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Health systems and Health Inequalities in Latin America[1]

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1. Introduction

A health system "consists of all organizations, people, and actions whose primary intent is to promote, restore, or maintain health" (World Health Organization 2007). Consequently, a health system would not only include the delivery of health services but also the functions of finance, resource generation, and stewardship, including those activities that affect the health impact of relevant interventions in other sectors, even if their primary objective as not to improve health (Figueras and McKee 2012, Arteaga 2014).

The incentives that derive from the contracts (implicit or explicit) that govern the relations between the different organizations and people that conform the health system, as well as the resources with which these organizations are endowed with, will partially determine the cost, quality, and accessibility of health care, the level of health spending as well as the type of public policies with a potential impact on health that are implemented.

The production of health is a complex process that depends on genetic, environmental, and societal factors, as well as an individual's resources and living conditions. Health care and other policies with a potential effect on health are inputs in the health production process, but on its own the health system cannot fully explain inequities in health. However, through the influence that the health system mainly has on the access, cost and quality of health care, the health system has an important role to play on the likelihood and consequences of ill health (Arteaga 2014).

During the late 20th century, most LAC countries have made a considerable effort to improve health outcomes and widen access to health services, resulting in clear improvements in the use of maternal and child health care, accompanied also by a reduction in the socio-economic inequalities associated with such care (Berlinski, Gagete-Miranda, and Vera-Hernández 2020; Cotlear et al. 2015; Savedoff 2009, Wagstaff et al. 2015), and an increase in the share of health spending that is financed through taxes or contributions to mandatory insurance schemes (Savedoff et al 2012)

Still most LAC countries have segmented health systems, in which the conditions to access health care of certain quality levels are largely dependent on the labor market status of the individual (formal or informal) and more generally to their income or wealth (Yazbeck et al 2020). The specific architecture of health coverage varies widely across countries. We start by describing health systems in the region and propose a taxonomy of four categories based on their main characteristics. The taxonomy considers how close health systems are to canonical models of health care: Beveridge, Bismarck, and Managed Care models. Few countries in the region follow Beveridge models –i.e., universal health care financed by a single public insurer– and instead most of them integrate elements of the three canonical models. Given the high level of labor informality in the region, two health systems coexist in all countries: the

contributory and non-contributory systems. The way in which countries treat the non-contributory population is key in the definition of our taxonomy.

Although different countries have different elements in their health systems that might lead to inequality in access to healthcare and health outcomes, it is a priori unclear which systems are more unequal. We first present measures of the levels of out-of-pocket expenditures and voluntary contributions to health care as percentage of total health care in the country as indirect measures of the extent to which the capacity to pay may determine access to more or better-quality health care. We show that both voluntary contributions (as a % of health expenditure) and government and compulsory scheme contributions per capita tend to be smaller in countries closer to the Bismarckian model and that feature a contributory and a non-contributory scheme (and hence a higher share of out-of-pocket payments). In these countries, the higher the government and compulsory scheme contributions per capita are, the lower the out-of-pocket expenditures (as % of healthcare) are.

Next, we proceed to outline measures of disparity in healthcare access and health outcomes, drawing from the standardized metrics introduced in our related study (Bancalari et al., 2023). Beveridge countries seem to be less unequal than Bismarckian countries. Yet, there is no strong pattern in inequalities across our taxonomy, indicating certain unobserved variables of the health system might wield more influence over health and health care disparities than the overarching features defining our health system taxonomy.

Finally, we analyze how differences in healthcare use and health outcomes within countries are related to whether individuals benefit from either the contributory or the non-contributory subsystems and assess main factors explaining such differences by means of Oaxaca decompositions.[2] Demographic characteristics, education, and location residence characteristics of individuals explain some of these differences, but still an important share of the difference remains unexplained for some indicators, a result that may point to quality differences in the health care coverage provided by each subsystem. The weight of the unexplained component is particularly significant for preventive adult healthcare, including mammography, cervical cancer testing, hypertension screening, and treatment. However, the unexplained component is negligible for antenatal care, possible due to important expansions of maternal and child healthcare in most countries, and for children's nutritional status, teenage motherhood, and other related reproductive health indicators, whose determinants are much broader than those comprised by the health systems.

2. Canonical models of health systems

[2] A very important issue is whether to rethink the division between contributory and non-contributory sectors, with the view of decoupling financing of the health system from employment status. This has implications not only for the health system, but also for the labour market, and the broader tax and benefit system. In this chapter we zoom in a narrower question: characterizing the differences in health and health care between these two sectors.

The canonical models of health systems build on the fundamental separation between the financing and delivery of health care. Patients receiving health care services are often not directly responsible for compensating the providers. In many countries, predominant health care funding stems from obligatory payroll contributions or taxes. These resources are pooled and administered by entities like funds or government agencies, which then allocate resources for delivering health care services. This separation of health care financing from service provision aims to enhance efficiency and minimize inequalities. The canonical models represent different approaches to organizing the distinct aspects of funding and providing health care services.

2.1. Beveridge Model[3]

The pure Beveridge system is characterized by a single public insurer, and by the principle that health care depends solely on health need and not on capacity to pay, which leads to free health care at the point of consumption (absence of copayments or deductibles when consuming publicly financed health care). Everyone, independent of their income or labor market status, would have the same formal entitlement to the health care financed by the public insurer. The single public insurer is financed through taxes, or a combination of taxes and social insurance contributions. The classical example of this model is the United Kingdom, where it originated.

In many settings, it might not be apparent to the population that they are "insured" as they might not have a formal insurance contract with the public insurer, but simply their treatment costs are covered when they get treated by health care providers (public or private) approved by the public insurer.

It should be emphasized that free health care at the point of consumption does not necessary guarantee timely access to health care. For instance, waiting lists for elective surgeries are common even in high income Beveridge countries (Propper 1995, Vera-Hernandez 1999, Besley et al 1999). Moreover, waiting time for appropriate treatment and access to medical technologies exhibit very significant geographic variation (The Medical Technology Group, 2017).

2.2 Bismarck Model

In the Bismarck model, health insurance coverage is provided through multiple (rather than a single) health insurance funds (public, not-for-profit, or private). The financing of health insurance coverage is primarily through payroll and other taxes, rather than through insurance premiums based on the health risk of the insured person, which leads to cross subsidization between sick and healthy individuals (the so-called "insurance behind the veil of ignorance"). Countries vary in how many choices individuals have of health insurance

[3] See Bhattacharya, Hyde, and Tu (2014) for a more detailed description of the health systems (Bhattacharya, Hyde, and Tu 2013).

funds. Typical examples of the Bismarck model are Germany, Switzerland, France, Israel, and Japan.

In the pure Bismarck model, individuals retain a significant degree of freedom with respect to their health care. They are usually free to choose health care providers, which are usually privately owned, charge regulated prices, and compete for patients. This freedom makes it very difficult for insurance funds to implement non-monetary barriers to care, and they rely on copayments to restrain demand.

In high-income countries, governments have expanded the coverage to those not working by partially or fully subsidizing their contribution to the health insurance fund and financing it through taxes. Contributions to the health insurance fund are increasing in income, and some countries explicitly subsidize the contribution of low-income individuals. Hence, the health system contributes to solidarity in two different ways: higher- income individuals pay higher contributions than lower-income individuals, and healthier individuals pay the same contributions (conditional on income) than sicker individuals despite their smaller health care costs. This is in contrast with actuarial insurance, in which the insurance premia depend on individuals' health and is independent of their income (given a level of coverage).

2.3 Managed Care

Managed Care (Enthoven 1993), popularized in the USA in the 90s, integrates elements of the Beveridge and Bismarck model. As in the Bismarck model, there are multiple insurance funds. Individuals can choose amongst these insurance funds, but (unlike the pure Bismarck model) they will be restricted to use the health care providers which have entered into agreements (or even vertical integration relationships) with the health insurance fund of their choice, hence scarifying part of the freedom of the pure Bismarck model.

The restriction that health care funds impose on the choice of health care providers allows them to introduce some of the non-monetary arrangements that moderate demand in Beveridge models, such as gatekeeping, waiting time, and restricted choice of specialists. These non-monetary arrangements to moderate health care costs allow health insurance funds to use low copayments to moderate demand.

The vertical relation between insurance funds and health care providers facilitates the implementation of care following guidelines and protocols, which is also typical of Beveridge systems. For instance, insurance funds can incentivize health care providers (either explicitly or through the payment mechanisms) to increase the uptake of preventive care.

However, there are also concerns that the vertical relation between insurance funds and health care providers might lead to undesirable outcomes. Although typically insurance funds cannot deny coverage to anyone (open enrolment), they might distort the quality of the services that they offer to attract "healthier types" – a strategy known as "service selection"

(Glazer and McGuire 2002). It might also facilitate undertreatment to reduce costs, what is known as "skimping" (Ellis 1998).[4]

3. Characterization of health systems in Latin American countries[5]

Only a few countries in the region structure their health systems solely based on the pure models outlined above. In many countries the health system incorporate elements of Bismarck models for individuals with formal employment or receiving a contributory pension: the contributory population. It additionally includes elements of Beveridge models for the rest: the non-contributory population. This generates a fragmentation into a contributory and a non-contributory system, in most cases with separate networks of health care providers. In recent years, some countries have integrated their entire population under a single public insurer in order to break the link between employment status and healthcare coverage. However, they also provide the option for the contributory population to opt out of the public system and acquire coverage through private insurers.

In what follows, we provide a taxonomy whose objective is to facilitate our understanding of health care inequalities in Latin American.[6][7] With this objective in mind, we attempt to categorize countries according to features of their health system architecture that lead to differential access to health care, or differential quality of health care to individuals with the same health need. Given the extent of informality in the region (see last column of Table 1), differential health care insurance arrangements between formal and informal workers seems, a priori, of first order importance.

[4] Examples of such strategies might include step therapy, according to which patients are only eligible for an expensive drug after it has been demonstrated that alternative drug therapies are ineffective.

[5] At the time of writing, there are ongoing discussions on important health care reform in several countries, including Colombia and Mexico, which are not reflected in this text.

[6] We focus on the countries for which there is microdata available for the next sections of the chapter.

[7] We categorise the countries according to their current arrangements. A very useful historical perspective is provided by Cotlear et al (2015).

