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DATA-DRIVEN ANALYSIS OF HEALTHCARE AFFORDABILITY AND ACCESS

Evaluating Nations with Open Datasets

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ABSTRACT

Ky Anh Nguyen Dang: Data-driven Analysis of Healthcare Affordability and Access: Evaluating Nations with Open Datasets
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Healthcare affordability and access have remained at the core of human well-being, global sustainable development, and social equity. This thesis assesses characteristics of healthcare systems across five chosen OECD nations - Finland, the United Kingdom, Luxembourg, the United States, and Mexico - and discovers how they differ in providing affordable and accessible care, and the role of economic, social, and policy factors in such differences.

The research focuses on analysing four key dimensions: economic context, social structure, policy and financing schemes, and healthcare capacity. Data were mainly gathered from OECD, World Bank, and WHO open databases, along with complementary public reports or academic literature. With the use of interpretive and comparative analysis, healthcare system of each country was evaluated regarding its structure, level of financing, equity, coverage percentage, workforce adequacy, and health outcomes.

Found results highlight that national economic capacity does not guarantee universal and equitable healthcare access on its own. Instead, factors such as equality rate, public financing, health prioritization, and governance efficiency are much more dominant at determining healthcare affordability and access. Finland, the UK, and Luxembourg showcase their universal, well-prioritized, and adequately financed systems and consequential achievements such as better health performance, along with higher equity and financial security. In contrast, the US and Mexico demonstrate how fragmentation, over-privatization, understaffing, and underfunding limit services access despite their differences in national wealth.

The findings generally indicate that healthcare systems also reflect broader a nation's social and political priorities, rather than only economic output. Universal and efficient systems with equitable and financially protected qualities remain crucial for achieving affordable and accessible healthcare.

Keywords: healthcare systems, affordability, healthcare access, OECD, public care, private care, public financing

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LIST OF ABBREVIATIONS

US: United States / **USA:** United States of America

USD: United States Dollars

UK: United Kingdom

EU: European Union

UN: United Nations

UHC: Universal Healthcare Coverage

WHO: World Health Organization

OECD: Organization for Economic Co-operation and Development

OOP: Out-of-pocket

GDP: Gross Domestic Product

VHI: Voluntary Health Insurance

NHS: National Health Service

SHI: Statutory Health Insurance

IMSS: Instituto Mexicano del Seguro Social (Mexican Institute of Social Security)

ISSSTE: Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (Institute of Social Security and Services for State Workers)

SPSS: Sistema de Protección Social en Salud (System for Social Protection in Health)

INSABI: Instituto de Salud para el Bienestar (Institute of Health for Wellbeing)

IMSS-Bienestar: Mexican Institute of Social Security - Wellbeing

1. INTRODUCTION

Healthcare affordability and access have long played a vital role in humankind's social well-being and sustainable development. The ability of individuals to receive necessary health services without financial hardship is considered a key goal of UHC and embedded in the UN' Sustainable Development Goals [1] [2]. In locations where healthcare is unaffordable or inaccessible, civilians face high risks of catastrophic spending, delayed treatment, or lower quality services, all of which eventually undermining individual welfare and economic productivity.

Despite the broad consensus on the importance of affordable and accessible healthcare, there have been distinctive systems designed to achieve it. Rather than attributing it to only national wealth or economic strength, the differences also stem from the social structures or policy design, along with the role of the private sector. Therefore, some countries guarantee near-universal public coverage, while others must rely on private care and direct payments to meet demand.

Aiming to understand these variations across different systems, there will be three main objectives for this study: To evaluate and compare healthcare affordability and access throughout separate models; to assess economic, social, and policy aspects that contribute to characteristics of each model; and to identify key factors that appear to affect access to care the most. Accomplishing these will be through comparative analysis of case studies, using open databases and other supporting reports or academic literature.

Discussing further, this thesis analyses five OECD countries, picked by their healthcare systems characteristics: Finland, United Kingdom, Luxembourg, United States, and Mexico. The data is drawn from the OECD, WHO, and World Bank databases, focusing on four key dimensions: healthcare, economic, social, and policy.

Regarding comparative health research, there has not been enough emphasis on the dynamics and roles of both public and private healthcare in shaping affordability and access across different national systems. Existing studies cater more to specifically performances of public systems or effects of insurance coverage [3] [4]. Hence, a systematic comparison of how private healthcare functions - whether it plays a complimentary role or directly substitutes for weak public systems - remains understudied, especially when studied on both high-income and middle-income OECD members within the same frame.

Among listed nations, three cases are selected where public health systems remain dominant, covering virtually the whole population: Finland, the United Kingdom, and Luxembourg. According to OECD and WHO data, public coverage is 100% in these countries, while the role of private healthcare stays mainly complementary to shorten waiting times or grant access to additional services.

By contrast, amidst high-income nations, the United States represents an outlier. With a population exceeding 330 million and still growing, the country spends nearly 17% of its GDP on healthcare, by far the highest in the OECD [5]. Yet, public programs cover less than half of the population. Life expectancy in the US lags some years behind Finland, the UK, and Luxembourg, highlighting structural issues caused by the absence of universal care. Skipped treatments and medicines due to cost are very common, disproportionately affecting the poor [6].

Mexico, another OECD member, highlights the issues faced by middle-income nations. According to OECD and World Bank data, with a large and fast-growing population, the country only allocates a small share of its GDP to public healthcare, and its UHC service coverage remains incomplete. Its life expectancy is also several years below the OECD average. Indicators such as healthcare employment and staff density reveal a significantly understaffed system. Private healthcare spending, however, is on par with public funding, but access to its services is restricted to a small, wealthier segment of the population, reflecting the nation's large inequality.

Preliminary findings indicate that national wealth does not determine healthcare affordability or access by only itself, but rather, differences also stem from the mix of financing sources, extent of public coverage, health prioritization, or reliance on out-of-pocket payments. Nations with strong public financing and universal coverage ensure high affordability and access, yet operational challenges such as waiting times remain [7]. Inequality appears much more pronounced where private healthcare is dominant or essential, as the wealthier groups can access care, and the poorer must face barriers and skip treatments.

In conclusion, across the five studied nations, universal care, supported by strong public financing and efficient governance, provides an equitable foundation for healthcare affordability and access. On the other hand, structurally challenged systems that face operational inefficiencies or rely on private healthcare to fill the gaps tend to widen in inequality and result in lower health outcomes.

2. BACKGROUND

2.1 Healthcare System

2.1.1 Definition

A health, or healthcare, system can be defined as a combination of all organizations, institutions, and resources whose primary purpose is to improve health. This includes not only the direct provision of medical services but also interested parties financing and regulating that determine the accessibility of the services [8].

According to WHO, a well-functioning healthcare system carries three main objectives:

- To improve health outcomes for the population. This includes promoting health, reducing illness, and extending lifespan, all contributing to the vision of achieving UHC.
- To enhance responsiveness to populations' expectations. This encompasses the quality of delivered care, the client orientation, and respect towards individuals in need of care.
- To provide protection against the financial costs of illness, promoting affordability and health equity.

2.1.2 Basic Healthcare Models

The characteristics of how a healthcare system model functions may differ between nations, as each country arranges its own methods of fulfilling the three main goals above - yet, for all the variations, all health systems tend to follow general patterns that are presented by the following four basic models [9]:

The Beveridge model, or tax-funded systems, relies primarily on the government revenues, financed through tax payments. Health services are delivered through public providers or contracted private figures. Either way, aiming for universal accessible care, these systems generally highlight low costs per capita due to the resource constraints, thus presenting certain limitations such as long waiting time or lack of attentive care. To troubleshoot these faults, private care is introduced as a complementary option for more convenience. Out of the selected countries, the UK and Finland highly reflect this model.

The Bismarck model, or social insurance systems, is structured around the mandatory financial contributions from employers and employees into insurance funds that finance healthcare services. Providers are usually private, but the coverage is mandatory and non-profit, technically providing universal care in practice. Out of the chosen nations, Luxembourg represents a strong social insurance system with its comprehensive coverage and limited reliance on private OOP spending [10].

The national health insurance model comprises elements of Beveridge and Bismarck, as it is funded nationally by the government using tax payments, yet health services are provided privately. The single payer usually has high enough market power to negotiate pricing - for example - getting lower-priced deals from pharmaceutical companies. To accommodate the need of universal care, costs may be controlled by less accessible services or longer waiting time.

