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THE HEALTH SYSTEM REFORM IN ECUADOR:
Has it contributed towards Universal Health Coverage?

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Dedication

To my family

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Abstract

Background

Universal Health Coverage (UHC) is the cornerstone of any health system that seeks to improve the overall health outcomes of its population, through adequate financial protection and effective responsiveness of health services as set outline in the framework of the Sustainable Development Goals.

In 2007, Ecuador embarked on an ambitious path of social and health system reforms aimed at improving the quality of life for all its citizens. The changes introduced in the National Constitution represented a turnaround from a scenario characterised by inadequate public service delivery, weak governance and inefficient public management. In the area of health, the government overhauled the comprehensive health care model, reorienting it to prioritise preventive and promotive services. The changes included the provision of free health services at all levels of care and various measures to reduce the fragmentation of the system. Significant investment has also been made in improving and building new health facilities, expanding the supply of medicines and incorporating better medical equipment. Over the course of a decade, efforts have been made to expand coverage and improve the efficiency and quality of public health care services.

However, despite the significant progress made during this period, the lack of a comprehensive evaluation of the reform has limited a better understanding of its outcomes. Although some studies have highlighted the success of the reform in terms of improving health coverage, there has been a lack of research examining its impact on reducing socio-economic inequalities in health and health care.

Objectives

The overall objectives of this thesis were i) to assess whether the recent reform of the Ecuadorian health system has contributed to reducing socio-economic inequalities in health care and financial protection, and ii) to identify the main facilitators and obstacles to the implementation of the reform.

Methods

A range of quantitative and qualitative methods were used to address the objectives. Three cross-sectional studies were conducted using nationally representative secondary data from the Living Standards Measurement Surveys (2006 wave before the reform and 2014 wave during the reform), Descriptive statistics were used to identify key population characteristics, prevalence of health indicators, and coverage of financial protection. Measures of health inequality assessed absolute and relative socio-economic differences in the components of UHC.

Several socio-economic variables (gender, residence, region, ethnicity, education, occupation, and wealth) were selected as independent variables to observe trends in coverage and inequalities between social groups. The health indicators chosen were those related to the use of health services and the financial protection indicators were those related to out-of-pocket expenditure by families.

Refraining from seeking health care during an illness was used as an indicator of population coverage, while indicators of preventive health care and treatment for women of reproductive age were chosen for health service coverage. In addition, catastrophic health expenditure (CHE) was used as an indicator of financial protection. To address the second objective, a series of individual interviews were conducted with key health care stakeholders involved to the design and implementation of the reform to, through a thematic analysis, identify the key facilitators and obstacles associated with the reform implementation process.

Results

Overall, an increase in population coverage and coverage of basic health services was observed. Refraining from seeking health care decreased from 27% to 18%, being higher among women than in men. Moreover, these reductions were found to be statistically significant in absolute and relative terms in all social groups of both sexes. Women's access to prevention and treatment services has increased over time, with an average increase in coverage of 8%. However, persistent socio-economic inequalities, particularly in terms of rural residence, ethnicity, occupational class, and education, remained. CHE decreased from 17% to 10%, and health expenditure on medicines decreased significantly by 35 percentage points in 2014. However, uninsured households remained at higher risk of facing financial hardship. Overall, political commitment, innovative coverage mechanisms and a comprehensive health care model focused on promotion and prevention were recognised as enablers that contributed to the implementation of the health reform. However, private interests at national and local levels, weak governance, and the increasing commodification of health care were highlighted as obstacles to successful reform implementation and improved health system performance in achieving UHC.

Conclusion

In attempting to assess the impact of the recent health reform, this thesis illustrates the implications for progress towards UHC in Ecuador. Overall, the reforms improved population coverage and expanded health service, with varying degrees of reduction in socio-economic inequalities in health care and financial protection. Although these improvements have been observed over time, inequalities have persisted, particularly for the most disadvantaged groups such as indigenous people, women, rural households and uninsured families.

Political commitment, the renewed health care model and free services have contributed positively to this progress. However, the obstacles identified (political, structural and governance) need to be addressed in the future in order to continue strengthening the health system in Ecuador by proposing new health reforms.

Keywords: Health reform, universal coverage, inequalities, Ecuador.

Resumen en español

Antecedentes

La Cobertura Sanitaria Universal (CSU) es la piedra angular de cualquier sistema sanitario que aspira a mejorar los resultados generales de salud de su población, a través de una adecuada protección financiera y una efectiva capacidad de respuesta de los servicios sanitarios tal como se establece en el marco de los Objetivos de Desarrollo Sostenible.

En 2007, Ecuador emprendió un ambicioso viaje de reformas en los sistemas social y sanitario con el objetivo de mejorar la calidad de vida de todos sus ciudadanos. Los cambios introducidos en la Constitución Nacional supusieron un giro para intentar dejar atrás un escenario caracterizado por la inadecuada prestación de servicios públicos, la débil gobernanza y la ineficiencia de la gestión pública. En el ámbito de la salud, el gobierno renovó el modelo de atención sanitaria integral, reorientándolo hacia la priorización de los servicios preventivos y de promoción. Los cambios incluyeron la prestación de servicios sanitarios gratuitos en todos los niveles de atención, junto con diversas medidas destinadas a reducir la fragmentación del sistema. Asimismo, se realizaron importantes inversiones en mejorar y crear nuevas instalaciones sanitarias, ampliar el abastecimiento de medicamentos e incorporar mejores equipos médicos. A lo largo de una década se realizaron esfuerzos enfocados en ampliar la cobertura y mejorar la eficiencia y la calidad de los servicios públicos de atención sanitaria.

Sin embargo, a pesar de los importantes avances logrados durante este periodo, la falta de una evaluación exhaustiva de la reforma ha limitado una mejor comprensión de los resultados. Aunque algunos estudios han destacado el éxito de la reforma en términos de mejora de la cobertura sanitaria, ha sido ausente las investigaciones que exploren su impacto en la reducción de las desigualdades socioeconómicas en materia de salud y atención sanitaria.

Objetivos

Los objetivos generales de esta tesis fueron i) evaluar si la última reforma del sistema de salud ecuatoriano contribuyó a reducir las desigualdades socioeconómicas en la atención sanitaria y la protección financiera, y ii) identificar los principales factores facilitadores y obstaculizadores de la aplicación de la reforma.

Métodos

Para alcanzar los objetivos, se aplicaron una serie de métodos cuantitativos y cualitativos. Utilizando datos secundarios representativos a nivel nacional de las Encuestas de Medición del Nivel de Vida (encuesta del 2006 antes de la reforma y de 2014 durante la reforma), se realizaron tres estudios transversales. Se

utilizaron estadísticas descriptivas para identificar las características principales de la población, la prevalencia de indicadores de salud y la cobertura de la protección financiera. Las medidas de desigualdad sanitaria evaluaron las diferencias socioeconómicas absolutas y relativas en los componentes de la CSU.

Se eligieron diversas variables socioeconómicas (sexo, residencia, región, etnia, educación, ocupación y riqueza) como variables independientes para observar las tendencias de la cobertura y las desigualdades entre los grupos sociales. Los indicadores de salud seleccionados fueron aquellos relacionados con el uso de los servicios sanitarios y los de protección financiera los relacionados con el gasto de bolsillo de las familias. La abstención de acudir a los servicios sanitarios durante una enfermedad se utilizó como indicador de la cobertura de la población, mientras que para la cobertura sanitaria se eligieron indicadores de atención sanitaria preventiva y de tratamiento para mujeres en edad reproductiva. Además, se utilizó el gasto sanitario catastrófico (GSC) como indicador de protección financiera. Para abordar el segundo objetivo, se realizaron varias entrevistas individuales con las principales partes interesadas en la sanidad relacionadas con el diseño y la aplicación de la reforma para, mediante un análisis temático, identificar los principales facilitadores y obstáculos relacionados con el proceso de aplicación de la reforma.

Resultados

En general, se observó un aumento de la cobertura de la población y de la cobertura de los servicios sanitarios esenciales. La abstención de buscar atención sanitaria disminuyó del 27% al 18%, siendo mayor en las mujeres que en los hombres. Además, se observaron que estas reducciones fueron estadísticamente significativas en términos absolutos y relativos en todos los grupos sociales de ambos sexos. El acceso de las mujeres a los servicios de prevención y tratamiento aumentó con el tiempo, con una cobertura creciente de un 8% en promedio. Sin embargo, persistentes desigualdades socioeconómicas fueron observadas, especialmente en términos de residencia rural, etnia, clase ocupacional y educación. Los GSC disminuyeron de 17% a 10% y los gastos en salud en medicamentos se redujeron significativamente en 35 puntos porcentuales en el 2014. Sin embargo, los hogares no asegurados siguieron teniendo un mayor riesgo de enfrentar dificultades financieras. En general, el compromiso político, los mecanismos de cobertura innovadores y un modelo de atención sanitaria integral reorientado a la promoción y la prevención fueron reconocidos como facilitadores que contribuyeron a la aplicación de la reforma en salud. Sin embargo, los intereses privados a nivel nacional y local, la débil gobernanza y la creciente mercantilización de la atención sanitaria se destacaron como obstáculos para el éxito de la aplicación de la reforma y la mejora del rendimiento del sistema sanitario para alcanzar la CSU.

Conclusión

Esta tesis en un intento de evaluar la última reforma del sistema sanitario e ilustrar los efectos en el progreso hacia la CSU en el Ecuador. En general, las reformas mejoraron la cobertura poblacional y expandieron la cobertura de los servicios de salud con reducciones variables de las desigualdades socioeconómicas en la atención sanitaria y protección financiera. Aunque estas mejoras se observaron a lo largo del tiempo, las desigualdades se mantuvieron especialmente en los grupos más desfavorecidos como los indígenas, las mujeres, los hogares rurales y las familias no aseguradas. El compromiso político, el modelo renovado de atención sanitaria y la gratuidad de los servicios contribuyeron positivamente a este avance. Sin embargo, varios obstáculos identificados (políticos, estructurales y de gobernabilidad) deben ser abordados en el futuro para continuar fortaleciendo el sistema de salud en Ecuador a través de la propuesta de nuevas reformas.

Palabras clave: Reforma sanitaria, cobertura universal, desigualdades, Ecuador.

Abbreviations

CCS	Cervical Cancer Screening
CHCM	Comprehensive Health Care Model
CHE	Catastrophic Health Expenditures
CI	Confidence Interval
CPHN	Comprehensive Public Health Network
CTP	Capacity to pay
ESSI	Ecuadorian Social Security Institute
IF	Inflation Factor
LAC	Latin American and Caribbean
MCU	Modern Contraceptive Use
MoPH	Ministry of Public Health
NISC	National Institute of Statistics and Census
OOP	Out of Pocket
OOPhe	Out of Pocket health expenditures
PAHO	Panamerican Health Organization
PCA	Principal Component Analysis
RII	Relative Index of Inequality
RTA	Reflexive Thematic Analysis
RR	Relative Risk
SBA	Skilled Birth Attendance
SDGs	Sustainable Development Goals
SII	Slope Index of Inequality
UHC	Universal Health Coverage
UHCN	Unmet Health Care Needs
WHO	World Health Organization

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Original papers

This thesis is based on the following four papers:

1. Quizhpe E, Teran E, Pulkki-Brännström AM, San Sebastián M. Social inequalities in health care utilization during Ecuadorian health care reform (2007-2017): a before-and-after cross-sectional study. BMC Public Health. 2022; Mar 14;22(1):499.

2. Quizhpe, E, Sebastian, M.S, Teran, E, Pulkki-Brännström AM. Socioeconomic inequalities in women's access to health care: ¿has Ecuadorian Health reform been successful? Int J Equity Health 2020;19, 178.

3. Quizhpe, E., Sebastian, M.S., Teran, Pulkki-Brännström AM. Socioeconomic inequalities in catastrophic health expenditures in Ecuador. Has the recent health system reform contributed to reducing socio-economic inequalities in financial protection? Manuscript.

4. Quizhpe E, Martens Ch, Teran E, Pulkki-Brännström AM, San Sebastian M. Insights from Ecuador's journey towards universal health coverage: Lessons from recent health system reform. Manuscript.

The original papers published are in Open-Access journals.

Prologue

How did this thesis come about?

This doctoral research has emerged from two sources. Firstly, as a result of my professional experience in public health, which has been acquired over the years in various roles in both the public and private health sectors. On a personal level, the completion of this doctoral degree personally represented a step forward in filling in the gaps in my knowledge resulting from my practical experience in epidemiology and public health, particularly in community health programmes in the Amazon region of Ecuador, and from my work in various positions in the public health sector, with responsibilities in both the Ministry of Public Health (MoPH) and the Ecuadorian Social Security Institute (ESSI). During the last period of reforms, I held several specific roles in the public health system, starting as an epidemiologist and provincial health director in the province of Orellana, then as a zonal coordinator for the Amazon region and in the city of Quito, capital of Ecuador, and finally as the national director of the National Agency for Quality of Health Services from 2016 to 2017.

Second, it was my interest in public health research, which emerged early on when I started my professional practice in the rural sector and gradually became linked to the public health system. At that time, my interest in analysing and evaluating public health policies intensified as I observed the positive and negative effects of health policies implemented by different governments in terms of access to and quality of health services, especially among the most vulnerable social groups, my interest in analyzing and evaluating public health policies became more intense. This interest became particularly relevant during the period between 2007 and 2017, when the government of the time made important changes to the health system.

Therefore, this thesis aims to combine these two components; on the one hand, the need for professional development and on the other hand, to contribute to understanding of those gaps in knowledge about the effects produced by the public policies of the health reform between 2007 and 2017.