Table 1: A taxonomy of health systems in Latin America

Taxonomy	Country	Year	% of population in contributory system
Beveridge	Brazil	2016	
	Costa Rica(*)	2018	
	Cuba	2019	
Bismarckian with explicit non-contributory insurance	Colombia	2015	49%
	Dominican Republic	2019	41%
	Mexico	2018	43%
	Peru	2016	36%
Bismarckian with implicit non-contributory insurance	Argentina	2018	61%
	Ecuador	2018	34%
	El Salvador	2014	29%
	Honduras	2019	19%
	Paraguay	2016	20%
Partial risk integration between contributory and non-contributory systems, with option to upgrade	Chile	2018	82%
	Uruguay	2013	71%

Note: the share of the population in the contributory system was calculated based on official sources. The contributory population includes formal workers and their dependents and as well as those receiving a contributory pension (except for Dominican Republic). In Chile, the contributory system does not include FONASA A enrollees (Chile). The contributory system in Uruguay does not include those who benefit from the public provider (ASSE) but do not make contributions. (*) Costa Rica is a special case that combines elements of both Beveridge and Bismarck schemes. Our understanding of the actual functioning of the system is that the more salient characteristics make it closer to a Beveridge model.

3.1 Beveridge

The health systems of Brazil, Cuba, and Costa Rica follow the Beveridge principles, though with some relevant departures.[8] For instance, in Brazil and Costa Rica, the public insurer

[8] The health system of Costa Rica is built around the Social Security system, which originally covered only formal workers through a Bismarckian scheme based on a contributory system. Since the 1960s, the system has expanded to provide access to the same benefits for the non-contributory population, including dependents, rural areas, low-income, and vulnerable populations. In 2010, the Costa Rican government made it mandatory for residency applicants to become members of the CCSS (*Caja Costarricense de Seguro Social*), the social security institution that manages public insurance. A key distinction between the health system of Costa Rica and, for example, Chile or Uruguay---both of which have expanded the coverage of the social security system to the non-contributory population----is that the Costa Rican system does not have clear upgrade or opting-out

contracts with both public and private health care providers to provide care for the population, under the conditions specified by the single public insurer.

Individuals under the Beveridge model usually face some extent of non-monetary barriers as well as rationing (restricted choice of specialists, gate keeping, waiting lists) to obtain care through the single public insurer, at least partially due to the absence of copayments, which would help to restrain demand in other settings. Hence, despite the public coverage, some individuals will purchase private health care of, at least in some dimension, higher quality than that provided by the public insurer. Such care could be fully financed through out-of-pocket payments or private medical insurance (leading to double coverage for those who buy private medical insurance).[9] Hence, the principle that health care depends solely on health needs and not on capacity to pay only ends up applying to health care which is publicly financed.

Bhalotra, Rocha, and Soares (2020) study the expansion of the universalization of healthcare in Brazil and find large reductions in maternal, fetal, neonatal, and post-neonatal mortality, and a reduction in fertility (Bhalotra, Rocha, and Soares 2019). Mora-García, Pesec, and Prado find that the 1995 Costa Rican reform which sought to universalize health care by strengthening primary health care led, in the longer term, to a 9 percent decrease in the rate of age-adjusted mortality (Mora-Garcia, Pesec, and Prado 2022). The effect is particularly important among adults older than 65 years and in cardiovascular related causes of death.

3.2 Bismarckian with implicit non-contributory insurance

The second group of countries, including Argentina, Ecuador, El Salvador, Honduras, and Paraguay, implement Bismarck schemes that are based on a contributory system, where insurance is mandated for those employed in the formal sector as well as those receiving a contributory pension. A single public agency typically administers the insurance[10], with the exception of Argentina, which has multiple insurers, including more than 300 non-profit insurance funds known as *obras sociales* (De la Mata and Estrada 2020). The provision of healthcare through Bismarck schemes in these countries combines public and private healthcare providers. The contributory insurance fund(s) are typically funded through a combination of social insurance contributions (payroll taxes) and general taxation, as well as

options like in these other two countries, as we document in subsection 3.4 (Comparative Health Policy Library, n.d).

[9] This "double coverage" is also widespread in High Income Countries which have adopted the Beveridge Model, such as the UK, Spain, and Italy (Besley, Hall, and Preston 1998; Propper, Rees, and Green 2001; Vera-Hernández 1999).

[10] The social security institutions that manage the contributory public insurance are *Instituto Ecuatoriano de Seguridad Social* (IESS) in Ecuador, *Instituto Salvadoreño del Seguro Social* (ISSS) in El Salvador, *Instituto Hondureño de Seguridad Social* (IHSS) in Honduras and *Instituto de Previsión Social* (IPS) in Paraguay.

some copayments. Among these countries, only Argentina guarantees an explicit health benefit plan for the contributory population (*Programa Médico Obligatorio*, PMO).

In these countries, individuals who are not employed in the formal sector or do not receive a contributory pension can obtain healthcare through the network of public health care providers, but they are not enrolled in a particular insurance program, and often there is not an explicit package of treatments or diagnostic tests to which they are entitled to. This lack of explicit insurance leaves them particularly exposed to whatever offers the particular health care provider that they visit.

Some exceptions are specific plans for particular segments of the population, as the *Plan* Nacer in Argentina, that in a first phase only covered the maternal and child population and it has gradually extended to the older population, changing its name to *Plan Sumar*. *Plan Sumar* is characterized by the introduction of incentives in its payment mechanisms to public providers, subject to the achievement of some predetermined goals. Using a randomized field experiment, Celhay et al. (2019) find that financial incentives paid to health clinics for the early initiation of prenatal care motivated providers to test and develop new strategies to locate and encourage pregnant women to seek care in the first trimester of pregnancy (Celhay et al. 2019). Despite large increases in early initiation of prenatal care, there were no effects on health outcomes.

Others have recently pushed for improvements in the quality of services offered by public health providers to the most vulnerable population. Through the Salud Meso-America Initiative (SMI), the Ministry of Health in El Salvador expanded access to primary healthcare via the creation of community health teams (CHTs), which generated not only coverage, but also efficiency gains in the system. Exploiting the roll-out of CHTs across municipalities in El Salvador, Bancalari et al. (2022) find that preventive care increased, which reduced the demand for curative care for communicable diseases, released resources to treat previously unattended communicable diseases, and decreased the need for hospitalizations due to causes amenable to quality primary care (Bancalari et al. 2022).

The fact that there is no explicit insurance also implies that there is no registry of those entitled to use the public health care network, which in turn allows those with contributory coverage to also use the public health care network, resulting in double coverage. For instance, in Argentina the workforce of national public hospitals is highly skilled, and some contributory enrollees use public hospitals for complex procedures, although they will use the *obras sociales* providers for more routine care, including primary care (Alzua and Pacheco 2021).[11]

[11] Similarly in the UK, Olivella and Vera-Hernández (2022) finds that most severe cases are treated in the public hospitals even if individuals have private medical insurance (Vera-Hernandez and Olivella 2022).

3.3 Bismarckian with explicit non-contributory insurance

The third group of countries, comprising Colombia, Dominican Republic, Mexico, and Peru, also follow a Bismarckian model for the contributory insurance. Yet they differ from the previous group in that the non-contributory population is enrolled in a specific fully subsidized public insurance program, which prioritizes their use of healthcare providers within the public system and guarantees them a defined package of healthcare benefits.[12]

In Mexico and Peru, there is a single public insurer for the contributory system, while enrollees in Dominican Republic can choose amongst 20 public, private or non-for-profit insurance funds (Barinas and Ñopo 2021).[13]

Colombia's health system follows a structure close to the managed care model, although with differences between those enrollees with formal and informal workers. Those with formal employment or retired with a contributory pension are covered by the *Regimen Contributivo.* Workers have to choose insurance coverage among 32 *Entidades Promotoras de Salud (EPS)* which do not compete in prices but on quality, as the distribution of contributory funds are based on capitation payments adjusted for risk (sex, age and residence location). The rest of the population get coverage through the *Regimen Subsidiado*. The premium that insurance funds receive for each enrollee is lower for *Regimen Subsidiado* enrollees than for *Regimen Contributivo* enrollees. Insurance funds must contract 60% of *Regimen Subsidiado*'s care with public sector providers, while such restriction does not apply to *Regimen Contributivo*'s insurance funds. Historically, *Regimen Subsidiado* enrollee were entitled to a less generous package of treatments than the explicit health plan in the contributory system (called *Plan Obligatorio de Salud*, POS), although this difference has disappeared *de jure* since 2012.

Eligibility criteria for the non-contributory insurance vary across countries. Households must pass a proxy means test in Colombia, and the Dominican Republic. In Peru, they must also pass a proxy means test, but those that do not meet it, might still get coverage in exchange

[12] All these countries' healthcare systems used to follow a Bismarckian model with implicit coverage for the non-contributory population. Although the public sector provided subsidized care, it failed to provide adequate financial protection and healthcare access. It was not until the 1990s or later that, as documented by Das and Qu (2023), many developing countries, including Colombia, the Dominican Republic, Mexico, and Peru, moved to some form of dedicated health insurance for the non-contributory population to address this situation. Non-contributory public insurance programs include the *Régimen Subsidiado* in Colombia (implemented in 1993), *Seguro Nacional de Salud* (SENASA) in the Dominican Republic (implemented in 2001), *Seguro Popular* (implemented in 2003) and *IMSS Oportunidades* (implemented in 2002) in Mexico, and *Seguro Integral de Salud* (SIS) in Peru (implemented in 2001 and expanded in 2012). In 2020 the *Seguro Popular* was discontinued. A new government agency, the *Instituto de Salud para el Bienestar, INSABI*, started providing medical services to the population previously covered by Seguro Popular. In 2023 the agency was merged into *IMSS-Bienestar (*previously named *IMSS-Oportunidades)*.

[13] Insurance in the contributory system in México is managed by IMSS (private formal employees) and ISSTE (public employees) and *Seguro Social de Salud* (EsSalud) in Peru. Around 3% of workers opt out of the public insurance fund in Peru to join a private one (see the next section for more details). In the Dominican Republic the insurance funds are known as *Administradoras de Riesgo de Salud.*

for a subsidized premium. In Mexico, it is free for most, but those with capacity to pay need to pay a premium. In the Dominican Republic, those retired from the labor force are eligible for neither the contributory nor the non-contributory (Barinas and Ñopo 2021).

Although Colombia and Peru have achieved almost universal health coverage, that is not the case for Mexico and Dominican Republic, and they still have significant shares of the population uninsured (Table 2). Those uninsured still have access to the network of public health care providers, but they face substantial costs as they are required to reimburse the provider for their health care cost.[14] This introduces a potentially important element of inequality amongst those without contributory insurance.

