Project HealthCare

CEE FISCAL INDEX

The **C**entral **E**astern **E**urope **F**easibility of F**I**scal Con**S**equences **CAL**culation

Author:

prof. Róbert Babeľa, FISAC

Vice-rector for R&D, Slovak Medical University, Bratislava, Slovakia,

Senior Partner, Project HealthCare/PHC, Bratislava, Slovakia

Reviewer:

Matej Mišík, MSc

Health Economist

Former Director of the Institute for Healthcare Analyses, Ministry of Health, Bratislava, Slovakia

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Executive Summary

The Central Eastern Europe Feasibility of FIscal ConSequences CALculation (further as CEE FISCAL Index) report provides a thorough analysis of the feasibility of the fiscal calculations providing the implications of healthcare investments across ten Central and Eastern European countries, including Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Serbia, Slovakia, and Slovenia. The report is built on a detailed examination of both economic and clinical data availability to evaluate the fiscal health and sustainability of healthcare systems in these nations. However, a significant finding of the report is the pronounced discrepancy between the availability and completeness of economic data versus clinical data, which presents challenges in accurately assessing the fiscal impact of healthcare investments.

Economic data across the countries are generally robust and well-documented, allowing for detailed analysis and comparison. In contrast, clinical data are often unavailable, incomplete or entirely missing, particularly in areas such as mortality rates, disease incidence, healthcare utilization and healthcare spending. Similarly social services data are often siloed without the possibility to integrate with healthcare data. This data gap with detached data siloes limits the ability to form a comprehensive view of healthcare outcomes and their economic consequences, thereby hindering effective policy development and resource allocation.

The report underscores the critical need for harmonization and sharing of healthcare and social data as a strategy to bridge this gap. Harmonization would involve standardizing data collection and aligning definitions across different countries and sectors, ensuring that the data are comparable and compatible. Data sharing, facilitated by secure and interoperable systems, would allow for broader access to crucial information, enabling more accurate fiscal modeling and informed decision-making.

The benefits of closing the data gap are manifold. For government agencies, it allows for better policy formulation, ability to align incentives across social and healthcare, efficient resource allocation, and long-term strategic planning. Healthcare providers can optimize service delivery and improve patient outcomes by leveraging comprehensive data. Insurance companies would benefit from more precise risk assessments and better product development, while pharmaceutical companies could use the data to guide research and development, ensuring that new treatments meet the most pressing needs. Businesses and the economy as a whole would see improved workforce productivity and reduced healthcare costs, and patients would benefit from more equitable access to high-quality care and better health outcomes.

Moreover, the report highlights the importance of investment in data infrastructure, including the development of secure databases with common approaches to data pseudonymization and protection, data analytics tools, and systems that ensure interoperability. It also calls for stronger collaboration between public and private sectors to enhance data integration and utilization. Establishing legal frameworks and ethical guidelines that support data sharing while protecting privacy is also essential.

In conclusion, the “CEE FISCAL Index” report reveals critical insights into the fiscal health of healthcare systems in Central and Eastern Europe, emphasizing the need for comprehensive data harmonization and sharing. By addressing the discrepancies in data availability and investing in necessary infrastructure, stakeholders can significantly enhance the accuracy of fiscal models, leading to more effective healthcare policies, better public health outcomes, and improved economic stability across the region.

Introduction

The intersection of healthcare and economics has become increasingly critical in the modern world, where rising healthcare costs and complex demographic shifts challenge the sustainability of health systems globally. The Central Eastern Europe Feasibility of FIscal ConSequences CALculation (further as CEE FISCAL Index) report aims, on top of the feasibility feature, to provide a comprehensive analysis of the economic implications of health-related interventions and policies. As healthcare continues to consume a growing portion of national budgets, understanding the long-term fiscal impacts of health investments is paramount for policymakers, healthcare providers, and society at large.

The following report draws upon almost two decades of expertise in analyzing the fiscal impact of diseases and healthcare interventions. It seeks to elucidate the complex relationships between health investments, population health outcomes, and economic consequences. By exploring the methodologies, importance and stakeholder implications of fiscal consequences modeling in healthcare, this report aims to equip decision-makers with the insights and tools necessary to navigate the intricate landscape of health economics.

In an era where evidence-based decision-making is crucial, this report underscores the importance of robust economic analysis in shaping health policy and resource allocation. It provides a roadmap for understanding how changes in morbidity and mortality, driven by strategic health investments, can have far-reaching fiscal implications across various sectors of the economy. The insights presented here are designed to foster more informed, efficient, and sustainable approaches to healthcare planning and delivery.

Overview of Fiscal Consequences Modeling in Healthcare

Fiscal consequences modeling in healthcare is an advanced analytical tool used to understand and predict the financial impacts of health-related changes on a macroeconomic scale. At its core, this type of modeling seeks to link health outcomes, particularly changes in morbidity (the rate at which diseases affect a population) and mortality (the rate of death), with economic variables such as healthcare costs, social care costs, productivity, tax revenues, and long-term economic growth.

The modeling operates within a framework that includes epidemiological data, healthcare spending, and economic performance metrics. This framework often employs complex mathematical and econometric models to simulate how different health scenarios impact economic outcomes. For example, it might model the economic effects of a decrease in cardiovascular disease prevalence due to a public health campaign promoting healthier lifestyles. By doing so, the model can estimate reductions in healthcare costs, increases in life expectancy, and improvements in workforce productivity and participation.

Robust fiscal consequences model typically incorporates several key components: epidemiological data (incidence, prevalence, and mortality rates of various diseases), healthcare utilization (hospital admissions, outpatient visits, and prescription medication usage), cost data (both direct healthcare costs like hospital care and indirect costs such as lost productivity and social transfers), and economic indicators (GDP, labor force participation rates, and public sector spending). Assumptions play a crucial role in these models, such as the expected effectiveness of health interventions, elasticity of healthcare demand, or future trends in disease prevalence. For instance, a model might assume that a new vaccine will reduce disease incidence by 50%, leading to a proportional decrease in healthcare costs and an increase in economic productivity. These assumptions must be based on the best available evidence and should be regularly updated as new data becomes available.

One of the primary applications of fiscal consequences modeling is in informing public policy decisions. Policymakers use these models to evaluate the potential economic returns on health investments. For instance, when considering a national cancer screening program, a fiscal model might weigh the long-term savings from early detection and treatment versus the costs of implementing the program not just on direct healthcare costs, but from a broader fiscal perspective. This analysis helps policymakers holistically determine whether the program is a sound investment for public funds.

Fiscal modeling also sheds light on the relationship between health investments and economic performance. Healthy populations tend to be more productive, with lower rates of absenteeism, higher levels of workforce engagement for longer portions of life. This, in turn, boosts economic growth by increasing the availability of labor and reducing the burden on social services. For example, a country that invests heavily in reducing the incidence of chronic diseases like diabetes and hypertension might see significant economic gains as the workforce becomes healthier and more capable of sustained productivity.

The results of fiscal consequences modeling are valuable for both the public and private sectors. Governments can use the model to forecast healthcare expenditures, model public health intervention impacts, increase revenue modeling precision, plan budgets, and allocate resources more effectively. In the private sector, businesses can use these models to understand how health trends might impact their operations, particularly in terms of employee health and productivity. Insurance companies, for example, can leverage fiscal modeling to set premiums and design coverage plans that align with projected healthcare costs and outcomes.

Despite its benefits, fiscal consequences modeling is not without challenges. One of the main challenges is the uncertainty inherent in predicting future health trends and their economic impacts. Factors such as emerging diseases, changes in healthcare technology, and shifting demographic patterns can all introduce variability into the model's projections. To mitigate these uncertainties, models often include sensitivity analyses to explore

how changes in key assumptions affect the outcomes. Additionally, models must be continually validated against real-world data to ensure their accuracy and relevance.

Several case studies illustrate the impact of fiscal consequences modeling. For instance, smoking cessation programs in various countries have been analyzed using these models to assess the economic benefits. Typically, the models show that the short-term costs of implementing smoking bans and providing cessation support are far outweighed by the long-term savings in healthcare costs and productivity gains. In the United States, fiscal modeling of smoking cessation initiatives has demonstrated significant reductions in healthcare expenditures related to smoking-related diseases, along with increases in life expectancy and workforce productivity.

Another example is the implementation of universal health coverage (UHC). Countries considering UHC often use fiscal consequences models to estimate the economic impact of such a policy. These models help predict the initial costs of extending healthcare access to the entire population and the subsequent economic benefits, such as improved public health, reduced poverty, and greater economic stability. For instance, Thailand's introduction of UHC was supported by fiscal modeling that projected long-term economic benefits from a healthier, more productive population.