Organisation of the thesis

The thesis is divided in several chapters. The first chapter one begins with an overview of the universal health coverage (UHC) strategy, exploring the components that are the framework of this thesis. It also describes the concepts and objectives of health system reforms, with a particular focus on the experiences of Latin American and Caribbean (LAC) countries in recent decades in order to contextualise the Ecuadorian experience. A rationale section is included, justifying the objectives of the thesis to reduce the knowledge gap related to the impact of the reform. The second chapter explains the objectives of this dissertation within the UHC conceptual framework, assessing social

inequalities in health care, and examining the facilitators and obstacles of the reform implementation process from the point of view of actors at the national level. Chapter three details the methodological aspects of the different sub-studies, covering the elements of design, sampling, variable definitions, data collection and analysis, as well as the ethical considerations for both the quantitative and qualitative studies in this research. Chapter four presents the main findings of the specific studies (quantitative and qualitative), both in terms of the coverage of the selected indicators and the measurement of socio-economic inequalities in health. Chapter five discusses the main findings of this thesis with relevant information on the local and regional scenario. It also includes the strengths and limitations of this research. Chapter six presents the conclusions taking into account the UHC conceptual framework and including reflections on practices for successful implementation and dissemination of the results. Chapter seven concludes with some recommendations for future health care reforms.

Chapter One: Introduction

This chapter discusses the concepts and definitions of the elements that underpin this study. First, it discusses the definition of UHC and its components (service coverage, population coverage and financial protection). Second, it examines the concepts and objectives of health system reform. It then provides a brief overview of the experiences of health reform in countries in LAC region, highlighting the specificities of the recent health reform in Ecuador.

1.1 The Universal Health Coverage strategy: an overview

This strategy embodies the idea that all individuals and communities, regardless of their financial status or location, should receive a full range of quality essential health services that they need [1, 2]. This definition encompasses several objectives to ensure that everyone has equitable access to essential health promotion, prevention, treatment, rehabilitation, and palliative care of the highest possible quality to improve overall health outcomes, with an adequate financial protection. UHC has its roots in the Constitution of the World Health Organization (WHO) and the "Health for All" agenda outlined in the Alma Ata Declaration of the 1970s. In addition, UHC intersects with all health-related Sustainable Development Goals (SDGs) that contribute to improving health and financial protection against risk, especially for the world's most disadvantaged populations, UHC is a critical component of the Sustainable Development Goal 3 ¨Ensure healthy lives and well-being for all at all ages¨. Finally, UHC aims to promote investment in human capital, thereby sustainable and inclusive economic growth [3].

However, despite these aspirations, nearly half of the world´s population still lacks adequate access to quality health care services, and around 100 million people are pushed into extreme poverty each year because of medical expenses. This situation highlights a health financing crisis that is hampering progress towards achieving the health-related SDGs and impeding efforts to eradicate poverty by 2030 [4, 5].

The existence of socio-economic inequalities in health and health care remains a key obstacle for achieving UHC. Even where countries are making progress in improving access to health care, aggregate data mask inequalities within countries. For example, access to reproductive, maternal, child, and adolescent health services tends to favour those with higher economic and educational levels, and those living in urban areas, particularly in low-income countries. In terms of financial burden, CHE disproportionately affects households in rural regions, and those with elderly family members are more vulnerable to falling further into poverty as a result of such expenditure. It is therefore imperative to monitor health inequalities in order to identify and monitor marginalised communities, and to provide policy-makers with empirical data to design more equitable policies and initiatives to progressively achieve UHC [6].

According to the WHO report on equity and UHC, countries need to make progress in the three components of the UHC, namely, *service coverage, population coverage and financial protection,* by building robust health systems, bringing more people under health insurance coverage, ensuring accessibility, availability and acceptability of quality health services and developing sustainable financing models that reduce financial hardship for individuals and households [7]. These components, commonly referred to as the *UHC cube*, are detailed in Figure 1. The following section provides a summary explanation of each component.

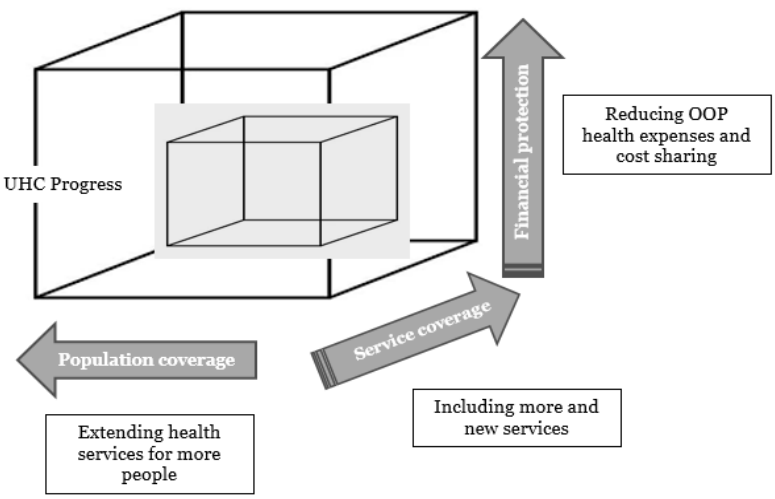

Figure 1. The Universal Health Coverage components. (WHO 2005) [8].

1.1.1 Service coverage

Service coverage dimension refers to the extent to which health services are available and used by the population. It includes the provision of a wide range of essential health services, such as preventive, promotive, curative, rehabilitative, and palliative care, covering areas such as reproductive, maternal and child health, infectious diseases, and non-communicable diseases. An example of service coverage in UHC is maternal and child health services, which include ensuring that all pregnant women receive timely and appropriate antenatal care, that skilled health workers are available for safe deliveries, that mothers and newborns receive postnatal care to ensure their well-being, and that all children receive all necessary immunisations to prevent common childhood diseases [9].

Key aspects of service coverage include ensuring the availability of a wide range of health services within the health system, making these services physically and financially accessible to everyone, providing effective, safe, and high-quality

services to improve health outcomes, and encouraging and ensuring that people use the health services available to them [10, 11].

Essential services should encompass quality in all aspects of promotion, prevention, treatment, rehabilitation, and palliative care programmes. While there may not be a universal consensus on what constitutes quality health care services, they should be effective and safe, minimizing harm to individuals. They should also include a number of key elements: be person-centred, taking into account individual preferences, needs, and values in health care; be timely, reducing waiting times and avoiding harmful delays; be equitable, providing the same quality of care regardless of socio-demographic or socio-economic status; be integrated, ensuring coordinated care across different levels and providing, and offering a comprehensive range of health services using a life-course approach; and be efficient, maximising the benefits of available resources and minimising waste [12, 13]. Consequently, the quality of health care services should be evaluated and continuously improved, taking into account the needs and preferences of service users, including patients, families, and communities [14].

1.1.2 Population coverage

This dimension is defined as the proportion or segment of the population that has access to essential health care services, under either through public or private programmes supported by government institutions or through health insurance schemes. Key aspects of population coverage include ensuring inclusiveness by providing access to health services for all segments of the population, regardless of age, gender, income, or geographical location. It also includes making health services sufficiently available in all areas, especially in rural and underserved regions. It also emphasises the importance of utilisation, ensuring that people not only have theoretical access to health services but also actively use them when needed [15].

Strategies to improve population coverage under UHC include expanding health insurance schemes to cover more people, especially those in vulnerable and underserved populations. Strengthening primary health care is essential by investing in systems that ensure essential health services are available and accessible to all. Integrating and coordinating health services is essential to reduce gaps in coverage and improve continuity of care. In addition, community involvement in the planning and delivery of health services is essential to ensure that services meet local needs and are used effectively [16].

1.1.3 Financial protection

Financial protection is a critical component of UHC, aiming to ensure that individuals and families do not face financial hardship in accessing necessary health services. This includes mechanisms to reduce out-of-pocket (OOP) expenditure, such as health insurance schemes, government-funded health

services and subsidies for vulnerable populations. By preventing catastrophic health expenditure and impoverishment due to medical costs, financial protection under UHC ensures that all individuals can access essential health services without facing financial barriers, thereby promoting equitable and sustainable access to health care [17].

Several strategies can be used to prevent such expenditure. Health financing models for achieving UHC include general taxation, where governments finance health services through taxes; social health insurance, where workers and employers contribute to a managed fund; private health insurance, where individuals or employers purchase coverage from private companies; community-based health insurance, where resources are pooled within local communities; and mixed financing, which combines elements of these models. Each model has advantages and challenges, with a focus on equity, efficiency, sustainability, quality and universal coverage to ensure that all individuals can access necessary health services without financial hardship [17, 18, 19].

1.1.4 Assessing Universal Health Coverage

Measuring UHC involves assessing indicators related to service coverage, which assesses essential health services in different health areas, and equity of coverage across different population groups. It also includes monitoring financial risk protection, such as the incidence of catastrophic health expenditure, effective coverage to ensure that services meet health outcome targets, and accessibility and availability of services. Data for these assessments typically come from household surveys, health facility surveys, administrative records and global health databases, and help countries track progress, identify gaps and improve health service coverage and financial protection.

In practice, however, while these indicators adhere to international measurement standards, they often lack a direct link to the UHC components and offer limited disaggregation of socio-economic stratifiers such as wealth, location, ethnicity, education and gender, making global comparisons difficult [20, 21]. Monitoring progress towards UHC also needs to be integrated into routine health sector assessments, which will improve the availability and quality of data needed to track progress. For example, WHO has currently defined an index of health service coverage that includes several tracer indicators (mainly maternal and child services) to assess trends over time, but data from many countries are often aggregated and unavailable. As a result, the frequency and content of these surveys often do not meet the specific information needs of each country [22].

1.2 Contextualizing the thesis: The health system reforms

Health system reforms include changes in policy, legislation and restructuring of the organisation, delivery and management of health services. These reforms

aim to improve the provision, coverage and financing of health services, and to increase efficiency and coordination in order to improve health system performance, population health and public satisfaction [23].

Health system reforms ensure wider availability of medical care, implement new policies and financial strategies that affect how individuals obtain and pay for health insurance. These reforms affect structural public health plans, taxes, subsidies and other financing mechanisms [24, 25]. In particular, the implementation of health system reforms is embedded in a political process within a changing scenario and limited resources; which is generally complex, with resistance to change from various stakeholders and beneficiaries [26]. In addition, health system reforms traditionally focus not only on health care systems, but also include complementary changes in other sectors (such as the workforce, poverty levels, education and others) to impact on the social determinants of health in the population [27].

In addition, an implicit goal of the reforms is often to achieve equity in health for the most disadvantaged populations. With this focus, governments tend to use policy changes to improve primary care, introduce social insurance models, change hospital governance and payment systems, rather than leaving them to respond to market forces alone.

1.2.1 Approaches to assess health reforms

Typically, a systematic process for evaluating health system reforms involves collecting and analysing relevant data and information to determine whether the reforms have achieved their objectives and had a positive impact on the health system. In general, evaluation frameworks aim to answer questions about the impact of these health reforms.

These approaches tend to focus on identifying the objectives of the reform before starting the evaluation, such as improving access to care, reducing costs, improving quality of care and expanding health insurance coverage. At the same time, key indicators are identified to assess the impact. These indicators should be specific, measurable and relevant to the objectives of the reform in order to compare data before and after the implementation of the reform and to identify trends of significant changes over time. Examples include rates of access to care, insurance coverage rates, health care costs, quality indicators and patient satisfaction from demographic data, health statistics, financial data and patient satisfaction surveys [23].

Equity assessments are also part of the evaluation. They therefore help to answer questions about inequalities in access to health care and health outcomes. To complete the evaluation, demographic data and community opinion, combined with qualitative analysis from health care experts, academics and health care professionals, enhance the evaluation process. Finally, the

assessment should be reported transparently and made available to the public and decision-makers.

1.2.2 Health systems reforms in the context of Latin America and the Caribbean

In the LAC region, the implementation and impact of health systems reforms have been uneven. Although some countries have made significant progress in improving health outcomes and reducing health care inequalities, others continue to face challenges due to limited resources, infrastructure deficiencies, and unequal access to health services. Political instability, economic fluctuations, and external factors such as natural disasters and pandemics have also influenced the course of these reforms [28]. Achieving equitable and efficient access to, the provision and coverage of health services has been an ongoing challenge in the countries of the Region over the past decades. Attempts at reform have produced mixed results in different various health systems, ranging from fully public models to mixed public-private models [29, 30]. In this context, most reforms to achieve UHC have sought to improve access and increase financial protection, thereby addressing the poor performance of health systems in terms of responsiveness and adaptation to changing health care needs. A common theme in health system reforms across the region has been the move towards UHC, with priority given to strengthening primary health care as a cornerstone of health systems, focusing on prevention, health promotion and community participation [31]. While reforms have generally included improvements in coverage, quality of care and financial protection, they have often been implemented in the context of neoliberal structural adjustment programmes with negative consequences for health equity [32, 33]. A 2015 study by Wagstaff et al. found that no country in the region had achieved UHC, despite significant efforts to move towards it [34].

Brazil and Cuba, for example, have introduced tax-funded health care systems that are accessible to all. These changes were complemented by policies to address poverty and various social determinants of health, as well as efforts to improve access for marginalised groups. Mexico's comprehensive health reform in the early 2000s, known as Seguro Popular, aimed to extend health coverage to the uninsured population. While Seguro Popular significantly expanded access to health services, it faced challenges related to fragmentation, inefficiency and variations in service quality [35, 36]. In 2020, the country launched a new health system reform aimed at consolidating fragmented health institutions into a single national health system, improving coordination between different levels of care and strengthening primary health care services. Colombia has also introduced universal health insurance, which has significantly expanded coverage and access to health services to achieve UHC. However, it has faced challenges related to inequities in service delivery, financial sustainability and the quality of care provided by private providers

[37]. In recent years, Colombia has implemented additional reforms to address these challenges and improve the performance of its health system [38]. Finally, Chile has implemented reforms in recent years to address access and quality of care, including the creation of a Universal Access with Explicit Guarantees (AUGE) programme to ensure timely access to a defined set of health services [39].