The out-of-pocket model is the case in which mass medical care is not available due to the lack of an established healthcare system, stemming from either a very poor or disorganized, unstable nation. Unfortunately, this represents the vast majority of the world's 195 countries, and in such places - the rich will get medical care, while the poor remains sick or decease.

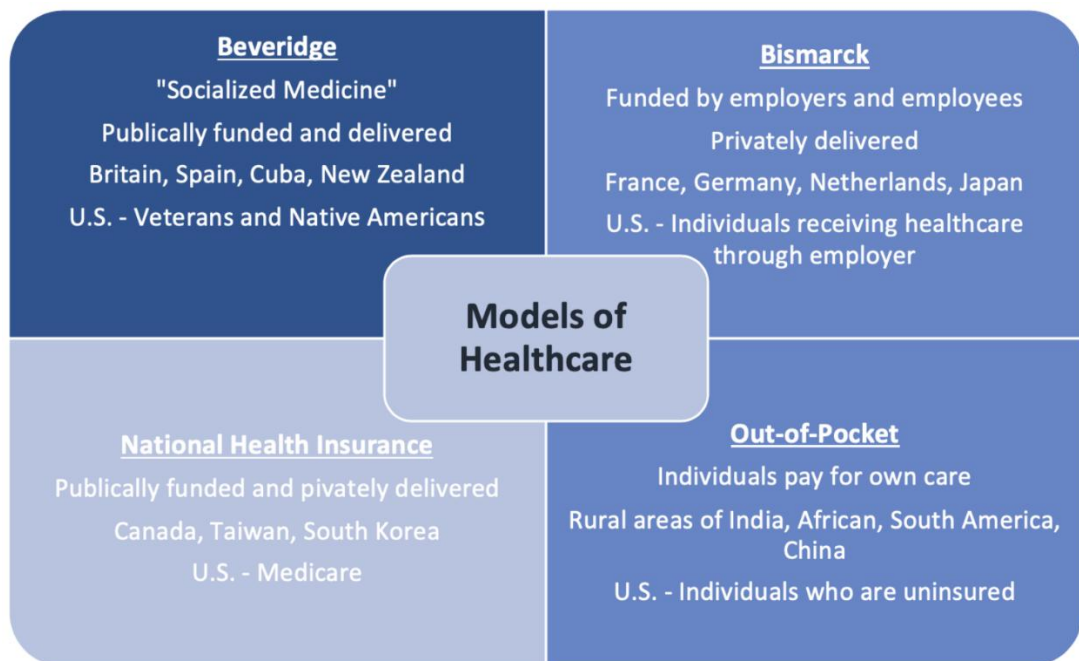


Figure 1: 4 Basic Models of Healthcare [11]

Regarding cases of Mexico and the United States, they both represent a combination of two or more above models. The former has public programs, but they are too underfunded and understaffed, leaving costly private healthcare to fill in the gaps for medical

service provision [12]. With the latter case, the country showcases many separate systems for different classes of people, from veterans, workers, to uninsured individuals, while spending the highest share of GDP on healthcare in the OECD, yet the universal public scheme remains absent resulting in unequal care access.

Altogether, each model comes with its own sets of trade-offs, and realistically, no country fits perfectly into one, including the five selected nations. For practical reasons, they all adapt their healthcare system around their economic capacity, cultural values, political structures, and other national circumstances.

2.2 Healthcare Affordability & Access

2.2.1 Healthcare Affordability

Primarily, affordability is about financial risk protection - WHO's promise of universal health coverage indicates no one will have to forego needed health services due to costs. The organization frames such objective under the three axes of the "UHC cube": Population coverage must be sufficiently broad, there must be enough services covered, and adequate costs handled for financial security.

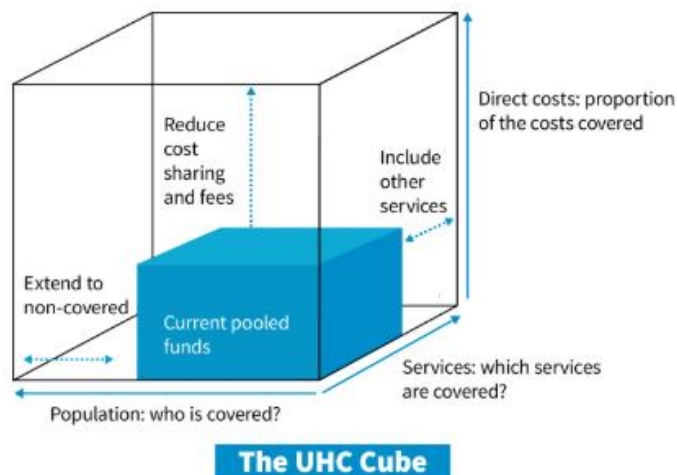


Figure 2: The UHC Cube [13]

Evaluating the healthcare affordability level of one nation allows a better and more precise understanding of its UHC delivery performance. Some key dimensions can be utilized for this task:

- Direct OOP health spending: This is the money households pay for health services and goods. A high proportion of this spending (e.g. >15-20% of total expenditure) will place great financial burden on individuals, resulting in an increased risk of catastrophic health expenditure - high medical costs that strain a

household's finances. In contrast, a low OOP spending percentage indicates the financial weight is more broadly distributed across society, providing better financial protection.

- Insurance coverage gaps: These can be observed when partial insurance schemes leave population groups exposed, even in high-income nations. This ultimately leads to greater financial hardship, increased OOP spending, and delayed or skipped medical care.
- Income inequality: Affordability is also shaped by distribution of capita, not just averages. The higher the Gini coefficients are, both inequality and affordability gaps will widen: The wealthy population can afford OOP costs while the poor cannot.

System design has been studied to play a crucial role, as people specifically from poor households can be protected from catastrophic health expenditures in a system less reliant on OOP payments and providing more financial risk protection [14].

2.2.2 Healthcare Access

Healthcare access reflects whether care recipients truly receive the services that they need, or in other terms, the fit between characteristics and expectations of providers and clients [15]. Even if the care is affordable and confirmed to be received on paper, lack of availability, accessibility, or treatment delays can undermine care effectiveness. According to Penchansky and Thomas, there are five key dimensions of access [16]:

- Availability: Whether the provider has the necessary resources and services to meet the needs of clients.
- Accessibility: How easily the client can physically reach the provider's location.
- Accommodation: Whether the ways provider's operation is organized can meet client's constraints and preferences, including working hours and waiting time.
- Affordability: How the services fees relate to the client's ability to pay. This also reinforces the connection between healthcare affordability and access.
- Acceptability: Whether the client is comfortable with the provider's fixed characteristics, such as age or gender, and vice versa.



Figure 3: Five Dimensions of Access [16]

With the 5 As of access forming a chain altogether, it is self-evident to be no stronger than its weakest link, such as improving affordability with health insurance will not greatly enhance utilization if other four dimensions remain unaddressed. Regarding practical cases, in both the UK and Finland, while services are universally affordable, waiting time limits accommodation vastly. The case is dual for Mexico, with both limited staff and facilities, along with high OOP costs. And with the US, there may be large numbers of hospital and doctors, but affordability is the bottleneck.

2.3 Nations Selection and Background

The 5 OECD nations were chosen based on the following reasonings:

- There is a diversity in models, as each nation comes with its own set of financial allocation and medical organizational methods. Models of the UK and Finland mostly resemble the Beveridge, Luxembourg's highly represents Bismarck, and systems of both Mexico and the US correspond to a mixed combination.
- The blend of both high-income and middle-income contexts within OECD can shed comparison insights in terms of system design, socioeconomic, and policy elements.

All five countries possess consistent and reliable data coverage across OECD, WHO, and World Bank open databases, especially regarding categories crucial for cases studies.

2.3.1 Finland

Finland's healthcare system is structured based on the Nordic welfare model, primarily focusing on universal and equal access, along with decentralized public provision. Since 1972, the nation has situated health centres - called "municipalities" - run and funded by local authorities in both urban and rural areas [17]. Public funding covers almost all residents, with municipalities responsible for organizing care services financed from taxation.