Fiscal consequences models are often integrated with broader economic models to provide a more comprehensive view of health-related economic impacts. For example, a fiscal model might be linked with a macroeconomic model that considers the effects of healthcare investments on GDP, inflation, and unemployment rates, allowing for a more holistic understanding of how health outcomes influence the broader economy.

The results of fiscal consequences modeling must be communicated effectively to stakeholders, including policymakers, healthcare providers, and the public. This involves translating complex model outputs into actionable insights that are easy to understand and apply. Visualization tools, such as graphs and dashboards, are often used to illustrate key findings and highlight the economic implications of various health scenarios.

Advancements in technology, particularly in data analytics and machine learning, have significantly enhanced the capabilities of fiscal consequences modeling. These technologies enable the processing of large datasets, the identification of patterns and trends, and the development of more accurate and dynamic models. For example, machine learning algorithms can be used to predict future health trends based on historical data, improving the accuracy of fiscal models.

Fiscal consequences modeling in healthcare is a powerful tool that provides valuable insights into the economic impacts of health outcomes. By linking health investments to economic indicators, these models help policymakers, healthcare providers, and businesses make informed decisions that promote both public health and economic growth. Despite its challenges, the continued development and refinement of fiscal consequences modeling will play a crucial role in shaping the future of healthcare and economic policy.

Importance of Modeling Fiscal Consequences in Healthcare

Modeling the fiscal consequences of healthcare interventions is essential for understanding the broader economic impact of health policies and investments. By providing a data-driven approach to evaluating the cost-effectiveness and long-term benefits of healthcare initiatives, fiscal modeling plays a critical role in shaping informed decisions that align with both public health goals and economic stability. The importance of this modeling can be broken down into several key areas, each with practical examples demonstrating its value.

Optimal resource allocation

Healthcare resources are inherently limited, and there is often intense competition for funding among various health programs. Fiscal consequences modeling enables policymakers to allocate these resources more effectively by identifying interventions that offer the greatest return on investment. For example, during the rollout of national vaccination programs, models can compare the fiscal impact of different vaccines or different vaccination schemas to determine which would provide the most significant public health benefit relative to cost. In the case of the HPV vaccine, fiscal models have shown that investing in widespread vaccination can lead to substantial long-term savings in healthcare costs related to treating cervical cancer, as well as reducing the overall disease burden.

Enhancing economic stability

Healthcare interventions that reduce the burden of disease can lead to enhanced economic stability. For instance, by preventing chronic diseases like diabetes or cardiovascular diseases, a country can avoid significant healthcare utilization and expenditures and maintain a healthier workforce, which contributes to economic productivity. In the case of Finland's North Karelia Project, which focused on reducing cardiovascular risk factors through dietary changes and public health campaigns, fiscal models demonstrated that the reduction in heart disease cases not only saved healthcare costs but also preserved economic productivity by reducing the number of premature deaths and disability cases.

Informed policy development

Fiscal consequences modeling is a powerful tool for policymakers when developing health policies. It provides evidence-based projections that show the potential economic outcomes of various health interventions, helping to prioritize actions that will have the most substantial impact. For example, the introduction of sugar taxes in several countries was heavily influenced by fiscal modeling. These models projected that reducing sugar consumption through taxation would decrease the prevalence of obesity and related diseases, such as type 2 diabetes, leading to significant savings in healthcare costs and improvements in population health. The UK's Soft Drinks Industry Levy, implemented in 2018, was supported by fiscal models that predicted both health benefits and economic gains from reduced healthcare spending on obesity-related conditions.

Long-term strategic planning

Governments and health organizations use fiscal modeling to plan for future healthcare needs and challenges. By understanding the long-term economic implications of current health trends, policymakers can develop strategies that ensure the sustainability of healthcare systems. For example, Japan, facing a rapidly aging population, has used fiscal models to project the future economic impact of increasing healthcare and long-term care needs. These models have been instrumental in shaping policies aimed at enhancing elderly care services while also encouraging preventive health measures to reduce the overall burden on the healthcare system.

Justifying healthcare expenditures

In times of economic austerity, healthcare budgets are often scrutinized, and there is a need to justify expenditures based on their economic returns. Fiscal modeling provides a robust framework for demonstrating the value of healthcare investments. For instance, the implementation of the Affordable Care Act (ACA) in the United States was supported by fiscal models that projected long-term savings

through expanded access to preventive services and insurance coverage. These models showed that by reducing the incidence of preventable diseases and lowering the costs of emergency care, the ACA would generate substantial economic benefits over time, justifying the initial investments required to implement the program.

Supporting public health campaigns

Fiscal models are also crucial in supporting public health campaigns by quantifying their potential economic impact. For example, anti-smoking campaigns in various countries have used fiscal modeling to demonstrate the economic benefits of reducing smoking rates. These models predict significant savings in healthcare costs associated with treating smoking-related diseases, such as lung cancer and chronic obstructive pulmonary disease (COPD). In Australia, the implementation of aggressive anti-smoking policies, supported by fiscal models, has led to one of the lowest smoking rates in the world, translating into billions of dollars in healthcare savings and increased productivity.

Addressing health inequities

Fiscal modeling can also highlight the economic impact of health inequities and inform policies aimed at addressing these disparities. For instance, models that examine the fiscal consequences of unequal access to healthcare can show the long-term economic costs of untreated conditions in disadvantaged populations. These models often reveal that investing in equitable healthcare access can reduce overall healthcare costs and improve economic productivity by ensuring that all segments of the population can contribute to the economy. In the United States, fiscal models have been used to advocate for expanded Medicaid coverage, demonstrating that improving access to healthcare in low-income populations leads to better health outcomes and economic gains.

Managing public health emergencies

During public health emergencies, such as pandemics, fiscal modeling is essential for rapid decision-making and resource allocation. For example, during the COVID-19 pandemic, fiscal models were used globally to predict the economic impact of various public health interventions, such as lockdowns, testing, and vaccination campaigns. These models helped governments balance the immediate costs of interventions with the long-

term economic benefits of controlling the spread of the virus. In New Zealand, fiscal modeling supported the government's decision to implement strict lockdown measures early in the pandemic, which ultimately minimized economic disruption by preventing widespread outbreaks and maintaining public health.

Evaluating the impact of technological advances

Fiscal consequences modeling is also important in evaluating the economic impact of new healthcare technologies, such as telemedicine, electronic health records, and personalized medicine. For instance, models can assess the cost-effectiveness of these technologies by comparing their implementation costs with the potential savings from improved health outcomes and increased efficiency in healthcare delivery. The widespread adoption of electronic health records (EHRs) in the United States, for example, was supported by fiscal models that projected significant savings from reduced paperwork, improved patient care coordination, and enhanced data analysis capabilities.

Encouraging preventive health measures

Preventive health measures, such as vaccination programs, screening tests, and health education campaigns, often require upfront investments. Fiscal modeling is crucial for demonstrating the long-term economic benefits of these preventive measures. For example, models that assess the economic impact of flu vaccination programs typically show that widespread vaccination can significantly reduce healthcare costs associated with treating influenza and its complications. These savings, combined with the economic benefits of maintaining a healthy and productive workforce, make a strong case for investing in preventive healthcare.

The importance of modeling fiscal consequences in healthcare extends across various aspects of health policy and economic planning. By providing a detailed understanding of the economic impacts of health interventions, fiscal modeling supports optimal resource allocation, enhances economic stability, informs policy development, and justifies healthcare expenditures. Real-world examples, such as smoking cessation programs, sugar taxes and the Affordable Care Act, demonstrate how fiscal models have been instrumental in shaping effective health policies that contribute to both public health and economic growth. As healthcare challenges continue to evolve, the role of fiscal consequences modeling will become increasingly critical in ensuring that health investments are both economically sound and socially beneficial.

Key Stakeholders

Understanding the fiscal consequences of healthcare investments is crucial for a wide range of stakeholders, each with their own specific interests, responsibilities, and influence on the healthcare ecosystem. These stakeholders—ranging from government agencies to private businesses and individual patients—play pivotal roles in shaping health policies, implementing programs, and ensuring economic sustainability. Fiscal modeling is a critical tool that provides the necessary data and insights for these stakeholders to make informed decisions. By balancing public health objectives with economic realities, fiscal modeling helps these stakeholders ensure that healthcare investments lead to optimal outcomes, both in terms of health and financial sustainability. The ripple effects of these decisions are felt far beyond the healthcare sector, influencing the broader economic landscape of nations.

Government agencies

Government agencies are central to shaping healthcare policies and allocating resources in ways that benefit public health while maintaining fiscal responsibility. These agencies are the primary users of fiscal consequence modeling because they oversee national health strategies and control public funds. Ministries of health, finance, and economic planning play interconnected roles in creating policies that respond to immediate healthcare needs while planning for long-term sustainability. These agencies must consider the broader economic impacts of healthcare decisions, which may affect budget allocations, public health priorities, and national economic growth.

