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The Fiscal Consequences Attributed to Changes in Morbidity and Mortality Linked to Investments in Health Care: A Government Perspective Analytic Framework

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ABSTRACT

Governments have an enormous economic and political stake in the health of their populations. Population health is not only fundamental to economic growth but also affects short-term and long-term government expenditure on health care, disability, and other social programs and influences direct and indirect tax receipts. Fiscal transfers between citizen and state are mostly ignored in conventional welfare economics analyses based on the hypothesis that there are no winners or losers through transference of wealth. However, from the government perspective, this position is flawed, as disability costs and lost taxes attributed to poor health and reduced productive output represent real costs that pose budgetary and growth implications. To address the value of health and health care investments for government, we have developed a fiscal health analytic framework that captures how changes in morbidity and mortality influence tax revenue and transfer costs (e.g., disability, allowances, ongoing health costs). The framework can be used to evaluate the marginal impact of discrete investments or a mix of interventions in health care to inform governmental budgetary consequences. In this context, the framework can be considered as a fiscal budget impact and/or cost-benefit analysis model that accounts for how morbidity and mortality linked to specific programs represent both ongoing costs and tax revenue for government. Mathematical models identical to those used in cost-effectiveness analyses can be employed in fiscal analysis to reflect how disease progression influences public accounts (e.g., tax revenue and transfers).

Keywords: fiscal, health, public economics, public finance, welfare economics.

Government Perspective Modeling in Health

Health economists and policy analysts regularly debate the merits of applying the societal perspective versus a health service perspective for evaluating the economics of medical technologies. An alternative and seldom considered perspective can be used to evaluate investments in health technologies: the perspective of government. We refer specifically to a "government perspective" analysis that takes into consideration how resulting morbidity and mortality changes from investing in medical technologies influence government accounts—both expenditures and tax revenues. If one considers that health care is mostly paid using centrally financed public money, the perspective of government is likely valuable for expressing to government the value of public health systems [1].

Traditional approaches for evaluating the economics of health originate from welfare economics, emphasizing health sector costs but ignoring transfers and taxes on the premise that there is no welfare gain or loss associated with transfers and taxes [2]. Although this does reflect the welfare economic perspective, it does not reflect fiscal reality and the observation that lost taxes and increased transfer payments represent real costs to government [3].

In many respects, welfare economics represents a theoretical framework for optimizing societal welfare; it is divorced from the reality of fiscal constraints and the necessity to tax citizens to pay for government programs. An illustration of these transfer costs was discussed in a report commissioned by the UK government describing the impact of ill health in working aged adults. The report noted the impact of poor health in working aged adults was £62 to £76 billion annually (2007), of which £29 billion was workless benefits and £28 to £36 billion was lost tax revenue [3]. The health sector costs traditionally considered in utilitarian cost-effectiveness analysis represented only 8% to 15% of total government costs. These figures highlight the fact that applying a

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limited health service perspective in working aged adults and children, who represent future taxpayers, may neglect the majority of the associated fiscal costs, which transcend the health system budget.

If we view publicly financed health systems from the perspective of public finances, there are alternative frameworks for assessing the impact of health care from the government perspective. One approach is based on the generational accounting (GA) approach, originally used to explore the cross-sectorial and intertemporal effect of government policy on the basis of estimating the value of the current and future taxes a person is likely to pay net of transfer payments over his or her lifetime and how taxes and transfers may change in relation to policy decisions [4].

When the GA approach is modified and applied at the health program level within a single cohort receiving an intervention, this framework can be used to evaluate discrete investments in health care with resulting changes in morbidity and mortality that impact tax revenue and transfers attributed to health investments. Applying a modified GA within an isolated cohort allows one to isolate the allocation problem to the cohort receiving an intervention, in contrast to traditional GA, which evaluates interacting cohorts.

Estimating the Fiscal Consequences of Investments in Health

Events such as premature mortality, disability, early retirement, or reduced labor force participation will reduce taxes paid to government. Similarly, health conditions that increase life expectancy will increase tax revenues but also increase transfer costs for government. The simultaneous consideration of transfer costs and tax revenue provides insights into the impact of marginal health changes on public finances. This could include improving educational attainment, future earnings, and productivity; delaying retirement decisions; or avoiding early mortality. In this respect, reduced labor force participation has the same effect as unemployment because people are disengaged from the labor market, requiring increased publicly funded social support programs.

