The Economic Value of Eliminating Cancer

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Abstract

This paper estimates the economic value to the United States of eliminating cancer mortality over a 35-year horizon beginning in 2030. We estimate that such an effort would eliminate 30.7 million cancer deaths with a total mortality burden of 380 million life-years. We quantify the economic value of this large reduction in cancer mortality by incorporating three components: monetized improvements in longevity, increased labor productivity, and additional government revenue. To value the longevity gains in monetary terms, we utilize the valuations used by the US federal government in its cost-benefit evaluations of regulations. Across all three components, we estimate that eliminating cancer mortality generates $186 trillion in total economic benefits over the 35 years, corresponding to a benefit of approximately 15 thousand dollars per American per year, or 39 thousand dollars per American household per year. If cancer elimination is viewed as an R&D investment, this amounts to an enormous internal rate of return, ranging from 537% to 965%, based on benchmarked R&D costs. In addition, we perform a sensitivity analysis by varying the elimination durations and the degree of success, using the benchmark case scenario in which cancer mortality is reduced by 80 percent over a 20-year transition. This achieves about 70 percent of the total economic value of full elimination above, corresponding to aggregate benefits of about $130 trillion, or approximately $10,500 per person per year. These findings highlight the exceptionally large economic value that can be realized by supporting private industry's innovation efforts to eliminate cancer.

Section 1: Introduction

By 1971, cancer had become the second leading cause of death in the United States, fueling a national effort to combat the disease. President Richard Nixon signed the National Cancer Act of 1971, which launched the "War on Cancer". The Legislation increased funding and authority for the National Cancer Institute (NCI). It established a coordinated National Cancer Program, giving the NCI director expanded powers (e.g., creating cancer centers, training programs, and a direct "bypass" budget to the President) to intensify research (National Cancer Institute). Yet despite these efforts, cancer incidence and mortality continued to rise throughout the 1980s, primarily due to smoking-related cancers. More specifically, in the early 1970s, when the War on Cancer began, the U.S. cancer death rate (age-adjusted) was roughly 190–200 per 100,000 people. Overall mortality peaked around 1990–1991 at about 215 per 100,000. Thereafter, a sustained decline set in. By 2019, the rate had fallen to 146.0 per 100,000, about 27% lower than in 1971 and 32% lower than the 1991 peak (NCHS, 2024). This downward trend has continued in recent years, reaching ~142 per 100,000 in 2023 (NCHS, 2024).

Yet despite this progress, cancer remains the second leading cause of death in the U.S. after heart disease. Over the past 50+ years, both cancer and heart disease mortality rates have declined, but heart disease treatments have improved significantly relative to cancer mortality. Heart disease death rates fell by roughly 66% between 1970 and 2022, thanks to advancements like better cardiac care and reductions in smoking (Bai, 2025). In comparison, the overall cancer death rate has decreased by about 27% since 1971 (and ~34% since 1991) (Kratzer et al. 2022). As a result of these underlying dynamics, the CDC estimates that cancer will overtake heart disease as the leading cause of premature mortality by 2030 (Harding et al. 2018).

Given the large, enduring health and economic burden of cancer in the United States, this paper applies a forward-looking valuation framework to quantify the national gains from eliminating or drastically reducing cancer mortality during the period 2030 to 2064. A key premise underlying such an exercise is that sustained investment in medical research and treatment can yield meaningful improvements in cancer survival. Since the National Cancer Act of 1971, the United States has maintained substantial public funding for cancer research, with the National Cancer Institute alone allocating more than $7 billion annually in recent years. U.S. cancer mortality rates have declined by approximately one-third since the early 1990s (AAMC, 2025). Beyond descriptive trends, more direct evidence links cancer-related spending and medical innovation to improvements in survival. Lakdawalla et al. (2010) provide an economic evaluation of the "War on Cancer," estimating that improvements in cancer survival between 1988 and 2000 generated approximately 23 million additional life-years and nearly $1.9 trillion in social value.

In our analysis, we consider the value of cancer elimination in terms of the direct value of health generated, the productivity effects as well as the fiscal effects. Under the status quo of no cancer elimination, we find that we would have 30.7 million cancer deaths during our study period, with a total mortality burden of 378 million life-years, equivalent to roughly 4.9 million full lives lost under current US life expectancy. Because our analysis focuses on valuing life-years lost for the remaining years for cancer patients, this framework implicitly values saving a child more than saving an older person, reflecting differences in remaining life expectancy at the time of death. To monetize the value of such cuts in mortality, we use the valuation of a life year of $531,000 used by the US federal government in its cost-benefit analysis of regulations, as reviewed in Philipson et al. (2023). To illustrate, for a breast cancer patient who dies at age 45 rather than living to age 75, this implies a loss of 30 life years. Using US federal government valuations, this implies a loss in value of 30 x $531,000, totaling $15.9 million. This calculation for a single cancer death illustrates why aggregate losses from cancer mortality of 30.7 million cancer deaths amount to trillions in value, that is, millions of millions.