Table 2. Estimates of percentage of uninsured population

Country	Year	Uninsured population	% of total population
Colombia	2015	1,167,921	2.4%
Dominican Republic	2019	2,394,993	23.1%
Mexico	2018	20,309,601	16.9%
Peru	2016	1,325,911	4.4%

Source: Correa et al (2021) for Mexico. Official sources and authors' own calculations for the other countries. The years correspond to those we use in the microdata. The figures should be taken as estimates subject to error.

The staggered expansions of the non-contributory schemes in these countries have lent themselves to rigorous evaluations of their effects, finding improvements in health, increased use of health care and reduction of catastrophic health expenditures (Bernal, Carpio, and Klein 2017; Camacho and Conover 2013; Conti and Ginja 2020; Grogger et al. 2015; Miller, Pinto, and Vera-Hernández 2013; Pfutze 2014) although there are also exceptions for Mexico (King et al. 2009; Spenkuch 2012).

3.4 Partial risk integration between contributory and non-contributory systems, with upgrade options.

Chile and Uruguay form the last group in the comparison. In these countries, individuals engaged in formal employment are mandated to make contributions (payroll taxes), which entitles them to public insurance coverage (contributory enrolees). Additionally, they have the option, to choose between public or private/non-profit healthcare providers at a higher cost. Although we refer to this as an "upgrade", it's essential to clarify that when we mean it

[14] In the Dominican Republic, consultations and hospitalizations are free of charge, but those uninsured must pay in full for their medicines and diagnostic tests.

in a revealed preference sense rather than an as objective quality comparison. Individuals can also completely opt out of the public insurance system and use their contributions to partially pay their private insurance premium, with this option being far more popular in Chile than Uruguay.

In these countries, coverage has expanded to also include individuals who are in the informal sector, and hence do not make contributions (non-contributory enrollees). By law, they are guaranteed the same coverage as those in the formal sector. [15] However, they are not allowed to "upgrade", and hence they receive care from the same public providers that the contributory enrollees receive care from if they choose not to "upgrade". Similarly to the countries with a Bismarckian with explicit non-contributory insurance system, the non-contributory enrollees are nominalized. However, there are two significant differences: (1) by law the non-contributory enrollees are guaranteed the same minimum bundle of services as the contributory enrolees,[16] and (2) the non-contributory share health care providers with a significant share of contributory enrollees.

In Chile, the public system is called FONASA. Beneficiaries are divided according to their income. The population in FONASA is divided into 4 groups. Group A is the fully subsidized population (have no formal employment). Groups B, C and D are the affiliates with formal employment and their dependents and the retired with a contributory pension. Group B is the population with income below the minimum wage (MW) or retired, group C with income between 1 and 1.5 MW and group D with income above 1.5 MW. Copayments are zero for group A and B, 10% for group C and 20% for group D.[17] Individuals in groups B, C and D can opt for private providers (called *Modalidad de Libre Elección*) paying specific regulated amounts depending on type of service. This choice is on a service-by-service basis; hence, it is only a partial opt out option, as it does not imply individuals fully leaving the public system. FONASA covers 75% of the total Chilean population, 76% of which are formal employees and their dependents and retirees (FONASA, 2018).[18]

In Uruguay, the contributory enrollees are covered by a public insurance fund, "*Seguro Nacional de Salud*", which is funded through payroll taxes paid to a fund also called FONASA. These enrollees can choose to obtain care from the public provider (*Administración de los Servicios de Salud del Estado, ASSE*) and have zero copayments, or receive care from non-for-profit integrated providers, called *Instituciones de Atención Médica Colectiva (IAMCs)* or

[15] Clearly, in Chile and Uruguay the share of the population with formal employment is high, which facilitates the integration of formally employed and not formally employed populations under a unified public health system.

[16] The minimum package of guaranteed services is called *Garantías Explícitas de Salud* (GES) in Chile and *Plan Integral de Atención a la Salud* (PIAS) in Uruguay. Colombia is an exception because it also guarantees the same minimum package of services (*Plan Obligatorio en Salud*) to contributory and non-contributory enrollees.

[17] Copayments have been zero since since September 2022 for the entire population covered byFONASA seeking care in the public health care network, (known as *Modalidad Institucional*).

[18] The rest of the population is covered by ISAPREs (18%) and other insurances (7%), which include the armed forces and individual private coverage.

mutualistas, and pay regulated copayments.[19] FONASA transfers to the IAMCs a fixed amount per contributory enrollee (adjusted for age, sex, and health care goals) which is equal to the amount transferred to ASSE per contributory enrollee. The IAMCs are not allowed to charge additional premia. ASSE provides care to around 40% of the total Uruguayan population, 37% of whom are formal employees and their dependents and retirees.

In both countries, individuals with formal employment can choose to have their contributions not paid to the public insurance system, but to a private insurance company (opt out).[20] This opt out option is different from the upgrade option previously mentioned, in which the contributions stay within the public insurance fund. In Chile, the opt out option implies first to choose one of the many health insurance plans offered by one of the 6 private insurance companies ---called *ISAPRE*s--- which are enabled to provide coverage to this population. The government transfers them an amount of resources that equals the amount of the payroll tax. If the premium of the plan that the individual choose exceeds that amount, the individual must pay the difference. This population have access to a network of private providers with an agreement with the insurer they choose. Benefits granted in the private sector are directly related to the contracted plan and subject to copayments. A similar scheme also exists in Uruguay, but only 3% of the population take it up in 2021 (Ministerio de Salud Pública, 2022), while it is 18% in Chile in 2018 (SuperSalud, 2018).

Balsa and Triunfo (2021) study the expansion of health coverage in Uruguay during the 2007-2013 period, which gave formal workers' children as well as disabled children the entitlement to choose between IAMCs or ASSE, in particular benefiting mothers younger than 18 years old. They find that the coverage expansion led, in the medium-term, to a decrease in adolescent fertility, improved prenatal care and birthweight, and decreased first year mortality among low birthweight children. They find that expanded provider choice and increased competition might explain the results (Balsa and Triunfo 2021).

4. Features of health systems and inequality

In this section, we will delve into the features embedded in various health systems that can contribute to horizontal inequity in healthcare utilization. We aim to understand why these features might result in individuals with similar healthcare needs accessing healthcare services differently (van Doorslaer and Wagstaff, 1992 and Wagstaff, van Doorslaer, and Paci ,1991).

A common feature of most countries in the region is the co-existence of a contributory and a non-contributory subsystem, with different healthcare providers networks in each subsystem. Differences in the density, accessibility and quality of the network might lead to systematic differences in frequency and quality of health care treatment between people

[19] As of December 2020, there were 36 active *IMACS*, but only between 1 and 3 in each Department, except for Montevideo where there are 11 (Junta Nacional de Salud 2020).
[20] For a dedicated analysis of opting out of public services in the region, see De La O et al. (2023).

enrolled in different subsystems.[21] Although we cannot estimate density, accessibility, and quality of the network, we provide in Table 3 below an estimate of the ratio of funding allocated to each subsystem for a set of countries for which we could find such estimates.[22]

Table 3. Ratio of per capita funding between Contributory and Non-Contributory subsystem

Country	Year	Ratio= Contributory / Non-Contributory	Source
Colombia	2015	1.12	(Ministerio de Salud y Protección Social 2021)
Ecuador	2019	1.29	(Ñopo and Peña 2021)
Honduras	2018	2.53	(Ham and Membreño-Cedillo 2021)
Mexico	2018	2.60	(Correa et al. 2021)
Dominican Republic	2020	4.68	(Barinas and Ñopo 2021)

Note: Colombia's figure corresponds to the "*Unidad de Pago por Capitación*" of the year of our microdata. For the other countries, we use the only estimate that we could find.

As it is clear from Table 3, contributory subsystems tend to be better funded than non-contributory ones, which probably translates into denser, and higher quality networks, which favor contributory enrollees over non-contributory ones. Moreover, in Bismarck countries without explicit insurance, contributory enrollees might have access to both the contributory and non-contributory network of health care providers (double coverage), which allows them to benefit from the best of each subsystem. As previously indicated, national public hospitals in Argentina are known to provide high quality care for complex cases, while *obras sociales* provide better primary and hospital routine care (Alzua and Pacheco 2021).

Differences in quality and accessibility of health care might also be important in Beveridge countries, even if there is not a contributory vs. non-contributory split. In Beveridge countries, all citizens have the same formal entitlement to publicly provided health care. Thus it might be seen as well-suited to eliminate inequality on health care, however higher income individuals have access to private health care, which at least in some dimensions, is of better

[21] This is despite legal provisions in certain countries (such as Chile, Uruguay, and Colombia) that formally ensure equal access to medical treatments for individuals enrolled in either the contributory or non-contributory system.

[22] The complexity of the funding arrangements (i.e. general taxation does not only fund the non-contributory but partially also the non-contributory in some countries, premia or copayment top ups in other countries), difficulty in estimating the beneficiary population in Bismarckian countries with implicit insurance, and limitations in the available information make estimating this ratio a challenging task, and hence we rely on specific country studies.

quality.[23] Indeed, some individuals obtain private health care to circumvent non-monetary mechanisms (i.e. waiting lists, restricted choice of specialists, and gatekeeping) which implicitly suppress demand and reduce costs, and which are commonly present in Beveridge countries due to the absence of copayments or user fees. Individuals might obtain such health care either through purchasing it out right and paying out of pocket, or voluntarily buying private insurance (or firms buy it for their employees), leading some individuals to benefit from double coverage (Propper 1995, Vera-Hernández 1999, Besley et al 1999). Typically, it will be individuals with higher income the ones who will enjoy private health insurance within a Beveridge system, which re-introduces a linkage between capacity to pay and access to health care, potentially undermining the principle of health care according to need, and not to capacity to pay.

Naturally, the lower the quality of publicly provided care, the more willing individuals will be to purchase health care in the private market, including private health insurance. Demand for private health insurance will tend to be low if the quality of publicly provided care is high, in particular because the individual does not receive any tax reduction upon buying private health insurance, and the premium must cover the average costs of private treatment, which is not subsidized by the public insurer (Olivella and Vera-Hernández 2013).

To investigate the relation between willingness to purchase health care in the private market and quality of publicly provided health care in Latin American countries, we present correlations between per capita government and compulsory scheme contributions in Latin American countries and voluntary contributions (as a % of total health expenditures) (Figure 1) and out-of-pocket payments (as a % of total health expenditures) (Figure 2). The countries are categorized according to our taxonomy of health systems.[24] It is worth noting that per capita government and compulsory contributions are significantly lower in all Latin American countries compared to OECD countries (excluding LAC countries), which averaged 3077 USD PPP in 2015. Meanwhile, the share of voluntary contributions and, especially, out-of-pocket expenditures tends to be higher in most (though not all) Latin American countries compared to OECD countries, which averaged 6.1% and 19%, respectively, in 2015.

