ALFA International
THE GLOBAL LEGAL NETWORK

2023 Workers' Compensation Seminar

September 27-29, 2023

Disentangling Pre-Existing Conditions from Work Related Injuries and the Cost Implications

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Summary

Workers with pre-existing medical conditions are more likely to sustain work-related injuries. It is often difficult to disentangle the effects of these pre-existing conditions from the medical costs associated with a workplace incident. The "attributable costs" of pre-existing conditions must be separated from the attributable costs of the work-related injury to accurately determine the total medical costs of the injury. This paper discusses the tools from the fields of health economics, epidemiology, and biostatistics that can be used to differentiate these two different types of costs in determining overall medical exposure.

Background

In personal injury cases involving work-related injuries, it is not unusual for some injured workers to have pre-existing health conditions. Workers with pre-existing medical conditions are more likely to sustain work-related injuries.[i] In addition, injured workers with pre-existing conditions may not experience the "average" life expectancies found in the life tables normally consulted in such cases.[ii]

These issues have two implications. First, the current and future medical care treatments provided to injured workers with pre-existing medical conditions can (and should) be separated into two groups: (1) medical and supportive care attributable to (or worsened by) pre-existing medical conditions, and (2) medical and supportive care attributable to the incident. In such cases it may be cost effective to "disentangle" these types of care, as the costs of care and services that can be accurately attributed to the pre-existing conditions could be removed from total past and future medical-related damages. This is an exercise that can be undertaken by a medical doctor, as part of an independent medical examination ("IME"), but can also be undertaken using statistical tools, by a biostatistician or health economist.[iii]

The second implication is regarding the life expectancy decrement that can be associated with certain pre-existing conditions. The fields of health economics and biostatistics routinely must address issues regarding mortality risk, survival, and life expectancy. For example, traditional "cost effectiveness analysis," which is a common tool to measure the economic value of a novel health care intervention, such as a drug, expresses results in terms of "costs per life year." In other words, how much does an additional year of life cost using the novel drug as opposed to the "standard of care?" Life expectancy from life tables is based on the "average" population, but if an individual has a known comorbidity (which is another term for pre-existing conditions), depending on the comorbidity, an individual is likely to experience a life expectancy different that that shown in a basic life table. Certain types of work, especially physically demanding labor, are also associated with substantial decrements in life expectancy.[iv] Shorter life expectancies have direct implications for the total estimated future costs expressed in life care plans ("LCPs") and total damages associated with future lost wages.

Methods

Attributable Costs. Disentangling costs associated with pre-existing conditions is a two-part exercise. The first step is to review past medical records,[v] and determine which treatments were occurring in the months or year prior to the incident. Medicare care and services provided previously are associated with either past incidents or pre-existing conditions. The second step is to identify past treatments, and associated average annual medical costs, associated with pre-existing conditions.[vi] These costs can be removed from post-incident costs. Both tasks do not necessarily require input from medical professionals, as neither requires a judgement of medical appropriateness or necessity.

Life Expectancy. It is well-known in the medical and biostatistics worlds that pre-existing medical conditions shorten life expectancy and work-life expectancy. Almost all LCPs include some estimate of how much longer an

individual is expected to live. This is necessary to add up expected costs over the remaining lifetime. These estimates are typically based on "life tables," which are prepared by actuarial scientists and made available to the public by the U.S. Social Security Administration ("SSA"). These estimates are useful for knowing how many years of life are remaining, for example, for a female who is 35 years old.

However, these estimates are, at best, only a very rough estimate, because they are based on population averages. What if we were interested in a particular individual, and for that individual we had some additional information; for example, whether they use tobacco, have chronic obstructive pulmonary disease ("COPD"), or are obese. These factors (and many others) are known to reduce life expectancy.[vii] Smoking, for example, reduces life expectancy by at least 13%.[viii] From a biostatistics perspective, if some known characteristic or comorbidity is associated with reduced life expectancy, the SSA life tables are no longer relevant. Thus, LCPs that simply assume a population average life expectancy in the presence of known comorbidities are inaccurate and should be challenged.

Summary

Pre-existing conditions are very important to consider in personal injury and work-related injury claims. Pre-existing conditions can "creep into" medical-related damages and can shorten life expectancy and work-life expectancy. Medical records should be obtained and reviewed carefully, ideally for a sufficient time prior to the incident; perhaps at least a year, preferably longer.

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[ii] See generally M. Boissonneault and P. Rios, "Changes in healthy and unhealthy working-life expectancy over the period 2002-17: a population-based study in people aged 51-65 years in 14 OECD countries," *Lancet Healthy Longev* 2, no. 10 (2021); R. H. Rautiainen and S. J. Reynolds, "Mortality and morbidity in agriculture in the United States," *J Agric Saf Health* 8, no. 3 (2002).

[iii] Health economics is a specific subfield of economics and is focused on the intersection of economics and public

health. Within the public health field, health economists typically focus on data analytics, statistics, biostatistics, and epidemiology.

[iv] See generally J. R. Myers, L. A. Layne, and S. M. Marsh, "Injuries and fatalities to U.S. farmers and farm workers 55 years and older," *Am J Ind Med* 52, no. 3 (2009); Rautiainen and Reynolds, "Mortality and morbidity in agriculture in the United States."; J. L. Schram et al., "The influence of occupational class and physical workload on working life expectancy among older employees," *Scand J Work Environ Health* 47, no. 1 (2021); R. K. Sokas, X. S. Dong, and C. T. Cain, "Building a Sustainable Construction Workforce," *Int J Environ Res Public Health* 16, no. 21 (2019).

[v] This step does not necessarily require a medical professional; it may also be conducted by a health economist, biostatistician, or epidemiologist.

[vi] See generally S. Cortaredona and B. Ventelou, "The extra cost of comorbidity: multiple illnesses and the economic burden of non-communicable diseases," *BMC Med* 15, no. 1 (2017); C. Hoffman, D. Rice, and H. Y. Sung, "Persons with chronic conditions. Their prevalence and costs," *Jama* 276, no. 18 (1996); L. Picco et al., "Economic burden of multimorbidity among older adults: impact on healthcare and societal costs," *BMC Health Serv Res* 16 (2016).

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[viii] See generally Jha et al., "21st-century hazards of smoking and benefits of cessation in the United States."; Tam, Warner, and Meza, "Smoking and the Reduced Life Expectancy of Individuals With Serious Mental Illness."