Given that health is the most valuable asset for most people, the direct gain from improved health makes up by far the largest component of the value of cancer elimination, but we also consider effects due to increased productivity and fiscal effects. This is important as many cancers are diagnosed during productive years and some cancers, such as colorectal cancers, are declining in age of diagnosis.

We find that the total economic gain from all 3 components is $186 trillion during the 2030-2064 period. This amounts to about $15,385 per American per year or $39,387 per American household per year. In present-value terms and inflation-adjusted, this amounts to $118 trillion in 2026 dollars.

If the elimination of cancer were viewed as an investment, the returns to such an investment would be extremely large. Assuming a range of costs to eliminate cancer of $500 to $900 billion, we find an extremely large internal rate of return of 537% to 965%, underscoring the exceptionally large social returns to investments that accelerate progress towards cancer elimination. Importantly, a sensitivity analysis scenario in which cancer mortality is reduced by 80 percent over a 20-year transition captures roughly 70 percent of the total economic value of full elimination, corresponding to aggregate benefits on the order of $130 trillion, or approximately $10,500 per person per year. Altogether, these findings highlight the excellent and robust returns from reducing and eliminating cancer mortality and the value of policies that stimulate medical innovation in cancer.

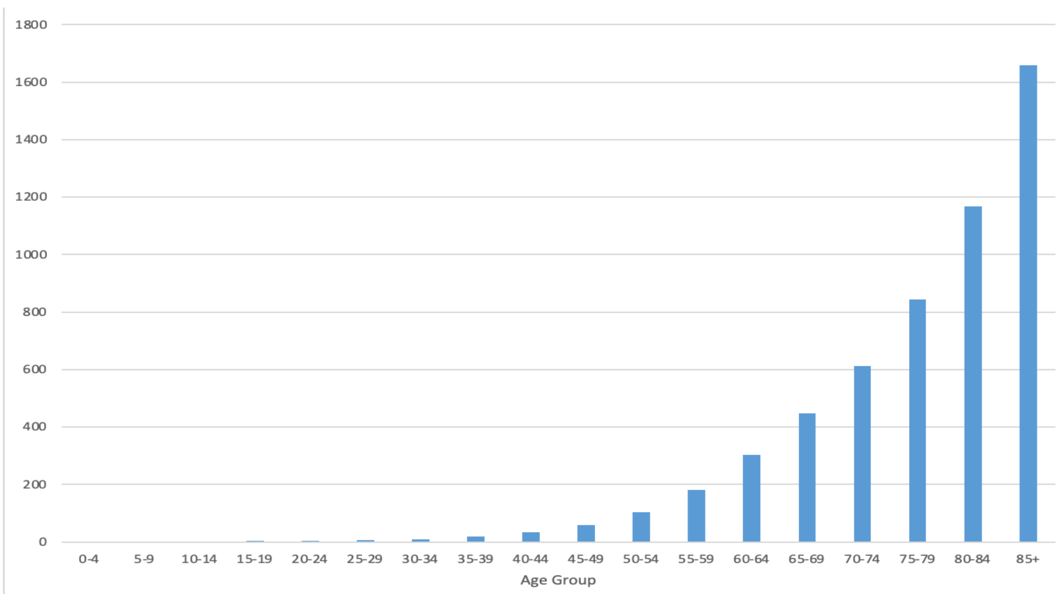
Section 2: The Future Mortality Burden of Cancer

In this section, we quantify the future cancer mortality burden in the United States over a 35-year period. We begin by documenting the current age distribution of cancer mortality to establish a baseline risk pattern. We then project age-specific cancer deaths from 2030 to 2064 using population forecasts and observed mortality rates. Finally, we translate these projected deaths into life-years lost and equivalent full lives lost, providing a comprehensive measure of the potential longevity gains that would arise from eliminating cancer mortality.

2.1 Mortality Rate and Projection

Figure 1 displays the age distribution of cancer mortality in the United States, as reported by the CDC in 2023. Mortality rates are extremely low in childhood and early adulthood, remain modest through middle age, and then rise sharply beginning around age 55. The steep acceleration after age 65 reflects both increased cancer incidence and higher fatality among older adults. The oldest age group (85+) exhibits mortality rates exceeding 1,600 per 100,000, underscoring the concentration of cancer mortality among the elderly population.