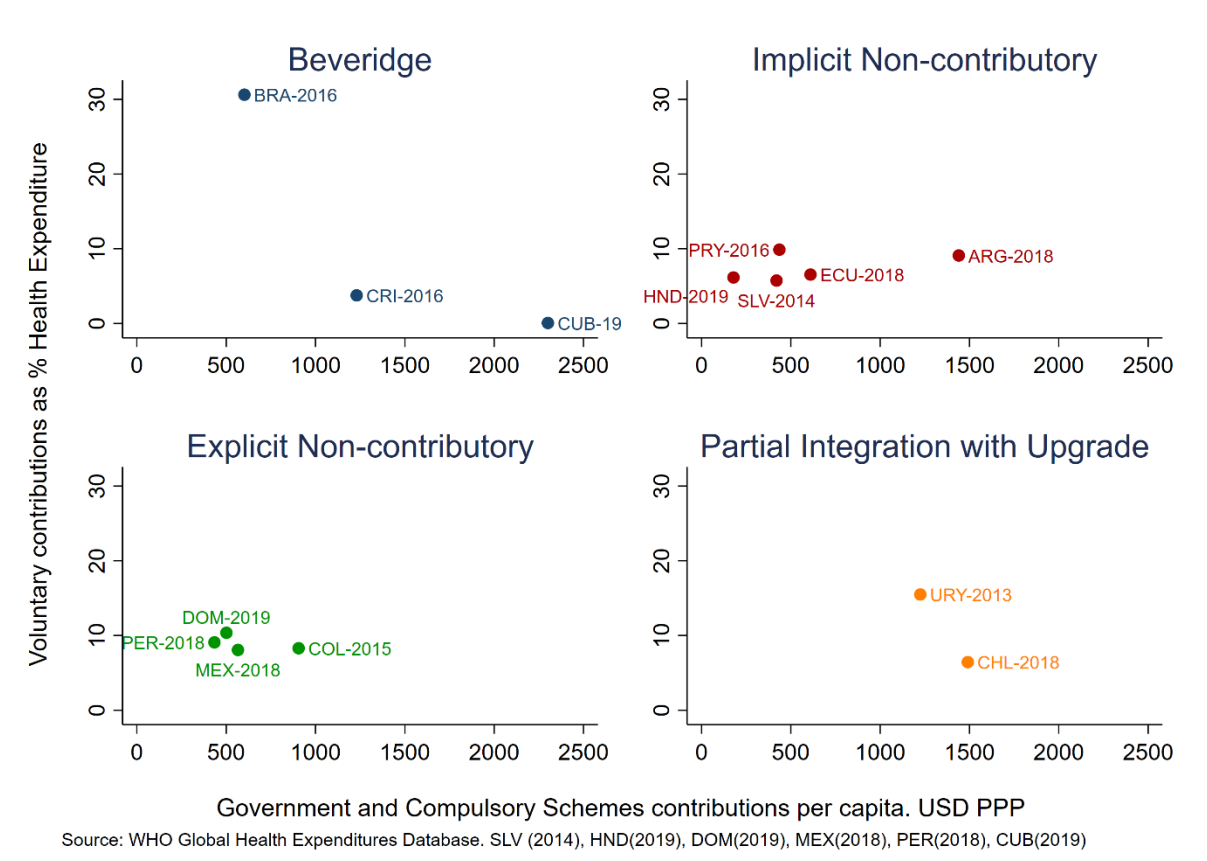
Consistent with the above argument, the top left panel of Figure 1 shows that, amongst all Latin American countries, Brazil has the largest participation of voluntary contributions (i.e. private insurance premia) on total health care, and indeed the level of per capita government-funded health is relatively low. One would expect that it is the individuals with higher capacity to pay the ones that benefit from private insurance coverage, which covers treatment under more advantageous conditions than the single public insurer, possibly reinforcing socio-economic inequalities in access to health care.

[23] In practice, there will be differences in non-monetary costs (i.e. transport costs) and quality of care, for instance, due to location.

[24] In Figure 1 and 2, we use different years for each country to match the year for which microdata is available in the remaining sections of the chapter.

As Figure 1 also shows, voluntary contributions tend to be smaller in countries with the other three types of systems, all of which feature a contributory and a non-contributory scheme. Possibly, this is because there is a mismatch between the individuals with capacity to pay for the private health insurance, and those who will benefit more from it (in terms of quality of care). On one hand, individuals in the non-contributory subsystem tend to have care of less quality (Table 2), so they would gain more from private health insurance, but they tend to have lower capacity to pay. On the other hand, individuals in the contributory subsystem enjoy higher quality care than those in the non-contributory one, so they gain less from buying private health insurance although they are the ones with higher capacity to pay.

Figure 1. Voluntary Contributions



Source: WHO Global Health Expenditures Database. SLV (2014), HND(2019), DOM(2019), MEX(2018), PER(2018), CUB(2019)

In a few countries, voluntary contributions are used as a mechanism to opt out of the public insurer. In Chile, in 2018 around 23% of the contributory population opted out of the public insurer (FONASA) (Fonasa, 2018) and used their social insurance contribution (7% of earnings) towards the premium of a private insurance fund (ISAPRES) of their choice. As expected, opting out is more popular amongst higher income workers, as their 7% contribution will cover a higher share of the private insurance premium (Morales and Olate 2021). In Uruguay, opting out is also an option but less than 4% take it up. The relatively high value of the share of voluntary contributions in Figure 1 might be due to private health insurance premia, especially as the recent reform that expanded coverage was still ongoing. In Peru opting out of the public insurer (EsSalud) is also possible, though only less than 3% of employees take advantage of it, possibly because individuals opting out can only take to the private insurance

company 2.25% of their earnings, leaving 6.75% in the public insurance fund (Ñopo 2021). Hence, those opting out will have to incur substantial voluntary contributions to cover the private insurance premium.[25]

Paying out of pocket for health care, at the point of need, can present a significant barrier to accessing healthcare services. This barrier often affects the less privileged more severely, potentially exacerbating health and healthcare disparities. Furthermore, it escalates the financial risks associated with illness, reducing welfare and potentially pushing households toward poverty.[26,27] Figure 2 shows wide variation across LAC countries on the percentage of health care expenditures financed through out-of-pocket payments, with lower values for Beveridge countries, for which they represent between 10% and 25% of health care expenditures, smaller than most other Latin American countries and roughly on par with the OCDE average of 19%.

Out-of-pocket payments come in two very different forms. Many formal insurance schemes (contributory, non-contributory, and private) include consumer cost-sharing mechanisms (copayments, coinsurances, deductibles). In HICs, consumer cost-sharing is traditionally justified as a tool to reduce moral hazard, overconsumption of health care due to insurance (Ellis and McGuire 1996). However, this logic might be less applicable to LMICs where health care use tends to be underutilized and consumer cost-sharing, even within formal insurance schemes, might play a more important role on the financing of health care.

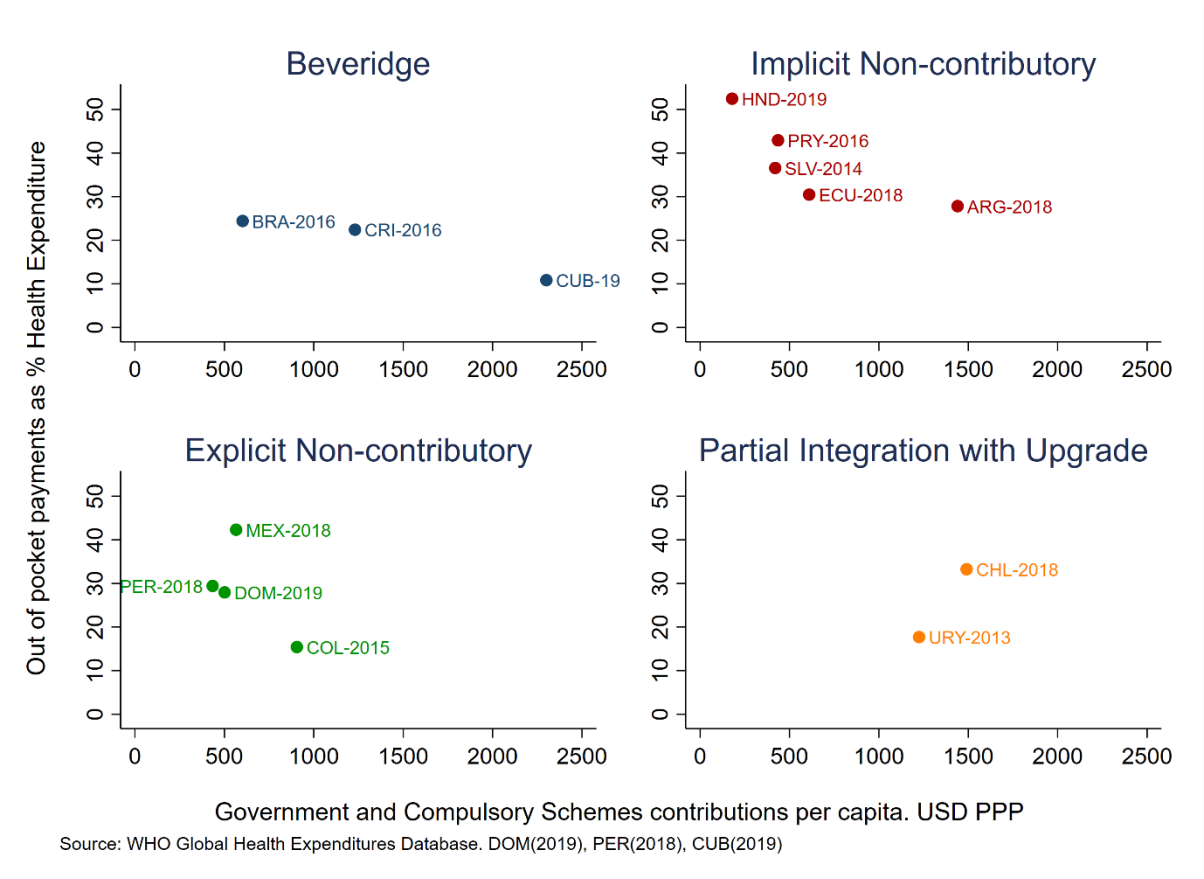
For instance, enrollees of the contributory subsystem in the Dominican Republic must cover 20% of the costs of diagnostic tests, 30% of the medicines, and US$10 per general medicine consultation, with additional costs per specialist consultations (Barinas and Ñopo 2021). In some countries, the copayments are a function of the enrollee's earnings. In Colombia, the copayment for each outpatient service (consultation, prescription, or diagnostic test) follows a step function of the enrollees' earnings as a share of the minimum wage. Within a given step, as earnings increase, the copayment represents a smaller share of individuals' earnings (Figure 3). Moreover, due to the steps, individuals with very similar earnings are subject to substantially different copayment values.