These studies have identified several factors as enablers and barriers to effective reform. Among the enablers, adequate political will and social protection programmes that prioritise the most disadvantaged groups have been highlighted [40, 41]. On the other hand, permanent fragmentation and segmentation, with weak coordination and inefficiencies in service delivery, financial constraints, inadequate legal frameworks and bureaucratic resistance have been identified as obstacles to reform implementation [42, 43, 44, 45].

Against this background of experience, in 2007 the Ecuadorian government launched an ambitious plan to improve the quality of life and health status of the population, with a particular focus on the most disadvantaged social groups, through a radical public sector social and health reform.

1.3 Ecuador's experience towards Universal Health Coverage

1.3.1 The setting

Ecuador is an upper-middle income country in South America (Figure 2). Ecuador has an estimated population of 17,797,737 and is ethnically diverse (71% mestizo, 7% indigenous, and the rest white and Afro-Ecuadorian minorities). The country is heavily dependent on commodities, agricultural products such as bananas, flowers and shrimp, and non-renewable resources such as oil. The economy has been dollarised since 2000, which has brought some financial stability. However, like most countries in the region, income inequality and unemployment are high, although there has been some improvement over time; the Gini index was 52.3 in 2006, compared with 46.5 in 2015.

Figure 2. Map of South America with Ecuador pointed by the arrow.
Source: Pinterest. Ar.pinterest.com [46].

Ecuador is divided regionally into the Coast, Andes, Amazon and Galapagos regions. The public administration is currently organised into 24 provinces with numerous cantons and parishes, which are the smaller administrative structures.

1.3.2 The Ecuadorian health system before the reforms

Structure and organisation
Ecuador's health system was rigidly structured into public and private sectors, with a Ministry of Health organised into national and provincial administrative levels [47]. The public health sector provided direct public services to the uninsured population and faced many challenges, including corruption, administrative instability and low investment in health by the central government. At the same time, the system was highly fragmented and segmented, with different benefits and quality of health services in public sector facilities. The private sector operated separately from the public system, serving different segments of the population with the ability to pay. The public sector included the Ministry of Health and the social security systems of formal employees, volunteers, pensioners, police and military personnel, which provided services to their members through their own health facilities, while the private sector was structured and supported by private clinics and hospitals working with private health insurance companies [48].

Population and service coverage
The Ministry of Health mainly served the uninsured population (60% of the total). Social health insurance schemes, such as the Ecuadorian Social Security Institute (IESS), covered their members and, with some exceptions, close

relatives; this coverage represented almost 30% of the total population. The public sector focused mainly on the provision of health services, usually focused on maternal and childcare. Specialised services were concentrated in urban hospitals in the country's main cities. Health facilities were unevenly and sparsely distributed, with poor coverage in the country's regions and provinces, leading to major problems of access and availability, particularly in remote areas.

Health financing and financial protection

The health financing system was mixed, as it included public funds from fiscal sources to finance MoPH health services and social security funds from user contributions, such as ESSI for civil servants, voluntary contributions and pensioners. Other social security schemes were also included, such as social security for farmers, social security for members of the army and social security for members of the police [49]. Much of the investment in health in the public sector also came from international cooperation or from international credit investment sources with cooperation partners or multinational financial services aimed at modernising and expanding health services. Private health services were financed by private insurance and out-of-pocket spending by users with the ability to pay. In 2004, health expenditure as a percentage of GDP was about 5.7%, with half of the expenditure coming from the public sector. Prior to the reforms, there were some efforts and attempts to establish universal health coverage, but these were not sustained due to the political and institutional instability of the MoPH. Prior to 2006, with the exception of maternal and child health programmes, the rest of the MoPH's health services were free of charge, paid for according to patients' ability to pay, and these funds were collected to self-finance the needs of the health facilities themselves. The social security health services operated under the pre-payment model, with discounts on the payment role of their monthly earnings through the employer.

Governance

The MoPH, as the governing health body, was responsible for health management in the provision of health services to the majority of the population, as well as for the health regulation of health agencies and the supervision of the functioning of all institutions of the national health system. Despite decentralisation efforts, difficulties remained in the standardisation and regulation of health services, particularly in the private sector. The MoPH's role included evaluating the performance of the health system, with serious problems in the ordering and distribution of the services of other public and private actors, resulting in the concentration of the most important and best health facilities and professionals in the large cities. In terms of management, each province (n=22) had a provincial health office with several small districts that managed financial resources to provide preventive and curative health services [50]. Figure 3 summarises the chronology of the reform process.

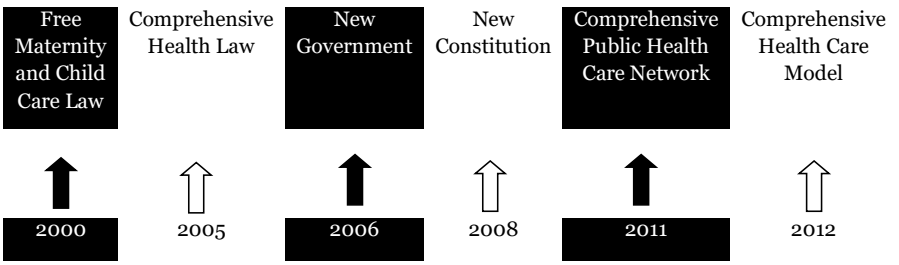

Figure 3. Timeline of the milestones in the health system reform process

1.3.3 The Ecuadorian health system reform

Planning the reform

During the administration of President Correa (2007-2017), a proposal was launched to transform the health system to provide universal, free and quality access. This strategy entailed the implementation of the MoPH's free health services and the declaration of a state of emergency to improve infrastructure, equipment, medicines and health personnel throughout the health system. Thus, in 2008, the MoPH developed a proposal to improve and strengthen the health sector, entitled 'Transformation of the Ecuadorian Health System', which included better integration between the actors and sectors involved in the provision of health services. The main strategies of this proposal included strengthening various components of the national health system, in particular strengthening the MoPH as the national health authority, improving the governance of the national health system, implementing a comprehensive care model with a network of public health services, increasing the financing of the system, strengthening the capacity for monitoring, control and epidemiological surveillance, innovating in the management of health information and promoting greater citizen and social participation. This proposal was supported by the government when the new constitution was reformed and approved. In addition, this proposal was in line with a new management model proposed for the MoPH by the National Planning Secretariat, which aimed to increase the capacity for administrative deconcentration and improve the efficiency of public services [47, 50].

Political context

The first step in the reform was a comprehensive amendment to the national constitution aimed at improving the quality of life of all citizens [51]. Thus, the new Constitution of 2008 reaffirmed the right to health as an axis of human development and a common good of society, contributing to poverty eradication, sustainable development and equitable distribution of resources. With regard to public health, the Constitution states:

> *Health is a right guaranteed by the State, the realization of which is linked to the exercise of other rights, including the right to water, food, education, physical culture, work, social security, healthy environments, and others that support good living (Article 32).*

In addition, several articles have been included to strengthen the exercise of the right to health in terms of access and financing, as well as the implementation of free health services.

> *Health care as a public service will be provided by the state, community services, and private entities. Health services will be safe, high-quality, and patient-friendly. State public healthcare services will be universal and accessible at all levels of care, encompassing diagnosis, treatment, medication, and rehabilitation needs (Article 362).*

Mechanisms of complementarity and integration between the public and private sectors for the improvement of continuity of care were also on the reform.

> *The system, through its constituent institutions, will ensure that health promotion, prevention, and comprehensive family and community care are based on primary health care and integrated across different levels of attention. The comprehensive public health network will be part of the national health system. It will consist of a coordinated group of state establishments, social security entities, and other state-affiliated providers, functioning with legal, operational, and complementary coordination. (Article 360).*

Finally, in terms of governance, the Constitution stated:

> *The State will exercise stewardship of the system through the national health authority, which will be responsible for formulating national health policy. It will standardize, regulate, and control all health-related activities, as well as oversee the functioning of entities within the sector. (Article 361).*

Structure and organization

Following the constitutional mandate, the MoPH launched the Integrated Public Health Network (RPIS - Red Pública Integral de Salud, in Spanish) in 2011 to ensure continuity of care with a coherent and coordinated delivery of health services, ensuring seamless transitions between different health care providers, settings and the three levels of care. It also implied an adequate flow of information, communication and collaboration between health professionals to ensure that patients' needs were effectively met. Although the public and private sectors remained in a kind of mixed health system over time, this network gradually reduced fragmentation by facilitating the movement of users between the different public health services, social insurance schemes and the private sector.

In addition, the government implemented a new territorial administrative reorganisation based on the deconcentration of nine sub-national zones (Coordinaciones Zonales in Spanish), which included several health districts. The new decentralised territorial organisation introduced nine zonal coordinations with 140 districts and 1134 circuits in the country, replacing the health offices in each province. The aim of this administrative reorganisation was to increase efficiency and bring public services closer to the population. The increase in financial resources in the health sector made it possible to ensure the necessary inputs to fulfil the national and zonal strategic plans and to implement the set of services financed by fiscal and international cooperation funds, mainly in infrastructure and equipment [52].

Population and service coverage

In 2012, the Model of Integrated Family, Community and Intercultural Health Care (MAIS-FCI - Modelo de Atención Integral de Salud con enfoque Familiar, Comunitario e Intercultural, in Spanish) was implemented [53]. In terms of organisation, the model included leadership, strategic planning and decision-making processes within the health sector. Several strategies were outlined to improve the management of the health system at different levels (national, zone and district). A significant increase in the budget of the MoPH enabled investment to be made mainly in drugs, consumables, ambulances, hospital equipment, specialised mobile units and human resources. The organisation of health services expanded their coverage by moving health facilities at different levels from urban areas to rural communities to ensure problem-solving capacity and continuity. The first level of care was established as the gateway to the health system, with the aim of progressively addressing 80% of the population's health needs. The MoPH also designed a new referral-counter-referral system to ensure access to more complex units and services.

The model prioritised the promotion and prevention of health problems and guaranteed free access to all health services. It established basic health teams to meet the diverse needs of the population, adopting the WHO's holistic definition of health and the updated strategy of primary health care, originally recognised in the Alma Ata Declaration of 1978. It also incorporated the principles of social medicine, addressing the social determinants of health and inequalities in access to services [53]. The updated model emphasised the needs and demands of diverse populations based on ethnicity, gender, stage of life and cultural background, and included and established specific technical guidelines for an intercultural approach, such as standards for alternative therapies, guidelines for culturally adapted obstetric care, standards for the protection of the health of indigenous peoples, and a nutrition guide for indigenous nationalities and peoples.

As part of the model implementation, integrated health care teams (EAIS – Equipos de Atención Integral de Salud, in Spanish) were created. The health teams, consisting of a doctor, a nurse and a primary health care technician (TAPS – Técnicos de Atención Primaria en Salud, in Spanish), provided support in health centres and home visits on a monthly basis. As a result, outpatient consultations at primary care and hospital level increased significantly each year between 2006 and 2016 [54, 55].

In addition, the reforms also affected the other subsystems of the social security and health systems by increasing the number of affiliations during this period. For example, the Ecuadorian Social Security Institute (IESS - Instituto Ecuatoriano de Seguridad Social, in Spanish) increased the number of beneficiaries from 2.7 million in 2007 (with a coverage of 20% of the total population) to 5.8 million in 2017 (with a coverage of 30% of the total population). This expansion improved coverage of users and their immediate family members, including their partners or cohabitants and children under the age of 18.

Financing and financial protection

Government investment in health was progressive. The health budget increased from $615 million in 2007 to $2,627 million in 2016. In addition, as mandated by the Constitution, all health services provided by the MoPH were free of charge, meaning that medicines, vaccines, procedures, medical supplies, hospitalisation and assistive devices were progressively made available free of charge to the uninsured population without differentiated restrictions. In 2011, investment in health reached USD 216 per capita, equivalent to 6.5% of GDP. In 2017, final health expenditure was 7.4% of GDP, with a cumulative increase of 2.8 percentage points during this reform period [56]. At the sub-national level, deconcentrated administrative areas were given programmatic, administrative and budgetary autonomy to implement the new model, which allowed them to hire new health professionals, increase the purchase of medicines and improve the infrastructure of health facilities at all levels of care [54].

Governance

The MoPH also undertook a major organisational restructuring, creating two new vice-ministries and zonal and district coordinating offices. Clear functions were established for each of the new structures, so that at the central level one vice-ministry focuses on governance and the other on integrated health care. Several regulatory bodies attached to the MoPH were established to monitor compliance with health policies and internal standards, and to ensure compliance with legal and regulatory requirements in all institutions providing health services or marketing products for human consumption. The new regulations also improved the quality of health services in the national health system. Improved patient safety standards were defined and implemented on a mandatory basis in all health facilities [57]. The CPHN led to a closer

relationship with other health care stakeholders and reduced the segmentation of the system, promoting greater integration between subsystems. The MoPH established a framework agreement between several private providers and public system institutions to meet the health care needs of the population, and implemented the National Health Tariff to purchase and pay for health care among providers in a fee-for-service model.

