9.2: Life Expectancy

Life Expectancy vs Lifespan

Lifespan or Maximum Lifespan is referred to as the greatest age reached by any member of a given population (or species). For humans, the lifespan is currently between 120 and 125. Life Expectancy is defined as the average number of years that members of a population (or species) live. According to the World Health Organization (WHO) (2016) global life expectancy at birth in 2015 was 71.4 years, with females reaching 73.8 years and males reaching 69.1 years.

Women live longer than men around the world, and the gap between the sexes has remained the same since 1990. Overall life expectancy ranged from 60.0 years in the WHO African Region to 76.8 years in the WHO European Region. Global life expectancy increased by 5 years between 2000 and 2015, and the largest increase was in the WHO African Region where life expectancy increased by 9.4 years. This was due primarily to improvements in child survival and access to antiretroviral medication for the treatment of HIV. According to the Central Intelligence Agency (2016) the United States ranks 43rd in the world for life expectancy.

World Healthy Life Expectancy: A better way to appreciate the diversity of people in late adulthood is to go beyond chronological age and examine how well the person is aging. Many in late adulthood enjoy better health and social well-being than average and would be aging at an optimal level. In contrast, others experience poor health and dependence to a greater extent than would be considered normal. When looking at large populations, the WHO (2016) measures how many equivalent years of full health on average a newborn baby is expected to have. This age takes into account current age-specific mortality, morbidity, and disability risks and is referred to as The Healthy Life Expectancy. In 2015, the global Healthy Life Expectancy was 63.1 years up from 58.5 years in 2000. The WHO African Region had the lowest Healthy Life Expectancy at 52.3 years, while the WHO Western Pacific Region had the highest at 68.7 years.
**Life Expectancy in America:** In the United States the overall life expectancy is 79.7 years, however, life expectancies vary by sex, race, and ethnicity. Table 9.3 shows the life expectancy of three demographic groups for males and females for a child born in 2012 (Ortman et al., 2014). As can be seen, females enjoy a longer life expectancy, and overall Hispanics have the highest life expectancy.

Table 9.3 2012 U. S. Life Expectancy by Sex, Race, and Ethnic Origin in Years

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Groups</td>
<td>81.97</td>
<td>77.32</td>
</tr>
<tr>
<td>Non-Hispanic White and Asian or Pacific Islander</td>
<td>81.7</td>
<td>77.1</td>
</tr>
<tr>
<td>Non-Hispanic Black and American Indian or Alaskan Native</td>
<td>78.0</td>
<td>71.7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>83.7</td>
<td>78.9</td>
</tr>
</tbody>
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**American Healthy Life Expectancy:** To determine the current United States Healthy Life Expectancy (HLE), factors were evaluated in 2007-2009 to determine how long an individual currently at age 65 will continue to experience good health (CDC, 2013). The highest Healthy Life Expectancy (HLE) was observed in Hawaii with 16.2 years of additional good health, and the lowest was in Mississippi with only 10.8 years of additional good health. Overall, the lowest HLE was among southern states. Females had a greater HLE than males at age 65 years in every state and DC. HLE was greater for whites than for blacks in DC and all states from which data were available, except in Nevada and New Mexico.

Figure 9.2. Source.

Although improvements have occurred in overall life expectancy, children born in the United States today may be the first generation to have a shorter life span than their parents. Much of this decline has been attributed to the increase in sedentary lifestyle and obesity. According to the American Heart Association (2014), currently one in three American children is overweight or obese. The rate of childhood obesity tripled from 1971 to 2011, and obesity in children is associated with a range of health problems, including high blood pressure, type 2 diabetes, elevated blood cholesterol levels, and psychological concerns including low self-esteem, negative body image and depression. Excess weight is
associated with an earlier risk of obesity-related diseases and death. In 2007 former Surgeon General Richard Carmona stated, "Because of the increasing rates of obesity, unhealthy eating habits and physical inactivity, we may see the first generation that will be less healthy and have a shorter life expectancy than their parents" (p. 1).

Gender Differences in Life Expectancy

**Biological Explanations**: Biological differences in sex chromosomes and different pattern of gene expression is theorized as one reason why females live longer (Chmielewski, Borysławski, & Strzelec, 2016). Males are heterogametic (XY), whereas females are homogametic (XX) with respect to the sex chromosomes. Males can only express their X chromosome genes that come from the mother, while females have an advantage by selecting the “better” X chromosome from their mother or father, while inactivating the “worse” X chromosome. This process of selection for “better” genes is impossible in males and results in the greater genetic and developmental stability of females.

In terms of developmental biology, women are the “default” sex, which means that the creation of a male individual requires a sequence of events at a molecular level. According to Chmielewski et al. (2016):

> These events are initiated by the activity of the SRY gene located on the Y chromosome. This activity and change in the direction of development results in a greater number of disturbances and developmental disorders, because the normal course of development requires many different factors and mechanisms, each of which must work properly and at a specific stage of the development. (p. 134)

Men are more likely to contract viral and bacterial infections, and their immunity at the cellular level decreases significantly faster with age. Although women are slightly more prone to autoimmune and inflammatory diseases, such as rheumatoid arthritis, the gradual deterioration of the immune system is slower in women (Caruso, Accardi, Virruso, & Candore, 2013; Hirokawa et al., 2013).

Looking at the influence of hormones, estrogen levels in women appear to have a protective effect on their heart and circulatory systems (Viña, Borrás, Gambini, Sastre, & Pallardó, 2005). Estrogens also have antioxidant properties that protect against harmful effects of free radicals, which damage cell components, cause mutations, and are in part responsible for the aging process. Testosterone levels are higher in men than in women, and are related to more frequent cardiovascular and immune disorders. The level of testosterone is also responsible, in part, for male behavioral patterns, including increased level of aggression and violence (Martin, Poon, & Hagberg, 2011; Borysławski & Chmielewski, 2012). Another factor responsible for risky behavior is the frontal lobe of the brain. The frontal lobe, which controls judgment and consideration of an action’s consequences, develops more slowly in boys and young men. This lack of judgment affects lifestyle choices, and consequently many more boys and men die by smoking, excessive drinking, accidents, drunk driving, and violence (Shmerling, 2016).

**Lifestyle Factors**: Certainly not all the reasons women live longer than men are biological. As previously mentioned, male behavioral patterns and lifestyle play a significant role in the shorter lifespans for males. One significant factor is that males work in more dangerous jobs, including police, fire fighters, and construction, and they are more exposed to violence. According to the Federal Bureau of Investigation (2014) there were 11,961 homicides in the U.S. in 2014 (last year for full data) and of those 77% were males.
Males are also more than three times as likely to commit suicide (CDC, 2016a). Further, males serve in the military in much larger numbers than females. According to the Department of Defense (2015), in 2014 83% of all officers in the Services (Navy, Army, Marine Corps and Air Force) were male, while 85% of all enlisted service members were male.

Additionally, men are less likely than women to have health insurance, develop a regular relationship with a doctor, or seek treatment for a medical condition (Scott, 2015). As mentioned in the middle adulthood chapter, women are more religious than men, which is associated with healthier behaviors (Greenfield, Vaillant & Marks, 2009). Lastly, social contact is also important as loneliness is considered a health hazard. Nearly 20% of men over 50 have contact with their friends less than once a month, compared to only 12% of women who see friends that infrequently (Scott, 2015). Overall, men's lower life expectancy appears to be due to both biological and lifestyle factors.