Assessing the fiscal impact of medical interventions requires some understanding of the degree to which a particular medical intervention and resulting changes in health status influence labor market activity/decisions and transfer payments. From the government perspective, morbidity and mortality that influence productivity, retirement decisions, and labor force participation will influence government revenues. The likely fiscal consequences associated with health and changes in health status are reflected in the life course public finance balance sheet shown in Figure 1.

At each age of life, per capita expenditure and anticipated tax revenue make it possible to estimate the likely fiscal impact of changes in health at any stage of life. For example, an intervention that maintains the health of a 58-year-old man and allows him to avoid health-related early retirement will generate increased tax for government and reduce disability costs and additional pension costs paid for early retirement. Additionally, understanding the role that some medical conditions can have on human capital accumulation, such as education, can also be considered [5,6].

The understanding of how medical interventions influence the fiscal life course of individuals can be used to evaluate the return on investment for government in future gross and net tax revenues associated with health status gains. Within publicly funded health services, new medical interventions represent an increased cost for government but can also increase tax revenues when employed effectively. To understand the gross and net fiscal effect, the fiscal value of new interventions can be assessed,

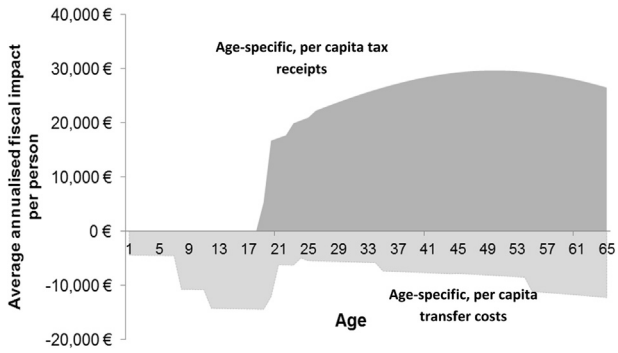

Fig. 1 – Fiscal life course reflecting 'per capita' age-specific transfer payments and tax receipts.

including investment costs within public expenditure profiles to evaluate fiscal consequences and whether the incremental costs can be justified.

For example, an individual who is diagnosed with a disease at the age of 41 years is likely to have decreased productive output for his or her remaining life and increased transfer costs (i.e., health care costs and disability). Graphically, that would result in shifting down both the age-specific, per capita tax receipts (lost tax revenue) and per capita transfer costs (increasing expenditure) (Fig. 1). Hence, an investment in a new medical technology that targets the disease is likely to moderate the shift down of the age-specific, per capita transfer costs (Fig. 1) and sustain the age-specific, per capita tax receipts.

The return on investment can be estimated by comparing the net fiscal effect with and without the investment in health technology. The fiscal health framework can also be used to account for future lost earnings from children because this represents anticipated revenue for governments and is well reflected in public finance methodologies and GA [4,7].

Quantitative Fiscal Analytic Framework

In its simplest form, the proposed value framework consists of a government perspective cost-benefit analysis, with costs representing the present value of a health care intervention and benefits representing the present value of an additional direct and indirect tax resulting from reduced mortality and morbidity and increased productivity plus cost offsets from current public health care and disability or social insurance costs. Because both costs and benefits are presented in monetary terms, alternative health interventions can be assessed and ranked using financial criteria, such as the net present value, return on investment, and internal rate of return.

In its extended form, the proposed framework takes into consideration the fact that public finances are influenced by two opposing population forces: government expenditures and tax revenues. As the population age structure and the health of the population change, these opposing forces, including economic growth and tax revenue influenced by labor market participation, and age-related expenditure also adjust [8].

By viewing population age structures, it is possible to see how changes in population health status can influence the government balance sheet via increased transfers and reduced tax receipts. As health status improves in one age cohort, we can expect to see increased productive output and tax revenues to arise from these improvements. From the government's perspective, investment choices made by national and regional health services can positively and negatively influence government accounts depending on the extent to which health care