How Should We Value Lives Lost to Cancer?

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To be trained in medicine, nursing or one of the other “sharp end” disciplines and then be faced with some hard-nosed, cold-blooded economist placing money values on human life and suffering is an anathema to many (1).

Cancer is one of the most feared of all diseases. The toll it takes on society in terms of suffering and early mortality is well known. Why then should we try to place a dollar value on cancer, when its impact is so obvious to all of us? This issue of the Journal contains two articles that try to address this question while estimating the value of life lost due to cancer (2,3). The authors use approaches that economists have used for decades to value morbidity and mortality effects of disease in monetary terms.

Bradley et al. (3) determine the cost of cancer in terms of lost productivity. Productivity is a measure of human capital: the value of the labor one contributes to society. Because not all labor is compensated with wages, Bradley et al. also value nonwage labor related to caregiving and housekeeping, which is commonly but not exclusively provided by women at home. Yabroff et al. (2) take a more expansive view of the cost of cancer, using estimates of willingness to pay for a year of life. This approach not only encompasses productivity effects but also includes intangible benefits, for example, the value of avoiding the pain and suffering that accompany cancer. Economists tend to favor the willingness-to-pay method because it conforms best to the underlying principles of standard welfare economic theory. Transactions in most markets take place with money—our purchases of cars, toothpaste, and meals at restaurants reflect the value we place on those items. Because we generally do not purchase health care the same way we buy other goods and services, economists have developed several methods to ask how much we would be willing to pay for the benefits that are afforded from health care, including years of life. Participants’ responses to a number of direct and indirect surveys have led some economists to estimate that in the United States, we value a year of life between $100,000 and $300,000 on average.

The different approaches give results that are somewhat different in ranking and very different in magnitude. Lung cancer has the largest impact on both the value of productivity and life lost, due to its incidence and mortality rate. After lung cancer, colorectal cancer accounts for the second largest productivity impact, whereas female breast and prostate cancers exceed colorectal cancer in terms of the value of life lost. The differences in ranking can be attributed to the ages at which these cancers are most commonly diagnosed, their predilection for men vs women, their mortality rates, and the earning differences in our society across sex and age. In short, the willingness-to-pay approach gives an equal amount of value to a year of life regardless of age or sex, whereas the human capital approach reflects wages that are lower for women and increase, peak, then decline as workers age for both sexes. Considering all cancers, the human capital loss is dwarfed by the value of life lost from cancer deaths ($116 billion to $232 billion vs $961 billion, respectively, in 2000). This difference highlights the fact that economists—perhaps contrary to public opinion—consider us to be worth much more than the sum of our earnings.

The human capital and willingness-to-pay methods have limitations that should give readers pause when considering the precision of these estimates. Valuing productivity simply as years of life missing from the workforce ignores the value of diminished productivity and uncompensated absences (eg, family leave) for those who remain employed with cancer. Approximately 40% of persons are employed at the time they are diagnosed with cancer (4). As noted by Bradley et al., the precise monetary value of homemakers and informal caregivers remains controversial. More importantly, economists have pointed out that the human capital method is an unreasonably narrow definition of the costs of illness because it focuses only on health’s impact on productivity and ignores the value of leisure and our preferences for health (5,6). An important limitation of the willingness-to-pay method is that one would expect the value of a year of life to be different depending on one’s age, health circumstances, and wealth and income (7). For example, few people would value an extra year of life with advanced cancer the same as a year of life in good health. Thus, $150,000 per year of life may be an oversimplification that biases the influence of the changing age and health of our population on the projections of the value of future losses due to cancer. Moreover, thought leaders in economics have noted several methodological and ethical shortcomings with the willingness-to-pay approach (8,9), one of the more vexing being the problem of ensuring that persons accurately and without bias estimate their value of an additional year of life.

The direct medical care costs of cancer were estimated to be $89 billion in 2008 (10), far less than the estimates of the value of life and productivity lost. Does this difference imply that we are spending too little when caring for persons with cancer? Unfortunately, we cannot simply take the difference between the costs of treatment and the value of years of life lost due to the disease to determine the “right” amount of spending. To estimate the value of treatment, we need to look at the impact of...
the treatment on survival, value that period of survival, and then compare it with the cost of treatment. For example, in advanced non–small cell lung cancer, the direct medical care costs associated with palliative chemotherapy using cisplatin plus etoposide are approximately $8000 more than supportive care without chemotherapy and provide 1.5 months of additional survival (11,12). If we value those 1.5 months at $12,500, then the costs of care are surpassed by the benefits, and we would conclude that palliative chemotherapy is a good value for expenditure in this setting.

How might policy makers use this information? One obvious way is in setting research priorities. The way to reduce the value of years of life lost due to cancer is to find better prevention, screening, and treatment modalities and to make sure those technologies are applied comprehensively and cost-effectively. Clearly, these two studies suggest that the value of that information far exceeds our research investment (the National Cancer Institute’s budget for 2008 is about $4.8 billion). These data can also be used to consider whether investments that make better use of our current technologies can be justified based on the value of benefits they might achieve. Federal, state, and private health insurance administrators can adjust their coverage policies to encourage more comprehensive use of cost-effective screening or treatment technologies for cancers with the greatest burden. Finally, policy makers can weigh the benefits and costs of funding primary prevention efforts (eg, smoking cessation) and set tax policies that reflect the true societal cost of tobacco addiction.

Should clinicians or patients care about these studies? Perhaps the primary benefit of monetary estimates is simply to translate what professionals and patients already know about the human costs of cancer into a metric that is universally understood. As a tool for advocacy, dollar values can be powerful, particularly when they are weighed against other programs that influence human life and health under limited budgets.

References