utah women is 37% lower than the national rate while the cancer mortality rate is 36% lower.

Factors Affecting Longevity in Utah

Identifying the underlying factors that affect mortality and longevity is a much more complicated enterprise. Addressing this issue comprehensively in this chapter is not feasible. Instead we discuss two noteworthy demographic characteristics that may explain differences between Utah and the nation: (1) the low percentage of minorities in Utah and (2) the high percentage of the population belonging to the LDS Church.

Minority Populations

A harsh reality in the United States is that African Americans have a markedly lower life expectancy than whites. In 2000, U.S. African American men had a life expectancy that was 6.6 years shorter than white men's (68.2 vs. 74.8 years), and black women lived 5.1 fewer years than white women (74.9 vs. 80.0 years) (Arias 2002). These racial discrepancies are roughly as large as gender differences in U.S. life expectancy (male 74.1 vs. female 79.5).

African Americans made up only 0.8% of the population of Utah in 2000, compared to 12.3% for the nation, among those reporting one race only (U.S. Census Bureau 2004). Thus, part of the mortality advantage in Utah is due to the small black population. If we compare the Utah population, which is almost all white (remember that most Utah Hispanics are classified racially as white), to the data for whites in the United States, the mortality advantages shown in tables 5.1 and 5.2 are attenuated. In the United States, white male life expectancy is 74.8 (compared to 74.1 for all races) while Utah's life expectancy (for all races) is 76.0. The difference in male life expectancy between Utah and the United States (all races) is therefore 1.9 years, while the difference between Utah and U.S. whites is 1.2. Similarly for women, the difference in life expectancy between Utah and the U.S. (all races) is 1.7 (81.2 vs. 79.5), a difference that drops to 1.2 (81.2 vs. 80.0) when comparing Utah to U.S. whites. This difference (1.7 versus 1.2) represents a 30% decline in life expectancy difference that can be attributed to differences in racial composition between the two populations. Unfortunately, official statistics about life expectancy of African Americans in Utah is not available.

The Influence of Religion

Roughly 70% of Utahns are affiliated with the Mormon Church (see chapter 12). Since the mid-nineteenth century, the Mormon Church has encouraged a health code that prohibits the use of all forms of tobacco, alcohol, and illegal narcotics. Adherence to this code has been mandatory for members in good standing in the church since about 1920 (Alexander 1981). The effect of the health code can be seen when comparing the prevalence of smoking in Utah to other states. The prevalence of smoking among adults in Utah in 2002 was 14.2% for men and 12.7% for women (CDC 2004a). Utah has by far the lowest smoking prevalence of any state in the nation (the next lowest is California, with 19.7% for men and 13.3% for women). The national average is nearly twice as high, with 25.2% of men and 22.0% of women smoking in 2002 (CDC 2004b). Smoking prevalence among non-Mormons is roughly what it is in the nation as a whole, but smoking among Mormons is, as of 1996, 9.2% among Mormon men and 4.2% among Mormon women (Merrill 2003).

R. M. Merrill (2003) reports significant differences in life expectancy between Mormons and non-Mormons in Utah for 1994–98. Mormon men live 7.3 years longer than non-Mormon men and Mormon women live 5.8 years longer than non-Mormon women. The magnitude of these differences is profound. Tobacco use might explain this difference, but Merrill's estimates indicate that differential tobacco use can account for only about 1.5 years of the male difference and 1.2 years of the female difference.

Mineau, Smith, and Bean (2004) show differences in longevity among active, inactive, and non-LDS members based on individuals who lived to age 40 and who were born in the late 1800s and early 1900s. These comparisons differ from Merrill's cross-sectional analysis in that they are based on data that follow the same individuals from age 40 to death, hence the need to require birth dates 100 years ago. Among males, active Mormons live longer than inactive Mormons, who, in turn, live longer than non-Mormons (average ages at death are 75.0, 71.2, and 70.2, respectively). The rank order for longevity was similar for women (77.4, 76.8, and 74.0, respectively).

Merrill (2003) examined factors other than smoking that might account for lower Mormon mortality. He notes that Mormons have lower death rates from motor vehicles than non-Mormons, probably due to lower alcohol consumption among Mormons. But while there is evidence linking religious activity to lower mortality (Strawbridge and Cohen 2000; Hummer et al. 1999), it is not clear why Mormons would experience greater health benefits from religious activity than people of other faiths.