Ministries of Health: As the drivers of public health policies, Ministries of Health are tasked with ensuring the population's overall well-being. These ministries use fiscal models to determine how best to allocate resources to maximize public health outcomes while minimizing costs. For instance, fiscal models have helped health ministries prioritize investments in disease prevention and treatment programs, demonstrating their long-term value in reducing healthcare costs and improving population health.

Ministries of Finance: Charged with maintaining the fiscal health of the nation, Ministries of Finance must weigh the costs of healthcare investments against other national priorities. Fiscal modeling helps finance ministries assess the long-term economic implications of healthcare expenditures. These ministries are particularly focused on how investments in healthcare can reduce future costs, such as through preventive care or improved public health measures that reduce the burden on healthcare systems.

Economic Planning Agencies: These agencies are responsible for coordinating national development strategies, including integrating health outcomes into broader economic goals. By using fiscal models, economic planning agencies ensure that healthcare policies align with overall economic growth strategies. They look at how healthcare investments contribute to a productive workforce, reduce long-term social welfare costs, and stimulate economic development through healthcare infrastructure improvements.

Healthcare Providers

Healthcare providers are at the frontline of delivering medical services and treatments, making them key beneficiaries of fiscal modeling. Providers, including hospitals, clinics, and individual medical professionals, rely on the insights generated by fiscal models to plan their services effectively and ensure they can meet the needs of patients while maintaining financial viability. By using fiscal models, healthcare providers can improve operational efficiency, optimize resource use, and enhance patient care outcomes. The ability to forecast patient demand and predict resource needs is essential for these providers to deliver high-quality, sustainable healthcare services.

Hospitals and Clinics: Hospitals and clinics are complex organizations that require careful management of resources to provide effective care. Fiscal models enable them to anticipate future patient demand, make decisions about expanding or reducing services, and optimize resource allocation. For example, hospitals use fiscal models to predict the cost-effectiveness of reducing readmission rates, which helps improve patient care and lowers the overall cost of treatment.

Medical Professionals: Physicians and other healthcare professionals play a critical role in advocating for specific treatments or interventions. Fiscal models help medical professionals argue for preventive care, early intervention, and other treatments that may have higher upfront costs but lead to long-term savings and better health outcomes for patients. For example, in managing chronic diseases

such as diabetes, medical professionals can use fiscal models to demonstrate the benefits of investing in preventive measures like regular screenings and patient education.

Insurance Companies

Insurance companies, both private and public, are essential players in healthcare financing. Their primary interest lies in managing risk and ensuring that healthcare coverage remains financially sustainable. Fiscal models are crucial for insurance companies as they help assess the potential costs of covering various medical conditions and interventions. By understanding the long-term economic impact of health interventions, insurers can design coverage plans that are both affordable for customers and financially sustainable for the company. Additionally, fiscal models enable insurance companies to set appropriate premiums that reflect the true cost of care, helping them balance profitability with comprehensive healthcare coverage.

Private Health Insurance Companies: These companies must balance profitability with the need to provide comprehensive health coverage. Fiscal models help private insurers assess the risks associated with different health conditions and treatments, allowing them to set premiums that reflect the true cost of care. For instance, fiscal models have been used to project the cost savings associated with covering mental health services, which helps insurers develop products that offer such coverage at competitive rates while ensuring long-term savings.

Public Health Insurance Programs: Public insurance programs like Medicare and Medicaid face the challenge of maintaining coverage for millions of individuals while controlling costs. Fiscal models help these programs predict future healthcare costs and ensure that they remain financially viable. For example, expanding Medicaid under the Affordable Care Act was supported by fiscal modeling, which showed that long-term savings from improved health outcomes would outweigh the initial costs of expansion.

Pharmaceutical Companies

Pharmaceutical companies are crucial stakeholders in the healthcare system, responsible for developing and marketing new drugs and treatments. These companies rely on fiscal models to guide key decisions in research and development, pricing strategies, and market entry. By using fiscal models, pharmaceutical companies can assess the potential market for new treatments, predict their economic impact on healthcare systems, and justify pricing based on long-term savings to the healthcare system. The insights provided by fiscal models are essential for pharmaceutical companies as they navigate regulatory approvals and determine the best strategies for making their products widely accessible.

Drug Manufacturers: Drug manufacturers must carefully assess the market potential for new drugs and vaccines. Fiscal models allow them to predict the financial impact of their products on healthcare systems and patients. For example, the development of the hepatitis C drug Sovaldi was influenced by fiscal models that demonstrated its long-term cost savings, despite the high upfront price of treatment. This kind of modeling helps manufacturers make informed pricing and marketing decisions.

Biotechnology Firms: Biotechnology firms, often at the forefront of developing cutting-edge treatments, use fiscal models to justify the high costs of innovative therapies. These models are crucial for demonstrating the long-term economic benefits of treatments that may be expensive but have the potential to cure previously untreatable conditions. For example, biotechnology companies developing gene therapies use fiscal modeling to show how curing a disease can lead to significant healthcare cost savings in the long run.

Businesses

Businesses, especially those with large workforces, are increasingly recognizing the connection between employee health and business performance. Poor employee health can lead to lower productivity, increased absenteeism, and higher healthcare costs, all of which impact a company's bottom line. Fiscal models provide businesses with insights into the economic value of investing in employee health programs. By investing in preventive measures and wellness programs, businesses can not only reduce healthcare costs but also improve employee retention, satisfaction, and productivity. As a result, more companies are leveraging fiscal modeling to design and implement effective health strategies for their employe„

Large Corporations: Large corporations with substantial workforces are often at the forefront of corporate health initiatives. Fiscal models help these companies identify high-return investments in employee health. For example, Johnson & Johnson's wellness program, supported by fiscal models, demonstrated that investments in employee

health led to lower healthcare costs and improved productivity, yielding significant ret„

Small and Medium Enterprises (SMEs): While SMEs may not have the resources of large corporations, they still recognize the importance of maintaining a healthy workforce. Fiscal models help SMEs determine the most cost-effective health interventions. For example, providing flu vaccinations to employees has been shown to reduce absenteeism, which leads to improved business performance without requiring significant financial investments.

The Economy as a Whole

The economic impact of healthcare investments extends beyond the healthcare sector itself. When healthcare policies and programs are designed with fiscal consequence modeling, they contribute to broader economic growth, fiscal stability, and social welfare. Healthcare investments can improve workforce productivity, reduce long-term social welfare costs, and stimulate innovation and research, which in turn drive economic growth. By understanding the long-term fiscal consequences of healthcare decisions, nations can promote economic prosperity while ensuring the health and well-being of their populations.

Impact on GDP: Health investments that extend life expectancy and improve population health lead to higher productivity and economic output. For instance, Brazil's maternal and child health programs have contributed to long-term economic growth by improving population health and reducing future healthcare costs.

Impact on Public Finances: Fiscal modeling helps governments predict the long-term costs and savings of healthcare investments. In Canada, models showing the benefits of preventive health measures like tobacco control policies have demonstrated significant long-term savings in healthcare spending.

Impact on Social Stability: Healthcare investments reduce income inequality by ensuring access to quality care for all socioeconomic groups. In Rwanda, fiscal models supported the successful implementation of a universal health insurance program, which improved health outcomes across all groups and contributed to social stability.

Impact on Workforce Productivity: Fiscal models highlight the relationship between health and workforce productivity. Many businesses have adopted wellness programs after models demonstrated the financial benefits of reducing absenteeism and improving employee health.

Impact on Innovation and Research: Investments in healthcare research foster innovation, create high-paying jobs, and drive technological advancement. Fiscal models have supported projects like the Human Genome Project, which has spurred significant economic growth by advancing biotechnology and personalized medicine.

Fiscal consequence modeling is crucial for a range of key stakeholders in healthcare, providing insights that inform policy, improve resource allocation, and promote long-term economic sustainability. Government agencies use these models to design health policies, balance public health needs with economic realities, and plan national economic strategies. Healthcare providers leverage fiscal modeling to optimize service delivery and manage resources more efficiently. Insurance companies, both public and private, utilize these models to assess risk, set premiums, and ensure coverage sustainability. Pharmaceutical companies depend on fiscal modeling for research and development decisions, pricing strategies, and market access planning. Businesses benefit by using fiscal models to improve workforce health and productivity through targeted wellness programs. Finally, the economy as a whole experiences growth and stability through healthcare investments that foster innovation, enhance workforce productivity, and support public finances. Fiscal modeling ensures that healthcare decisions benefit not only public health but also economic prosperity, making it a critical tool for all involved stakeholders.