[25] Opting out from the contributory insurance funds (*obras sociales*) is also possible in Argentina, although as in Peru, not that common. Only 5% of the population within the contributory scheme (corresponding to 3.7% of the total population) decide to opt out (Torres, Jorgensen, and Robba 2020).

[26] According to Wagstaff et al. 2020, 10% of households across LAC incurred in out -of -pocket health care expenditures which exceeded 10% of their household monthly income (which are known as catastrophic health expenditures) (Wagstaff, Eozenou, and Smitz 2020).

[27] Buitrago, Miller, and Vera-Hernández (2021) show that higher cost-sharing in the Colombian contributory scheme leads to lower health care use in the short-term, but also to missed diagnosis of chronic conditions and increased health care use in the medium and longer-term.

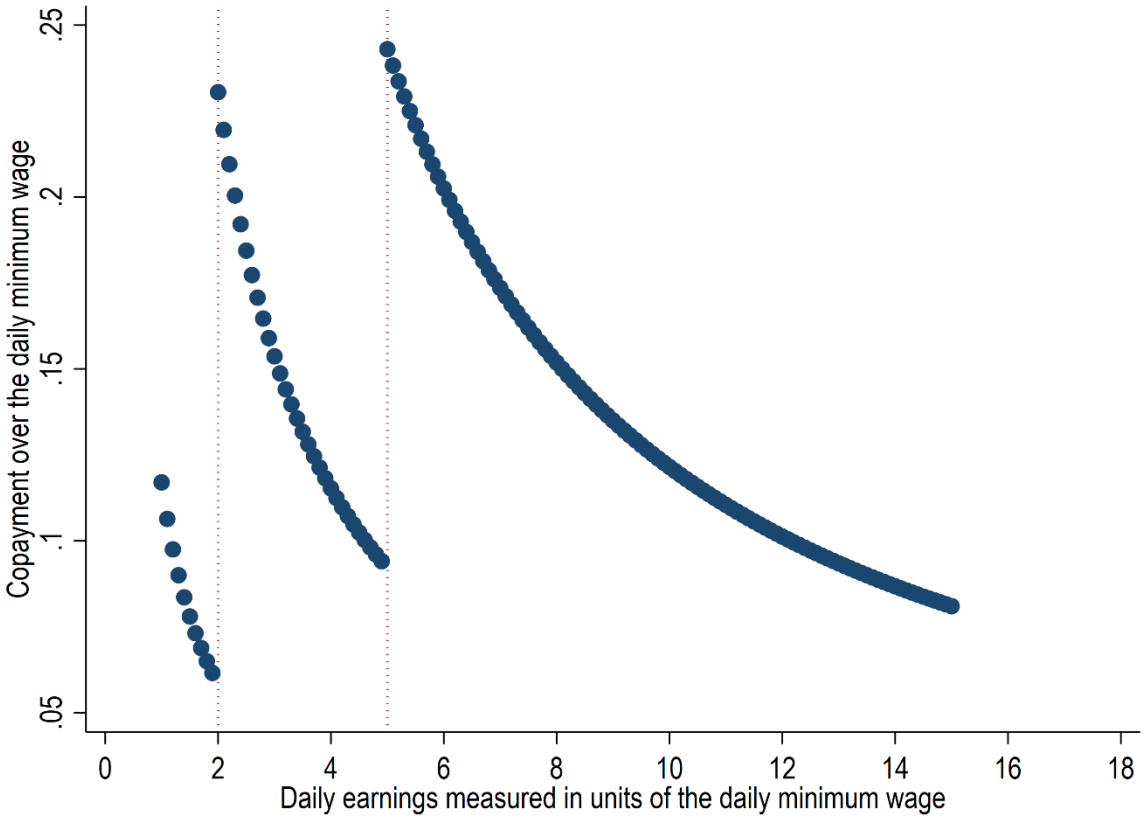
Figure 2. Out-of-Pocket Payments



Source: WHO Global Health Expenditures Database. DOM(2019), PER(2018), CUB(2019)

For instance, enrollees of the contributory subsystem in the Dominican Republic must cover 20% of the costs of diagnostic tests, 30% of the medicines, and US$10 per general medicine consultation, with additional costs per specialist consultations (Barinas and Ñopo 2021). In some countries, the copayments are a function of the enrollee's earnings. In Colombia, the copayment for each outpatient service (consultation, prescription, or diagnostic test) follows a step function of the enrollees' earnings as a share of the minimum wage. Within a given step, as earnings increase, the copayment represents a smaller share of individuals' earnings (Figure 3). Moreover, due to the steps, individuals with very similar earnings are subject to substantially different copayment values.

Figure 3. Copayments as a function of contributory enrollees' earnings in Colombia



Source: authors' own calculations using simulations.

Chile is an example of a complex consumer cost-sharing arrangement. Up to September 2022, those FONASA enrollees in the third- and fourth top income category (28.4% in 2017) had to pay 10% and 20% of the health care costs respectively, even if they used the network of public health care providers.[28] Moreover, those in the second, third and fourth top income categories can choose private health care providers by paying additional copayments ("upgrading"), which depends on the individual's income and the provider's category (Morales and Olate 2021). And moreover, those opting out to private insurance funds (ISAPRES) will be under the cost-sharing arrangements detailed in their contract. This extensive use of copayments is consistent with the large share of out-of-pocket expenditures reported in Figure 2.

Consumer cost-sharing can also be a mechanism for "upgrading". In Uruguay, formal workers can choose between being treated by the public providers (ASSE) and pay zero copayments,

[28] FONASA also provides loans to cover the copayments.

or non-for-profit integrated providers (IAMCs) and pay regulated copayments for each medical service (PAHO n.d.).[29]

Out-of-pocket payments can also occur outside formal insurance schemes. Individuals who are not satisfied with the care that they receive through their insurance, are unable to receive timely care, face non-monetary barrier to access (i.e., location of clinics); or simply require treatments not covered by their insurance schemes, might seek health care through the private market and pay outright. Moreover, in some countries (i.e. countries with a Bismarckian scheme and explicit non-contributory insurance), uninsured individuals might be charged to obtain care in public health care providers, or they choose private health care providers and pay accordingly. On the other hand, in countries with Bismarckian schemes with implicit non-contributory insurance, out-of-pocket payments may most likely reflect the incapacity of the public sector to supply basic health care services which are then sought after through private providers, a common feature observed in many LMICs by the late 1990s (Das and Do, 2023). Indeed, in countries like El Salvador, Honduras and Paraguay, where the contributory scheme covers a small share of the population, out-of-pocket expenditures represent between one third to half of total health expenditures.

De la Mata and Estrada (2020) find that the probability of catastrophic health care expenditures (above 10% of household income) is only higher for non-contributory enrollees in Argentina and Mexico, while it is higher for contributory enrollees in Peru, Bolivia, Colombia, and Chile. This reflects that consumer cost-sharing tends to be higher in contributory schemes than non-contributory ones, and that copayments are sometimes used as "upgrading" mechanisms to access private health care. Moreover, poor individuals might respond to cost-sharing by not obtaining health care, and hence this latent cost-sharing is not recorded in the data. In line with this, de la Mata and Estrada (2020) provide evidence showing that non-contributory enrollees are less likely to visit a health care professional when they are sick than contributory enrollees, and they are more likely to indicate that "lack of money" was the reason for not visiting a healthcare professional. This depicts a very complex picture between observed costs-sharing and health care access and quality (De la Mata and Estrada 2020).

Overall, we expect individuals to pay more out of pocket if either they are uninsured, their insurance covers a smaller share of the treatment costs, and/or the quality care provided by the insurance is worse. Interestingly, for most categories, Figure 2 features a negative relationship between the average funding per capita of the government and compulsory schemes, and the share of health expenditures which is financed out of pocket.

[29] The data for Uruguay in Figures 1 and 2 correspond to 2013, when the country was still expanding the new health insurance coverage system previously described (see Balsa and Triunfo 2021 for more details). We report the 2013 data to match the microdata that we will report in the next sections of the chapter.

5. Health systems and health care use and health outcomes inequalities

In this section we present measures of socioeconomic inequalities in health care use and health outcomes measured in in our related study (Bancalari et al., 2023). Selected indicators of health care use and health outcomes analyzed in this section include: (i) maternal and child health, (ii) reproductive health, (iii) non-communicable diseases.

We study inequalities for all countries with available data. We use Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) to report inequalities in maternal and child health as well as reproductive health. To study inequalities in non-communicable diseases and mental health we use a wide range of national health surveys. For the former, we also use the WHO STEPwise approach to NCD risk factor surveillance (STEPS), which uses a standardized questions and protocols for collecting key biological risk factors across countries, including physical and biochemical measures. See our accompanying work, Bancalari et al. 2023, for more information about data sources and construction of selected indicators that are key across the life cycle (also see Appendix A in this chapter).

5.1 Maternal, child and reproductive health and health care access

We focus on two indicators of maternal healthcare: antenatal care with four or more visits (ANC 4+ visits); and quality antenatal care, defined as having at least one antenatal care visit in which blood pressure was measured and urine and blood sample were taken, following WHO guidelines (World Health Organization 2016). As a sentinel indicator of child health, we analyze infant mortality measured as not surviving the first year of life among children born during the five years preceding the survey (multiplied by 1,000 to be comparable with traditional infant mortality rates). For reproductive health we use teenage pregnancy, measured as whether the women had their first child under 20 years old.