According to EU Healthcare, private services play a mainly complementary role to the public system, providing perks such as faster access to specialist care. Contribution from the private sector remains small when compared to the public system, and only about 17% of the population is covered by voluntary health insurance - yet this number has been on the rise in recent years due to long waiting queues or demand for higher quality services [18]. Regardless, healthcare affordability remains high due to low OOP expenditure and extensive public financing.

2.3.2 The United Kingdom

The United Kingdom is one of the clearest representatives in terms of Beveridge model application, as it formed the basis of the National Health Service in 1948, granting universal medical access to British citizens [19]. Funded through taxes which ensure everyone's contribution, the system provides free and comprehensive care at the point of service.

Over time, increasing people, declining hospital quality, and staff shortages have challenged service capacity greatly and seen waiting times stretched much longer more recurrently [20]. Reflecting these waits, there has been more civilians purchasing private care for faster access. Still, public support for the NHS model remains vastly high, and private spending accounts for only 13.8% of total health expenditure [21]. Similarly to Finland, the UK maintains an image of a universal, tax-funded healthcare system that facilitates affordability, in exchange of limited accessibility due to resource constraints.

2.3.3 Luxembourg

According to WHO, Luxembourg's health system is a statutory health insurance system, following the Bismarck model, and combines majority public financing with contributions from employers and employees. Since its creation, SHI has expanded gradually and now covers almost the entire population.

The nation's strong economic performance and small population allow universal coverage and OOP costs kept low. 86% of health expenditure is funded publicly, placing the nation among the top five highest within the WHO European Region [22]. Access to care is equitable, with a comprehensive benefits package and the OOP spending on health being only at 8.7%, significantly lower than EU average [22]. Hence, private insurance's role remains supplementary.

2.3.4 The United States

On the other hand, the United States differs greatly from the European systems. Being one of the wealthiest nations and spending nearly 17% of its GDP on health - by far the highest in OECD - it still lacks a universal public insurance framework [5]. The system instead is fragmented and highly complicated, combining private care with employment-based insurance and targeted public programs.

Employer-sponsored insurance covers more than half of the population, while public programs like Medicare for the elderly or Medicaid for low-income citizens both accumulate an approximated total of 36-37% [23]. Yet, according to a Commonwealth Fund study, about one out of five individuals remains uninsured, and almost a quarter are underinsured despite insurance ownership [24]. This results in high OOP spending and several cases either skipping treatment due to costs or carrying medical debts.

Despite significantly higher health spending, life expectancy in the US remains much lower than in Finland, the UK, and Luxembourg. With the system heavily relying on privatization, along with high inequality and an inefficient insurance structure, the US remains an outlier among developed nations.

2.3.5 Mexico

Mexico, being one of the few upper-middle-income OECD nations, helps shed insights on the challenges of the process to achieve universal health coverage in emerging economies. Public healthcare in Mexico has historically been separated according to employment categories: IMSS for formal salaried workers, ISSSTE for public-sector employees, and other smaller schemes [25]. This structure leaves large portions of the informal workforce without medical coverage.

To support Mexicans without social security, many schemes and programs were introduced, with the largest one being SPSS in 2003, a public insurer that financed health providers. The program transformed health financing and access for eventually 95% of

Mexicans without social security ten years later [25]. However, aiming to centralize financing, the Mexican government decided to terminate the program in 2019 and replaced it with INSABI, a service provider through public establishment. This effort proved to be unsuccessful, with significant decline in specialized care and large average healthcare expenses increase throughout INSABI's short lifespan [26]. In 2023, the program was substituted by IMSS-Bienestar.

Regardless, Mexico's public health financing remains one of lowest in OECD, while OOP expenditure sitting at 41% signals a significant portion of health spending, highlighting affordability barriers [27]. Hence, to high-income groups, private healthcare in Mexico functions as a necessary substitute.

2.4 Solution Approach

2.4.1 Data Sources

The study mainly gathers data from three major international databases - the OECD, the World Bank, and WHO. These reputable institutions provide extensive, reliable, and standardized indicators, especially closely observed nations - such as the selected five within OECD, allowing accurate and up-to-date comparison for cross-country systems. Other open databases or public reports are sometimes utilized to strengthen claims or complete insufficient datasets.

Combining the use of the three main databases forms a multi-dimensional evaluation structured around four following key categories:

- Healthcare: Public/Private coverage rates, medical staff employment and density.
- Economic: GDP/capita, Gini coefficient, public/private healthcare financing scheme, OOP spending.
- Social: Demographic structures, projected population growth, life expectancy.
- Policy: UHC coverage index, financing composition - government transfers, social insurance contributions, private spending

2.4.2 Data Collecting and Filtering

All indicators were gathered from the most recent available years, from 2020 to 2024, ensuring as much relevance and comparability as possible. Any data inconsistency be-

tween sources was resolved by prioritization of OECD figures due to their uniform methodologies. Still, they were complemented with WHO, World Bank data, or other sources when necessary.

With each indicator, only countries with complete or near-complete data, the latter of which tended to be approximated by the sources, were retained. Using mentioned databases or outside secondary reports, numerical gaps were frequently cross-checked to maintain accuracy and relevance.

During analysis, instead of isolating variables, different factors will be combined for a more systematic understanding of the healthcare model, its equity, and healthcare affordability and access. Some notable examples can include:

- High GDP/capita may often correlate with better coverage, yet the relationship weakens once inequality (high Gini index), high private expenditure, or great health catastrophic spending is dominant.
- Low OOP spending tends to indicate affordability and large coverage, but as it is observed from cases of Finland and the UK, staffing shortages, long waiting times, or funding constraints can still restrict immediate access.

Ultimately, the results will be interpreted using both quantitative comparison and contextual understanding, both of which are supported by secondary evidence from prior studies or reports to ensure observed patterns from used data correspond to real-world records and phenomena.

2.5 Personal Work Experience

The motivation for this research primarily stems from my past professional experience. During my internship at MedScore, then a Vietnamese FinTech startup supporting patient access, I worked as part of the Business Intelligence team, and was responsible for validating affordability formula, producing analytical reports, and developing data models/sheets for treatment eligibility assessment. The exposure introduced me to micro-level aspects of healthcare affordability, such as how financial thresholds, along with socioeconomic and lifestyle factors determined how much financial support a patient could get for their treatment.

Eventually, I started noticing and understanding more about how the data groups corresponded to broader patterns of affordability, access, and inequality. The opportunity to do market research outside of Vietnam also came to me at the same time, giving me a more comprehensive perspective across different healthcare systems. The moment I

started questioning why such disparities existed, what factors were in play, and how system design influenced them - I knew it was my desire to conduct more macro-analysis studies on this topic.

3. ANALYSIS

This section introduces the analytical framework through which healthcare affordability and access are examined across five chosen OECD nations: Finland, the UK, Luxembourg, the US, and Mexico. Indicators - drawn primarily from OECD, WHO, and World Bank databases - are picked across economic, social, policy, and healthcare categories, serving to highlight interpretive relationships. Each subsequent section of this chapter will examine one of the four key dimensions:

- Economic context to provide economic output and inequality context.
- Social structure to reflect demographics scene, population growth, and life expectancy.
- Policy and financing schemes to assess healthcare financing schemes and their sources, along with public financing balance and OOP expenditure.
- Healthcare system capacity to evaluate services access such as healthcare coverage or staff density.

Visualizations, such as comparative bar charts, column charts, and scatterplots, are utilized to highlight relationships and trends among numbers. Explanations and narrative interpretations are provided for better understanding of data within current policy and contexts. Besides, some findings are also supported or contrasted with evidence from other nations or global studies for an overall in-depth validation.

3.1 Economic Context

A country's economic capacity and how it is distributed inherently reflects a lot about healthcare affordability and access. For this purpose, economic indicators such as GDP per capita and Gini coefficient - income inequality - have been selected for more context of the national structural resources.

To begin with, among the five selected nations, there is an observable variation in per capita GDP levels. At 137 thousand USD, Luxembourg ranks among the world's highest, showing a strong, high-income economy despite its small size. Not too far behind lies United States at 85 thousand USD, a number indicating high GDP per capita and a great economy, especially considering its massive population. With the numbers both presented at around 53 thousand USD, both Finland and the UK represent moderately high-income economies. For Mexico, meanwhile, remains a middle-country within the OECD

with a much lower GDP per capita of 14 thousand USD, resembling a nation with low fiscal capacity.