Patients and fiscal consequences modelling

While fiscal consequences modeling is often discussed in the context of government policy, healthcare providers, and insurers, patients themselves are central stakeholders who directly benefit from the outcomes of these analyses. By aligning healthcare investments with economic efficiency and patient-centered outcomes, fiscal modeling plays a crucial role in enhancing the accessibility, quality, and equity of healthcare services. The following sections explore the specific advantages that fiscal modeling offers to patients, highlighting how it contributes to better health outcomes, reduced financial burdens, and increased trust in the healthcare system.

Improved access to care

Fiscal consequences modeling can lead to policies that improve access to affordable healthcare services for patients. By demonstrating the economic benefits of expanding healthcare coverage or subsidizing certain treatments, these models can

support initiatives that reduce out-of-pocket costs for patients. For example, fiscal models used in the expansion of Medicaid under the Affordable Care Act in the USA showed that providing broader access to healthcare could reduce overall healthcare costs by preventing expensive emergency room visits and hospitalizations. As a result, more patients gained access to preventive and primary care services without facing financial barriers.

Enhanced quality of care

Patients benefit from higher quality care when fiscal models are used to allocate resources effectively within the healthcare system. These models can identify which interventions and treatments provide the most significant health benefits relative to their costs, ensuring that patients receive care that is both effective and efficient. For instance, fiscal modeling of chronic disease management programs has shown that investing in coordinated care for conditions like diabetes and hypertension leads to better health outcomes and reduces complications. Patients in such programs often experience improved health and a higher quality of life.

Reduced financial burden

One of the direct advantages of fiscal modeling for patients is the reduction in the financial burden associated with healthcare. Models that assess the long-term savings of preventive measures, such as vaccination programs or early screening initiatives, can justify the funding of these programs by public health agencies. This often results in lower healthcare costs for patients, either through reduced insurance premiums, lower co-pays, or free access to essential preventive services. For example, the introduction of widespread breast cancer screening programs, supported by fiscal models, has led to early detection and treatment, reducing the need for more expensive, late-stage interventions and lowering costs for patients.

Increased health literacy and engagement

Patients also benefit from fiscal modeling through increased health literacy and engagement. When fiscal models are used to design and implement public health campaigns, they often highlight the cost-effectiveness of education and awareness programs. These campaigns can empower patients with the knowledge to make informed decisions about their health, leading to better self-management of chronic conditions and healthier lifestyle choices. For instance, public health initiatives aimed at reducing obesity rates, supported by fiscal modeling, often include educational components that help patients understand the long-term benefits of healthy eating and regular exercise.

Greater equity in healthcare

Fiscal consequences modeling can play a crucial role in promoting equity in healthcare by identifying and addressing disparities in access to care. These models can demonstrate the economic benefits of providing equitable healthcare services to underserved populations, leading to policy changes that ensure all patients, regardless of their socioeconomic status, receive the care they need.

Improved health outcomes

Patients directly benefit from the improved health outcomes that result from fiscally sound healthcare policies. Fiscal models that support investments in preventive care, early diagnosis, and effective treatment strategies can lead to policies that prioritize these areas, ultimately improving patients' health and extending their lives. For example, the widespread implementation of childhood vaccination programs, justified by fiscal modeling, has led to significant reductions in vaccine-preventable diseases, ensuring that patients—particularly children—enjoy healthier lives free from preventable illnesses.

Empowerment through personalized medicine

Fiscal modeling can support the adoption of personalized medicine by demonstrating its cost-effectiveness. Personalized medicine, which tailors treatments to individual patients based on genetic, environmental, and lifestyle factors, has the potential to significantly improve patient outcomes. For example, fiscal models might show that while the upfront costs of genetic testing and targeted therapies are high, the long-term savings from reduced adverse drug reactions and more effective treatments justify these expenses. As a result, patients benefit from treatments that are specifically designed for their unique health profiles, leading to better outcomes and fewer side effects.

Increased trust in the healthcare system

When patients see that healthcare decisions are based on robust fiscal analysis and are aimed at improving public health while being economically sustainable, their trust in the healthcare system increases. Fiscal modeling helps ensure that healthcare policies are transparent, evidence-based, and focused on long-term benefits. This increased trust can lead to greater patient engagement, better adherence to prescribed treatments, and more proactive participation in preventive health measures.

Patients, as key stakeholders in the healthcare system, gain numerous advantages from the use of fiscal consequences modeling. These benefits include improved access to affordable and high-quality care, reduced financial burdens, greater health equity, and better overall health outcomes. By ensuring that healthcare policies and investments are designed with both economic efficiency and patient well-being in mind, fiscal modeling helps create a healthcare system that serves the needs of patients more effectively and equitably. As a result, patients are not only the primary beneficiaries of healthcare improvements but also crucial participants in the broader economic and social gains that come from a healthier population.

Overview of the Methodology for Fiscal Consequences Modeling

The methodology behind fiscal consequences modeling in healthcare is a multi-step process that requires careful planning, data collection, analysis, and interpretation. This methodology is designed to link changes in health outcomes with their economic impact, providing stakeholders with the insights needed to make informed decisions. Below is a detailed explanation of the key principles, steps, and real-life examples that illustrate how fiscal consequences modeling is conducted effectively.

Basic principles

Fiscal consequences modeling is grounded in several fundamental principles.

Data-driven decision making

Accurate and comprehensive data are the foundation of any fiscal model. This includes data on disease incidence, healthcare utilization and costs, population demographics, social benefits costs and economic indicators. The quality of the data directly affects the reliability of the model's outputs.

Scenario analysis

Fiscal models often involve creating and comparing different scenarios to understand the potential economic impact of various health interventions. These scenarios can include baseline projections (without intervention), as well as optimistic and pessimistic outcomes based on different assumptions.

Dynamic interaction

The model must account for the dynamic interaction between health outcomes and economic factors. For example, improved health can lead to higher productivity, which in turn affects GDP and public finances.

Sensitivity analysis

To address uncertainty, sensitivity analysis should be performed to see how changes in key assumptions (e.g., disease prevalence rates or intervention costs) impact the model's results. This helps in identifying the most critical variables and understanding the robustness of the model's conclusions.

Steps in Fiscal Consequences Modeling

Step 1: Define the scope and objectives

The first step in fiscal consequences modeling is to clearly define the scope and objectives of the study. This involves identifying the specific health outcomes to be modeled, the population to be studied, and the economic indicators to be analyzed. For example, a model might be designed to assess the economic impact of a national diabetes prevention program in reducing public spending on healthcare and social care and improving workforce productivity.

Example: In the UK, the NHS implemented a diabetes prevention program aimed at reducing the incidence of type 2 diabetes. The fiscal model for this program defined its scope to include the at-risk adult population and focused on outcomes such as reduced incidence of diabetes, lower healthcare costs, and increased labor productivity. The model's objective was to demonstrate the long-term economic benefits of investing in preventive health measures.

Step 2: Data collection

Once the scope is defined, the next step is to gather comprehensive data. This data typically includes:

- Epidemiological Data: Information on disease incidence, prevalence, and mortality rates.
- Healthcare Cost Data: Direct costs (e.g., hospital care, medication) and indirect costs (e.g., lost productivity due to illness).
- Demographic Data: Age, gender, income, and other demographic factors that influence health outcomes.

- Economic Data: GDP, employment rates, public expenditure, and other economic indicators.

Example: For the aforementioned diabetes prevention program in the UK, data was collected from multiple sources, including NHS health records, national health surveys, and economic reports. This data provided a comprehensive picture of the current and projected burden of diabetes, the costs associated with managing the disease, and the potential economic benefits of prevention.

Step 3: Develop the model

Developing the model involves creating a mathematical framework that links health outcomes with economic indicators. This typically involves:

- Modeling Disease Progression: Estimating how disease prevalence will change over time with and without the intervention.
- Estimating Costs: Calculating both the direct and indirect costs associated with the disease and the intervention.
- Linking Health and Economic Outcomes: Establishing the relationship between health outcomes (e.g., reduced disease incidence) and economic factors (e.g., healthcare savings, productivity gains).

Real-Life Example: In the case of the introduction of the HPV vaccine, the fiscal model developed in the United States included projections of how vaccination would reduce the incidence of cervical cancer. The model estimated healthcare savings from fewer cancer treatments and linked these health improvements to economic gains through increased productivity and reduced healthcare spending.

Step 4: Scenario testing

With the model in place, the next step is to run various scenarios to explore different possible outcomes. This might include:

- Baseline Scenario: What happens if no intervention is implemented?
- Optimistic Scenario: What is the best possible outcome if the intervention is highly effective?
- Pessimistic Scenario: What is the worst-case scenario if the intervention is less effective than expected?

Scenario testing allows policymakers to see the range of possible outcomes and understand the risks and benefits of different courses of action.