Table 4 presents inequalities by socio-economic status proxied by education level for the four indicators. Countries are organized according to their type of health system. Education is stratified in the following five categories: (i) no education or incomplete primary, (ii) complete primary, (iii) incomplete secondary, (iv) complete secondary, and (v)tertiary. To quantify the degree of inequality, we report inequality ratios comparing the two lowest with the two highest categories:

$$\boldsymbol{Ratio} = \frac{\boldsymbol{Completed\ primary\ education\ or\ less, but\ without\ any\ secondary\ educ.}}{\boldsymbol{Completed\ at\ least\ secondary\ education}}$$

Table 4: Child and maternal health and health care inequality by type of health system

Type of health system	Country/survey	ANC 4+ visits			Quality antenatal care			Infant Mortality			Teen mother		
		N	Mean	Ratio	N	Mean	Ratio	N	Mean	Ratio	N	Mean	Ratio
Beveridge	Costa Rica 2018-MICS	1286	94.4	0.98	1286	98.7	0.99				4468	39.3	2.61***
	Cuba 2019-MICS	1870	79.3		1870	99.2					6017	29.5	2.11***
Implicit Non-contributory	Argentina 2011-MICS	3327	90.6	0.89***	3327	98.3	0.97**				12592	29.6	2.90***
	Honduras 2012-DHS							11064	22.7	1.33			
	Honduras 2019-MICS	3278	88.4	0.86***	3278	95.6	0.93***				10574	50.6	3.02***
	Paraguay 2016-MICS	1803	93.6	0.87***	1803	98.5	0.97	4445	16.0	2.60*	4058	39.5	2.97***
	Salvador 2014-MICS	2832	90.2	0.90***	2832	98.2	0.97***	7191	16.0	1.37	7194	46.9	3.42***
Explicit Non-Contributory	Colombia 2015-DHS	4660	90.1	0.79***	4660	94.4	0.87***	11849	13.4	2.84***	22467	36.3	2.32***
	Dominican Republic 2019-MICS	3336	92.7	0.87***	3336	98.2	0.95***	8442	25.7	1.28	13147	46.1	1.98***
	Mexico 2015-MICS	3032	94.3	0.86***	3032	98.3	0.93***				7059	37.8	3.00***
	Peru 2016-ENDES	18029	96.2	0.94***	18087	93.2	0.88***	17894	12.0	3.09***	21594	31.4	3.33***
Partial Integration with Upgrade	Uruguay 2013-MICS	433	76.8	1.12	433	98.6	0.98						

Note: Ratio = Lowest/Highest. 'Lowest' corresponds to primary education completed or less, but without any secondary education, and 'Highest' corresponds to completed at least secondary education. Missing values in ratios if unweighted population in each education category <30. Mean refers to the population average. See Appendix A for the definition of the indicators "ANC 4+ visits", "Quality antenatal care" "Infant mortality" and "Teen mother".

Irrespective of the health system characteristics, inequality in coverage for ANC 4+ visits is pro-high educated (ratio lower than 1) in all countries, with Uruguay being the only exception. The ratio is, however, not statistically significant in this country nor in countries with Beveridge models. The countries with higher pro-high educated inequality are Colombia, Honduras, Paraguay, Dominican Republic and Mexico, all Birmarckian. There are no differences in the levels of inequality between the two Bismarckian groups: the ratios range between 0.86 and 0.90 in countries with implicit insurance for the non-contributory population, while the range is 0.86 and 0.94 for countries with explicit insurance for the non-contributory population.

Interestingly, top and bottom education categories tend to show lower disparities in the quality of antenatal care than for ANC 4+visits, as the ratios for most countries are closer to one. Still, inequality is pro-high educated in all countries (ratio lower than 1), except Cuba. Although there is not a strong association between type of system and inequality, two of the Bismarckian countries with explicit insurance for the non-contributory population, Colombia and Peru, have the largest gaps between the more and less educated. On the other hand, inequality in this measure does not seem to be prevalent in Beveridge countries nor in those with partially integrated systems.[30]

Teenage pregnancy is amongst the most unequal indicators. Less educated women are between 2 and 3.4 times more likely to be teenage mothers than more educated mothers. In this case, data is missing for the partial integration countries (Chile and Uruguay). According

[30] Infant mortality is missing for most countries of Table 4, preventing us from obtaining conclusions.

to the estimates, Beveridge countries seem to be less unequal than all Bismarckian countries except Dominican Republic and Colombia.

5.2 Adult health care access

Next, we also study inequalities on the detection and treatment of hypertension, an important risk factor for cardiovascular disease, which has the most comprehensive coverage of all the metabolic risk factors in the available data (see our accompanying work, Bancalari et al. 2023). We only use datasets which measure individuals' blood pressure, so we have an objective measure of individuals' hypertension status independently of whether they have been diagnosed or not. Because hypertension varies by age, but the different surveys that we use sample people of different age ranges, we standardize the result at age 60, using a Logit regression with a second order polynomial on age and dummies for education groups.

Table 5 reports on whether the individual's blood pressure has ever been measured, as well as, for those individuals suffering from hypertension whether they are having it treated or not. Concerning the first indicator, for all countries except Peru, most individuals have had their blood pressure taken by age 60, and the inequality ratios are very close to one (absence of inequality). In Peru, only 56% of the population has had their blood pressure taken at age 60, and the pro-high educated inequality is very significant (ratio = 0.66).

Table 5 also shows the education gradients in the proportion of individuals with untreated hypertension. When they are statistically significant, they are always pro-highly educated (ratios larger than 1). The Beveridge countries do not exhibit pro-highly educated inequalities. The rest of the countries (except Colombia) exhibit pro-highly educated inequality which is statistically significant except for Peru. Inequality is pro highly-educated and statistically significant in countries with partially integrated health subsystems with upgrade (Chile and Uruguay), and for the two Bismarckian countries with implicit coverage for the non-contributory population (Argentina and Ecuador). For the Bismarckian countries with explicit coverage, the results are only pro-highly educated and statistically significant for Mexico (not statistically significant for either Colombia or Peru).[31]

[31] As previously indicated, in 2013 Uruguay was still rolling out the reform that expanded health care coverage using the scheme that we previously discussed.

Table 5. Inequalities on prevention and treatment of hypertension by education groups, standardized at age 60

Type of health system	Country/survey	Ever had their blood pressure taken			Hypertension untreated		
		N	Mean	Ratio	N	Mean	Ratio
Beveridge	Brazil 2016-ELSI	9335	99.8		5880	26.5	0.92
	Costa Rica 2010-CRELES	2794	99.5		2908	24.6	0.95
Implicit Non-contributory	Argentina 2018-ENFR	29224	97.7	0.97***	7466	53.1	1.09*
	Ecuador 2018-STEPS	4638	92.3	0.94***	897	43.4	1.24*
Explicit Non-Contributory	Colombia 2015-SABE				3533	29.6	0.74
	Mexico 2018-ENSANUT				4556	42.6	1.27***
	Peru 2016-ENDES	32352	56.1	0.66***	4203	55.9	1.06
Partial Integration with Upgrade	Chile 2019-ENS	5714	97.3	0.99	1981	27.1	1.62**
	Uruguay 2013-STEPS	2458	97.7	0.97***	810	39.6	1.30*

Note: Ratio = Lowest/Highest. 'Lowest' corresponds to primary education completed or less, but without any secondary education, and 'Highest' corresponds to completed at least secondary education. Mean refers to the population value standardized at age 60. Missing values in ratios if unweighted population in each education category <30. Estimated margins at age 60 from a Logit regression controlling for the second order polynomial of age. STEPS, Step towards a healthier world: monitoring noncommunicable diseases and their risk factors; ENFR, National Survey of Risk Factors; ELSI, Longitudinal Study of Aging; ENS, National Health Survey; SABE, Survey on Health, Well-Being, and Aging; CRELES, Longevity and Healthy Aging Study; ENSANUT, National Survey of Health and Nutrition; ENDES, National Survey of Demography and Health. See Appendix A for the definition of the indicators "Ever had the blood pressure taken" and "Hypertension untreated." Statistical significance of difference across groups is denoted by * p < 0.1, ** p < 0.05, *** p < 0.01.

We also report in Table 6 inequalities on the uptake of mammography (test for breast cancer) and cervical cancer screening (cytology-based tests or HPV DNA-based tests), using the same method to standardize at age 60 than on Table 5. Unfortunately, the information is sparse across countries. When statistically significant, which is for most countries, the inequality is pro-highly educated. It is difficult though to ascertain a pattern of inequality according to the type of health system.

Table 6. Mammography and cervical cancer test standardized at age 60.

Type of health system	Country/survey	Mammography in the last 2 years			Cervical Cancer Test in the last 3 years		
		N	Mean	Ratio	N	Mean	Ratio
Beveridge	Brazil 2016-ELSI	3727	60.1	0.71***			
	Costa Rica 2010-CRELES	1705	56.6	0.75***			
Implicit Non-contributory	Argentina 2018-ENFR	4709	63.6	0.68***	9110	62.1	0.70***
	Ecuador 2018-STEPS	778	24.2	0.22***			
	Honduras 2012-DHS				17530	19.9	0.78***
Explicit Non-Contributory	Colombia 2015-DHS				26670	60.2	0.82***
	Dominican Republic 2013-DHS				7508	21.9	0.64***
	Peru 2016-ENDES	564	45.5	1.14	6186	76.4	
Partial Integration with upgrade	Chile 2019-ENS	1197	58.2	0.93	1449	8.3	
	Uruguay 2013-STEPS	546	71.7	0.66***	895	14.6	0.47

Note: Ratio = Lowest/Highest. 'Lowest' corresponds to primary education completed or less, but without any secondary education, and 'Highest' corresponds to completed at least secondary education. Mean refers to the population value standardized at age 60. Missing values in ratios if unweighted population in each education category <30. Estimated margins at age 60 from a Logit regression controlling for the second order polynomial of age. STEPS, Step towards a healthier world: monitoring noncommunicable diseases and their risk factors; ENFR, National Survey of Risk Factors; ELSI, Longitudinal Study of Aging; ENS, National Health Survey; SABE, Survey on Health, Well-Being, and Aging; CRELES, Longevity and Healthy Aging Study; ENSANUT, National Survey of Health and Nutrition; ENDES, National Survey of Demography and Health. See Appendix A for the definition of the indicators Mammography in the last 2 years" and "Cervical Cancer Test in the last 3 years." Statistical significance of difference across groups is denoted by * p < 0.1, ** p < 0.05, *** p < 0.01.

6. Segmentation between contributory and non-contributory subsystems: a key source of inequality?

As it is clear from the previous description, most countries in the region have a contributory subsystem, which only formal workers have access to, and which is better funded than the non-contributory subsystem to which informal workers have access to, although often copayments are higher in the contributory system. In some countries, contributory enrollees benefit from double coverage or can pay extra to "upgrade" and use private providers. Hence, differences in insurance coverage might play an important role on inequalities in the access to health care (both quantity and quality), and health. Indeed, previous country specific studies have highlighted the role that the type of insurance coverage might play on determining inequalities in health and health care (Barraza-Lloréns et al. 2013, Vásquez et al. 2013, González and Triunfo, 2020).

