



THE VALUE OF Oncology Medicines

Advances in cancer research have yielded valuable treatments that increase the quality and length of patients' lives. These positive clinical gains for cancer patients also generate societal value that reaches in the billions of dollars every year by extending lives and improving productivity.

Social Health Impact

- According to the NCI's Surveillance, Epidemiology and End Results (SEER) database, since its peak in 1991, the cancer death rate has fallen by 20 percent.¹
- Innovative cancer medicines have provided other advantages such as improvements in the treatment delivery – from intravenous to oral administrations.
- An analysis² conducted in the U.S. in 2011 showed that on average, new cancer drugs introduced over the past 30 years have increased the life expectancy of patients with cancer by almost one year. Since some of these newer drugs have better tolerability than traditional chemotherapy, the quality-adjusted benefit could be even greater.
- The overall 5-year relative survival rate for childhood cancer has improved markedly over the past 3 decades, from 58.1% for cases diagnosed from 1975 to 1977 to 82.5% for diagnoses during 2001 to 2007, due to new and improved treatments.³
- Survival in childhood leukemia was virtually non-existent forty years ago; approximately 80% of Canadian children and teenagers diagnosed with acute lymphoblastic leukemia (ALL) are now alive 5 years after diagnosis.⁴
- According to a report from Cancer Research UK, more than half of patients diagnosed with Non-Hodgkin's (NHL) are now surviving the disease thanks to improved diagnosis and treatment.⁵
- In the U.S., survival rates for colon cancer and prostate cancer went from 41% to 63% and 43% to 98%, respectively, from 1975 to 1995, which has been attributable in part to pharmaceutical innovation.⁶
- Improved therapies are a significant factor contributing to advances in cancer care, with research estimating that the increase in the stock of medicines from 1975-1995 accounted for 50-60 percent of the increase in age-adjusted cancer survival rates in the first 6 years after diagnosis.⁶

Economic Impact

- According to a recent landmark study, cancer has the greatest economic impact from premature death and disability of all causes of death worldwide. The total economic impact of premature death and disability from cancer worldwide was \$895B in 2008; representing 1.5% of the world's GDP. Cancer causes the highest economic loss of all

KEY TAKEAWAYS

Improved therapies are a significant factor contributing to advances in cancer care.⁶

Improvements in cancer survival between 1988 and 2000 were estimated to have created 23 million additional life-years and roughly \$1.9 trillion of additional social value.¹¹

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of the 15 leading causes of death worldwide. Balancing the world's global health agenda to improve outcomes in cancer will not only save millions of lives, but could also save billions of dollars.⁷

- One study⁸ that valued improvements to health and life expectancy based on Americans' willingness to pay, estimated that even a modest one percent reduction in cancer mortality could represent nearly \$500 billion of present value to current and future generations of Americans.
- Based on the average cancer drug expenditure per patient from diagnosis until death over the past decade, an analysis showed that the cost of that added year of life – plus any further benefits to the individual's quality of living – was about \$6,500. Given that surveys indicate that most Americans would be willing to pay \$100–\$300 thousand to extend their lives by one year, \$6,500 represents a bargain for society.²
- For decades, the U.S. public and private sectors have committed substantial resources toward cancer research, but the societal payoff has not been well-understood. One study⁹ estimated between 1988 and 2000, life expectancy for cancer patients increased by roughly four years, and the average willingness-to-pay for these survival gains was roughly \$322,000. Improvements in cancer survival during this period created 23 million additional life-years and roughly \$1.9 trillion of additional social value. The share of value flowing to patients has been rising over time. In terms of economic rates of

return, R&D investments against cancer have been a success, particularly from the patient's point of view.