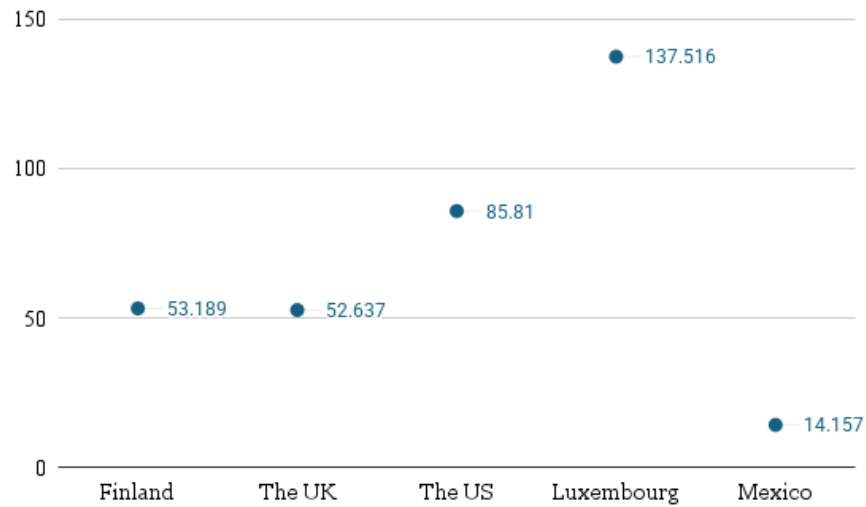


Figure 4: GDP/capita (US\$) [28]

The Gini coefficient helps measure the inequality level, and the higher it may be from 0 to 1, the more likely it is for one person to have all the income, or a lot of inequality is prevalent. Among the five studied nations, Mexico and the US record the highest at 0.435 and 0.418 respectively, indicating an alarmingly high level of inequality. Meanwhile, Finland remains among the most equal nations at 0.279. Both the UK and Luxembourg fall in the middle at 0.324 and 0.341 correspondingly, presenting a low-moderate level of inequality.

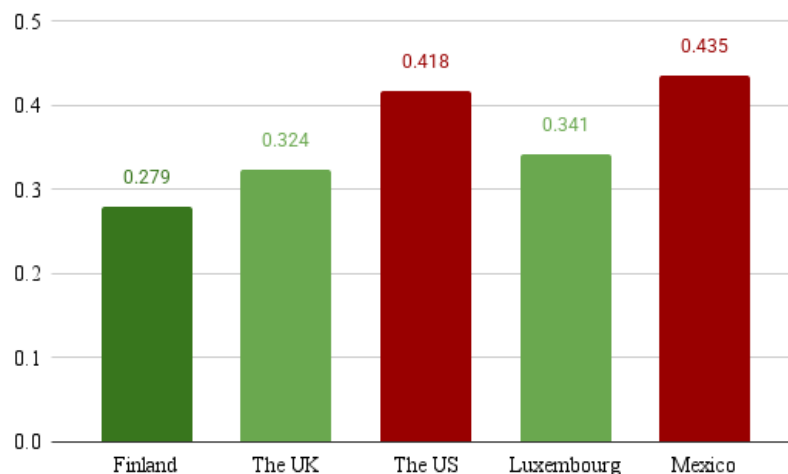


Figure 5: Gini coefficient [28]

There have been many studies concluded on how high inequality correlates with reduced healthcare affordability, access, and poorer health outcomes [29]. This indicates that

despite the benefits of economic growth and strength, such as what is reflected from the US's GDP per capita, those perks will be less likely to be reflected in health services considering the nation's inequality status.

3.2 Social Structure

While economic capacity determines a nation's potential to fund healthcare - demographic and social structures can show a glimpse of the scale of healthcare demand, influencing factors such as the need for more staff or better infrastructure. At the same time, some other indicators like life expectancy can effectively reflect a nation's health performance and access.

Within the demographics scene - Finland, the UK, and the US all face the dilemma of an aging population, with the most critical case being the Nordic country as a quarter of their population is 65 or older. For the other two countries, one out of five people is older than 64, and the elderly percentage of these nations are only likely to grow in upcoming decades with the low youth rate. Despite having to deal with a similar issue to a high degree, Luxembourg can sustain its population inflow through migration, observable through high working-age percentage, with nearly half of the residency not having Luxembourg nationality [30]. In contrast with mentioned cases, Mexico has a much younger demographic profile, in terms of both children (0-14) and people of working age (15-64).

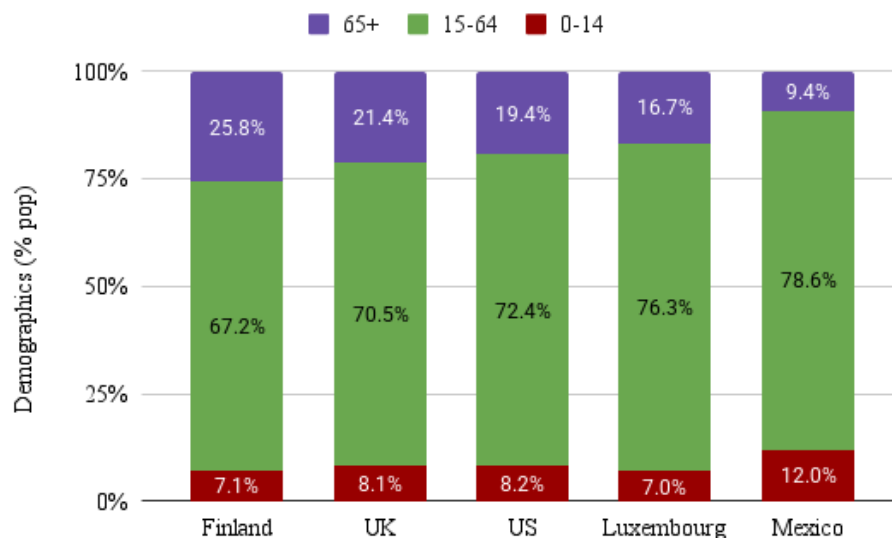


Figure 6: Population demographics (% population) [31]

Studies have been done on the aging population scene, particularly among developed countries such as Finland, the UK, and the US, has a much-increased risk of facing health risks and issues, thus putting more strain on the national healthcare services [32].

This is clearly reflected by much longer waiting time or queue in the three nations [33] [34] [35].

In terms of population growth, WHO estimates that by 2050, Luxembourg will have grown by 19%, the most significant amount out of the five nations - and this also supports the case of this nation's continuity using migration. Mexico follows behind with its mentioned young demographic profile, projected to grow by 15%, while Finland presents an alarming case of its population declining by 4.5%. Both the UK and the US show a moderate amount of growth at 10-11%.

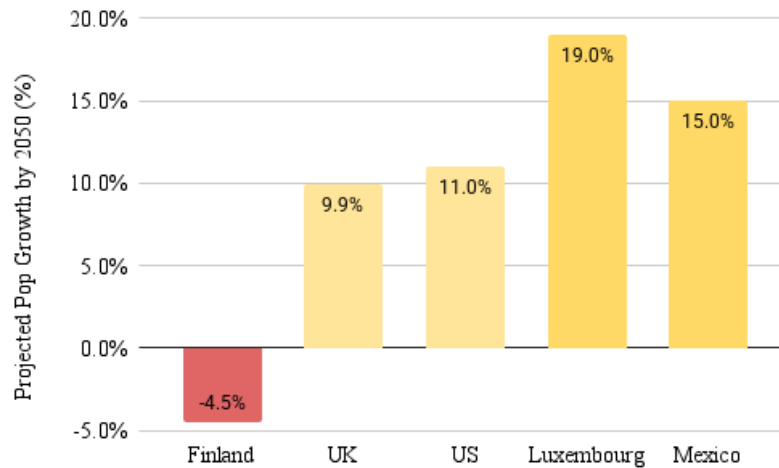


Figure 7: Projected population growth by 2050 (% population) [31]

Regarding health performance reflected from life expectancy data, both three nations of Finland, the UK, and Luxembourg appear to perform well at 81-82 years old, particularly the case of Luxembourg being the only nation reaching over 82. Despite economic strength, the US's fragmented healthcare system shows an underwhelming performance with the life expectancy being 79.3 years old, lower than OECD's average of 80.3 in 2021 [36]. However, Mexico paints the clearest portrait of a weak, underfunded medical system, as its life expectancy only reaches 75.07 years old - significantly lower than the four nations.