Figure 1: Age-Specific Cancer Mortality Rates in the United States (per 100,000 Population), 2023



To project future cancer mortality by age, we combined the 2023 U.S. cancer mortality rates with population forecasts from the U.S. Census Bureau. Because age-disaggregated population projections were available only for selected benchmark years (2030, 2035, and 2040), we interpolated each age group's proportional population share across the benchmark years and applied these shares to annual total population projections to construct consistent age-by-year population estimates. Cancer incidence is prominent in the most productive years of life, which tend to be in one's 50s as measured by age-earning profiles, and remains so through the working ages into the 70s. In addition, some major cancers, such as colorectal cancer, have experienced a declining age of diagnosis, increasingly affecting individuals during high-productivity years.

Projected cancer deaths were first calculated for each CDC age group as the product of the age-specific mortality rate and the projected population in that age group, yielding an initial age-group-by-year matrix of predicted deaths. To convert these grouped estimates into single-year ages ($N_{t,a}$) for subsequent analysis, we then assumed a uniform distribution of mortality within each age group.

2.2 Estimated Life Expectancy for Cancer Patients

We estimate life expectancy for cancer patients by combining baseline conditional life expectancy with long-term relative survival rates for major cancer types. Baseline life expectancy is measured as projected remaining life expectancy conditional on age and year, obtained from the *United Nations World Population Prospects (2024 Revision)*. For an individual dying at age a in year t, the conditional life expectancy is denoted by $L_{t,a}$, representing the expected number of additional life years in the absence of cancer-related excess mortality.

Because the UN dataset only provides projected conditional life expectancy for ages 0, 15, 65, and 80, we interpolate conditional life expectancy across all ages. Because life expectancy is expected to continue rising over the next several decades due to improvements in overall population health, allowing $L_{t,a}$ to vary by year ensures that our calculations accurately reflect the longevity lost of a group at a given age and year.

To adjust baseline life expectancy for cancer patients, we use long-horizon relative survival rates. We collect 5-year, 10-year, and 15-year relative survival rates for four major cancer types: breast cancer, colorectal cancer, prostate cancer, and lung cancer. Then we compute the arithmetic mean across these cancers to construct a representative survival profile. Relative survival rates are reported cumulatively, reflecting survival from treatment to a given horizon. We therefore convert cumulative relative survival into interval-specific survival using conditional survival. For example, relative survival between years 5 and 10 is given by

$$RS_{5-10} = \frac{RS(10)}{RS(5)},$$

and similarly for subsequent intervals.

Cancer-adjusted remaining life expectancy is then computed as a piecewise weighted sum of baseline conditional life expectancy across future time intervals, where each interval is weighted by the corresponding interval-specific relative survival rate. Specifically, cumulative relative survival at 5, 10, and 15 years is used to construct interval-specific survival probabilities for the periods 0–5, 5–10, and 10–15 years. Survival beyond 15 years is assumed to follow the 15-year relative survival rate, reflecting convergence toward long-run survival. Baseline conditional life expectancy is decomposed across these future intervals and weighted by the corresponding interval-specific relative survival probabilities. For an individual aged a in year t, cancer-adjusted life expectancy is given by:

$$L_{t,a}^{cancer} = l_{0-5} \times RS(5) + l_{5-10} \times \frac{RS(10)}{RS(5)} + l_{10-15} \times \frac{RS(15)}{RS(10)} + l_{15+} \times RS(15)$$

where:
l_{0-5} , l_{5-10}, l_{10-15}, l_{15} denote the contributions of each future interval to baseline remaining life expectancy $L_{t,a}$;

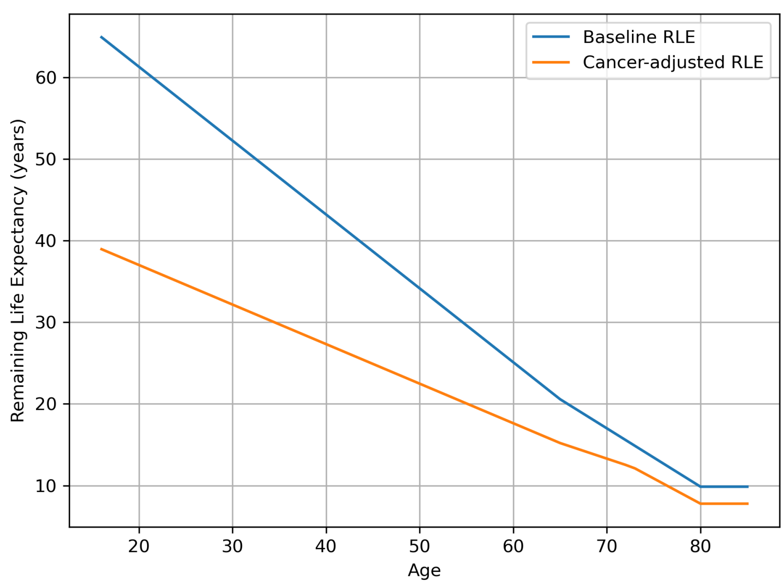
RS(5), *RS (10)*, and *RS(15)* are cumulative relative survival rates to 5, 10, and 15 years, respectively;

Survival beyond 15 years is assumed to remain constant at the 15-year relative survival rate.