In this subsection we use household surveys to report differences in health care use and health outcomes between the population in the contributory and non-contributory subsystems of each country, and decompose such differences with respect to observed characteristics: demographics (age and sex), education (own education for adults, parental education for children's outcomes) and location (rural/urban) of individuals. When available, we also use as covariate a household proxy wealth index available in the DHS and MICS datasets, which captures the quintiles of the first principal component of a set of assets which are correlated with overall household wealth.[32] This decomposition reveals how far inequalities in health outcomes by insurance coverage can be explained by differences in observable characteristics.[33]

To achieve our objective, we use the Oaxaca decomposition (Oaxaca 1973) which typically involves three steps: (i) estimating a regression model to predict the outcome variable of interest; (ii) decomposing the difference between the outcome variable between two groups (i.e., with or without access to contributory health insurance); (iii) analyzing the contribution of each independent variable to the overall difference in outcomes between the two groups. In particular, assume that we have two groups, those who have contributory insurance and those without non-contributory insurance. The difference in average health outcomes between the two groups can be decomposed in an explained and an unexplained part. The explained part is calculated using a linear regression model that predicts a health outcome from a set of independent covariates for each group. We then use the predicted regression model for each group to estimate the difference that can be explained by the independent

[32] see https://dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm.

[33] The Oaxaca decomposition can also decompose the inequality between the two groups on differences in how these characteristics affect health outcomes (the coefficients of the regression), but in this chapter we have assumed such coefficients to be the same.

variables. The difference between the actual difference in health outcomes between the two groups and the difference in predicted values reflects the unexplained part.

Although the Oaxaca decomposition can provide useful insights into the source of group differences in health outcomes, and it has been extensively used in the literature (O'Donnell 2007; O'Donnell, Doorslaer, and Wagstaff 2006; Wagstaff and Nguyen 2002)), it is a statistical decomposition that reveals the associations that conform the inequalities by insurance scheme rather than casual effects.

We study inequalities in health on selected indicators that are key across the life cycle, and in particular on (i) maternal and child health, (ii) reproductive health, and (iii) non-communicable diseases. We use Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) to report inequalities in maternal and child health as well as reproductive health. To study inequalities in non-communicable diseases we use a wide range of national health surveys and the surveys conducted by WHO STEPwise approach to NCD risk factor surveillance (STEPS). See Appendix A for a detailed description of all indicators. We use fewer countries than in previous sections because the insurance coverage variable is missing in many of the surveys that we rely on (see Appendix B for the definition of the contributory and non-contributory population in each country).

For each indicator, we first report the inequality by insurance, as well as how much of that inequality we are able to explain by inequality in the selected factors. We then report the decomposition of the disparity and the relative contribution of inequality in the selected factors for the explained part of the inequality.

6.1 Maternal and child health

We first focus on two indicators of maternal healthcare: antenatal care with four or more visits; and quality antenatal care, defined as having at least one antenatal care visit in which blood pressure was measured and urine and blood sample were taken, following WHO guidelines (World Health Organization 2016) .[34]

Table 7 reports important disparities in antenatal healthcare favoring those in contributory schemes: a lower share of women enrolled in non-contributory insurance schemes gets access to frequent and high-quality antenatal care than women enrolled in the contributory. However, the covariates of the model (age, education, rural dummy, and a proxy household wealth index) explain the bulk of the differences, and none of the unexplained differences are statistically significant except for Mexico in the frequency of antenatal care. According to

[34] We focus on the last live birth (and current pregnancy if women were pregnant at the moment of the interview). The survey data includes women aged 12-49 years old. The DHS sample is restricted to live births taking place during the five years preceding the interview, while the MICS sample to the last two years.

Figure 4 and 5, wealth and education are the variables that drive most of the observed differences.

The results are consistent with the differences on antenatal care between contributory and non-contributory being driven by composition effects, rather than differential features between subsystems. This is consistent with the important expansion of primary care that took place between the 70s and the 90s into underserved rural and peri-urban areas, which prioritized maternal and child healthcare, and an observed decrease in the inequality on maternal and child healthcare (Berlinski et al. 2020; Cotlear et al. 2015).

Table 7. Decomposition of Antenatal care indicators in explained and unexplained

Panel A. Received at least 4 antenatal care visits

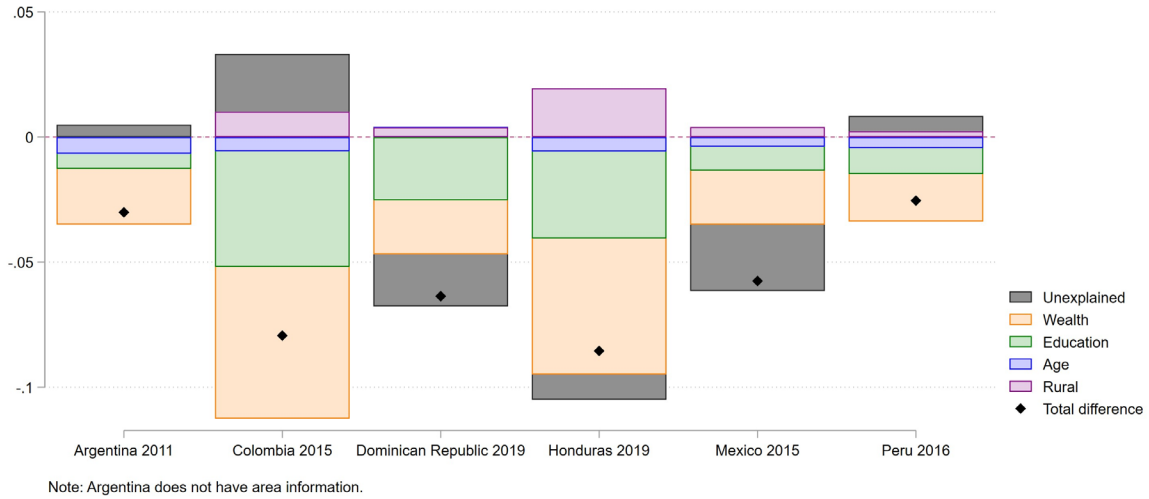
Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2011	3318	0.889	0.919	-0.030	-0.035***	0.005
				[0.019]	[0.012]	[0.021]
Colombia 2015	4652	0.866	0.945	-0.079***	-0.102***	0.023
				[0.013]	[0.012]	[0.016]
Dominican Republic 2019	3332	0.903	0.967	-0.064***	-0.043***	-0.021
				[0.011]	[0.008]	[0.013]
Honduras 2019	3278	0.876	0.961	-0.085***	-0.075***	-0.010
				[0.016]	[0.010]	[0.017]
Mexico 2015	3032	0.927	0.984	-0.058***	-0.031***	-0.026***
				[0.010]	[0.007]	[0.010]
Peru 2016	18029	0.955	0.981	-0.025***	-0.031***	0.006
				[0.005]	[0.003]	[0.005]

Panel B. Antenatal quality: received all recommended antenatal test in at least one antenatal visit

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2011	3318	0.977	0.989	-0.012*	-0.006*	-0.006
				[0.006]	[0.003]	[0.006]
Colombia 2015	4652	0.921	0.973	-0.051***	-0.054***	0.002
				[0.009]	[0.009]	[0.011]
Dominican Republic 2019	3332	0.975	0.993	-0.019***	-0.013***	-0.005
				[0.006]	[0.004]	[0.006]
Honduras 2019	3278	0.952	0.988	-0.036***	-0.036***	-0.000
				[0.009]	[0.006]	[0.009]
Mexico 2015	3032	0.978	0.996	-0.018***	-0.015***	-0.003
				[0.005]	[0.005]	[0.004]
Peru 2016	18087	0.919	0.969	-0.050***	-0.054***	0.004
				[0.006]	[0.004]	[0.006]

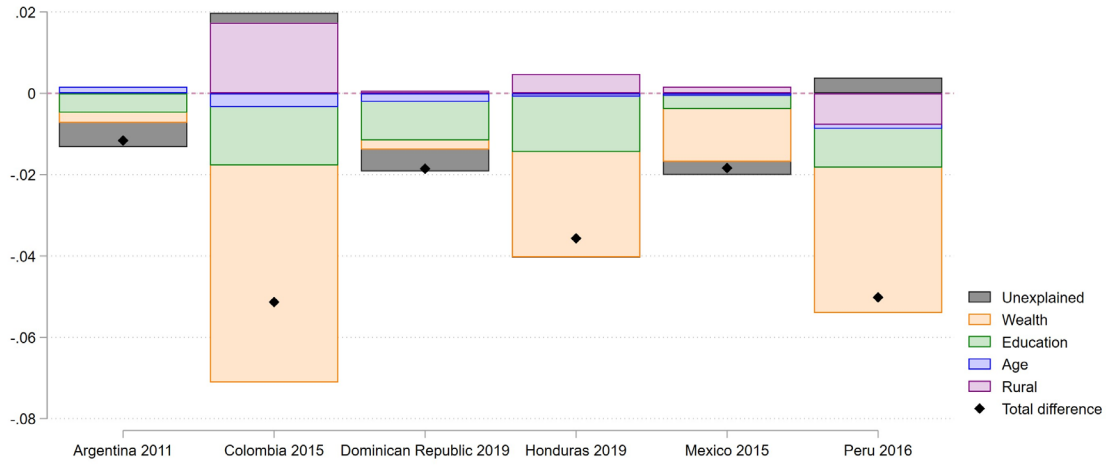
Notes: Oaxaca decomposition linear regression controls for age, education, household proxy wealth quintiles, and residence (urban/rural).

Figure 4. Oaxaca decomposition: Antenatal care 4+ visits



Note: Argentina does not have area information.

Figure 5. Oaxaca Decomposition: Quality antenatal care



Note: Argentina does not have area information.

We next focus on child health, and particularly on the double burden of malnutrition that exists in the LAC region: stunting and overweight. Table 8 reports that across all countries in the analysis, stunting rates are lower for children enrolled in the contributory schemes. The gap ranges from 2.9 ppts in Dominican Republic (2019) to 14 ppts in Honduras (2019). On the contrary, rates of overweight are higher for the contributory, and smaller in size.