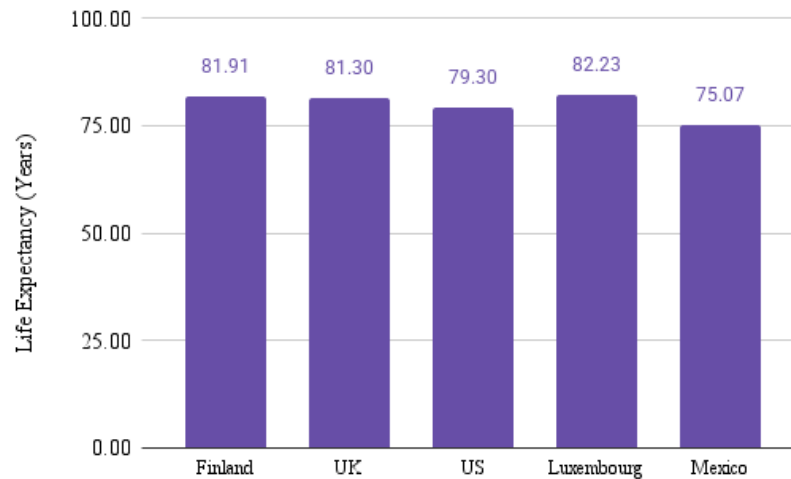


Figure 8: Life expectancy (Years) [31]

3.3 Policy and Financing Schemes

In this part, the functions of healthcare systems will be more established, as the way a government organizes and funds its healthcare system can directly shape healthcare affordability and access. Financing schemes can reflect the prioritization level of a government in terms of healthcare, and the revenues of such reveal the framework of the healthcare model - whether it is fully tax-funded or reliant on private sectors. Additionally, proportion of public expenditure in health spending can reflect a country's health policy orientation, and OOP spending may also serve as an indicator of care inclusiveness and financial protection level.

With public healthcare, allocation of GDP percentage in financing is affected by population number and local healthcare operation costs. Both Finland, the UK, and Luxembourg demonstrate a similar pattern of a moderately high portion of GDP being put into public care, and less than a quarter of such amount will be used for private services that serve as complementary. Both the US and Mexico stand out for its differences for distinctive reasons. The former nation has a significant spending on public health at 13.9% GDP, highest among OECD nations, yet its healthcare system remains to be fragmented and complicated [5]. Despite its reliance on the private sectors, with healthcare being one of the most prominent fields, services are mainly privately run and not governmentally funded, thus keeping the private financing scheme low. With Mexico, not only is public care being very underfunded at 2.9% of the nation's GDP - the private care also receives a roughly similar amount, indicating how it is not simply about lack of resources but insufficient prioritization towards healthcare for the masses.

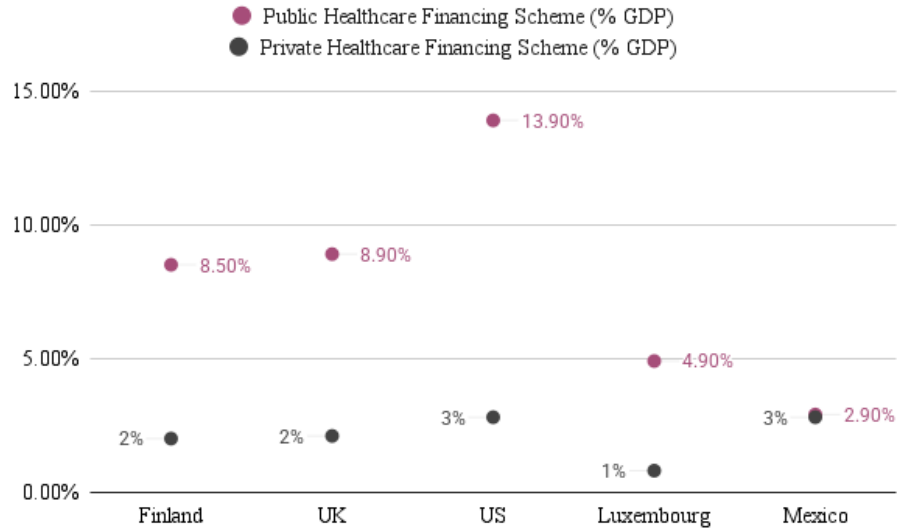


Figure 9: Public & Private healthcare financing schemes (% GDP) [6]

Diving deeper into the funding sources - or revenues - of the public healthcare financing scheme, most systems tend to rely either on transfers from government domestic revenue, which is tax-funded contributions, and/or social insurance contributions, which are funds collected from employers, employees, or self-employed individuals. With Finland and the UK, their systems are predominantly tax-funded, with Finland having 93.2% from government revenue and the rest from social insurance - while the UK's NHS model is nearly entirely tax-based. Regarding Luxembourg and Mexico, these two nations show dual financing reliance, an almost equal amount in both government revenue and social insurance, yet their healthcare outcomes differ. The US also shows a mixed model with 51.3% reliance on taxes and 14.5% from social insurance - yet these figures do not add up to 100% due to the nation's reliance on private contributions and other revenues.

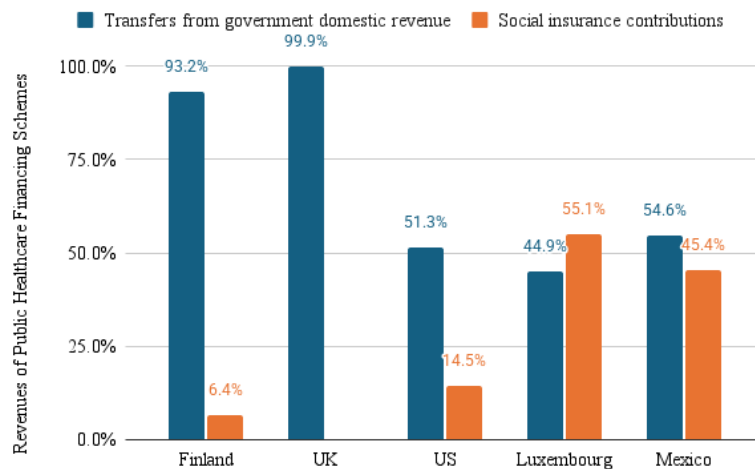


Figure 10: Revenues of public healthcare financing schemes (%) [6]

In terms of public spending in health expenditure, the higher the rate is, the stronger collective financing and financial protection appear to be. Across the five nations, Luxembourg maintains its position among the top five in WHO European region for 86% public share of total health spending [22]. Finland and the UK also show strong public commitment with 80-81% of healthcare expenditure publicly funded. In contrast, both the US and Mexico demonstrate a low allocation rate at 50-51% of total spending from public sources - a high number within the OECD - both reflecting significant reliance on private insurance and direct payments.

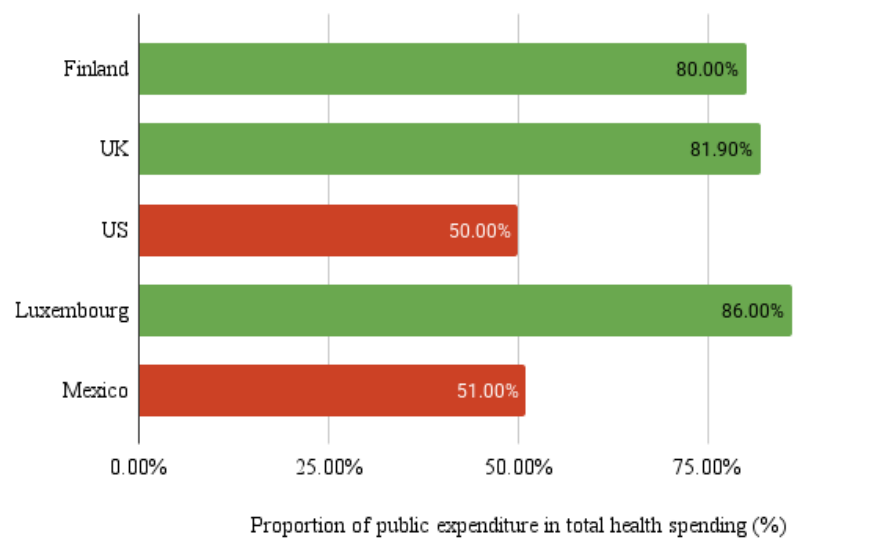


Figure 11: Proportion of public expenditure in total health spending (%) [21] [22] [27]

OOP expenditure, in this study, indicates the direct payments made for health services that are not covered by insurances. WHO and OECD have identified approximately 20% of total health spending as a critical threshold, and spending above the level will increase risks of catastrophic health expenditure [37]. Finland, Luxembourg, and the UK have all maintained OOP shares below 20%, ensuring financial protection for healthcare. While the US reports OOP spending at around 11%, which appears low - as explained above, OOP does not involve private insurance premiums and copayments, both of which the national healthcare relies on heavily. Hence the inclusion of them would greatly increase individual financial burden. Mexico presents a clear case of affordability challenges at 40% OOP expenditure, as a large portion of the population lacks sufficient insurance, thus leading to direct payments for costly private services or medicines.