This estimation preserves the age profile and calendar-year variation of baseline life expectancy while accounting for excess long-term mortality among cancer survivors. The resulting cancer-adjusted life expectancy is used in subsequent mortality, productivity, and fiscal impact calculations.

Figure 2 plots baseline and cancer-adjusted remaining life expectancy by age for the year 2030. The difference between the two curves is larger at younger ages and declines steadily with age. This pattern arises because younger individuals have a longer remaining life horizon, so excess mortality translates into a larger absolute reduction in remaining life expectancy. As age increases and remaining life expectancy shortens, the absolute decrease in life expectancy associated with cancer correspondingly diminishes. As a result, this pattern implicitly values saving a child more than saving an older person.

Figure 2: Baseline and Cancer-Adjusted Remaining Life Expectancy by Age (2030)



2.3 Cancer Mortality Burden

Under the status quo scenario, total projected cancer deaths over the 35-year period from 2030 to 2064 sum to 30.7 million. In the following, we calculate the aggregate mortality burden by summing years of life lost across all ages up to 85 and calendar years from 2030 to 2064. The formula is as follows:

$$Mortality\ Burden = \sum_{t=2030}^{2064} \sum_{a=0}^{85} N_{t,a} \times L_{t,a}^{cancer},$$

where t indexes the year, a denotes the age, and $N_{t,a}$ is the number of deaths due to cancer at the age a in year t. In terms of equivalent loss in full lives, we convert the life-year burden by the U.S. life expectancy of 78.4 in 2025 as follows:

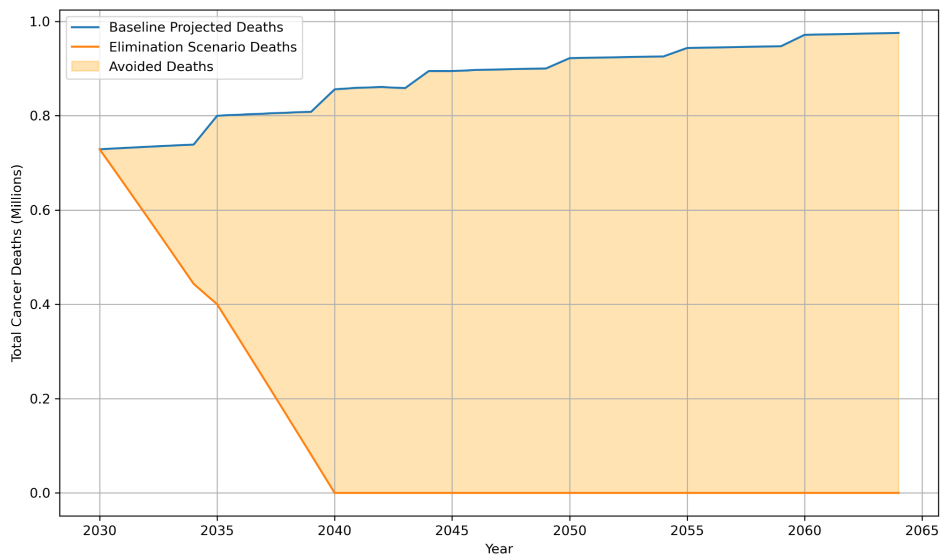
$$Equivalent\ Full\ Lives\ Lost = \frac{Mortality\ Burden}{U.S. Life\ Expectancy} = \frac{Mortality\ Burden}{78.4}.$$

Aggregating the age-specific life-years lost across 2030–2064 yields a total mortality burden of 379.96 million life-years under the status quo, reflecting the longevity that would be forfeited in the absence of further progress against cancer. When expressed as equivalent full lives lost—dividing total life-years lost by the 78-year life expectancy benchmark—this corresponds to approximately 4.9 million full lives lost, providing an intuitive measure of the population-level impact. These estimates underscore the magnitude of health gains that could be realized from eliminating cancer mortality.

Section 3: The Monetary Value of Eliminating Cancer Mortality

This section estimates the economic value to the United States associated with a modeled reduction in cancer mortality over the period 2030–2064. We consider a counterfactual elimination scenario in which cancer mortality declines linearly during a transition period from 2030 to 2039 and remains at the reduced level thereafter. Specifically, we assume that cancer deaths fall linearly over the transition period, reaching the elimination target by 2040, and that this reduced mortality level persists through the remainder of the sample period. The baseline mortality series used for comparison corresponds to the status quo mortality burden estimated in Section 2. Figure 3 presents the baseline mortality path and the implied mortality trajectory under this linear transition framework. In our elimination scenario, the avoided deaths result in a total of 339.1 million life-years gained.