Example: For the COVID-19 vaccination rollout, fiscal models in countries like Israel and the UK included multiple scenarios. These scenarios explored outcomes based on different levels of vaccine coverage and efficacy. The models predicted healthcare savings from reduced hospitalizations and deaths, as well as economic benefits from avoiding further lockdowns and maintaining workforce productivity.

Step 5: Sensitivity analysis

Sensitivity analysis is conducted to test how changes in key assumptions affect the model's results. This step is crucial for identifying which variables have the most significant impact on the outcomes and for ensuring the robustness of the model.

Example: In the analysis of smoking cessation programs, sensitivity analysis was used to test the impact of different smoking reduction rates on long-term healthcare costs. The analysis helped identify that even small changes in smoking prevalence could lead to substantial economic savings, reinforcing the value of sustained investment in anti-smoking campaigns.

Step 6: Interpretation and reporting of results

The final step involves interpreting the model's outputs and translating them into actionable insights for stakeholders. The results should be presented clearly, with an emphasis on how the health intervention will impact economic indicators like healthcare costs, GDP, and public finances.

Example: When Canada's government was considering expanding its national immunization program, the fiscal model's results were presented to policymakers, showing the long-term economic benefits of reducing vaccine-preventable diseases. The report highlighted cost savings, improved public health outcomes, and the broader economic impact of a healthier population, leading to the program's expansion.

The methodology for fiscal consequences modeling in healthcare is a structured and data-driven process that involves defining the scope, collecting data, developing a model, testing scenarios, conducting sensitivity analysis, and interpreting results. This approach not only provides a detailed understanding of the potential economic impacts of health interventions but also equips policymakers and other stakeholders with the insights needed to make informed decisions. Real-life examples, such as the UK's diabetes prevention program, the HPV vaccination rollout, and Canada's national immunization expansion, illustrate how this methodology has been successfully applied to guide public health investments and achieve better health and economic outcomes.

FISCAL Index – introduction and feasibility study

The assessment of fiscal consequence modeling in the context of emerging and transitional economies presents a crucial step towards enhancing the fiscal sustainability and economic resilience of nations. This feasibility study seeks to evaluate the potential for implementing a comprehensive fiscal model in ten Central and Eastern European countries: Bulgaria, Croatia, Czechia, Estonia, Hungary, Lithuania, Latvia, Slovenia, Slovakia and Serbia. These countries share a unique set of historical, economic, and institutional characteristics that make such an assessment particularly relevant and necessary.

Importance of the study

The implementation of a robust fiscal consequence model is imperative for policymakers to predict, analyze, and mitigate the economic impact of various fiscal policies. In the context of the European Union and its neighboring regions, where economic integration and convergence are ongoing processes, understanding the potential fiscal outcomes is essential for maintaining economic stability and growth. A well-structured fiscal model can provide these countries with the tools needed to assess the impact of taxation, government spending, and public debt management on their economies, thereby facilitating more informed decision-making.

For Bulgaria, Croatia, Czechia, Estonia, Hungary, Lithuania, Latvia, Slovenia, Slovakia and Serbia, this study is particularly timely. As these countries navigate the complexities of post-transition economies, often characterized by varying levels of economic development, EU integration challenges, and socio-political dynamics, a comprehensive fiscal model could play a pivotal role in aligning national policies with broader European objectives.

Commonalities among the countries

These ten countries exhibit several commonalities that will significantly impact the feasibility and potential success of implementing a fiscal consequence model.

Transition Economies

All these nations transitioned from centrally planned to market economies in the late 20th century. This transition has resulted in significant economic restructuring, which is critical to consider when designing fiscal models that can accommodate both legacy economic issues and current market dynamics.

EU Membership

Except for Serbia, all the countries in this study are members of the European Union. This membership imposes certain fiscal constraints and obligations, such as adherence to the Stability and Growth Pact, which need to be integrated into any fiscal consequence model. Even for Serbia, as an EU candidate country, alignment with EU fiscal standards is a key objective.

Small Open Economies

These countries are characterized by relatively small and open economies that are highly integrated with global markets. This openness exposes them to external economic shocks, which must be accounted for in any fiscal modeling to ensure robust predictions under various global scenarios.

Demographic Challenges

Many of these nations face similar demographic trends, such as aging populations and declining birth rates. These factors have significant implications for future fiscal policies, particularly in areas such as pension systems and healthcare financing.

Post-Crisis Recovery

The recent global financial crises and the COVID-19 pandemic have highlighted the vulnerabilities in the fiscal frameworks of these countries. Lessons learned from these crises underscore the need for advanced fiscal modeling to better prepare for and manage future economic shocks.

This feasibility study will delve into these commonalities and their implications for fiscal consequence modeling. By understanding the shared challenges and opportunities, we can better assess the practicality of implementing a unified fiscal model across these nations. The goal is to provide a framework that not only supports individual national policies but also contributes to the broader stability and integration of the European economic landscape.

FISCAL Index: Scaling Approach

Economic components for the fiscal model – scaling approach

Component name / Score	Data available with valid source	Data available but not complete with valid source*	Data unavailable or only partly available with valid source	Data unavailable
Mean and median income by age and sex	3	2	1	0
Employment rate	3	2	1	0
Average annual sick leave allowance	3	2	1	0
Average annual disability pension	3	2	1	0
Tax wedge	3	2	1	0
Value added type taxes (VAT)	3	2	1	0
Reference and discount rates	3	2	1	0
Inflation rate	3	2	1	0
GDP per hour worked	3	2	1	0
Tax revenue	3	2	1	0
Maximum score	30			

* e.g. information not available for all years needed for the analysis

Clinical data components for the fiscal model – scaling approach

Component name / Score	Data available with valid source	Data publicly unavailable, special request needed, with valid source*	Data unavailable or only partly available with valid source	Data unavailable
Mortality	3	2	1	0
Incidence	3	2	1	0
Paid Sick Leave	3	2	1	0
Paid disability	3	2	1	0
Disability years expectancy	3	2	1	0
Healthcare spending	3	2	1	0
Caregivers data availability	3	2	1	0
Maximum score	21			

* e.g. information not available for all years needed for the analysis

Structure of the datasets needed for populating the model

Economic components

Component	Years	Age Groups (Y/N)	Details (Local Currency or EUR, constant)
Mean and median income by age and sex / Annual gross earnings from employment	2009+	5 Years Age Groups	In EUR, Before tax, annual, earnings from employment and not from other sources
Employment rate	2009+	5 Years Age Groups	% of population employed
Average annual sick leave allowance	2009+	5 Years Age Groups (Nice to have)	Total in EUR % receiving annual sick leave allowance
Average annual disability pension	2009+	5 Years Age Groups (Nice to have)	Total/Yearly/in EUR % receiving disability pension
Tax Wedge	2009+	N.A.	OECD/Eurostat
Value added type taxes (VAT)/ Indirect tax e.g. VAT/	2009+	N.A.	ECD/Eurostat
Reference and discount rates	Current or latest available	N.A.	European Council, Eurostat, OECD, National Bank of the country, local Ministry of Finance*
Inflation rate	Current or latest available	N.A.	European Council, Eurostat, OECD, National Bank of the country, local Ministry of Finance*
GDP per hour worked	Current or latest available	N.A.	European Council, Eurostat, OECD, National Bank of the country, local Ministry of Finance*
Tax revenue / Tax to GDP Ratio	Current or latest available	N.A.	European Council, Eurostat, OECD, National Bank of the country, local Ministry of Finance*

* Any of the sources or any additional local official source will be sufficient – one reliable and verifiable source is sufficient

Healthcare data components

Component	Years	Age Groups (Y/N)	Details
Mortality	2009+	5 Years Age Groups	Man, Women, All, Total
Incidence	2009+	5 Years Age Groups	Man, Women, All, Total
Paid Sick Leave	2009+	10 Years Age Groups (nice to have)	Man/Women/Total Years/Total days/Total Costs/Cost per day/Average days on Sick Leave
Paid Disability	2009+	10 Years Age Groups (nice to have)	Man/Women/Total Under/Above 70%/Total Number/ Costs
Disability years expectancy	2009+	10 Years Age Groups (nice to have)	Man/Women/Total Years
Healthcare spending	2009+	Nice to have, but not needed.	All patients. Total spending include all reimbursed care associated with disease: medications, primary care, secondary care, diagnostics, rehabilitations, transports + any special reimbursed care.
Caregivers specifications (if any)	Current or latest available	N.A.	European Council, Eurostat, OECD, National Bank of the country, local Ministry of Finance*

* Any of the sources or any additional local official source will be sufficient – one reliable and verifiable source is sufficient