- Indirect costs account for the major part of total attributable costs of cancer. A recent study¹⁰ suggests that spending on innovative drugs reduces the indirect costs to the point where it becomes beneficial both economically to the system, and medically to patients.
- Personalized medicine is playing an increasing part in the cancer care framework. By targeting treatment to individuals who will benefit most, we are increasing value for health services and providing substantially improved outcomes for patients. Moreover, we can expect that the additional spending on innovative targeted medicines will be partly offset by the savings made from more effective and tailored strategies that move treatment from an acute end-of-life care setting to earlier in the treatment pathway, enabling patients to be treated at home and even return to work.¹¹

Personal Impact

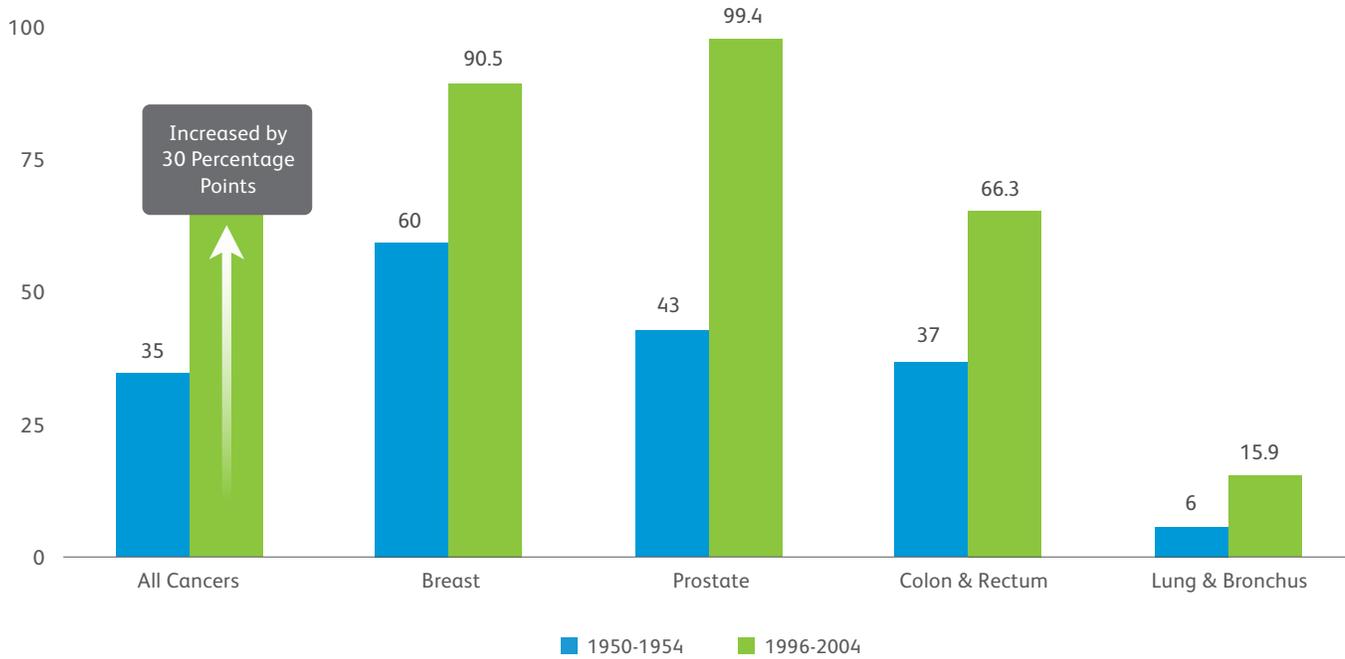
Jack Whelan is a cancer survivor who received novel cancer treatments that he started while in a clinical trial. He has since become a strong patient advocate and speaks passionately about the dedicated individuals who brought these new medications to patients like him.



“Coming from a lifelong career in information technology, I’ve seen the benefits of good science. So, it was no surprise that I immediately began to research what science and medicine could do for me... In grammar and high school, some kids always paid attention; they were motivated to get the right answer. Perhaps they were brighter or perhaps their keen interest served them well as they consumed and retained information. These are the kids who later studied biology, medicine, and science, who are now as motivated as ever to get the right answer... It is that confidence and desire that gives cancer patients like me, hope for a cure.”