1.4 Rationale

In general, the literature on the impact of health or health system reforms on health equity is limited. In the context of LAC, reforms implemented over several decades have faced various challenges related to financing, political instability, fragmentation, integration and institutional capacity, among others, which have contributed to different outcomes in terms of efficiency and coverage. However, with the introduction of UHC, reforms have mainly aimed at reducing inequalities in access to health care. However, empirical research has shown that socio-economic inequalities continue to influence health outcomes and the use of health services, making the analysis of specific health policies to address the needs of vulnerable groups and improve equity a perennial challenge in the evaluation of health system performance [58, 59].

In Ecuador, previous studies have mainly focused on assessing the impact of the 1990-2010 reform, a scenario that marked the country's transition from severe public budget cuts to the introduction of universal insurance, with limited coverage for certain groups, and later the outsourcing of services to private providers. Despite these efforts, the national health system remained fragmented, with weak integration of services between the MoPH and social security systems [47, 50]. Since the new health reforms, positive results in health coverage and improvements in sensitive health indicators have projected Ecuador as an effective and successful model for achieving UHC. For example, in 2017, the Pan American Journal of Public Health dedicated a special issue to the Ecuadorian health reform, highlighting the achievements and challenges of the Ecuadorian health system towards UHC. This publication highlighted the successes of the reform in terms of access and coverage, with significant funding for the health sector. It also highlighted the innovative reorientation of the health care model and the implementation of the public health network [54]. However, this publication lacked in-depth analysis of several areas, such as quality, access and efficiency of health services, as well as social participation and socio-economic inequalities in health care. It was also subject to potential publication bias, as all authors were affiliated with MoPH and PAHO [60].

Independent research on the recent health reform in Ecuador has been mainly descriptive, focusing on health inequalities and highlighting achievements such as improved access to health services for disadvantaged groups in terms of income and accessibility. Some studies have highlighted geographical

inequalities in the distribution of health services, mainly with a higher concentration of services in urban areas and an unequal distribution of health professionals [61]. Sanhueza's 2017 study highlighted that national averages of health coverage can be misleading, often masking differences between social subgroups at the local level. The results of this study also showed that higher maternal mortality was significantly associated with certain socio-economic indicators, leading to notable inequalities in maternal health [62]. In 2019, a study by Granda et al. showed that health inequalities in Ecuador decreased after reforms to the public health system [63]. The pro-rich balance in the use of curative visits decreased significantly, and the use of public facilities for medical visits showed a moderate reduction in socio-economic inequality, with higher use across all socio-economic groups. Finally, in 2021, the study by Ríos et al. found a significant reduction in inequalities in the coverage of maternal and child health interventions, coinciding with greater political stability, better redistributive policies and increased social spending on health, which contributed to improved outcomes, in contrast to the neoliberal reforms implemented previously [64]. However, in the same study, territorial heterogeneity led to significant inequalities, particularly in the provision of basic health services.

However, the current literature lacks a deeper understanding of the impact of the reform and UHC on its different components and, in particular, on socio-economic inequalities in health care, which is one of the objectives of the UHC strategy. In addition, none of the studies cited has examined the main challenges faced during implementation or the factors that facilitated better outcomes, which are the objectives of this research.

Chapter Two: Aims, objectives and conceptual framework

2.1 Aims

The overall aims of this thesis were i) to assess whether the recent reform of the Ecuadorian health system has contributed to reducing socio-economic inequalities in health care and financial protection, and ii) to identify the main facilitators and obstacles to the implementation of the reform.

To achieve this goal, four specific objectives were planned:

- **Aim 1 (Sub-study 1):** To assess the socio-economic inequalities in refraining to seek health care services before and during the reform.
- **Aim 2 (Sub-study 2):** To assess the socio-economic inequalities in women's access to health care before and during the reform.
- **Aim 3 (Sub-study 3):** To assess financial protection and socio-economic inequalities in household catastrophic health expenditure before and during the reform.
- **Aim 4 (Sub-study 4):** To explore the perceptions of key national stakeholders regarding the challenges faced in implementing the reform.

2.2 Conceptual framework

The framework used in this paper (Figure 4) was adapted during the research process from the WHO UHC and SDG Monitoring Report, as well as several publications on monitoring and progress towards UHC [65, 66]. UHC monitoring includes population health monitoring and system performance in assessing the components of UHC: population coverage, service coverage and financial protection. The first three (quantitative) sub-studies address the three components of the UHC cube by assessing specific health and financial indicators. For example, Sub-study 1 analysed information on non-use of health services among adult men and women to assess socio-economic inequalities in access and coverage in the general population. To assess the coverage of services needed and used by the population, several preventive and treatment indicators related to women's health were included according to different socio-economic indicators. Financial protection to avoid economic hardship in the use of health services was assessed through out-of-pocket payments and CHE incurred by households according to different socio-economic positions. Finally, the final sub-study examined the challenges of implementing the reform by interviewing key stakeholders at the national level to understand the findings of the previous three sub-studies (represented in the figure by the area under the red circle).

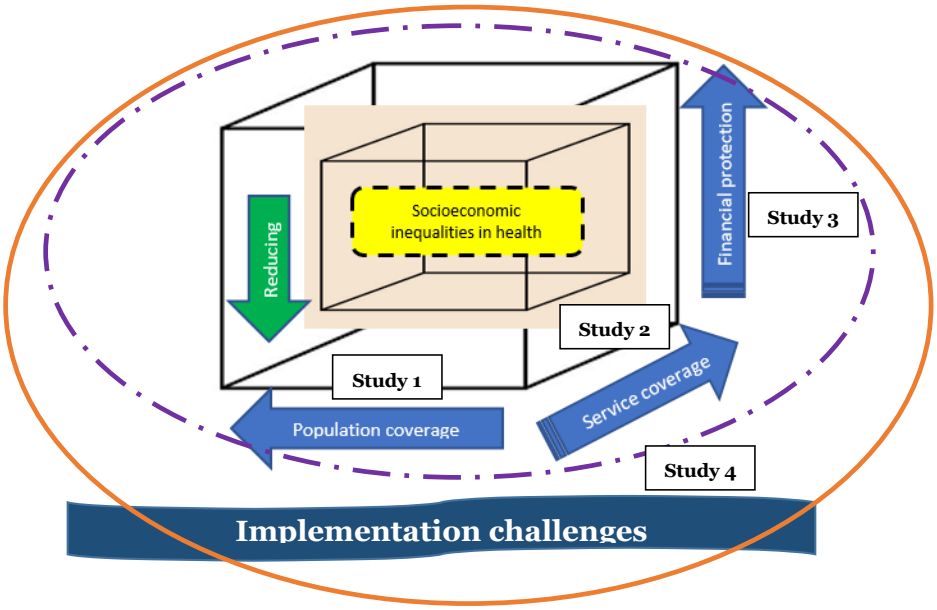

Figure 4. The UHC framework including the sub-studies of this thesis

Moreover, by implicitly recognising that progress towards UHC also reduces socio-economic inequalities in health and health care, this research adds value beyond the analysis of UHC components in terms of coverage (Figure 4). For example, while the UHC monitoring framework considers only the proportional value of improvements in health indicators, the monitoring of social inequalities in health incorporates information and outcomes by each of the social strata, or equity strata, represented in this paper by place of residence, ethnicity, wealth, education, occupation and gender (see yellow box within the cube in Figure 4).

2.3 Socio-economic inequalities in health/health care and health equity

Socio-economic inequalities in health/health care

Socio-economic inequalities in health are systematic differences in health outcomes between different socio-economic groups, influenced by factors such as income, education, occupation and social status [67]. These inequalities are influenced by the social determinants of health, which include the conditions in which people are born, grow, live, work and age, as well as access to health care, individual or collective behaviours, psychosocial stressors and educational attainment [68]. More disadvantaged socio-economic groups often face greater difficulties, such as living in inadequate housing, financial instability due to lack of full employment, and higher levels of stress, which together contribute to adverse health outcomes. Differences in access to health services are an important component of health inequalities. Factors such as the availability,

affordability and quality of health services can vary widely between socio-economic groups [69].

Health equity

Health equity refers to the attainment of the highest standard of health for all people, achieved by ensuring that everyone has a fair and equal opportunity to be as healthy as possible. This concept emphasises the elimination of health inequalities that are systematically associated with social disadvantage or marginalisation. Health equity involves addressing the social determinants of health, such as socio-economic status, education, neighbourhood and physical environment, employment and social support networks, which have a significant impact on health outcomes [70, 71].

Efforts to achieve health equity are essential to improve the overall health of the population and to ensure that all people, regardless of their social or economic background, have the opportunity to live healthy lives. Providing equitable access to health care, promoting health literacy, reducing barriers to healthy behaviours, and implementing policies that address the underlying social and economic determinants of health are key to achieving equity. It also requires recognising and addressing the root causes of health inequalities, such as discrimination, poverty and lack of access to resources, and involving communities in developing solutions that promote health for all [72].

Chapter Three: Methods

3.1 Study timeframe

This paper analyses the period between 2007 and 2017, when the health reforms were implemented. The data examined in 2006 was considered the pre-reform period, while the 2014 information was considered the reform period. The main milestones of the reform period are shown in Figure 5. It highlights the new constitution, the CPHN and the renewed comprehensive health care model. Sub-studies 1, 2 and 3 used population information from the two points mentioned (before and during the reform), while Sub-study 4 was conducted in 2023 as a review and reflection of the reform period.

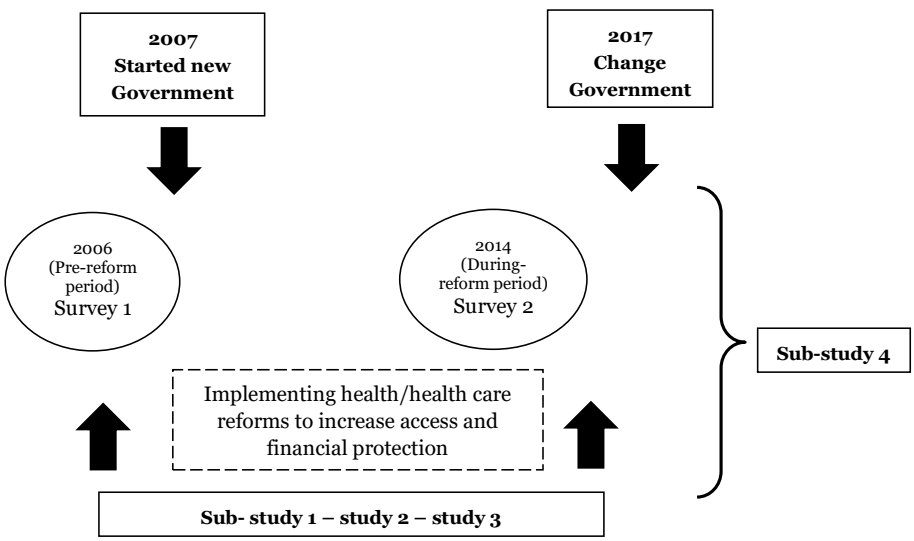

Figure 5. Sub-studies time frame during the health system reform period

3.2 Research process

In the following section, I will first present the quantitative studies with their study design, data source, sampling, data management, operationalisation of variables and data analysis; followed by the qualitative study with its design, data collection and analysis.

3.3 The quantitative studies

3.3.1 Study design

The first three sub-studies were cross-sectional observational studies using data from 2006 (before the reform) and 2014 (during the reform). This type of

design is typically used in population-based surveys that aim to assess the prevalence of specific outcome(s) or exposure(s).

3.3.2 Data source

All quantitative sub-studies used secondary data from the Living Standards Measurement Surveys conducted by the National Institute of Statistics and Census (INEC - Instituto Ecuatoriano de Estadisticas y Censo, in Spanish) on the general population in 2006 (before the reform) and 2014 (during the reform) [73, 74]. The surveys collected information at the individual and household levels on health, education, economic activity and expenditure. The size of the population and the socio-economic characteristics of the participants in each period varied for each survey. In terms of technical guidelines, the NISC followed international recommendations for the conduct of population-based surveys and household censuses [75]. For Sub-study 1, the total population was 14,639 men and 15,815 women in 2006, and 30,115 men and 32,369 women in 2014. For Sub-study 2, the total population of women of childbearing age analysed was 13,781 in 2006 and 26,767 in 2014. Finally, in Sub-study 3 a total of 12,100 households were analysed in 2006 and 21,523 in 2014.

3.3.3 Sample design

The surveys selected for this research provided information on the population at national level by period. For Sub-study 1, the entire adult population (over 20 years of age) was included, while for Sub-study 2 the sample focused on women of reproductive age (15-45 years). For Sub-study 3, information at the household level was used due to the lack of information for each individual. The sampling design is shown in Figure 6. At each wave, sampling was multi-stage, stratified and proportional to population size. Households were randomly selected from a complete and updated list of occupied households, with each household having the same probability of selection. The population was stratified by region and by rural or urban residence. The units initially sampled, consisting of clustered census sectors, were referred to as primary sampling units (PSUs), while households were referred to as secondary sampling units (SSUs) [74].

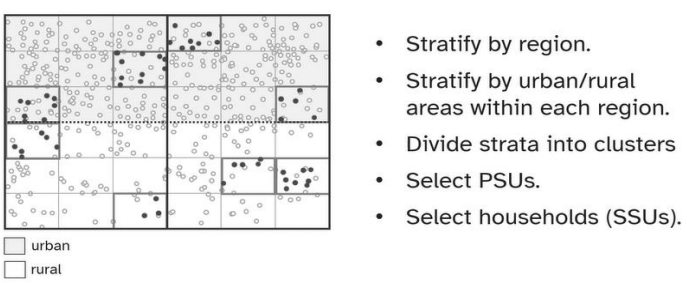

Figure 6. Stratified two-stage clustering sample in each survey wave
Source: Inequality analysis using Stata: Disaggregated data from surveys Course. OpenWHO [76].