Figure 3: Cancer Deaths under Baseline and Elimination Scenarios



We then quantify the economic value of these avoided deaths across three dimensions. First, reductions in mortality yield monetized health gains through additional life years, valued using the standard Value of a Life Year (VLY). Second, extended survival generates additional employment years, and subsequently labor productivity gains equal to the discounted value of future earnings weighted by age-specific employment probabilities. Third, longer survival increases fiscal contributions through additional income-based and consumption-based tax revenue. Together, these components provide a comprehensive estimate of the economic gains associated with achieving a mortality reduction trajectory towards cancer elimination.

3.1 Health Gains

To quantify the health benefit from averted cancer deaths in the United States, we converted the avoided mortality burden measured as projected life-years lost into monetary terms using estimates of the value of a life-year (VLY). Our valuation is based on how the US federal government and the scientific literature have assessed the value of a life year. Based on the systematic review by Philipson et al. (2023), we applied a baseline VLY of \$531,501 for the value of a life-year. The monetary value of eliminating cancer was calculated as:

$$Health\ Gain = VLY \times \sum_{t=2030}^{2064} \sum_{a=16}^{85} D_{averted,t,a} \times L_{t,a}^{cancer},$$

where $D_{averted,t,a}$ denotes the number of averted cancer deaths of age group a at year t. Using the baseline VLY of \$531,501 and life expectancy conditional on age, we estimate that eliminating cancer between 2030 and 2064 would generate a total economic value of \$180.2 trillion. These gains reflect the substantial increase in longevity that would accrue across all ages and capture the long-run welfare improvements associated with reduced cancer mortality. Together, these results underscore the significant economic benefits of accelerating progress toward eliminating cancer mortality.

3.2 Productivity Gains

To measure the productivity gains from reduced cancer deaths, we construct a lifetime-earnings model that estimates the value of wages individuals would have earned had their working lives not been cut short.

We apply this framework to cancer deaths between 2030 and 2064 from age 16 to 85, and calculate the increased productivity through 2100, since the added productivity occurs after the year of death. This entails using four inputs: (i) averted cancer deaths by age and year, taken from the mortality-burden estimates developed in previous parts; (ii) remaining life expectancy (RLE) for each age–year combination, obtained from United Nations Department of Economic and Social Affairs, Population Division (2024); (iii) age-specific wage projections for 2030–2100, constructed by taking 2023 pre-tax wages from IPUMS as the baseline and project them forward using a constant long-run real wage growth rate of 1.3%, as projected by the Congressional Budget Office; and (iv) employment probabilities derived from the BLS Employment-to-Population Ratio tables, where employment probability reflects the share of individuals employed in each age group. For this exercise, we used employment probabilities of the year 2024.

For an individual who dies at age *a* in year *t*, we construct a counterfactual stream of earnings they would have generated had they survived, where future earnings in year $t+i$ correspond to the wage $W_{t+i,a+i}$ associated with the future age $a+i$ and are weighted by the employment probability P_{a+i}. These earnings are discounted back to the year of death using a 3% real discount rate *r*, producing an expected per-person gain of

$$Unit\ Productivity\ \ Gain_{t,a} = \sum_{i=1}^{I_{max}} \frac{W_{pre-tax,t+i,a+i} \times P_{a+i}}{(1+r)^i},$$

where

$W_{pre-tax,t+i,a+i}$ denotes the projected pre-tax wage in future year $t+i$ for age $a+i$;

P_{a+i} denotes the employment probability at future age $a+i$;

r denotes the real discount rate (3%);

i denotes the number of years after the year of death;

I_{max} denotes the maximum number of years for which counterfactual earnings are projected, expressed as $I_{max} = min(L_{t,a}^{cancer}, 2100 - t)$.

Combining with the projected averted deaths $D_{averted,t,a}$, the aggregate productivity gains are estimated as follows:

$$Total\ Productivity\ Gain\ = \sum_{t=2030}^{2064} \sum_{a=16}^{85} D_{averted,t,a} \times Unit\ Productivity\ \ Gain_{t,a}\ .$$

This framework quantifies the total value of the added productivity approximated by pre-tax wage incomes. Using this methodology, we estimate that averted cancer deaths will produce a total productivity benefit of \$4.32 trillion from averted deaths between 2030 and 2064. This value reflects the aggregate productivity forgone due to individuals dying before the completion of their expected working lives, underscoring the significant long-term economic implications of cancer mortality.