It is noteworthy that not only do non-Mormon Utahns have lower life expectancy than Mormons, but they also have lower life expectancy than Americans in general. Conversely, Utah Mormons have higher life expectancy than the national figure. When we compare the 1996 Utah estimates with the 1996 U.S. life tables (Utah Governor's Office of Planning and Budget 2005), we see that non-Mormons have a life expectancy 2.6 years lower than the national average, with non-Mormon women even worse off, living 3.0 years less. Mormon men, however, live 5.7 years longer than the U.S. figure and Mormon women live 2.8 years longer.

Explaining these differences in full is beyond the scope of this chapter but we suggest an additional factor beyond differences in smoking and alcohol consumption. Mormons may differentially benefit from the social cohesion and social support associated with active church involvement. For this support to occur, it must also be true that this benefit somehow exceeds a similar effect potentially present to members of other faiths. Viewed in this light, the religious disparity in life expectancy may represent a more complex story than simply the advantages of the Mormon health code.

Familial Aspects of Exceptional Longevity

Everyone has thought about how long they will live and factors that might affect their lifespan. A common strategy is to look to relatives and their longevity as a clue. Using the Utah Population Database, we are able to estimate the relative improvement in longevity when one does or when one does not have a long-lived parent.

Table 5.6 provides data on the increase in an individual's odds of living to an advanced age depending on the age to which a mother or father lived. This table is based on the simple assumption that an adult who dies before age 85, which is certainly an old age, is not counted as exceptionally long-lived. Therefore, if you have parents who died before 85, then they are treated as the "control" or reference group to which all other people will be compared.

Table 5.6 is organized so that comparisons are made between daughters/mothers, daughters/fathers, sons/mothers, and sons/fathers. For example, we see that if a daughter has a mother who lived to age 90, her odds of living past age 90 are 75% higher compared to a daughter whose mother died before age 85. The most extreme example of sharing a pro-

TABLE 5.6. *Odds of exceptional longevity based on parental longevity*

	MOTHER LIVED TO THIS AGE (IN RELATION TO MOTHERS WHO DID NOT LIVE PAST 85)				FATHER LIVED TO THIS AGE (IN RELATION TO FATHERS WHO DID NOT LIVE PAST 85)		
Daughter Lived to this Age (in relation to Daughters who did not live past 85)	85	90	95	100	85	90	95
85	41	58	85	205	39	66	96
90	49	75	108	174	44	74	124
95	54	97	140	238	52	72	116
100	88	116	201	520	58	72	#
Son Lived to this Age (in relation to Sons who did not live past 85)	85	90	95	100	85	90	95
85	34	48	54	91	48	54	85
90	41	62	84	150	51	68	90
95	56	93	227	294	67	77	102
100	77	94	366	313	29	94	343

#-too few cases

pensity for a long life occurs for daughters whose mothers lived to be a centenarian (100 years old)—the odds that these daughters will also be centenarians is 520% greater than for daughters whose mother died before age 85. Confirming our intuition, this table clearly shows that living a long life is associated with parental longevity and that the longer-lived the parent, the greater the odds that the child will also be long-lived.

IMPLICATIONS FOR THE 21ST CENTURY

Living a long time with a high quality of life is what we wish for ourselves as well as for our families, friends, and communities. Overall, Utah is closer to achieving this wish than the United States at large and nearly all other states. Despite this desirable position, Utah's low mortality and high longevity create a number of challenges for the state.

The first challenge is the pressure that low mortality has on the age distribution. While Utah is among the youngest states in the nation, owing to its historically high fertility rate, it is also steadily aging due to a combination of a slow secular decline in fertility and low mortality at nearly all ages (see chapter 16). These trends will push the general public and policy makers to consider the increasing needs of a population that is experiencing subtle but real aging when the state's infrastructure has been geared for many years toward the young. This means that Utah will be faced increasingly with issues in the coming century that are common elsewhere such as geriatric health care and retirement communities but that will be considered alongside policies focusing on youth such as public education.

Another challenge facing Utah will be population growth and its impact on longevity and health. Given Utah's advantageous health profile and its overall desirability as a place to live, Utah will continue to experience growth fueled by high fertility and low mortality but certainly also by in-migrants seeking a high quality of life (see chapter 6). Determining how this growth will affect mortality rates (for example, traffic fatalities and obesity-related deaths associated with increasing reliance on automobiles for transportation) will be important public policy challenges in the coming years.

Finally, the health bounty that exists in Utah is not shared equally among its inhabitants. In the years ahead, where growth will be accompanied by increasing racial and religious diversity, the legislature and public health officials will no doubt face problems associated with health inequalities within the state's borders. Low rates of mortality for the majority may be offset by excess risks of death among less privileged subgroups.

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