3.3.4 Data collection

The data were collected between November 2005 and October 2006 (before the reform survey) and between November 2013 and October 2014 (during the reform survey) by trained enumerators distributed throughout the country, recruited and supervised by the NISC technical team. The questionnaires were administered by duly trained enumerators of local preference. The interviews were conducted in Spanish. During this period, as many household visits as necessary were made to obtain information from family members. In Sub-studies 1 and 2, information was provided by each individual, while in Sub-study 3, information was provided by the person with the greatest knowledge of the household situation. In general, the proportion of missing data and non-response was less than 1% or non-existent for the variables collected. Therefore, no specific action was taken to deal with missing data.

3.3.5 Data management

The dataset for each survey in the period analysed is publicly available and was downloaded in dta format for use in the Stata statistical package programme [73, 74]. In all studies, the population sample was weighted according to the recommendations for the analysis of population survey data (WHO manual). Similarly, 95% confidence intervals were calculated for statistical inference, and all analyses were performed using Stata 15.1.

3.3.6 Operationalization of variables

The table 1 describes the socio-economic and outcome variables for sub-studies.

Table 1. The socio-economic and outcome variables

	Sub-study 1	**Sub-study 2**	**Sub-study 3**
Socio-economic variables	Residence, ethnicity, education and wealth	Residence, ethnicity, education, occupation and wealth	Region, residence health insurance and wealth
Outcome	Unmet Health Care Needs – (Refraining)	Skilled Birth Attendance (SBA) Cervical Cancer Screening (CCS) Modern Contraceptive Use (MCU)	Catastrophic Health Expenditures (CHE)
Analysis	Descriptive statistics	Descriptive statistics	Descriptive statistics
	Regression Slope Index of Inequality (SII) Relative Index of Inequality (RII)	Regression Slope Index of Inequality (SII)	Regression Relative risk

Socio-economic variables

Variables were selected on the basis of their relevance and availability. Inequality results were based on socio-economic variables such as gender, education, ethnicity, wealth, residence, employment and region.

The sex/gender variable included males and females for Sub-study 1. The level of education in sub-studies 1 and 2 was categorised as incomplete primary education (including the categories illiterate, literate but no formal education and initial education), primary, secondary (middle secondary and technical) and higher education (undergraduate and graduate), the latter being chosen as the reference for the gap analysis. The ethnicity used in sub-studies 1 and 2 was based on each individual's self-identification. Figure 7 shows the ethnic distribution and proportion across the country. Non-indigenous groups were used as the reference group in the analysis, and were grouped together to include whites, mestizos, Afro-Ecuadorians and others for comparison with those who self-identified as indigenous. This decision was based on the fact that indigenous groups have historically been less favoured by public social and health programmes [77].

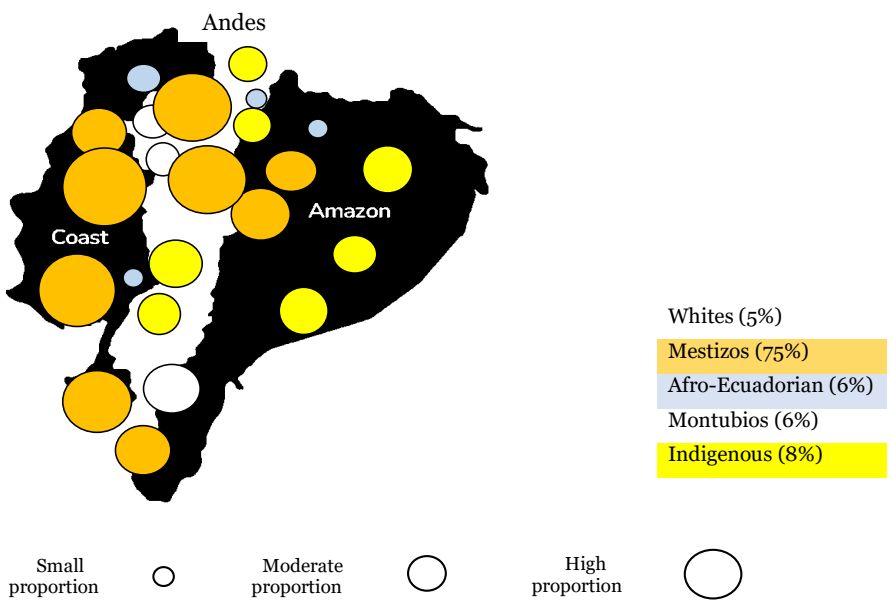

Figure 7. Map of regions and ethnicity distribution in Ecuador (created by the author). Source: National Institute of Statistics and Census. National Census 2022.

For the wealth variable used in all the quantitative studies, a wealth index was constructed from household items. This index was constructed using Principal Component Analysis (PCA), a method that allows the dimensionality of large datasets to be reduced by transforming a large set of variables into a smaller set that contains most of the information in the large set [78]. In this research, the index was based on 15 household characteristics and assets reported in the surveys, such as type of household entrance, roof, wall and floor material, materials used in house construction, cooking facility, cooking fuel, toilet, water source, lighting source, fixed telephone, home internet, satellite TV and household waste disposal. The PCA was performed separately for 2006 and 2014 and the index was divided into quintiles, with the first quintile being the richest and the reference quintile for the analysis.

The residence variable was divided into rural and urban, with the rural area being considered as the place with less than 5,000 inhabitants according to the census and used in the three sub-studies, and the urban area being considered as the reference area for the analysis. In Sub-study 3, the geographical variable region was divided into three regions (Andean, coastal and Amazonian), with the Andean region being taken as the reference, since this is where the country's most developed cities are concentrated. Health insurance status was used as a proxy for social protection; the household was defined as insured if at least one member had private or public health insurance. The occupational class used in Sub-study 1 was considered on the basis of five categories according to the current International Occupational Classification: managers, administrative workers, farmers, plant and machine operators and elementary occupations; managers were the reference group for the analysis [79].

Population and service coverage outcomes

To assess the three components of UHC, several indicators were selected that were available and recommended for monitoring progress over time [20, 34].

In Sub-study 1, population access to health care services was assessed using the indicator of unmet health care needs (UHCN), referred to in this paper as abstinence, which is defined as the failure to seek health care services despite an individual's health needs [80]. Self-reported abstinence is widely used as an indicator of access to health care, and this was captured by several survey questions. First, participants were asked: "Have you had any illness or injury in the last month?". Those who responded positively were asked: "Did you visit a doctor, nurse or traditional healer for this illness or injury? Those who answered negatively were classified as abstainers, unless the reason for abstaining was that the illness or injury was minor.

In Sub-study 2, three indicators related to women's sexual and reproductive health were included to assess service coverage in access and use of services.

Skilled birth attendance (SBA) was based on the question 'Who attended your most recent birth? Responses in which a recognised health professional, such as a doctor, gynaecologist, nurse or midwife, was involved in the delivery were considered to be SBA. Traditional birth attendants, whether trained or not, were excluded. The second indicator was cervical cancer screening (CCS), where women were asked if they had ever had a Pap smear. The third indicator, satisfaction with family planning, was assessed by preference for a modern method of contraception, with the question 'Do you use any method of contraception?' being answered with a yes or no answer. Those who answered yes were asked if they had ever had a smear test. Those who answered yes were then asked, "What methods do you use to avoid becoming pregnant? Respondents who said they used a female sterilisation (tubal ligation), implant, contraceptive injection, contraceptive pill, any intrauterine device or condom (female or male) were classified as modern contraceptive users (MCUs), while those who said they used another method or a natural method were classified as non-modern users.

Financial protection outcome

In Sub-study 3, CHE was selected as the financial outcome. This variable was constructed using the out-of-pocket health expenditure (OOPhe) of household members in the last three months for visiting or using a general health service or for childbirth. OOPhe included physician fees, medicines, hospitalisation, laboratory, diagnostic and imaging services, and alternative/traditional medicine costs. Indirect costs such as time, transport, parenteral/enteral nutrition and health insurance premiums were excluded [81]. Following the methodology proposed by WHO, households with OOP health expenditure equal to or greater than 40% of their ability to pay (ATP) were considered at risk of CHE [82, 83]. The main reason for choosing a threshold of 40% was that it had been used previously in other studies in Latin America and the Caribbean, including in Ecuador, allowing comparisons to be made [84, 85].

The CTP was calculated on the basis of household non-food expenditure during a given period and included four types of expenditure: 1) those related to fuels and energy sources in the last week; 2) those related to household and personal care products, entertainment, culture, membership fees and household services in the last month; 3) those related to clothing and footwear in the last three months; and 4) those related to appliances, furniture, recreation, sports goods, jewellery, vehicles, transport, professional services, prepaid fees, taxes and transfers to relatives in the last year.

3.3.7 Data analysis

In Sub-study 1, prevalence was first calculated to characterise the population separately by sex and year. Refraining was then analysed as a function of socio-economic variables by sex and year. Absolute and relative socio-economic

inequalities in health care were estimated using the slope index of inequality (SII) and the relative index of inequality (RII), respectively. The most advantaged group was used as reference. Ridit scores, which reflect the distribution of the population according to socio-economic indicators, were used to estimate the SII and RII for men and women separately, adjusted for age, in 2006 and 2014. An SII of 0 and an RII of 1 indicate no inequalities. Values of SII greater than 0 and RII greater than 1 indicate higher refrain among socially disadvantaged groups.

In Sub-study 2, population characteristics were summarised using descriptive statistics in 2006 and 2014. Absolute differences and SII were calculated as absolute measures of health inequality for each socio-economic variable and time period. For Sub-study 3, the proportion of households with monthly OOPhe was first calculated in 2006 (pre-reform) and 2014 (during the reform). All expenditures were measured in US dollars, the current currency in Ecuador. For CHE, the average monthly expenditure was calculated and divided by the CTP. A dummy variable was created where 1 indicates households with CHE (CHE=1 if OOPhe/ CTPh ≥ 0.4) and 0 indicates households without CHE (CHE=0 if OOPhe/ CTPh < 0.4). In addition, I calculated the CHE at a threshold of 20%. Log-binomial regression analyses were then performed to assess the relative risk (RR) of CHE for each socio-economic variable in 2006 and 2014. First, a crude model (model 1) was estimated and then a multivariable model (model 2) was estimated, including the statistically significant variables from model 1.

To assess changes in inequalities between 2006 and 2014, the two national surveys were merged and a multiplicative interaction term between ridit and time was used in all three sub-studies [86, 87].

3.4 The qualitative study

3.4.1 Study design and data collection

Sub-study 4 collected the perceptions of key health stakeholders on the facilitators and obstacles to the implementation of the reform. This study was conducted in the capital city of Quito between August 2022 and June 2023. Thirteen national health stakeholders were purposively selected for their expertise in public health and their involvement in the design and implementation of the reform. Initial contact was made by email or telephone, resulting in 11 participants agreeing to be interviewed, seven women and four men. The participants were aged between 40 and 65 years and had many years of experience in public health and health system management. The interviews were conducted face-to-face and online (via Zoom) in Spanish, the official language of Ecuador, and lasted between 40 and 60 minutes. Participants received no compensation for their time.

Prior to the interviews, a brief overview of the health reform process and relevant studies on its impact on health inequalities was provided to establish a context for the analysis. The interviews followed a structured guide with open-ended questions on the challenges of reform implementation, focusing on issues such as coordination mechanisms, community participation, organisational structure (planning, human resources, financing), quality of health services and social impact. Field notes and non-verbal observations were made during the interviews. The interview guide was developed, and I pilot-tested the interviews to clarify and refine the questions (see interview guide in Appendices). Given the results of the quantitative studies, the interview guide was geared towards understanding possible factors related to the application process rather than the components of UHC. The interviews were digitally recorded and transcribed verbatim.

3.4.2 Data analysis

Reflective thematic analysis using inductive and latent methods was used to extract key themes from the raw data [88]. Coding was carried out manually based on the data collected, involving the interpretation of paragraphs, marginal notes and highlighted excerpts from individual interviews. Once the codes were generated, they were organised into initial themes based on their meaning, significance, thematic relationships and relevance to the research question. The research group then reviewed and discussed these preliminary themes to finalise the themes. Throughout the process of writing the manuscript, all authors participated in the interpretation of the findings.

3.5 Ethical considerations

No ethical approval or consent to participate was required for the quantitative studies. However, the statistical data obtained from the surveys complied with accepted standards of practice and legal restrictions designed to protect the confidentiality of respondents, in accordance with Art. 21 of the Ecuadorian Statistics Law. In each wave, the confidentiality of respondent data was enforced through a combination of anonymisation, restricted access, legal protection, computer security and controlled disclosure of individual and household records. For Sub-study 4, the ethical application was approved by the Ethics Committee of the University of San Francisco de Quito (CEISH-USFQ code: 2022-058TPG). Prior to the interview, all participants were informed of the purpose and content of the study and of their right to withdraw from the interview at any time; they were also asked to give written consent to participate and to be recorded.

Ethical approval was not required for this research in Sweden for the following reasons. Sub-studies 1-3 used publicly available anonymised data. In Sub-study 4, interviews were conducted, but no sensitive personal data were collected or processed.

Chapter Four: Results

In this section, a summary of the main results for each quantitative study (Sub-studies 1, 2, and 3) and the qualitative study (Sub-study 4) are displayed.

4.1 Quantitative studies

Table 2 describes the main socio-economic characteristic population for each study.