FISCAL Index: Countries Profiles and Scores

Bulgaria

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	2
Incidence	2
Paid Sick Leave	2
Paid disability	0
Disability years expectancy	0
Healthcare spending	0
Caregivers data availability	1
Score	7

Total score: 37

Croatia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	2
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	29

Healthcare data components – score

Component name / Score	Scores
Mortality	3
Incidence	3
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	2
Healthcare spending	2
Caregivers data availability	1
Score	15

Total score: **44**

Czechia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	2
Incidence	2
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	0
Healthcare spending	1
Caregivers data availability	1
Score	10

Total score: 40

Estonia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	2
Incidence	2
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	2
Healthcare spending	2
Caregivers data availability	1
Score	13

Total score: 33

Hungary

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	2
Incidence	2
Paid Sick Leave	1
Paid disability	1
Disability years expectancy	1
Healthcare spending	1
Caregivers data availability	1
Score	9

Total score: 39

Latvia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	2
Incidence	2
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	2
Healthcare spending	1,5
Caregivers data availability	1
Score	12,5

Total score: 42,5

Lithuania

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	3
Incidence	2
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	2
Healthcare spending	2
Caregivers data availability	1
Score	14

Total score: 44

Serbia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	2
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	1
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	27

Healthcare data components – score

Component name / Score	Scores
Mortality	3
Incidence	3
Paid Sick Leave	0
Paid disability	0
Disability years expectancy	0
Healthcare spending	0
Caregivers data availability	1
Score	7

Total score: 37

Slovakia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

Component name / Score	Scores
Mortality	3
Incidence	2
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	1
Healthcare spending	2
Caregivers data availability	1
Score	13

Total score: 43

Slovenia

Economic components – score

Component name / Score	Scores
Mean and median income by age and sex	3
Employment rate	3
Average annual sick leave allowance	3
Average annual disability pension	3
Tax wedge	3
Value added type taxes (VAT)	3
Reference and discount rates	3
Inflation rate	3
GDP per hour worked	3
Tax revenue	3
Score	30

Healthcare data components – score

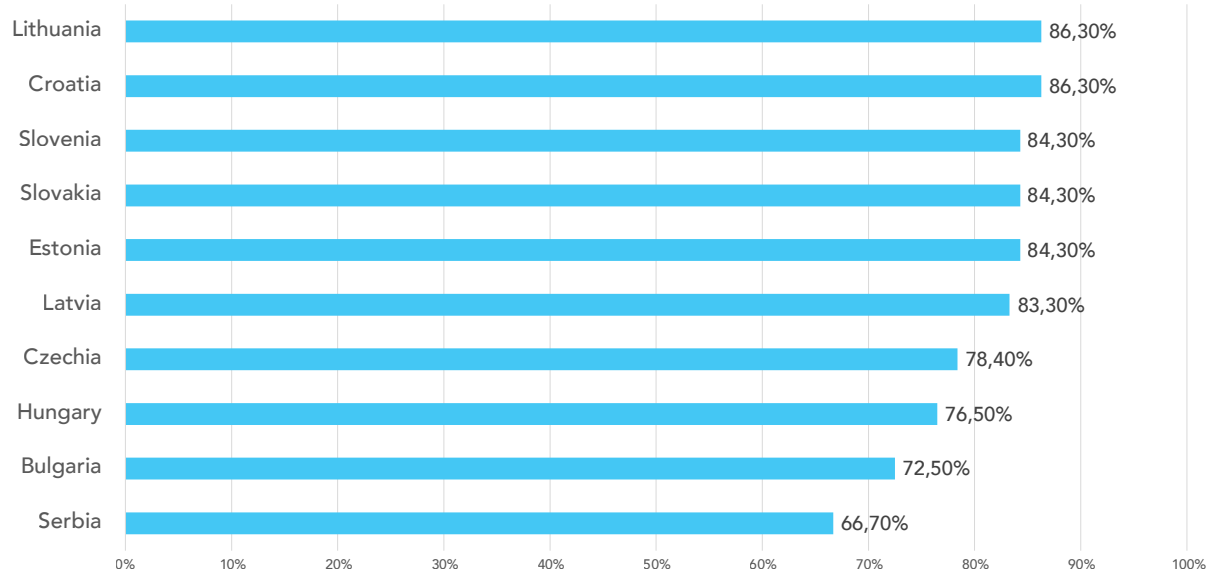
Component name / Score	Scores
Mortality	3
Incidence	3
Paid Sick Leave	2
Paid disability	2
Disability years expectancy	2
Healthcare spending	0
Caregivers data availability	1
Score	13

Total score: 43

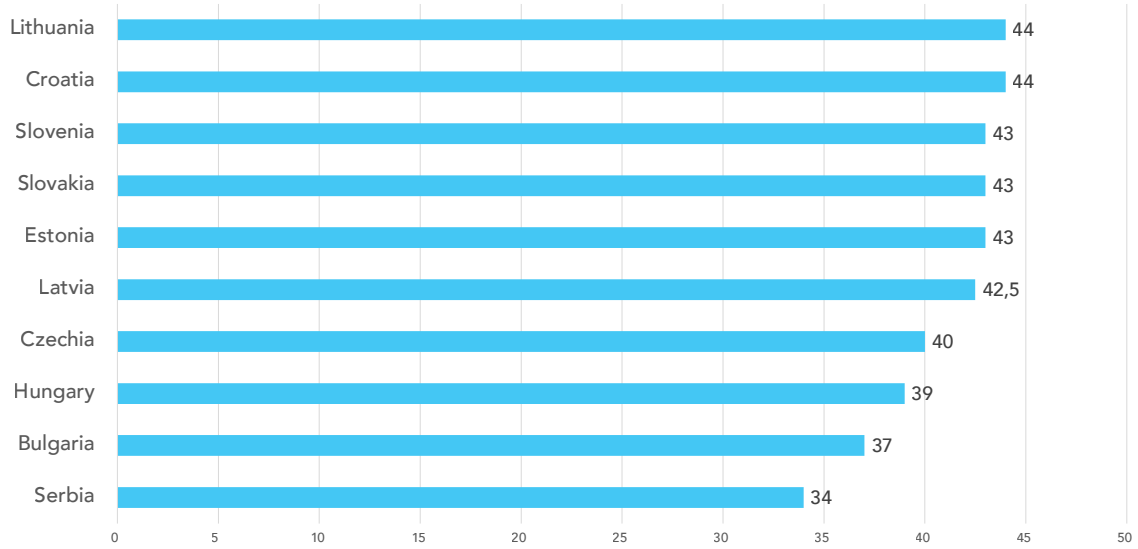
FISCAL Index: Results and Rating

Country / Score / Rating	Economic Score	Healthcare Score	Total Score	Rating in % (higher is better)
Bulgaria	30	7	37	72,5%
Croatia	29	15	44	86,3%
Czechia	30	10	40	78,4%
Estonia	30	13	43	84,3%
Hungary	30	9	39	76,5%
Latvia	30	12,5	42,5	83,3%
Lithuania	30	14	44	86,3%
Serbia	27	7	34	66,7%
Slovakia	30	13	43	84,3%
Slovenia	30	13	43	84,3%

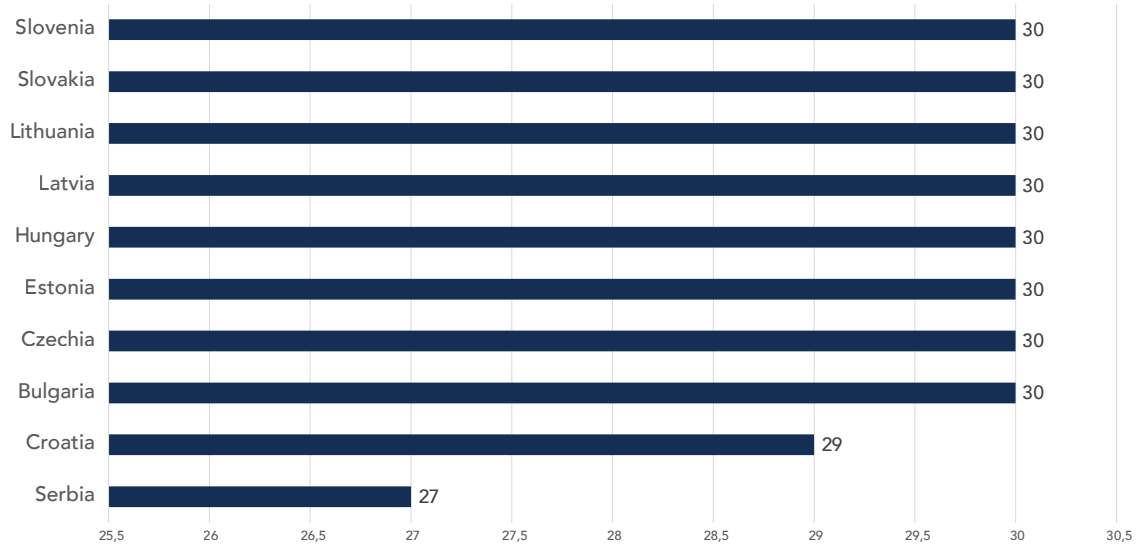
Overall rating from the perspective of %