3.3 Tax Revenue Gains

Fiscal consequences represent an important dimension of the economic impact of eliminating cancer. The averted cancer death typically generates substantial additional tax revenue for the government. Philipson et al. (2026) evaluated the increase in tax revenue resulting from longevity gains due to medical innovation, using a pre-tax wage dataset stratified by year-age profile. Similarly, Paquete et al. (2025) computed government revenue by applying effective tax parameters to the economic output generated each year. Following these conceptual structures, we estimate annual tax revenues by linking yearly pre-tax wage gains to tax deductibles and coefficients.

Not all labor income is included in the taxable base. Consistent with federal tax rules and the fiscal modeling approach used in prior disease-specific analyses, we apply the U.S. standard deduction for single filers (\$14,600 in 2024) to each year's labor income. Taxable income in year t is therefore:

$$W_{taxable,t,a} = max(W_{pre-tax,t,a} - 14{,}600, 0).$$

This adjustment ensures that only earnings above the statutory threshold are treated as taxable and available to generate fiscal revenues.

We consider two channels through which eliminating cancer generates tax revenue. The first is direct revenue from income and payroll taxes. Following the OECD definition, the U.S. tax wedge of 30.1 percent in 2024 captures the combined burden of income and social security contributions and is applied to taxable wages, defined as earnings above the federal standard deduction.

The second component is indirect taxation. The 4.13 percent coefficient we use is the national tax on goods and services (GST) measured as a percentage of GDP, reflecting the share of total economic output that flows to governments through consumption-based taxes. Because our pre-tax wage measure represents the incremental economic output generated by cancer survivors, which is an effective proxy for GDP gains, the GST coefficient is applied to pre-tax wages rather than taxable income. This ensures consistency with the GDP-based nature of the GST parameter. Thus, the direct and indirect tax revenues an employed cancer survivor contributes are estimated as follows:

$$Tax_{t,a} = 30.1\% \times W_{taxable,t,a} + 4.13\% \times W_{pre-tax,t,a}$$

Therefore, following our year-age analysis framework, the per-person contribution and total tax revenue gains will be estimated as follows:

$$Unit\ Tax\ Gain_{t,a} = \sum_{i=1}^{I_{max}} \frac{P_{a+i} \times Tax_{t+i,a+i}}{(1+r)^i},$$

$$Total\ Tax\ Gain_{t,a} = \sum_{t=2030}^{2064} \sum_{a=16}^{85} D_{averted,t,a} \times Unit\ Tax\ Gain_{t,a}\ .$$

Applying the fiscal incidence parameters to the annual taxable productivity gains, we estimate that reducing cancer mortality would generate approximately $1,108.5 billion in direct labor tax revenue and $178.4 billion in indirect consumption-based taxes over the increased lifetime horizon. Following the approach used in both the medical-innovation and HIV fiscal literature, we apply the national tax wedge and the goods-and-services tax share of GDP to taxable economic output to obtain these fiscal estimates. The combined fiscal impact amounts to $1.29 trillion, reflecting the government revenue associated with the projected economic gains from cancer elimination.

3.4 Total Benefits and Return of Elimination

The combined economic returns from eliminating cancer mortality between 2030 and 2064 are substantial when accounting for health, productivity, and fiscal gains. Summing across the study period, we estimate a total economic benefit of $185.8 trillion, which includes monetized improvements in longevity, increased labor productivity from additional survival, and additional tax revenue generated through heightened earnings and consumption. On a per-capita basis, this amounts to an estimated $538,474 for the 2030 projected U.S. population. Spread evenly over the 35-year study period, this implies a benefit of $15,385 per person per year or $39,387 per American household per year. For context, this figure is nearly six times the current U.S. per-capita annual income. When expressed in present value terms, assuming a 2 percent annual inflation rate and a 4 percent discount rate applied to today's dollars (2026), the total economic benefit corresponds to an aggregate present value of approximately $118.5 trillion.

To further evaluate the estimated economic benefits, we calculate the internal rate of return (IRR) associated with eliminating cancer mortality. The IRR is defined as the constant discount rate that equates the total program cost incurred during the transition period to the entire stream of economic benefits. Formally, the IRR satisfies

$$\sum_{t=2030}^{2039} \frac{C_t}{(1+R)^{t-2030}} = \sum_{t=2030}^{2064} \frac{B_t}{(1+R)^{t-2030}},$$

where C_t denotes program cost in year t, B_t denotes the economic benefit in year t, and R represents the internal rate of return. We benchmark the cost of curing cancer using empirically grounded estimates of research and development (R&D) expenditure. We assume that total program costs are evenly distributed over the 10-year elimination phase, such that $C_t = \frac{Assumed\ Total\ Cost}{10}$ for $t = 0, 1, \ldots, 9$.

