MUSC Medical University of South Carolina

Fact Sheet

HEALTH, EMPLOYMENT & LONGEVITY PROJECT

Life Expectancy and SCI

What is life expectancy? Life expectancy reflects the average actual number of years of life for a group of individuals with similar characteristics. It reflects basically the point at which half of the people with a certain set of characteristics will still be alive. For instance, standard life tables typically provide the life expectancy of persons of a certain age and sex. Approximately half of the people will still be alive of that age.

How accurate are life expectancy estimates? The accuracy of life expectancy estimates depends on a number of factors, including the quality of the data upon which they are based, the number of individuals upon which they are based, and the number of factors that are used in the prediction. In general, the higher the quality of the study, the greater the number of participants, and the greater number of factors accounted for will lead to more accurate life expectancy estimates. Most studies of life expectancy with SCI in the USA use data from a national network of specialty hospitals called the Model SCI Systems, all of whom send data to a data center at the University of Alabama Birmingham (https://www.uab.edu/medicine/sci/).

How do life expectancy estimates apply to me as an individual? Life expectancy estimates are not intended to suggest how long a particular individual will live. There will be a wide range in actual number of years lived between individuals with similar characteristics. By definition, approximately half of the people with a particular life expectancy estimate will not live as long as the estimate and approximately half will outlive the estimate.

How do life expectancy estimates for people with spinal cord injury (SCI) differ from estimates within the general population, such as a standard life table? The basic way in which life expectancy is calculated is similar to that of the general population. The primary differences are: 1) the research upon which the estimates are based use people with SCI rather than the general population, and 2) some aspects of the SCI are taken into account when making the prediction.

Are there different ways of calculating life expectancy? Yes. There are different methods and researchers are always looking for the best way to predict life expectancy. We use the method that has recently been suggested to be the most appropriate and best method for people with SCI (DeVivo et al., 2018).

I have heard of terms like risk of "all cause mortality" or "cause specific mortality". What do these mean and how do they relate to life expectancy? All cause mortality simply means death due to any cause. Anything that increases the chances of all cause mortality (or raises the risk of all cause mortality) will also decrease life expectancy. Cause specific mortality is death due to specific types of causes, such as infections, heart attack, and cancer. The relationship between cigarette smoking and cancer is an example of a risk factor for a specific cause of mortality. All things being equal, something that raises the risk of a particular cause of mortality will also decrease life expectancy. However, the amount of decreased life expectancy would depend on the strength of the relationship and also how often the specific cause for type of mortality occurs.

How are my age and sex related to life expectancy? The number of additional years you may expect to live will decrease as you age, just as in the general population. However, life expectancy declines more quickly for people with SCI. Women tend to live longer than men.

How does my SCI affect my life expectancy? SCI is associated with a reduced life expectancy. The degree to which life expectancy is reduced will be affected by a number of factors related to the injury and to the way that the SCI affects someone's sensory and motor functioning (Savic et al., 2017). In general, the higher the neurologic level of injury (where

the injury occurred in the spinal cord), the lower the life expectancy. Similarly, the more neurologically complete the injury, the lower the life expectancy. So people who have incomplete injuries where they are able to have sensation and movement below the level of injury, the greater the life expectancy. People who are ambulatory have greater life expectancy. People who are ventilator dependent have a shorter life expectancy. There is also some evidence that people who are injured in their childhood have further reduced life expectancy (Shavelle, DeVivo, Paculdo, Vogel, & Strauss, 2007).

How does my general health affect my life expectancy? It will come as no surprise that how healthy you are, the greater your life expectancy. This is true for people in the general population as well as people with SCI and other disabling conditions. However, when health complications occur, they may have a greater impact on life expectancy for those with SCI compared to people in the general population because people with SCI are more susceptible to many complications. For those with SCI, preventing pressure ulcers, all types of infections, the flu and pneumonia, are particularly important (Krause & Saunders, 2011). People who have more severe injuries are particularly susceptible to respiratory complications (Krause, Cao, DeVivo, & DiPiro, 2016, DiPiro, Cao, & Krause, 2019).