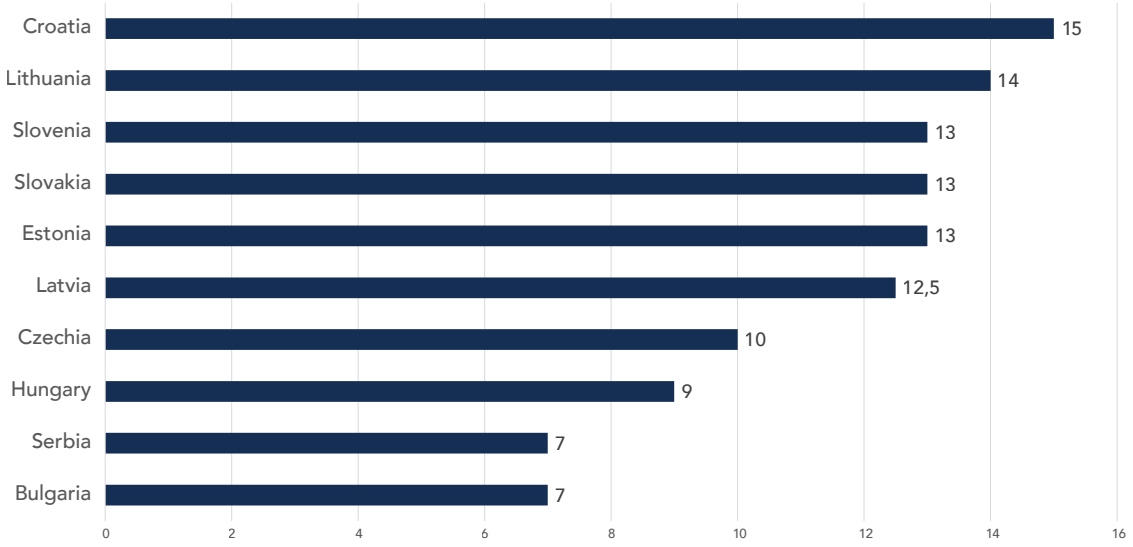
Overall rating from the perspective points



Overall rating – Economic Data availability



Overall rating – Healthcare Data availability



Next Steps

Following are key observations and recommendations.

Discrepancy between economic and clinical data availability

The most striking issue in the report is the substantial gap between the availability of economic data and clinical data. While economic data components are well-represented and complete, clinical data components are often incomplete or missing. This discrepancy hinders the comprehensive evaluation of healthcare systems and their fiscal impacts across the Central and Eastern European countries covered in the report.

There are few possibilities how to bridge the gap.

Data Collection Initiatives

Stakeholders should prioritize the development of robust data collection systems for clinical data. This could involve partnerships between government health agencies, healthcare providers, and international organizations to standardize and streamline the collection of clinical data.

Integration of Data Systems

Establish integrated health information systems that can aggregate both economic, social care and clinical data. This would facilitate real-time data analysis and improve the accuracy of fiscal models.

Capacity Building

Invest in training programs for data management and analysis across healthcare institutions to improve the quality and consistency of clinical data collection and modeling utilization.

Advantages of bridging the data gap

Closing the gap between economic and clinical data availability offers several advantages for stakeholders.

With more comprehensive data, governments can make more informed policy decisions, ensuring that healthcare investments are both economically sound and beneficial to public health. It allows for better resource allocation and more effective long-term planning. Access to complete clinical data enables providers to optimize patient care strategies, reducing costs and improving outcomes. This data also supports the development of preventive health measures, which can reduce the overall burden on healthcare systems. More accurate and complete data allow insurers to better assess risk, set premiums, and develop products that are both competitive and sustainable. This, in turn, can lead to more affordable healthcare options for patients.

Well established fiscal modeling could empower cross sectoral incentive structures and financing. The aim of aligning the healthcare system's incentives to focus on optimizing not just healthcare outcomes, but also e.g. labourforce participation could be incentivesed through inovative health impact bonds.

For pharmaceutical firms, access to comprehensive data can guide research and development efforts, ensuring that new drugs and treatments address the most pressing clinical needs. This can enhance the efficacy of treatments and improve market access strategies.

Businesses benefit from a healthier workforce, which can be achieved through targeted health interventions informed by accurate clinical data. This leads to reduced absenteeism, increased productivity, and overall cost savings.

Ultimately, patients are the primary beneficiaries. Bridging the data gap ensures that they receive high-quality, equitable care. It reduces financial burdens by enabling the development of cost-effective treatments and preventive measures. Moreover, patients gain from improved health literacy and engagement, leading to better health outcomes.

Healthcare and social data harmonization and data sharing

One of the key strategies to address the data gap is through the harmonization and sharing of healthcare and social data. Harmonization refers to aligning data standards and definitions across different sources and sectors, ensuring that data from various systems are compatible and comparable. Data sharing, on the other hand, involves making data available across different stakeholders and institutions, enabling broader access and use of this information.

There are several advantages of data harmonization and sharing.

Improved decision-making

Harmonized data allows for more accurate comparisons and analyses across regions and populations. When healthcare and social data are standardized, policymakers and healthcare providers can make decisions based on a unified understanding of the health landscape, leading to more targeted and effective interventions.

Enhanced public health outcomes

Harmonization and data sharing can lead to more comprehensive public health surveillance and research. By integrating data from multiple sources, it becomes possible to track disease patterns, health outcomes, and social determinants of health more effectively. This leads to better-informed public health strategies and interventions.

Increased efficiency and cost savings

Data harmonization reduces duplication of effort and allows for more efficient use of resources. For instance, healthcare providers can avoid redundant tests and procedures if they have access to a patient's complete health history through shared databases. This not only saves costs but also improves patient care.

Facilitation of cross-border healthcare initiatives

In regions like Central and Eastern Europe, where countries may have interconnected health and social challenges, harmonized data can facilitate cross-border healthcare initiatives. This enables collaborative efforts in managing public health issues that transcend national boundaries, such as infectious disease outbreaks or the management of chronic conditions.

Innovation and research

Access to harmonized and shared data provides a rich resource for innovation in healthcare. Researchers can utilize large datasets to identify trends, develop new treatments, and test interventions on a scale that would be impossible with isolated data sources. This accelerates the pace of medical discovery and the development of evidence-based practices.

Greater equity and access

Data harmonization and sharing contribute to greater equity in healthcare by ensuring that all populations are represented in health data analyses. This can highlight disparities and drive policies aimed at reducing inequities in health outcomes. Furthermore, shared data systems can improve access to care by ensuring that all healthcare providers have the information needed to deliver appropriate services.

Challenges and mitigation strategies

One of the main challenges of data sharing is ensuring the privacy and security of patient information. This can be mitigated by implementing robust data protection protocols, including encryption, anonymization, and strict access controls. Then there is an Interoperability and ensuring that different systems can work together seamlessly is a technical challenge that requires investment in compatible technologies and adherence to international data standards. Different countries have varying regulations regarding data sharing. It's important maintain these principles when establishing clear legal frameworks and ethical guidelines that respect national laws while promoting data sharing such as the EHDS, AI act or MDR regulations.

Next steps for stakeholders

Given the findings of the "CEE Fiscal Index" and the potential benefits of data harmonization and sharing, the following actions are recommended.

Standardization Initiatives

Implement a standardized approach to data collection and sharing across all countries involved, ensuring consistency and comparability of both economic and clinical data.

Cross-sector collaboration

Foster collaboration between public and private sectors, including government agencies, healthcare providers, insurance companies, and technology firms, to enhance data integration and utilization.

Infrastructure investment

Invest in the necessary technological infrastructure to support data harmonization and sharing, including secure databases, data analytics tools, and interoperable systems.

Regular monitoring and updating

Establish a framework for the regular monitoring and updating of the fiscal index, incornporating

new data as it becomes available to maintain the relevance and accuracy of the model.

By addressing the data discrepancies, harmonizing healthcare and social data, and implementing these next steps, stakeholders can significantly enhance the effectiveness of fiscal modeling in healthcare. This will lead to better-informed decisions, improved public health outcomes, and increased efficiency in healthcare delivery across the Central and Eastern European region.