Table 2. The socio-economic characteristics of the population

Variables	Sub-study 1 (Men/Women)		Sub-study 2 (Women)		Sub-study 3 (Households)	
	2006	2014	2006	2014	2006	2014
Residence						
Urban*	9888/11084	21537/23691	9355	18888	7424	12167
Rural	4751/4731	8578/8678	4426	7879	4676	9356
Region						
Andes*	-	-	-	-	6376	1054
Coast	-	-	-	-	4859	7749
Amazon	-	-	-	-	865	2701
Ethnicity						
Non-indigenous*	13612/14767	28053/30142	12869	24863	-	-
Indigenous	1027/1048	2062/2227	912	1904	-	-
Education						
Higher*	2931/3124	6439/7033	2959	5596	-	-
Secondary	4622/4876	10710/11164	5560	11995	-	-
Primary	6193/6272	10867/11075	4392	6200	-	-
Incomplete	892/1542	2098/3096	870	2976	-	-
Occupation						
Managers*	-	-	763	2730	-	-
Clerical workers	-	-	2699	6085	-	-
Farmers	-	-	198	1677	-	-
Plants and operators	-	-	671	1392	-	-
Elementary	-	-	1136	4646	-	-
Wealth index						
Q1*	3525/4216	9168/10448	2971	8325	2524	4859
Q2	3241/3707	6815/7672	2950	6170	2459	4486
Q3	2917/3145	5632/5938	2958	5221	2432	4302
Q4	2422/2478	4176/4500	2485	3945	2312	4035
Q5 (poorest)	2254/2161	3726/3633	2334	2974	2144	3430

Health insurance						
Private	-	-	-	-	542	724
Social security	-	-	-	-	3097	6989
Uninsured	-	-	-	-	9942	13810

*Reference group

4.1.1 Socio-economic inequalities in health care access (*population coverage*)

Population coverage prevalence

In 2006, 27% of participants reported not seeking health care despite a perceived need, with a higher proportion of women (28.95%) than men (24.33%). By 2014, this prevalence had decreased to 17.3% and 19.3% for men and women respectively. Reductions in prevalence were also observed in all socio-economic groups, and the differences between time periods were statistically significant (Table 3).

Table 3. Socio-economic prevalence of refraining among adult men and women 2006 and 2014

	Men		Women	
Socio-economic variables	**2006**	**2014**	**2006**	**2014**
Total *	24.33	17.32	28.95	19.25
Residence*				
Urban	21.95	16.34	26.61	18.67
Rural	29.29	19.76	34.41	20.85
Ethnicity*				
Mestizos/afro/white	23.80	22.78	28.22	19.09
Indigenous	31.33	24.06	39.23	21.46
Education *				
Higher (highest)	14.25	11.92	18.21	13.46
Secondary	21.13	15.06	24.94	16.93
Primary	29.49	21.46	33.78	23.83
Incomplete primary (lowest)	38.22	23.91	43.68	24.38
Household wealth*				
1st quintile (highest)	15.72	12.57	19.09	15.08
2nd quintile	22.05	15.42	27.07	20.14
3rd quintile	26.90	21.04	32.79	21.49
4th quintile	28.98	21.36	34.99	22.04
5th quintile (lowest)	32.11	21.48	39.10	22.14

* $P < 0.01$ Chi square test was performed between sex and period.

Socio-economic inequalities

Table 4 shows the SII and RII for refrain in 2006 and 2014 for men and women and the change over time. Overall, a significant reduction in socio-economic

inequalities in health care was observed over time in both absolute and relative terms for both sexes. For men, the absolute difference was reduced by more than 7 percentage points for residence, ethnicity, education and household wealth. Similarly, inequalities decreased in relative terms in all socio-economic groups. For example, the RII for education fell from 2.46 in 2006 to 1.90 in 2014. Changes over time were only statistically significant for residence and education. For women, significant reductions in absolute differences over time were observed in all social groups, with decreases of more than 11 percentage points. A similar pattern was observed for relative measures and changes over time, with statistically significant decreases for residence and education.

Table 4. Absolute and relative index of inequality in refraining for men and women 2006 and 2014

	Residence		**Ethnicity**		**Education**		**Household wealth**	
Men	**SII**	**RII**	**SII**	**RII**	**SII**	**RII**	**SII**	**RII**
2006	12.68	1.68	14.46	1.69	22.16	2.46	20.84	2.22
2014	5.38	1.36	4.62	1.32	11.48	1.90	13.50	1.99
Reductions over time 2006-2014*	**-7.46**	**-0.82**	**-9.94**	**-0.78†**	**-10.21**	**-0.85**	**-7.48**	**-0.90†**
Women	**SII**	**RII**	**SII**	**RII**	**SII**	**RII**	**SII**	**RII**
2006	14.34	1.63	21.19	1.94	23.77	2.29	25.68	2.27
2014	2.75	1.18	4.32	1.22	8.96	1.60	10.21	1.59
Reductions over time 2006-2014*	**-11.43**	**-0.74**	**-16.76**	**-0.63†**	**-12.12**	**-0.86**	**-15.39**	**-0.71†**

**age-adjusted.*
†not-statistically significant
SII: Slope index of inequality. RII: Relative index of inequality.

4.1.2 Socio-economic inequalities in women's health care services use (*service coverage*)

Service coverage prevalence
The overall coverage of all three health care indicators increased statistically significantly over time (Table 5) over 7 percentage points.

Table 5. Percentage coverage for each women's health care service indicator by period

Year	Skill Birth Attendance (SBA)	Cervical Cancer Screening (CCS)	Modern Contraceptive Use (MCU)
2006	85.6%	51.3%	40.7%
2014	93.7%	59.8%	48.4%
Percentage variation over time	**+8.1%***	**+8.1%***	**+7.7%***

**Statistically significant*

The coverage by socio-economic subgroups for each health indicator is shown in Table 6. For most of the socially disadvantaged groups, coverage increased for the three indicators. In the case of SBA, coverage decreased slightly only for elementary workers and machine operators. The largest increases in SBA coverage, of more than 15 percentage points, were observed for indigenous women, rural dwellers, the least educated and the poorest. For CCS, women in the poorest quintile, with primary level of education and in the highest occupational class experienced the largest increase in coverage of this service. Conversely, for MCU, women with the lowest occupational class, primary education and the poorest had the highest coverage of MCU compared to their reference groups. However, indigenous women were less likely to use this type of method than their counterparts.

Table 6. Prevalence of coverage for skilled birth attendance, cervical cancer screening and modern contraceptive use by socio-economic groups and year

Socio-economic variables	Skill Birth Attendance		Cervical Cancer Screening		Modern Contraceptive Use	
	2006	2014	2006	2014	2006	2014
Residence						
Urban	95.96	98.39	55.53	63.13	40.07	47.45
Rural	67.46	83.94	42.33	51.89	42.07	51.17
Ethnicity						
Whites/mestizos/afro	89.79	96.79	52.93	61.53	40.98	48.86
Indigenous	37.87	58.58	28.17	37.63	34.17	42.82
Education						
Higher (highest)	99.37	99.61	56.34	68.09	33.25	42.97
Secondary	94.77	96.95	52.28	58.85	39.94	47.32
Primary	73.03	85.62	51.99	71.66	49.20	62.57
Incomplete primary (lowest)	53.25	88.62	24.26	23.57	28.74	32.71
Occupational class						
Managers (highest)	92.08	99.53	56.92	80.36	42.91	43.43
Clerical support workers	92.13	98.03	60.58	69.78	44.78	50.59
Farmers	98.61	76.08	56.41	65.93	29.97	61.23
Plants and machine operators	95.67	94.90	67.78	72.29	36.23	56.41
Elementary occupations (lowest)	89.01	85.73	55.40	61.75	44.89	50.79
Household wealth						
1st quintile (highest)	99.49	99.39	58.79	63.14	36.56	41.09
2nd quintile	97.08	98.30	56.06	64.63	39.43	49.14
3rd quintile	92.62	95.52	52.29	59.14	41.31	51.70
4th quintile	82.09	90.22	48.44	55.51	43.93	53.50
5th quintile (lowest)	61.89	78.19	37.23	47.66	44.04	56.94

Socio-economic inequalities

Results of the socio-economic inequalities in health care indicators are shown in Table 7, presenting the SII for 2006 and 2014, as well as comparing the two periods.

Table 7. Slope index of inequality in health care outcomes of women in reproductive age 2006-2014

	Skilled Birth Attendance		Cervical Cancer Screening		Modern Contraceptive Use	
Socio-economic variables	**SII**	**SII differences (2006-2014) (95% CI)**	**SII**	**SII differences (2006-2014) (95% CI)**	**SII**	**SII differences (2006-2014) (95% CI)**
Residence						
2006	57.00		26.40		-3.99	
2014	28.88	-28.11 (-32.69,-23.53)*	22.47	-3.92 (-8.11,0.26)	-7.44	3.45 (-7.99,10.78)
Ethnicity						
2006	103.83		49.52		13.62	
2014	76.41	-27.41 (-38.05,-16.78)*	47.79	-1.73 (-8.97,5.51)	12.08	-1.53 (-10.50,7.43)
Education						
2006	36.06		16.84		-15.84	
2014	16.09	-20.04 (-22.49,-17.59)*	23.53	6.69 (3.15-10.22)*	-8.93	6.91 (3.10,10.72)*
Occupation						
2006	0.41		0.22		0.49	
2014	3.94	3.53 (2.75,4.31)*	3.59	3.37 (2.45,4.28)*	-1.38	-1.88 (-2.87,-0.08)*
Wealth index						
2006	7.39		5.27		-2.14	
2014	3.43	-3.96 (-4.47,-3.45)*	3.50	-1.76 (-2.47,-1.05)*	-3.93	-1.79 (-2.55,-1.02)*

**Statistically significant*

Skilled birth attendance:

In 2006, the SII for skilled birth attendance was positive and statistically significant for place of residence, ethnicity, education and wealth, but not for occupational class, indicating higher coverage among socially advantaged subgroups. Between 2006 and 2014, there were statistically significant reductions in socio-economic inequalities related to place of residence (SII difference= -28.11; 95% CI: -32.69, -23.53), ethnicity (SII difference= -27.41; 95% CI: -38.05, -16.78), education (SII difference= -20.04; 95% CI: -22.49,-17.59), and wealth (SII difference= -3.96; 95% CI: -4.47,-3.45). Conversely, there was a statistically significant, but small, increase in inequality by occupational class (SII difference= 3.53; 95% CI: 2.75,4.31).

Cervical cancer screening:

Over time, the SII for cervical cancer screening also decreased by area of residence, ethnicity and wealth, although there were no statistically significant differences between the periods for area of residence (SII difference = -3.92;

95% CI: -8.11,0.26) and ethnicity (SII difference = -1.73; 95% CI: -8.97,5.51). Significant increases in inequality by education (SII difference = 6.69; 95% CI: 3.15,10.22) and occupational class (SII difference = 3.37; 95% CI: 2.45 to 4.28) were observed. The only statistically significant reduction in inequality over time was observed for wealth (SII difference = -1.76; 95% CI: -2.47, -1.05).

Modern contraceptives use:

Between 2006 and 2014, there was a non-statistically significant increase in inequality by place of residence (SII difference = 3.45; 95% CI: -7.99, 10.78), but a statistically significant decrease in inequality by education (SII difference = 6.91; 95% CI: 3.10 to 10.72). The small observed reduction by ethnicity was non-statistically significant (SII difference = -1.53; 95% CI: -10.50, 7.43). There was however a slightly statistically significant increase in occupational class (SII difference = -1.88; 95% CI: -2.87 to -0.08) and wealth (SII difference = -1.79; 95% CI: -2.55 to -1.02). Figures 9 and 10 show the absolute differences (SII) in the ethnicity and education variables as an example of the trend in inequalities in these groups.

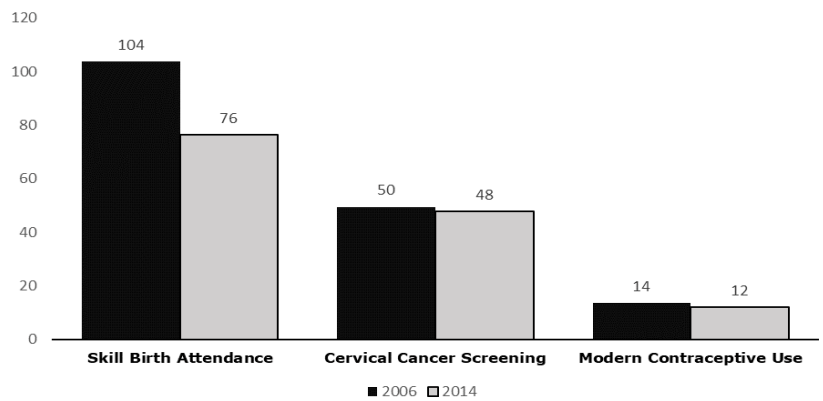

Figure 9. The slope index of inequality by ethnicity over time 2006 and 2014

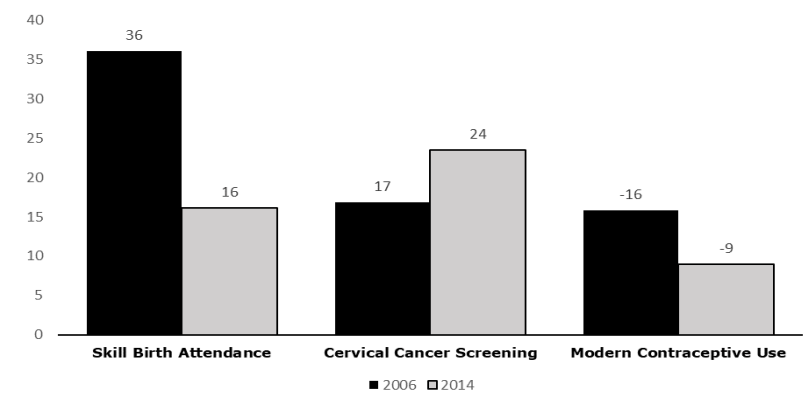

Figure 10. The slope index of inequality by education over time 2006 and 2014

4.1.3 Socio-economic inequalities in catastrophic health expenditure (*financial protection*)

Financial protection coverage

Overall, reductions in OOP and CHE were observed over time. In 2006, out-of-pocket payments for medicines and diagnostic procedures were the most common (Table 8). The percentage of households with OOP decreased from 89% in 2006 to 74% in 2014, and the median value of OOP decreased by 49.8%. In 2014, households that continued to incur health expenditures had an average expenditure of $8 per month.