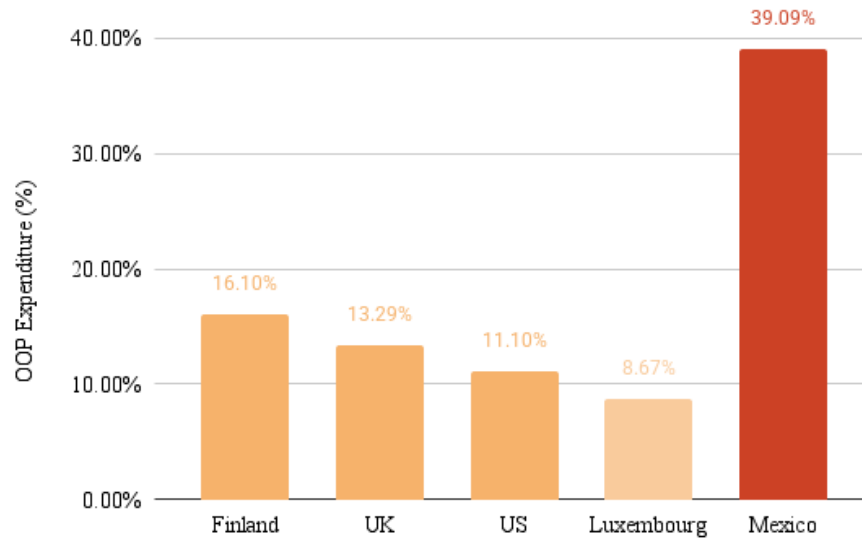


Figure 12: OOP expenditure (% of current health expenditure) [31]

3.4 Healthcare System Capacity

Continuing the previous section's focus on healthcare systems functions, this section evaluates the effectiveness level of resources such as financial schemes or medical workforce.

Regarding public healthcare coverage, which reflects universal care level of the nation, both Finland, the UK, and Luxembourg achieve a rate of complete coverage over its population. Mexico lags behind at 77.6%, while the US shows its fragmented, inefficient public system with the rate of 40.2%. In terms of private care, both the numbers of Finland and the UK demonstrate the complementary nature of the more costly services - yet in Finland, due to a continuous need for quickening long waiting queues, the ownership number has been rising in recent years [18]. The significant coverage rate in the US, sitting at 61.3%, far surpassing the public rate demonstrates its heavy reliance on private care; while Mexico, despite the low 14.5% coverage, is more likely to indicate most civilians not being able to afford private care due to its high OOP spending. Despite not publishing any specific data on private services ownership, due to its high public financing and low OOP expenditure, healthcare majorly remains universal and affordable [22].

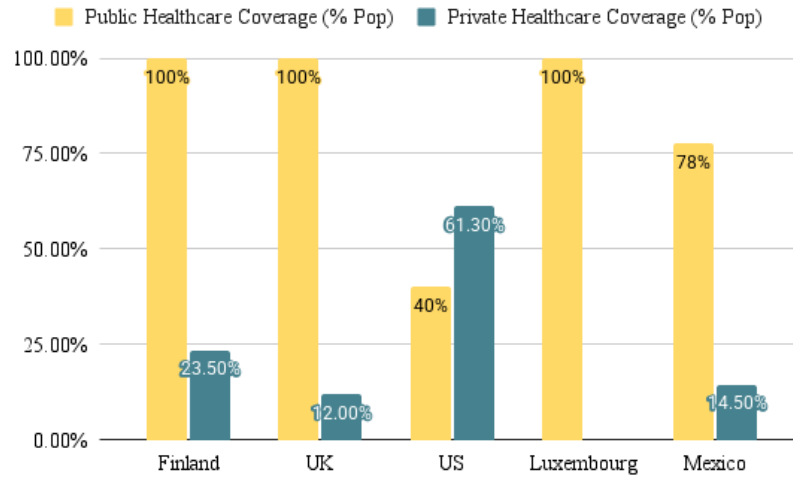


Figure 13: Public & Private healthcare coverage (% population) [6]

Ratio of healthcare professionals, particularly doctors and nurses, to the population can indicate the system capacity to deliver timely and sufficient care. Generally, a higher density of skilled health workforce is associated with better levels of health outcomes [38]. For every 10,000 population, Finland appears to have the largest medical workforce at more than 200 members, along with comprehensive nursing and pharma units compared to others. This size can partially be attributed to the growing need for healthcare amidst the large list of elderly citizens [39]. Not too far behind lies the US and Luxembourg, both of which achieving more than 180 medical employees. The UK appears to be highly understaffed, especially in terms of nursing positions, which is due to its high vacancy and resignation rate caused mainly by burnout [40]. Regardless, the nation with the lowest staff density appears to be Mexico, which possesses a significantly lower rate than other countries at only more than 5 members per 1000 population - highlighting a severely understaffed medical system.

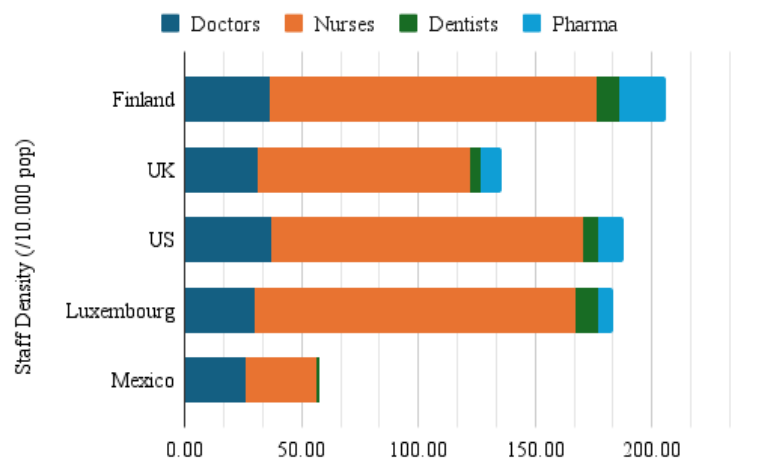


Figure 14: Density of medical staff (per 10,000 population) [31]

4. RESULTS & DISCUSSION

As the **Analysis** chapter has explained and described indicators and patterns for each of the four dimensions - economic, social, policy, and healthcare - this section will combine them together as recurring and similar patterns, dynamics, and factors highlighting differences are identified and pointed out among the five studied nations. Furthermore, lessons learned, limitations of the study, and potential areas for future research will be discussed in the latter half of the chapter.

4.1 Results

4.1.1 General Patterns

Assessing the four analytical dimensions reveals a set of outcomes driven by key factors such as economic capacity, equity, public financing, and system functionality:

Regarding economic capacity or output - this element highly sets the foundation and potential, but not always equity. For example, Luxembourg and the US both demonstrate strong wealth, yet only the former nation leverages this strength into universal care access - underscoring the vital role of the system and policy structure. This can be further observed through Finland and the UK achieving comparable affordability outcomes due to their redistributive systems, despite being less of an economic powerhouse.

Inequality indubitably plays a crucial role in determining health access - as high Gini coefficients in the US (0.418) and Mexico (0.435), indicating high inequality level, correspond with lower affordability capacity. This is further reflected in lower healthcare coverage and higher OOP expenditure. A direct opposite example is Finland with its low equality rate (0.279) and a high-performing healthcare system.