Summary

The "CEE Fiscal Index" report critically examines the fiscal implications of healthcare investments across several Central and Eastern European countries. A key finding of the report is the significant disparity between the availability of economic data, which is comprehensive and well-documented, and clinical data, which is often incomplete or missing. This gap hinders the ability to fully assess the fiscal impact of healthcare systems in these countries. The report underscores the importance of addressing this discrepancy to enhance the accuracy and utility of fiscal models.

The harmonization and sharing of healthcare and social data are highlighted as essential strategies to bridge this gap. By standardizing data collection and ensuring compatibility across different systems, stakeholders can improve decision-making, public health outcomes, and efficiency in healthcare delivery. Additionally, data harmonization facilitates cross-border healthcare initiatives, supports innovation, and promotes equity in healthcare access and outcomes.

The report also stresses the need for investment in data infrastructure, collaboration between public and private sectors, and the establishment of legal frameworks that protect data privacy while encouraging data sharing. These steps are crucial for improving the accuracy of fiscal models and ensuring that healthcare investments are both economically sound and beneficial to public health across the region.

References

Economic data

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1. DOI (Digital Object Identifier): https://doi.org/10.2908/ILC_DI03
2. DOI (Digital Object Identifier): https://doi.org/10.2908/SPR_EXP_SUM
3. International Monetary Fund (IMF): https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VEN/CZE?year=2024

Hungary

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2. DOI (Digital Object Identifier): https://doi.org/10.2908/SPR_EXP_SUM
3. International Monetary Fund (IMF): https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VEN/CZE?year=2024

Slovenia

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Bulgaria

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Serbia

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Croatia

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Lithuania

1. DOI (Digital Object Identifier): https://doi.org/10.2908/ILC_DI03
2. DOI (Digital Object Identifier): https://doi.org/10.2908/SPR_EXP_SUM
3. International Monetary Fund (IMF): https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VEN/CZE?year=2024

Estonia

1. DOI (Digital Object Identifier): https://doi.org/10.2908/ILC_DI03
2. DOI (Digital Object Identifier): https://doi.org/10.2908/SPR_EXP_SUM
3. International Monetary Fund (IMF): https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VEN/CZE?year=2024

4. Latvia

5. DOI (Digital Object Identifier): https://doi.org/10.2908/ILC_DI03
6. DOI (Digital Object Identifier): https://doi.org/10.2908/SPR_EXP_SUM
7. International Monetary Fund (IMF): https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VEN/CZE?year=2024

Slovakia

1. Statistical Office of the Slovak Republic (Štatistický úrad SR): https://slovak.statistics.sk
2. Eurostat: https://ec.europa.eu/eurostat
3. Social Insurance Agency of Slovakia (Sociálna poisťovňa): https://www.socpoist.sk
4. Ministry of Labour, Social Affairs and Family of the Slovak Republic: https://www.employment.gov.sk
5. National Health Information Center (Národné centrum zdravotníckych informácií): http://www.nczisk.sk
6. World Health Organization (WHO): https://www.who.int/countries/svk
7. OECD: https://data.oecd.org/slovak-republic.htm
8. World Bank: https://data.worldbank.org/country/slovak-republic
9. OECD: https://www.oecd.org/en/data/indicators/tax-wedge.html#indicator-chart
10. OECD: https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/global-tax-revenues/revenue-statistics-slovak-republic.pdf
11. World Bank: https://data.worldbank.org/indicator/FP.CPI.TOTL?end=2022&locations=SK&start=1991&view=chart
12. Time trends in survival and causes of death in multiple myeloma: a population-based study from Germany. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10080943/#MOESM1
13. EUROSTAT: https://ec.europa.eu/eurostat/databrowser/view/gov_10a_taxag/default/table?lang=en

Healthcare Data

Slovakia

1. NCZI / National Health Information Centre: www.nczisk.sk
2. NCZI / National Health Information Centre: National Oncology Registry – NOR. National Health Information Center, Available at: www.nczisk.sk
3. NCZI / National Health Information Centre : Insurer's account – prescription drugs, medical devices, and dietary foods covered by public health insurance in Slovakia. National Health Information Center, Available at: https://www.nczisk.sk/Statisticke_vystupy/Tematicke_statisticke_vystupy/TOP-50-liekov/Pages/Ucet-poistenca-humanne-lieky-hradene-z-verejneho-zdravotneho-poistenia-v-SR.aspx
4. SocPoist / Social Insurance Agency: https://www.socpoist.sk

5. Statistical Office of the Slovak Republic : Databases. Available online: https://slovak.statistics.sk/wps/portal/ext/Databases

Lithuania

1. State Agency of Statistics https://osp.stat.gov.lt/pradinis

Estonia

1. Centre for Health Technology Assessment | Tartu University https://ut.ee/en/unit-health-information-analysis

Serbia

1. Institute for Public Health of Serbia – Malignant Tumors https://www.batut.org.rs/index.php?content=2096

Croatia

1. Croatian Public Health Agency – Mortality Statistics: https://www.hzjz.hr/sluzba-epidemiologija-prevencija-nezaraznih-bolesti/odjel-za-mortalitetnu-statistiku-2/
2. Croatian Public Health Agency – Malignant Diseases Publications https://www.hzjz.hr/sluzba-epidemiologija-prevencija-nezaraznih-bolesti/publikacije-odjel-za-maligne-bolesti/
3. Croatian Pension Insurance Institute https://www.mirovinsko.hr/en
4. KBC Zagreb Hematology Department https://www.kbc-zagreb.hr/odjel-za-zlocudne-tumore-krvotvornih-sustava.aspx
5. KROHEM Task Force https://www.krohem.hr/radne-skupine/
6. Croatian Public Health Agency – Mortality Statistics https://www.hzjz.hr/sluzba-epidemiologija-prevencija-nezaraznih-bolesti/odjel-za-mortalitetnu-statistiku-2/
7. Croatian Public Health Agency – Malignant Diseases Publications https://www.hzjz.hr/sluzba-epidemiologija-prevencija-nezaraznih-bolesti/publikacije-odjel-za-maligne-bolesti/
8. Croatian Pension Insurance Institute https://www.mirovinsko.hr/en
9. Croatian National Sick Fund Director Contact Email: ravnatelj@hzzo.hr

Hungary

1. Hungarian State Treasury – https://www.allamkincstar.gov.hu/nyugdij/egyeb-ellatasok/rokkantsagi-jaradek
2. Hungarian Central Statistical Office KSH – https://www.ksh.hu/stadat_files/szo/hu/szo0021.html
3. World Health Organization WHO – https://gateway.euro.who.int/en/indicators/hfa_67-1080-disability-adjusted-life-expectancy-world-health-report/#id=18872
4. Hungarian Central Statistical Office KSH – https://www.ksh.hu/stadat_files/szo/hu/szo0030.html
5. Hungarian Central Statistical Office KSH – https://www.ksh.hu/docs/hun/xftp/idoszaki/pdf/tappenz16.pdf
6. Hungarian Central Statistical Office KSH – https://www.ksh.hu/stadat_files/mun/hu/mun0001.html
7. Hungarian Central Statistical Office KSH – https://www.ksh.hu/stadat_files/mun/hu/mun0005.html
8. Hungarian Central Statistical Office KSH – https://www.ksh.hu/stadat_files/szo/hu/szo0034.html
9. Organisation for Economic Co-operation and Development OECD – https://www.oecd.org/content/dam/oecd/en/topics/policy-issues/tax-policy/taxing-wages-hungary.pdf
10. Hungarian Tax and Customs Administration NAV – https://nav.gov.hu/ugyfeliranytu/adokulcsok_jarulekmertekek/afakulcs_adomen/afa-kulcsok-es-a-tevekenyseg-koz-erdeku-vagy-egyeb-sajatos-jellegere-tekintettel-ado-mentes-tevekenysegek-kore
11. Hungarian National Bank MNB – https://www.mnb.hu/letoltes/hun-ir-digitalis-26.pdf
12. OECD Data Explorer – https://data-explorer.oecd.org/
13. World Bank – https://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS?locations=HU
14. Hungarian Central Statistical Office KSH – https://www.ksh.hu/stadat_files/mun/hu/mun0184.html
15. Hungarian National Healthcare Services Center AEEK – https://kollegium.aeek.hu/Iranyelvek/Index
16. Human Mortality Database HMD – https://mortality.org/cgi-bin/hmd/country.php?cntr=HUN&level=1

Slovenia

1. ZZZS: https://www.zzzs.si

Other Links Generic

1. KBC Zagreb Hematology Department: https://www.kbc-zagreb.hr/odjel-za-zlocudne-tumore-krvotvornih-sustava.aspx
2. KROHEM Task Force: https://www.krohem.hr/radne-skupine/

Czechia

1. RMG Registry: https://rmg.healthregistry.org
2. UZIS: https://www.uzis.cz

Notes

Project
HealthCare

September 2024