Regarding CHE (Table 9), households in the poorest quintile, those living in rural areas and those without health insurance had a higher prevalence of CHE. The overall prevalence of CHE decreased from 17% in 2006 to 10% in 2014, with reductions observed in all socio-economic groups. The largest reductions were observed in the Amazon region (from 17% to 7%) and in rural areas (from 22% to 12%).

Table 8. Percentage of households with out-of-pocket health expenditure and reductions in 2006 and 2014

	2006	2014	Reductions percentage points
Total	89.2	74.8	-14.4
Expenses for general health care	88.5	73.4	-15.1
Medicines	84.8	70.7	-14.1
Consultations professionals	49.2	32.4	-16.8
Clinical laboratory	23.0	10.8	-12.1
Dental plates, prosthesis	14.0	6.2	-7.7
Alternative medicine	8.9	4.8	-4.1
Diagnostic imaging exams	7.9	4.6	-3.3
Lenses / vision products	4.3	2.6	-1.7
Consultations non-professionals	3.9	2.1	-1.7
Hospitalization	2.3	0.9	-1.4
Expenses for pregnancy/delivery	**5.6**	**4.2**	**-1.3**
Medications	4.7	3.0	-1.6
Consultations profess.	3.0	1.7	-1.2
Diagnostic imaging	2.3	1.7	-0.6
Clinical laboratory	2.2	1.1	-1.0
Hospitalization	1.0	0.4	-0.5
Consultations non-professionals	0.3	0.7	0.4

Table 9. Prevalence of catastrophic health expenditure in households 2006 and 2014

Socio-economic variables	2006	2014
Total	17.39	10.07
Region		
Andes	17.89	11.20
Coast	16.81	10.16
Amazon	16.87	6.92
Residence		
Urban	14.06	8.75
Rural	22.26	11.51
Health insurance		
Private	6.83	3.67
Social	8.75	3.86
Uninsured	20.66	13.09
Household wealth		
1st quintile (highest)	11.88	6.95
2nd quintile	15.32	10.60
3rd quintile	16.34	10.43
4th quintile	19.76	10.56
5th quintile (lowest)	23.85	11.79

Socio-economic inequalities

The risk of CHE in 2006 was lower in the Coast and Amazon regions compared with the Andean reference area. Families living in rural areas (RR: 1.27; 95% CI: 1.14-1.40), those without health insurance (RR: 2.57; 95% CI: 1.87-3.53) and those in the poorest wealth quintiles (RR: 1.65; 95% CI: 1.41-1.93) had a significantly higher risk compared with the reference groups. In 2014, people living in the Coast and Amazon regions had a statistically significantly lower risk of CHE (Amazon RR: 0.59; 95% CI: 0.53-0.67) than the Andean reference group. Over time, the risk by rurality (RR: 1.05; 95% CI: 0.96-1.14) and wealth (RR: 1.06; 95% CI: 0.92-1.22) almost disappeared in 2014. However, the risk became higher among the uninsured (RR: 3.62; 95% CI: 2.53-5.17). Finally, when comparing socio-economic inequalities over time (relative differences), the results showed a statistically significant decrease in the relative risk of CHE in the regions (Coast and Amazonian), in rural areas (RD: 0.88; 95% CI: 0.79-0.97) and among the poorest (RD: 0.82; 95% CI: 0.69-0.97), but an increase, although not significant (RD: 1.39; 95% CI: 0.95-2.94), among uninsured households (Table 10).

Table 10. Relative risk and difference of catastrophic health expenditure by socio-economic group in 2006 and 2014

Socio-economic variables		2006	2014	Relative differences 2014-2006
Region	Andes	1	1	
	Coast	0.94	0.92	0.86 (0.78-0.96)*
	Amazonia	0.87	0.59	0.58 (0.44-0.76)*
Residence	Urban	1	1	
	Rural	1.27	1.05	0.88 (0.79-0.97)*
Health insurance	Private	1	1	
	Social security	1.22	1.07	0.99 (0.66-1.48)
	Uninsured	2.57	3.62	1.39 (0.95-2.04)
Wealth index	Q1 (richest)	1	1	
	Q2	1.27	1.24	1.14 (0.97-1.35)
	Q3	1.30	1.08	1.15 (0.97-1.36)
	Q4	1.42	0.99	0.95 (0.80-1.13)
	Q5 (Poorest)	1.65	1.06	0.82 (0.69-0.97)*

** Statistically significant*

4.2 Qualitative study

4.2.1 Lessons from recent health system reform (*implementation challenges*)

This Sub-study analysed the factors that contributed to or limited the implementation of health reform from the perspective of some stakeholders. Four themes were identified, each with a set of facilitators and barriers, as shown in Table 11. Each theme is supported by quotes from participants reflecting their views.

Table 11. Themes with facilitators and obstacles to health reform implementation

Themes	Facilitators	Obstacles
Strong political commitment despite the influence of private and political interests	Improving the social sector Financing to improve services Free services to improve access Financing to improve the quality	Soft/Silence corruption Demobilization of social organizations Health market
Good health care model in place but weak implementation	Model to improve access Implementing model with resources Model to prevent diseases Increasing quality in services Bringing communities closer Looking for universal coverage Planning to improve access Strengthening health care services	Weak territorial planning of services Persistent medical model Lack normative health legislation Lingering bureaucracy Lack of continuity of care
Innovating coverage mechanisms amid with fragmentation and integration	Innovating to improve access Reducing health system segmentation Strengthening governance Supporting legal framework Improving efficiency health system	Lingering weak articulation services Segmentation increasing inequalities High segmentation in health system Growing health care market Weak organization of health care level
MoPH leadership was a struggle for governance	Implementing two vice ministries Constitution recovery leadership Regulatory body in health	Weak MoPH structure inside and outside Turnover leaders all administrative levels Changing of intersectoral actions Weak information of services

Strong political commitment despite the influence of private and political interests

The role of politics was the element most recognised by participants as influencing the reform process, driven by significant financial resources and constitutional mandates. Strong political commitment led to structural changes in the health system, including emergency declarations and increased investment. As one participant mentioned:

…. I would believe that in the Correa government, there was a political decision to strengthen the social sector. Furthermore, the new Constitution, with the Constitutional mandate to allocate resources for health, was a crucial element during the reform. (P1, female)

However, the implementation of free health care should have been gradual to ensure sustainability, and political interference often distorted the allocation of resources, favouring certain regions for political reasons. As one participant pointed out:

In this case, there was a political impact in deciding where to locate health centres, but the organisation of health services seemed very rational in practice. On the one hand, there was centralism and, on the other, favouritism and political expediency. (P2, female)

Good health care model in place but weak implementation

The reorientation of the health care model towards prevention and community involvement faced several implementation hurdles, such as inadequate training, bureaucratic obstacles and weak citizen involvement. On the other hand, the redirected prevention and promotion activities became accessible to the most socially disadvantaged groups. As one participant commented:

…. the care model (CHCM) made family doctors go to households. Undoubtedly, I visited many houses and went to many neighbourhoods in the rural area. (P2, female)

Improvements in infrastructure, catering, equipment and transport have been accompanied by substantial investment in human resources. A large number of health workers, particularly general practitioners and specialists, were included in a targeted training and recruitment plan to expand the coverage and range of services.

There was an urgent need to carry out a project to strengthen human resources, and the project was funded with 242 million from governmental funds. Thus, progressively, health care providers were trained. (P2, female)

Innovating coverage mechanisms amid fragmentation and integration

The establishment of a comprehensive public health network improved access, but faced problems of fragmentation and coordination. Fee-for-service payment mechanisms in the private sector aimed to integrate public and private providers. Several interviewees felt that the network was successful in integrating the different subsystems of the public and private sectors because it was clearly stated in the new Constitution of 2008:

> *…. with the Comprehensive Public Health Network established in the Constitution, the fragmentation was eliminated because the agreement obliged us to care for people who were not our contributors. (P4, female)*

However, several challenges limited its adequate performance; for example, weak coordination between levels (three tiers) and between private and public subsystems was mentioned. Also, persistent bureaucratic procedures (paperwork, confirmation of health insurance coverage, delayed referral codes, etc.) limited access.

> *We continue to have a fragmented public health system with few joints, so each fragment has a population segment that does not have the same benefits as the others. (P6, female)*

MoPH leadership was a struggle for governance

The recovery of the health system rectory to the MoPH was the most relevant issue regarding governance. Nevertheless, the MoPH struggled to assert leadership due to a centralized decision-making and frequent personnel changes.

> *…. concerning the changes of personnel and ministers, it is a problem with the different administrations since it became a limitation that did not guarantee the continuity of the programs proposed to implement the model. (P10, male)*

Greater collaboration with local governments and community participation would have been required to address the social determinants of health, but unclear objectives and limited intersectoral action posed challenges. Finally, the financial sustainability of the reform remained a major challenge, with historical budgets insufficient to address the basic health needs included in the reform.

Chapter Five: Discussion

The results of this research showed that access to and coverage of health care services increased significantly during the period of health care reform between 2006 and 2014. Certain socio-economic inequalities in health care also decreased over time. In terms of population coverage and socio-economic inequalities, there was a decrease in non-utilisation of health services among indigenous and poorer groups, and especially among women. In terms of coverage, the SBA indicator increased significantly among women living in rural areas, among indigenous groups and among those with less education, and both absolute and relative differences decreased, especially among indigenous and low-income women. However, despite these gains in coverage, only moderate reductions in CCS and MCU health indicators were observed for most socially disadvantaged groups. An overall reduction in economic deprivation was also observed over time. The risk of CHE decreased for those living in the Amazon region and in the poorest quintiles, but remained for the uninsured.

In the following section, using the results of Sub-study 4, I will examine the results obtained and try to explain, to some extent, the factors or forces that have facilitated or hindered the process of implementing reforms to achieve UHC, with a particular focus on socio-economic inequalities in health care. Finally, I will conclude the section by reflecting on some relevant methodological considerations of the studies conducted.

5.1 Facilitating factors contributing to the reform implementation

The research identified several factors that improved the process of health reform implementation during this period. The most important factor identified was the political commitment of the government to prioritise health and health care, followed by a significant increase in health spending, active governance and the expansion of health services to cover more of the population.

First, after taking office, the government reformed and called for a national referendum to approve the new national constitution in 2008. This constitution, the highest legal norm within the Ecuadorian legal system, included several key aspects related to the provision, financing, integration and guarantees of health for the entire population. The government prioritised the health sector as a mechanism to reduce poverty and promote the well-being of all citizens, reflecting similar situations to other successful experiences in countries in the region, such as Mexico's Seguro Popular and Colombia's 1993 constitutional health reform, which increased universal coverage through a combination of public and private plans [19, 35].

In particular, the main health policies introduced in the Ecuadorian Constitution included the provision of free public health services at all levels of

care, the reorientation of the health care model to prioritise promotion and prevention to cover particularly disadvantaged social groups, and the establishment of a comprehensive public health network to reduce fragmentation. The government allocated an increased health budget with financial resources from taxes and revenues from oil sales. In addition, the government twice declared a state of emergency in the public health sector, which facilitated the mobilisation of resources from the national budget. This investment was aimed at removing all financial barriers to access to all MoPH services, resulting in a significant increase in outpatient consultations, clinical diagnostics and drug distribution, in line with the Alma Ata Principles on Primary Health Care [89].

Access to cost-effective interventions to improve coverage of services for non-communicable diseases, kidney dialysis, cancer treatment and HIV/AIDS care have been included in health benefit packages, helping to reduce CHE [90]. Funding has been provided for health infrastructure, medical equipment, drug supplies and health workforce development, improving the quality of services. New hospitals and health centres were built, especially in rural and marginalised areas, and primary care was restructured to reduce preventive hospitalisations. As a result, these health policies helped to reduce the prevalence of non-utilisation of health services and thus to expand the population coverage component of universal health coverage. Women's access to health services was also facilitated over time, with free Pap smears and the availability of modern contraceptives, including female sterilisation for family planning.

During this period, most MoPH hospitals adopted international quality accreditation standards (Accreditation Canada) to implement best health practices and improve patient safety [54, 91]. Studies have shown that increasing the number of specialists, family doctors and primary care technicians has improved the capacity to solve health problems and the delivery of services. The MoPH led the implementation of the Integrated Public Health Care Network to reduce fragmentation between the public and private sectors, improve continuity of care and reduce the overall proportion of CHE. The literature suggests that countries that have adopted public policies to reduce reliance on user payments and improve the efficiency of health spending have achieved better UHC outcomes [19, 92]. All these efforts could explain to some extent how socially disadvantaged groups, such as women, people with low educational attainment, the poor, the Indigenous and those living in rural areas, increased their use of health care services, thereby decreasing refraining and lowering out-of-pocket health care expenditures.