Will smoking affect my life expectancy? Yes. Smoking is associated with a lower life expectancy in the general population. For people with SCI, the effect on life expectancy may be greater. Although the risk related to cancer is typically not higher for those with SCI compared with the general population, smoking may affect many respiratory functions and may affect healing when people have pressure sores. In fact, one of our studies did suggest that smoking may have an even greater effect on life expectancy among those with SCI compared with data from the general population (Krause & Saunders, 2012).

Will drinking alcohol affect my life expectancy? People who frequently do heavy drinking or binge drinking of five or more drinks during a single occasion may have reduced life expectancy. This is due, at least in part, to a greater risk of dying from unintentional injury. The more frequent the heavy drinking, the greater the risk. Drinking small amounts of alcohol has not been, to our knowledge, linked with a greater risk of mortality or decreased life expectancy.

Will taking medication to treat my secondary health conditions affect my life expectancy? Taking a lot of prescription medications to treat pain and other secondary conditions may increase your risk of mortality, especially due to unintentional drug overdose or other unintentional injuries. Further, research has suggested that taking frequent prescription medications to treat pain is related to risk of mortality and a decrease in life expectancy (DiPiro, Cao, & Krause, 2019, Krause, Cao, & Clark, 2017). Taking some types of medications and heavy drinking may particularly lead to a greater risk of mortality. On the other hand, decreasing the frequency of use of prescription pain medication has been found to result in decreased risk of mortality. *This does not mean individuals should stop or cut back on their prescription medication use based on these findings. Individuals with SCI who take prescription medications should consult their physicians or healthcare providers before making any changes.*

Will exercise and nutrition affect my life expectancy? Yes, we have found that unhealthy eating practices are associated with higher all-cause mortality and fitness (planned exercise, exercise compared to others with SCI, overall fitness, and overall lifestyle) is protective from heart and blood vessel disease deaths and death by other causes (DiPiro, Cao, & Krause, 2019). Being overweight was associated with increased risk of mortality by sepsis. However, being underweight, rather than overweight, was a risk factor for all-cause mortality, which may reflect the importance of at least meeting minimum daily caloric intake needs.

How does my socioeconomic status, including my education, employment status, and income affect my life expectancy? Socioeconomic factors are highly related to longevity. As educational level increases, so does life expectancy (Krause, Saunders, & Acuna, 2012). This is due, in part, to the fact that people with higher educational levels also improve their chances for being employed and for making more money. Being employed is associated with greater life expectancy, as is having a higher family income. We do not know for certain the reasons for these relationships, although people who work tend to have more active lifestyles and a higher quality of life. People with higher income are better able to obtain the services that they need. They may also have less stress from worrying about how they are going to pay for their health needs.

***Are there any resources to help me to get a better idea of my life expectancy*?** We have developed a calculator to help you have a more general estimate of life expectancy for people with different characteristics. [Reference to calculator]. The SCI Model Systems and the National SCI Statistical Center at the University of Alabama also has a calculator for life expectancy (https://www.nscisc.uab.edu/Public_Pages/LifeExp). The two calculators differ somewhat in the specific questions that are asked of you and this may lead to somewhat different estimates. Keep in mind, that life expectancy estimates are the average expectation for people with certain characteristics. There will always be individual circumstances and factors which are not included in these estimates and estimates will differ between studies.

Should I base my health care decisions on this or other fact sheets? No. The information is only to help you understand what we know about life expectancy and SCI. No single study is definitive. Although we have attempted to summarize the relevant information from a number of studies published in scientific journals, we have not conducted a systematic or comprehensive review of the literature. We rely heavily on our own findings which are generally representative of the SCI studies reported in the literature.
You should always consult your physician or healthcare provider before making important decisions regarding your health and health behaviors. In particular, if you have concerns that something you are doing might affect your life expectancy you should consult with your healthcare provider. It is always important to see how the results of studies may apply to you as an individual.

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