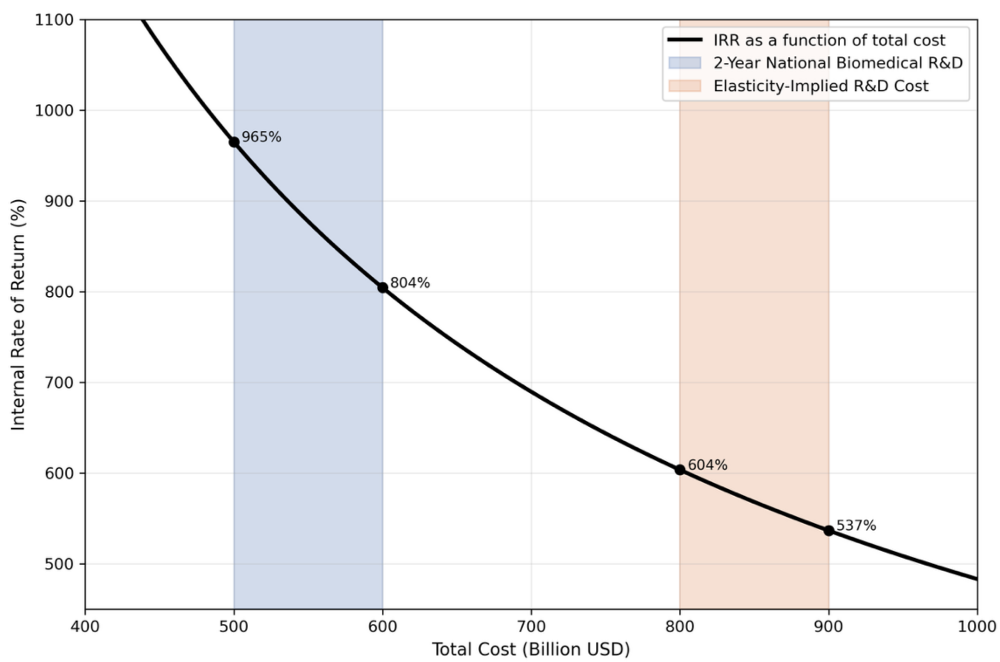
First, drawing on Lichtenberg (2002), which estimates that pharmaceutical R&D expenditure required to gain one life-year is approximately $1,345 in 2002 dollars, we update this figure to

2026 dollars (≈ $2,475 per life-year). Applying this estimate to the 339 million life-years gained under our elimination scenario implies a total R&D investment of approximately $839.1 billion. Then we benchmark on a range of costs from $800 to $900 billion, and the implied IRR ranges from approximately 537% to 604%.

Second, we benchmark cure costs against the scale of total U.S. biomedical research and development spending. According to a report of Research!America, U.S. medical and health R&D expenditures were approximately $245.1 billion in 2020. Using a conservative two-year benchmark (roughly $500–600 billion) as a plausible upper bound for a concentrated national cancer cure effort, the implied IRR ranges from approximately 804% to 965%.

Figure 4 plots the implied IRRs as a function of the assumed total program cost. Across these empirically grounded cost benchmarks, the estimated returns to eliminating cancer mortality remain extraordinarily high, with IRRs ranging from roughly 500% to nearly 1,000%, even under conservative assumptions regarding total program costs.

Figure 4: Implied Internal Rates of Return from Averted Cancer Death



3.5 Sensitivity to Elimination Speed and Final Reduction Levels

Having established the aggregate economic value associated with eliminating cancer mortality, this section examines how these estimates vary with key assumptions about the speed of elimination and the ultimate reduction level in cancer mortality. Because complete elimination is unlikely to occur instantaneously, the economic value of cancer control depends critically on both how rapidly mortality declines and how far those reductions extend in the long run. In all scenarios, mortality reductions are assumed to increase linearly during the transition period and to remain at the final reduction level in all subsequent years.

Table 1 reports total economic value aggregated over the 2030–2064 study period under alternative mortality reduction paths. Rows vary the number of years required to reach the final reduction level, while columns vary the long-run percentage reduction in cancer mortality. Across all specifications, total economic value increases monotonically with both faster transitions and larger final reductions.