Public investment and funding play a vital role in financial protection for the mass, with the likes of Luxembourg (86% public share in total health spending), Finland and the UK (80-81% share) all maintain their OOP costs below the suggested amount of 20%. In contrast, Mexico - with its low public share proportion (51%), public funding (2.9% of GDP), and significant OOP spending (39%) - highlights the financial burden of a severely underfunded public system.

The functionality of a medical system also determines healthcare performance, with examples of both Luxembourg and Finland - despite operating on different scales and organization methods - both exhibit similar strengths such as sufficient workforces or aging

demographic solutions (migration, increasing staff due to needs). Mexico, on the other hand, shows inefficiency and lack of access through its massively understaffed system.

4.1.2 Case-Specific Observations

Finland: Low inequality and strong public financing form a well-performing and affordable healthcare system, with mainly operational issues such as long waiting times, highly driven by an aging population.

The UK: While coverage remains universal with essential health services provided through public financing similar to Finland, workforce burnout and capital underfunding have presented continuity issues like increased waiting times or staff shortage.

Luxembourg: The nation represents an ideal mix of high economic strength, sufficient public financing, high financial protection, and an efficient system. Its universal coverage and low OOP spending further highlight the country's equitable quality.

The US: Despite world-leading economic capacity and allocating the most GDP proportion into healthcare, its fragmented and complicated medical system undermines healthcare affordability and access. Its dependence on private insurance highlights lack of universal and accessible care, something further worsened by the nation's high inequality rate.

Mexico: This country showcases many fundamental issues of middle-income systems - particularly through its persistent underfunding and lack of staff issues. Structural inequality, continuously changed insurance model, reliance on private services, and high OOP expenditure all contribute to limiting the nation's health affordability, access, and progress towards universal care.

4.1.3 Combined Insights

Combining evidence from the four selected categories (economic, social, policy and financing, healthcare) indicates four central dynamics:

Economic strength provides great support but does not guarantee healthcare affordability and access. Without fair redistributive financing, like the US, it can lead to high inefficiency level, while moderate-income nations but strong public commitment like Finland or the UK achieve much better health outcomes.

Equity regarding income, along with healthcare financing and spending can maximize a system's effectiveness. Low inequality rate combined with high public share in health spending can greatly increase efficiency of model's resources usage.

Health prioritization and suitable policies are crucial, observable through coherent and sufficient funding, workforce density, and addressing of health needs without over-reliance on private sectors and parties.

Finland, the UK, and Luxembourg have accomplished high healthcare performance with a clear health system framework, highly influenced by the Beveridge or Bismarck model. An unclear, complicated or underprioritized hybrid health system like Mexico or the US often encounter different structural issues.

4.2 Discussion

4.2.1 Lessons Learned

Through this study, healthcare outcomes are illustrated to reflect layered systemic design, rather than simply economic capacity. Comparative data and results from previous sections indicate that universal public financing, equitable income distribution, adequate healthcare prioritization, and efficient governance can consistently produce high affordability and access across different contexts and countries' backgrounds.

Systems with fragmented funding and organization, along with over-reliance on private sectors - such as those of the US and Mexico - highlight how in achieving health equity and access, there are many limits of market mechanisms. In contrast, with coordinated and fair financing, welfare-state models have shown to achieve greater efficiency per unit of spending. These findings also reflect OECD analyses on how universal health coverage improves population health, reduces financial hardship, and strengthens systems' ability to cope with and recover from crises [41].

However, even world's top-performing medical systems can face inner constraints - such as Finland and the UK both simultaneously possessing care universality and operational issues like aging populations or long waiting queues. Hence, evaluations of demographic, economic, and even social factors must be frequently made to ensure coherence and effectiveness of policy designs.

4.2.2 Study Limitations

There are some limitations within this study that can be pointed out: In terms of data comparability and relevance - The selected OECD, World Bank, and WHO datasets offer highly reliable and comprehensive metrics, yet still, reporting years and methods can vary between indicators to a certain degree. Some particularly specific categories may return blank or insufficient. Secondly, regarding scope limitation, while five OECD nations

facilitate streamlined ways of collecting data and drawing comparisons, generalizing collected results for non-OECD countries may not continuously generate similar patterns. And finally, odds of variable simplification happening are not slim. For health affordability and access concepts, selected indicators may not have provided the entirety of their representations.

4.2.3 Future Work Suggestions

The dataset shows a lot of potential to include additional OECD and other emerging nations to further expand the scope and insights or utilize qualitative data such as patient satisfaction or treatment adequacy to strengthen further contextual understanding. More complex expansions can also involve using statistical methods, such as econometric modelling for economic mechanisms and outcomes.

Additionally, findings showcase potential lessons in healthcare reform, particularly the role of public investment for cases such as the US or Mexico that require addressing its inequality, or administrative streamlining toward the UK to ensure workforce sufficiency and sustainability.

5. CONCLUSIONS

Throughout the study, characteristics and differences in healthcare affordability and access across five OECD nations - Finland, the United Kingdom, Luxembourg, the United States, and Mexico - have been analysed using indicators in economic, social, policy, and healthcare dimensions. With such statistics collected from databases such as OECD, World Bank, and WHO, the narrative has illustrated clearly the traits and dynamics of those factors to achieve observed outcomes in each healthcare system. This is followed by drawn lessons for the design characteristics of a more effective, accessible care model.

Across the five examined cases, results have shown that economic capacity does not determine healthcare affordability or access by itself - factors such as GDP per capita may establish the foundation and potential for financing, but do not guarantee equal chances and outcomes. Instead, prioritization and organization of resources factors like public funding extent or income distribution appear to be the more decisive elements in determining the overall system performance.

Expanding on aspects of public financing and redistributive mechanisms, the two have consistently proved to be playing the most crucial roles in dictating healthcare affordability and access. Nations such as Luxembourg, Finland, and the United Kingdom, all of which maintaining strong public financing shares, sufficient allocation of GDP percentage, and universal coverage, showcase high financial protection and widely accessible care. In contrast, the United States and Mexico, despite differences in wealth levels and health prioritization, both two experience major health accessibility dilemmas due to their systemic structural issues, high inequality rate, and most majorly, over-reliance on private sectors or OOP payments.

At the same time, systemic coherence factors like sufficient workforce density or a clear model framework can help maximize the efficiency of healthcare systems further - while understaffing issues or models that bear complexity but little coordination, highly reflected by systems of the US and Mexico, highly lessen the impact of organization efforts and financial investment.

Still, no system comes without challenges, and this is verified through findings of this study. Top healthcare models such as those of Finland or the UK often face internal issues ranging from long waiting queues, workforce shortages, to aging populations with

higher medical demands. This poses the need for an adjustment method that can balance universal insurance and operational sustainability.

This thesis, with its findings, has reinforced a recurring, prevalent health policy theme on how healthcare affordability and access are also social and political achievements. While they depend on national wealth to a certain extent, it is always more about how societies choose to fund and prioritize health as a public asset, along with maintaining equality and redistributing risk. Systems that institutionalize equity and public commitment - Finland, the UK, and Luxembourg in this study - consistently achieve both better affordability and long-term health outcomes like higher life expectancy.

Despite the study's scope being limited to five OECD nations and secondary data sources, the findings support a more in-depth understanding of global healthcare systems. With lower and middle-income nations, progress toward universal care requires attention to adequate public investment, along with administrative efforts from sufficient workforce to clear model frameworks. Regarding high-income countries, focus should be put into balancing between system efficiency and changing demographics or costs.

Future work can expand the study's scope with a broader list of countries or adding qualitative measurements such as patient satisfaction or effectiveness of policy reforms in flawed systems. Statistics methods bear potential for further study complexity, such as econometric models that strengthen understanding in economic mechanisms and outcomes.

In conclusion, the findings of this study reinforce that the most effective path to achieving affordable and accessible healthcare is through universal, well-financed, risk-secured, and efficiently governed systems. To differentiate numerous systems to evaluate whether health is treated as a tradable good or collective right, understanding and assessing of the balance between equity, health prioritization, public commitment, and policy coherence factors are necessary.