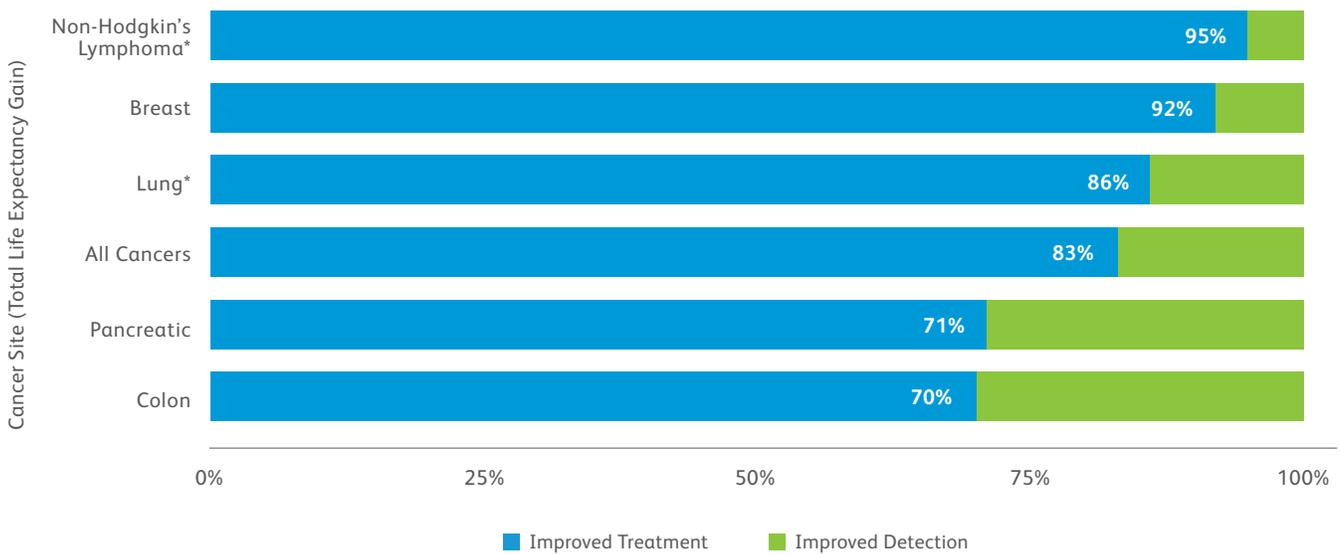
– Jack Whelan

5-Year Relative Survival Rates for Cancers in US



Adapted from: National Cancer Institute, Survival Epidemiology and End Results (SEER), posted to website. (2013). Retrieved from http://seer.cancer.gov/csr/1975_2005/accessible_contents.html

Share of Life-Expectancy Gain Attributable to Improved Treatment vs. Improved Detection, 1980–2000*



Asterisk (*) indicates Life Expectancy gains from 1990–2000 because 1980 data was not available for these conditions.

Adapted from: E. Sun et al. (May 2008) "The Determinants of Recent Gains in Cancer Survival: An Analysis of the Surveillance, Epidemiology, and End Results (SEER) Database," *Journal of Clinical Oncology*.

Cancer Type	Life-Expectancy Gain
Non-Hodgkin's Lymphoma*	3.1–3.6 years
Breast	5.9–6.0 years
Colon	2.8–3.2 years
Pancreatic	0.6 years
Lung*	0.4–0.5 years
ALL CANCERS	2.8–3.2 years

Asterisk (*) indicates Life Expectancy gains from 1990–2000 because 1980 data was not available for these conditions.

Adapted from: E. Sun et al. (May 2008) "The Determinants of Recent Gains in Cancer Survival: An Analysis of the Surveillance, Epidemiology, and End Results (SEER) Database," *Journal of Clinical Oncology*.

Endnotes

- 1 Thomas F. Gross, Picard E, Tarab A. (2012) Recognizing value in oncology innovation: white paper. Boston Healthcare. Retrieved from www.bostonhealthcare.com.
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