5.2 Obstacles to progress towards UHC

The literature has highlighted that the implementation of health reforms is a complex process that requires strong leadership, a consistent legal framework, appropriate timing and effective coordination between actors, institutions and social organisations, and the Ecuadorian experience is no exception [23, 93, 94].

Although the strategies implemented during this period helped to expand coverage and reduce certain levels of inequality in the country, numerous obstacles related to political or private interference have been identified that have hampered the achievement of reform goals. Political and economic groups at national and local levels often interfered with the functioning and performance of the health system. At the local level, politicians often sought or favoured administrative management positions in the public health sector to benefit private companies or to prioritise health investments in their regions, thereby enhancing their political image in exchange for political support at the local and national levels. As a result, the government often directed substantial resources to selected areas or provinces where local political parties were sympathetic to the government, often in contravention of territorial planning.

The government also used its political commitment to strengthen the legitimacy of its political project by using health investments to maintain control over the electorate, as the majority of the population was satisfied with the infrastructure improvements. On the other hand, at the national level, studies have shown that private hospitals and health insurers have reaped significant economic benefits during these ten years as a result of referrals of patients from the public sector, particularly from second and third level hospitals, and increased payments to external private providers for specialised care and diagnostic services. Although this strategy increased coverage and reduced health expenditure for families, the sustainability of the model and the real intention of the health network have been questioned [95, 96].

Specifically, in terms of overall service coverage and socio-economic inequalities, only moderate improvements in CCS and MCU services were observed during this period. Although the MoPH has partially improved the provision of medical supplies (syringes) and contraceptives and promoted an intercultural approach, the integration of best practices in traditional birth care into all public health services has been slow and fraught with difficulties [97]. Studies have reported that a disconnect with social organisations, especially indigenous ones, regarding traditional birth care and with the user committees of the former free maternity law could explain the limited success [98]. Similarly, studies in Latin America and the Caribbean have shown that the inclusion of traditional midwives in the formal health system improves SBA rates and facilitates the use of sexual and reproductive health services [99].

However, despite improvements in access and quality of care, several barriers have been identified for indigenous women. A study from Ecuador found that this population, which tends to live in rural areas, tends to be less aware of obstetric warning signs and of the use of public health services than mestizo women [100, 101]. In addition, national reports on obstetric violence and sexual and reproductive rights have found that provider barriers play an important role in the use of health services [102]. In the case of indigenous women, although the MoPH has introduced new guidelines to ensure the availability of family planning methods and to promote sexual and reproductive health at the primary care level, the lack of an intercultural approach in practice, together with an adequate supply of resources, has limited improved outcomes [103]. Studies have shown how comprehensive interventions that combine factors such as economic opportunities, prevention of gender-based violence and recognition of community roles have contributed to empowerment in contraceptive use [104, 105].

At the same time, the government maintained a conservative attitude towards sex education programmes in schools and the promotion of health services, which further limited their use [106]. In addition, weak implementation of health promotion policies (such as intercultural policies), lack of trust in the health system and adherence to certain cultural norms may explain the smaller reduction in inequalities in CCS and MCU in the case of the variables of rurality, low educational level and occupational class. Studies from Ecuador have identified several barriers to accessing preventive services, including feelings of shame, negative perceptions of health workers, concerns about test results, fear of procedures, or previous negative experiences with the health system [101]. In addition, rural Ecuadorian women have often switched from biomedical to traditional family planning because of the lack of availability of contraceptive methods in public health services [107]. Programmes that are not tailored to community needs, offer a limited choice of methods, or lack cultural adaptation have hindered access even when contraceptives are widely available. In addition, health barriers such as missed appointments and unavailability of medicines, particularly in rural and uninsured households, can increase out-of-pocket and catastrophic expenditure [108].

Although the government initially set out to improve the public health sector, a weak state capacity to meet new demands for coverage and continuity of care, such as lack of investment in state-of-the-art technology, inflexible incorporation of specialists, insufficient investment in adequate equipment, and delayed referrals for diagnostic tests and specialized care, resulted in outsourcing of services to the private sector with significant growth in referrals to the private sector to support population coverage [96].

Although there is no specific recipe for avoiding health expenditure, WHO recommends the widespread use of pooled financing or prepayment health

insurance models [109]. Efficient management and sufficient public resources are essential to sustain this type of financing model. During the reform period, although the Ecuadorian Social Security and the Farmers' Social Security increased enrolment, especially among public employees and farmers, the expansion of health coverage for their dependents was limited, especially in rural areas; these schemes excluded the elderly and other family members with greater health needs and limited economic resources, who are more likely to have CHE or poor health outcomes [110]. As shown in Sub-study 3, uninsured households had a higher risk of CHE in both periods.

Several structural problems identified by stakeholders may explain some of the poor performance observed in this paper. Centralised decision-making at the MoPH limited administrative autonomy and decentralised implementation at the territorial level. Frequent changes in leadership, including ministers of health, led to constant delays and shortcuts in the implementation of priority health policies. In addition, the lack of a secondary health legal framework limited the MoPH's governance capacity. A draft Organic Health Code, which aims to consolidate various health-related laws, continued to be debated in the National Assembly without being adopted, hindering the effective consolidation of health reforms. Social security systems continued to operate under their own laws, which regularly led to competition for health professionals and inequitable distribution of resources. A 2014 study found that Ecuador had moderately reduced system fragmentation through coordinated efforts, standardisation of health packages and improved referral processes between sub-systems [111].

On the other hand, inadequate training of health workers and ineffective territorial planning contributed to lower coverage of certain services. As noted in Sub-study 4, bureaucratic obstacles, poor citizen participation and a superficial understanding of the purpose of the model further limited access. Compared with successful experiences in countries with high levels of UHC, the implementation period was relatively short. The government had been in power for ten years, but the health model was only launched in 2012, leaving only five years for full implementation.

Finally, coordination with health and social organisations was limited, with significant tensions between the government, the MoPH and social organisations [112]. The Ministry minimised the presence and input of civil society, health professional organisations and health workers' unions, which led to resistance to the implementation of several health policies. Social organisations were affected by the relationship with the government in relation to the Free Maternity Act, which allowed for the creation of citizens' oversight committees, and the implementation of participatory budgeting at the territorial sub-levels through the cantonal health councils. To counter political opposition, the MoPH created local health committees and networks of health professionals in parallel to counter the presence of historically shaped social groups. In

addition, interviewees in Sub-study 4 acknowledged that a narrow focus on the social determinants of health prevented better policies and more effective intersectoral coordination. Over time, the government shifted resources from health promotion to curative hospital services, weakening the paradigm of primary care and prevention promoted at the beginning of the reform period [113]. Large infrastructure projects have been used to enhance the image of the state, exacerbating social inequalities in health services as investment priorities in the regions have changed due to political influence.

5.3 Methodological considerations

There are a number of strengths and limitations to this research that need to be considered when interpreting the results. The main ones are highlighted below.

Strengths

A major strength of this study is its comprehensive nature. It assessed three components of UHC over time. It also examined socio-economic inequalities in health care in absolute and relative terms, providing a broader picture of the impact of the reform.

The sample size in each wave of the surveys was nationally representative of the different socio-economic groups before and during the implementation of the reform. Publicly available data can be accessed, allowing the results to be replicated.

My personal relationship with the MoPH allowed for better access to key actors for the qualitative study, an aspect that is usually more difficult for researchers outside the institution. In addition, both male and female stakeholders with different positions in the reform participated in the interviews, thus balancing the gender perspective and providing a diversity of views.

Limitations

Firstly, although the health reform was implemented between 2007 and 2017, the study only included two points in 2006 and 2014, which limits the assessment of trends. As the reform continued until 2017, it would have been interesting to observe whether the results differed, but no data were available. As mentioned above, the fact that the reform was fully implemented in 2012 may have influenced the results.

Second, despite the thorough training of the interviewers, the surveys may have been subject to response and recall bias. Questions about not using health services focused on curative, but not preventive, needs. In addition, one month may be a short time to assess preferences and use, so the extent of total non-use could only be partially assessed. Also, the questions did not allow separate analysis between formal medical care and traditional healers.

Third, the cross-sectional before-and-after study design did not allow causal attribution to the reform, as other factors may have influenced the use of health services. However, this was the only possible design given the data available in the country.

With regard to health expenditure, in order to compare these results with those of other Latin American countries, the CHE cut-off point was a threshold of 40%, which differs from the current threshold in the WHO CHE calculations. In addition, the lack of information on household size, age distribution and health insurance status for each family member limited a more in-depth analysis.

In the qualitative study, the interviews included actors close to the MoPH, which may have influenced their perspective and thus limited the overview of the challenges of decentralisation and implementation of the health care model. Several measures were taken to enhance trustworthiness and credibility. The coding process was done from the original version of the interviews in Spanish to better preserve the meaning. Specific understandings of the raw data were checked among the participants during the interview process. The scripts were also continuously checked for misinterpretations, exaggerations and errors.

Chapter Six: Conclusions and dissemination

6.1 Concluding remarks

The main conclusions of this study can be summarised as follows:

1. The reforms in Ecuador have positively improved access and coverage of health services by reducing socio-economic inequalities in health care. However, a limited reduction in inequalities was observed among indigenous and rural social groups.
2. Social inequalities decreased in OOPhe and CHE. However, uninsured households continued to suffer from high levels of CHE.
3. The revamped health care model contributed positively to achieving gains in UHC, especially among socially disadvantaged groups.
4. Political commitment, increased health spending and innovative coverage mechanisms were the main factors contributing to improved UHC outcomes.
5. However, the potential commoditisation of health care, the persistent fragmentation of the system and financial sustainability were challenges that limited the implementation of health reforms.

6.2 Dissemination efforts

Various dissemination efforts have been undertaken locally and internationally to share the findings of this thesis. Specifically, three presentations were made as part of my research efforts. Two took place within the South American region, including presentations and posters at the Virtual Pre-Conference and Global Symposium of Health System Research in Bogota, Colombia, 2022 respectively. I also presented at the international Development Research 2021 event in Sweden. I also gave several presentations to public health and social science students at the University of San Francisco de Quito.

Chapter Seven: Recommendations for future steps

7.1 Recommendations

Addressing the facilitators and barriers to improving health system performance comprehensively is critical to the successful implementation of any health reform. Identifying successful and unsuccessful strategies is essential for policymakers to plan and implement future policies effectively. A resilient health system should be able to adapt and withstand disruptions such as natural disasters, disease outbreaks, economic crises and other emergencies, while meeting ongoing health needs.

In this section, I would like to make some concrete recommendations based on the findings of my dissertation that could guide health policy makers in future reforms.

1. Political commitment is crucial in driving health system change, but measures are needed to mitigate its influence and ensure that decisions prioritise health needs over political considerations.
2. The introduction of free public health services should be phased in, taking into account the availability of resources to shift away from out-of-pocket spending, to ensure long-term sustainability.
3. Balancing public and private interests in policy-making is essential to prioritise public health over financial gain, and effective coordination among national stakeholders is essential for successful health reforms.
4. In the current global context, it is essential to build a resilient health system with the capacity to anticipate, prepare for and respond to emergencies, and to recover and rebuild better after crises.
5. New reforms must include key components of the health system, such as strong infrastructure, sufficient health workers, effective governance and leadership, flexible financing mechanisms, strong community participation and integration of health services with other social sectors.

Epilogue

After 2017, two different governments took office. President Moreno, between 2017 and 2020, initially continued with the same previous political project, but slowly introduced some reforms to modify the policies previously implemented. These decisions were mainly focused on reducing the size of the state, which led to the dismissal of a significant number of health workers in the administration and health services. In addition, no significant health infrastructure was built during his mandate. It should be noted that during this period, Ecuador, similar to the rest of the world, faced major challenges due to the COVID-19 pandemic, but the epidemiological management generated much criticism due to the strategies implemented to stop its spread, which resulted in one of the highest mortality rates in the region. In addition, during this period, there were reports of weak management of health services, such as a reduction in the number of home visits due to budget cuts, and numerous allegations of corruption in the purchase of medicines and supplies [114].

The next government began in 2021, but ended prematurely again in 2023 due to the political and economic instability of the country as a result of the crisis caused by the COVID-19 pandemic and the lack of adequate public and political management. During this mandate, the government continued its efforts to combat the COVID-19 pandemic through vaccination campaigns, diagnostic tests and improvements in health infrastructure. As a result, Ecuador was one of the first countries in the region to achieve high vaccination coverage against COVID-19. Emphasis was placed on the use of technology in health care, including the implementation of digital health solutions to improve access to health services and streamline administrative processes. The last period of this mandate saw some improvements in service delivery and pre-hospital care as a sign of recovery from the pandemic. However, the lack of information has limited a comprehensive assessment of the performance of the primary health care model and the path towards UHC during this period.

The current right-wing government will serve until February 2025, when new elections will be held. This leaves no time for changes in health policy. The composition of the next government and the implementation of policies to support UHC remain of course uncertain.

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Appendices

Appendix 1: Interview guide questions for health stakeholders

Before starting, an open interview question was asked: Please, I would like you to tell me how long you have been involved in public health/health issues?
After that, general topics about the implementation process through several open-ended questions were addressed.

a) To starting, in your opinion, you can tell me what do you consider to have been the biggest challenge that health reform faced?
b) Please, could you tell me how the MoPH (health system) addresses this challenges?
c) Regarding of limitations, what other possibilities/alternatives could have been taken, please could you describe to me how is that?
d) When did you say that……? have been a clue factor in health reform process. What other elements? Please could you tell me more about that?
   Probe: coordination mechanisms, community participation, organization structure (planning, human resources, financing), quality of services.
e) What is your perception regarding the effect of reform, the repercussions (the most positive most negative) on people's health?