REFERENCES

- [1] UN, "Sustainable Development Goals: Good Health and Well-being," 2016. [Online]. Available: <https://www.un.org/sustainabledevelopment/health>.
- [2] WHO, "World Health Report: Health Systems Financing – The Path to Universal Coverage," 2010. [Online]. Available: <https://www.who.int/publications/i/item/9789241564021>.
- [3] B. R, S. RB ja F. J, *Social Health Insurance Systems in Western Europe*, Open University Press, 2004.
- [4] W. S ja H. DU, *The Relationship of Health Insurance and Mortality: Is Lack of Insurance Deadly?*, *Ann Intern Med*, 167(6): p. 424-431, 2017; doi:10.7326/M17-1403
- [5] OECD, "Understanding Differences in Health Expenditure Between the United States and OECD Countries," 2022. [Online]. Available: https://www.oecd.org/content/dam/oecd/en/publications/reports/2022/09/understanding-differences-in-health-expenditure-between-the-united-states-and-oecd-countries_cafc404c/6f24c128-en.pdf.
- [6] OECD, "OECD Data Explorer," [Online]. Available: <https://data-explorer.oecd.org/?lc=en>.
- [7] F. I. f. H. a. W. "Number of People Waiting for Non-Urgent Specialised Medical Care Falls During the Spring," 2024. [Online]. Available: <https://thl.fi/en/-/number-of-people-waiting-for-non-urgent-specialised-medical-care-falls-during-the-spring>.
- [8] WHO, "The world health report 2000," 2000. [Online]. Available: https://apps.who.int/gb/ebwha/pdf_files/WHA53/ea4.pdf.
- [9] P. f. a. N. H. P. "Health Care Systems - Four Basic Models," 2010. [Online]. Available: https://www.pnhp.org/single_payer_resources/health_care_systems_four_basic_models.php.
- [10] OECD ja E. O. o. H. S. a. Policies, "Luxembourg: Country Health Profile 2021, State of Health in the EU," OECD, Brussels, 2021.
- [11] L. S. o. E. a. M. *Macroeconomics II, Lecture 14: Social Structures and the Welfare State*.
- [12] A. AJ, "The Paradox of Mexico's Healthcare System," 2025. [Online]. Available: <https://platform.coop/blog/a-collective-cure-rethinking-healthcare-through-platform-cooperatives-in-mexico>.
- [13] WHO, "What Are the Overall Principles of HBP Design? Resource Guide for the use of health-technology assessment and benefit-package design processes," [Online]. Available: <https://www.who.int/teams/health-financing-and-economics/economic-analysis/health-technology-assessment-and-benefit-package-design/resource-guide-for-the-use-of-hba-and-hbp-design-processes/what-are-the-overall-principles-of-hbp-design>.
- [14] X. K, E. DB, K. K, Z. R, K. J ja M. CJ, *Household catastrophic health expenditure: a multicountry analysis*, *Lancet*, 362(9378): p. 111-117, 2003; doi:10.1016/S0140-6736(03)13861-5
- [15] M. CG ja W. L, *Access to care: remembering old lessons*, *Health Serv Res*, 37(6): p. 1441-1443, 2002; doi:10.1111/1475-6773.12171
- [16] P. R ja T. JW, *The concept of access: definition and relationship to consumer satisfaction*, *Med Care*, 19(2): p. 127-140, 1981; doi:10.1097/00005650-198102000-00001
- [17] K. S, *Integrated primary health care: Finnish solutions and experiences*, *Int J Integr Care*, 2009; doi:10.5334/ijic.310
- [18] K. I, T. LK, R. E ja e. al, *Finland: Health System Re-view. Health Syst Transit*, 21(2): p. 1-166, 2019.

- [19] . I. P. C. "From Vision to Reality: How the Beveridge Model Birthed the NHS," 2024. [Online]. Available: <https://www.ipcupdate.co.uk/from-vision-to-reality-how-the-beveridge-model-birthed-the-nhs>.
- [20] I. f. G. "Funding Health Care in England," 2023. [Online]. Available: <https://www.instituteforgovernment.org.uk/sites/default/files/2023-09/funding-health-care-england.pdf>.
- [21] O. f. N. S. *Healthcare Expenditure, UK Health Accounts: 2022 and 2023*, Statistical Bulletin, 2024.
- [22] E. O. o. H. S. a. Policies, "Luxembourg: Health System Review 2024," 2024. [Online]. Available: <https://eurohealthobservatory.who.int/publications/i/luxembourg-health-system-review-2024>.
- [23] L. M ja H. T, "Health Insurance Coverage in the United States: 2024," 2025. [Online]. Available: <https://www.census.gov/library/publications/2025/demo/p60-288.html>.
- [24] T. C. Fund, "Nearly 1 of 4 Adults with Health Coverage Struggle with High Out-of-Pocket Costs and Deductibles; Majority of Underinsured in Employer Plans," 2024. [Online]. Available: <https://www.commonwealthfund.org/press-release/2024/new-survey-nearly-1-4-adults-health-coverage-struggle-high-out-pocket-costs-and>.
- [25] W. B. "Mexico's System for Social Protection in Health and the Formal Sector," 2012. [Online]. Available: <https://documents1.worldbank.org/curated/en/706101468287156360/pdf/767360ESW0whit000Labor0Market0final.pdf>.
- [26] C.-A. LJ ja G.-D. O, *The termination of Seguro Popular: impacts on the care of high-cost diseases in the uninsured population in Mexico*, *Lancet Reg Health Am*, 46:101078, 2025; doi:10.1016/j.lana.2025.101078.
- [27] L. V. L, "The health economy in Mexico," 2020. [Online]. Available: <https://repositorio.cepal.org/server/api/core/bitstreams/7794a370-58e5-42ee-870b-e1ba7f6456de/content>.
- [28] W. B. "World Bank Open Data," [Online]. Available: <https://data.worldbank.org/>.
- [29] P. KE ja W. RG, *Income inequality and health: a causal review*, *Soc Sci Med*, 128: p. 316-326, 2015; doi:10.1016/j.socscimed.2014.12.031
- [30] L. L. M. I. Happen, "Thriving through migration," 2025. [Online]. Available: <https://luxembourg.public.lu/en/society-and-culture/population/emigration-immigration.html>.
- [31] WHO, "WHO Data Portal," 2019. [Online]. Available: <https://data.who.int/countries>.
- [32] K. HTA, *Population ageing in a globalized world: Risks and dilemmas?*, *J Eval Clin Pract*, p. 754–760, 2019; doi:10.1111/jep.13071
- [33] Yle, "Tens of thousands waiting for more than 6 months to see a specialist," 2024. [Online]. Available: <https://yle.fi/a/74-20118292>.
- [34] A. U. "Older People Are Often Waiting Far Too Long for the Social Care They Need," 2023. [Online]. Available: <https://www.ageuk.org.uk/latest-press/older-people-are-often-waiting-far-too-long-for-the-social-care-they-need>.
- [35] S. J, "America's aging population faces a growing shortage of geriatric care," 2025. [Online]. Available: <https://www.businessinsider.com/geriatric-care-aging-population-boomers-healthcare-nursing-homes-doctor-shortage-2025-2>.
- [36] OECD, "Society at a Glance 2024: OECD Social Indicators," 2024. [Online]. Available: https://www.oecd.org/en/publications/society-at-a-glance-2024_918d8db3-en/full-report/life-expectancy_37a61588.html.
- [37] C. Quintal, "Evolution of catastrophic health expenditure in a high income country: incidence versus inequalities.," *Int J Equity Health* 18, p. 145, 2019; doi:10.1186/s12939-019-1044-9
- [38] J. Liu ja K. Eggleston, "The Association between Health Workforce and Health Outcomes: A Cross-Country Econometric Study," *Soc Indic Res* 163, p. 609–632, 2022; doi:10.1007/s11205-022-02910-z
- [39] Yle, "Expert: Finland needs 30k more healthcare workers by 2030," 2021. [Online]. Available: <https://yle.fi/a/3-11782213>.

- [40] Y. J, "NHS staff shortages," 2025. [Online]. Available: <https://www.statista.com/topics/9575/nhs-staff-shortage>.
- [41] OECD, "Universal Health Coverage and Health Outcomes," 2016. [Online]. Available: https://www.oecd.org/content/dam/oecd/en/publications/reports/2016/09/universal-health-coverage-and-health-outcomes_446e0f96/932b3cde-en.pdf.