Table 1: Total Economic Benefits under Different Scenarios (in Trillion USD)

Years	**Final Reduction Level**					
	50%	60%	70%	80%	90%	100%
15	86.25	103.51	120.76	138.01	155.26	172.51
20	79.29	95.15	111.01	126.87	142.73	158.58
25	72.06	86.47	100.88	115.29	129.71	144.12

Note: Years indicate the number of years required to reach the Final Reduction Level of Cancer Mortality

At the same time, the sensitivity analysis reveals that a substantial portion of the total economic value is realized before complete elimination. For example, under a 20-year transition horizon, an 80 percent reduction in cancer mortality generates approximately $127 trillion in total economic value over the study period. Expressed on a per capita basis, this scenario corresponds to an average annual economic value of approximately $10,500 per person per year over 2030–2064.

This per capita framing provides an intuitive interpretation of the magnitude of the gains. An annual benefit exceeding $10,000 per person reflects not only large health gains from avoided mortality, but also substantial downstream productivity and fiscal effects that accrue broadly across the population. Importantly, these gains are achieved without requiring the complete elimination of cancer mortality. Relative to the baseline full elimination, which yields approximately $186 trillion in aggregate value, or about $13,100 per person per year, an 80 percent reduction captures about 70% of the attainable economic value, despite being achieved over a longer transition horizon.

Overall, this sensitivity analysis demonstrates that the estimated economic value of reducing cancer mortality is robust across a wide range of plausible transition paths. While faster implementation increases total gains, the results indicate that large and sustained reductions in cancer mortality—even if short of full elimination—are sufficient to deliver most of the economic value associated with eliminating cancer.

Section 4: Conclusion

This paper values the mortality burden of cancer over the period 2030 to 2064 and thereby the economic value of reducing cancer deaths in the United States. By aggregating longevity lost due to 30.7 million cancer deaths across the sample period, our analysis yields a total mortality burden of 379.96 million life-years under the status quo, which is equivalent to roughly 4.9 million full lives lost under the U.S. average life-expectancy. We estimated the health, productivity, and fiscal gains that would arise if cancer mortality declined to zero from 2030 to 2039. The resulting benefits total $185.8 trillion. Under the assumptions of a 2 percent annual inflation rate and a 4 percent discount rate, this corresponds to a present value of $118.5 trillion in 2026 dollars. On an annual per capita basis, the total value amounts to $15,385 per person per year or $39,387 per American household per year over 2030-2064. If cancer elimination were viewed as an investment, its internal rate of return would range from 965% to 537% when the assumed program cost climbs from $500 to $900 billion, reflecting the substantial longevity and economic value generated by averting premature cancer deaths. Importantly, our sensitivity analysis shows that a scenario in which cancer mortality is reduced by 80 percent over a 20-year transition captures roughly 70 percent of the total economic value of full elimination, corresponding to aggregate benefits on the order of $130 trillion, or approximately $10,500 per person per year.

The progress of medical innovation is a central driver of increased cancer longevity. Philipson et al. (2012) find that U.S. patients experienced greater improvements in survival than in Europe due to higher therapeutic spending, and that the incremental value generated for U.S. cancer patients was substantial. Although medical investment plays an important role in reducing cancer mortality, it is important to recognize that declines in cancer burden can arise through multiple complementary channels. A substantial body of epidemiological evidence links modifiable behaviors—including smoking, obesity, physical inactivity, excessive alcohol consumption, and poor diet—to increased cancer risk across multiple major cancer types (Khan, Ahmed, & Mukhtar, 2010). Comprehensive global reviews similarly conclude that maintaining a healthy body weight, engaging in regular physical activity, limiting processed meats and alcohol consumption, and adopting plant-forward dietary patterns can significantly reduce cancer incidence (World Cancer Research Fund & American Institute for Cancer Research, 2007). These prevention pathways complement therapeutic innovation and highlight that reductions in cancer mortality may be achieved through both medical advances and public health interventions. But it is important to stress that our valuation framework applies to mortality reductions regardless of the channel through which they are realized.

Moreover, our analysis evaluates a broad range of plausible total cost assumptions of a cancer elimination program, ensuring that the estimated returns are not driven by any single implementation pathway. The large returns to cancer elimination suggest that US policy should try to stimulate and not hinder cancer innovation. Notably, the Biden administration's Inflation Reduction Act has had dramatic negative implications for cancer R&D (Philipson et al., 2022). In addition, IRAs' compressed exclusivity periods discourage precisely the follow-on research that enables drugs to reach earlier disease stages, where treatment is most effective, and cures are most possible (Philipson et al., 2025). The "pill penalty" discriminates against the precision oral medications that represent the future of targeted oncology (Grabowski et al., 2024). And recent policies of most-favored-nation pricing compound these harms by importing foreign price controls that undervalue medical innovation.

Given the significant economic value of reducing cancer mortality, the long-run returns to pharmaceutical innovation dwarf any short-term savings from attempts to hold down prices through price controls or other means. The trillions in potential benefits from eliminating cancer mortality mean that investing in cancer innovation is among the highest-return investments society could make.

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