In general, most of the differences are explained by the covariates of the models: mother's education; child's age and sex; rurality, and basic services. In the latter we include access to piped water and safe sanitation facilities, which have been found to affect the disease environment and child's nutritional status in the region (Attanasio et al. 2004; Attanasio, Maro, and Vera-Hernández 2013; Bancalari and Martinez 2017; Bhalotra et al. 2021). We also include access to electricity, as alternative fuels can impair children's physical development (Ghosh et al. 2011; Nazif-Muñoz et al. 2020). With these factors we explain 50-95% of the

disparity in stunting by health insurance scheme, with the highest explanatory power achieved in Peru (2016). In most countries the inequality is mostly explained by inequalities in household's access to basic services, followed by inequalities in mother's education (Figure 6).

With respect to overweight, Figure 7 reports that most of the difference is explained by education and access to basic services, which will also be correlated with wealth, both going in the same direction. Rurality does not seem to play a major role in explaining the observed differences.

Table 8. Decomposition of children's nutritional indicators

Panel A. Stunted for children under 5 years

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Colombia 2010	15707	0.156	0.086	0.070***	0.052***	0.019**
				[0.008]	[0.005]	[0.009]
Dominican Republic 2019	7772	0.081	0.051	0.029***	0.017***	0.013
				[0.008]	[0.005]	[0.010]
Honduras 2019	7841	0.201	0.062	0.140***	0.095***	0.045***
				[0.013]	[0.008]	[0.015]
Mexico 2015	7699	0.142	0.087	0.054***	0.031***	0.023
				[0.017]	[0.007]	[0.017]
Peru 2016	20519	0.157	0.051	0.106***	0.089***	0.017***
				[0.006]	[0.005]	[0.006]

Panel B. Overweight for children under 5 years

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Colombia 2010	15698	0.044	0.056	-0.012**	-0.016***	0.004
				[0.005]	[0.003]	[0.006]
Dominican Republic 2019	7711	0.061	0.100	-0.040***	-0.024***	-0.016*
				[0.009]	[0.005]	[0.009]
Honduras 2019	7788	0.043	0.069	-0.026**	-0.022***	-0.004
				[0.013]	[0.005]	[0.015]
Mexico 2015	7676	0.047	0.063	-0.016	-0.003	-0.014
				[0.010]	[0.003]	[0.011]
Peru 2016	20519	0.065	0.110	-0.046***	-0.034***	-0.012
				[0.008]	[0.003]	[0.009]

Notes: Oaxaca decomposition linear regression controls for age, sex, mother's education, household's access to basic services (piped water, sewerage system, safe cooking fuel, finish house walls, finish house floor, finish house roof, house connected to electricity network, and rooms over people), and residence (urban/rural).

Figure 6. Oaxaca Decomposition: Stunting

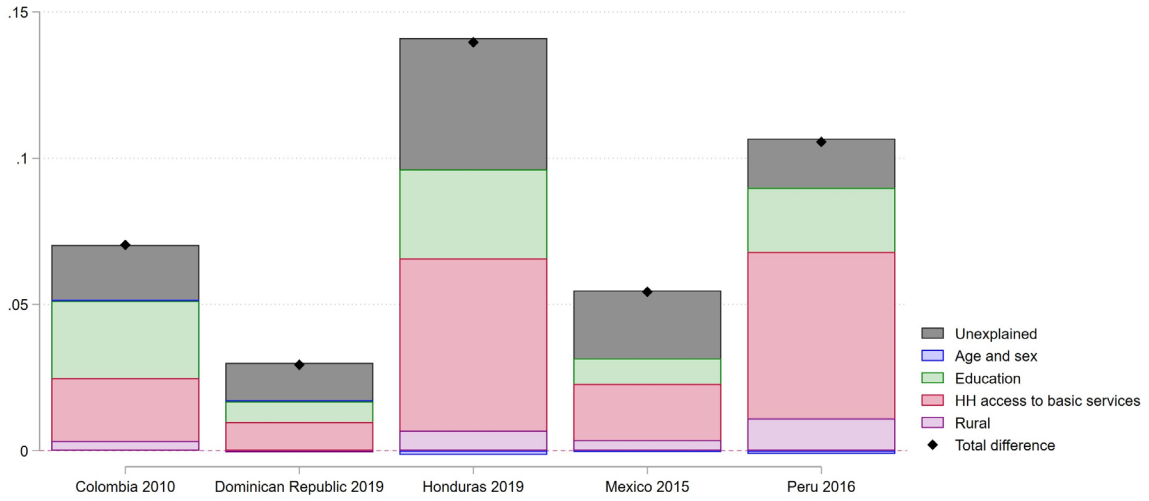
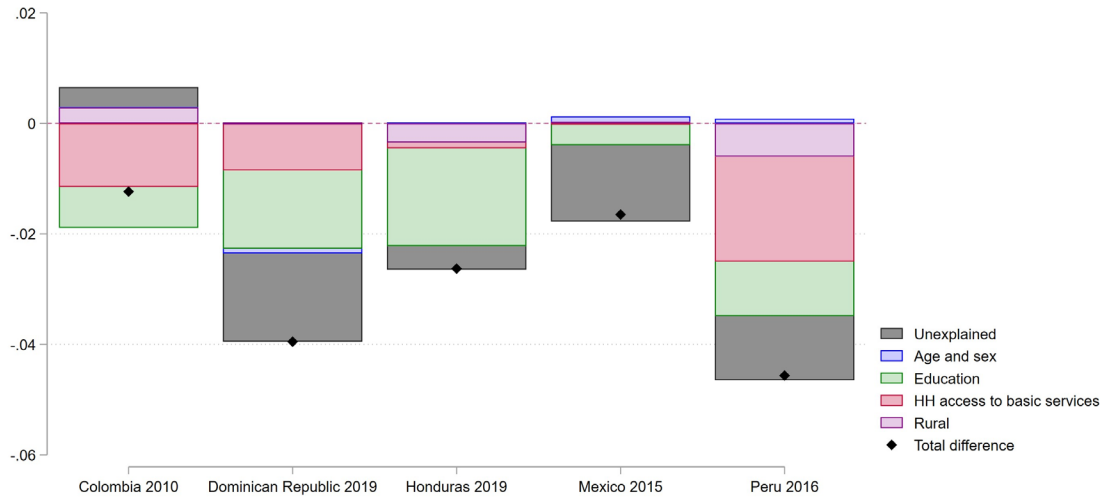


Figure 7. Oaxaca Decomposition: Overweight



Overall, we find that the gaps in children's nutritional status are mostly explained by our covariates, and that the unexplained component tends to be small. These results are consistent with dietary choices as well as children's physical activity being mostly driven by parental resources and choices, as well as access to basic services, rather than access to health care. Although the health system can play a role through monitoring children's growth and providing information to parents, these are either not very effective or similarly well provided in the contributory and non-contributory scheme (thanks maybe to the expansion that we previously referred to).

In summary, inequalities in maternal and child health by health insurance scheme are mostly explained by composition effects (differences in education, wealth, and access to public

services). It is interesting that differences in rurality often explain little of the gap between contributory and non-contributory, with a few exceptions. The relatively small unexplained differences between contributory and non-contributory take us to hypothesize that differential insurance coverage is no longer a major determinant of gaps on antenatal care, child stunting and overweight, and that broader policies would be needed to reduce inequalities in these indicators.

6.2 Reproductive health

We next focus on three health outcomes linked to reproductive health and family planning: (i) teenage pregnancy (measured when the mother is 25 years old or older); (ii) unwanted pregnancy; (iii) unmet need for contraceptives (for spacing or limiting). Access to quality health insurance can affect the demand for family planning, as it enables greater interaction with health staff that promotes adoption, as well as the supply of services and contraceptives.[35],[36]

Table 9 reports the levels and differences in the three indicators of interest between contributory and non-contributory enrollees. As we already discussed in our accompanying work, Bancalari et al 2023, the rates of teenage motherhood are very large. For women enrolled in the contributory schemes, they range from 16.9% to 36.8%, and in the non-contributory from 38.6% to 53.7%. The gaps between these two groups is 20 ppts for most countries. Although the rates and differences on unwanted births and unmet need for contraceptives are smaller (4-18 ppts for unwanted pregnancy and below 5 ppts for unmet needs for contraceptives), they are still very sizeable, especially for unwanted births. Contributory enrollees have, across all countries, better indicators than non-contributory enrollees.

Table 9 also shows that most of the gaps between contributory and non-contributory are explained by the model covariates (education, proxy index of wealth, rural and age), with most unexplained differences being far smaller than the explained ones, and with only a few being statistically significant.

The gap on teenage motherhood is mostly explained by education, with wealth playing a much smaller role (Figure 8), with almost no role for rurality (except maybe in Colombia (2015)). Most of the disparities in unmet need and unwanted pregnancies are driven by the women's education and her household's wealth (Figures 9 and 10). Rurality tends to explain

[35] We focus on the last pregnancy (or two last pregnancies if woman was pregnant at the moment of the interview). The DHS sample is restricted to pregnancies taking place during the five years preceding the interview, while the MICS sample to the last two years.

[36] Women with unmet needs are those who are fecund and sexually active (aged 15-49 years old) and married or in a consensual union, but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child.

little of the gap between contributory and non-contributory, except in Colombia (2015) where it seems more relevant.

Similar to children's nutritional status, the fact that the differences between contributory and non-contributory enrollees in the rates of these reproductive health indicators seem to be driven by observed composition effects lends to hypothesize that either the health services of both schemes exert a similar effort on reproductive health, or that the efforts are different but, in either case, they tend to be ineffective because these behaviors might be largely determined by gender norms, socio-economic, and other cultural factors which are at some distance of the role that health system traditionally plays. Hence, interventions to reduce the inequalities will need to consider the very broad set of determinants, and work across sectors to affect them.

Table 9. Decomposition of reproductive health indicators

Panel A. Woman was a teenager mother (Currently age +25 years)

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2011	12498	0.410	0.228	0.182***	0.134***	0.049***
				[0.015]	[0.009]	[0.018]
Colombia 2015	22406	0.463	0.273	0.190***	0.172***	0.017
				[0.011]	[0.008]	[0.012]
Dominican Republic 2019	12678	0.537	0.368	0.170***	0.149***	0.021*
				[0.012]	[0.008]	[0.013]
Honduras 2019	10573	0.535	0.320	0.216***	0.201***	0.014
				[0.018]	[0.012]	[0.018]
Mexico 2015	7055	0.419	0.298	0.121***	0.108***	0.013
				[0.024]	[0.013]	[0.023]
Peru 2016	21594	0.386	0.169	0.217***	0.199***	0.018
				[0.010]	[0.007]	[0.011]

Panel B. Unwanted birth

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Colombia 2015	2970	0.290	0.131	0.159***	0.133***	0.025
				[0.022]	[0.019]	[0.027]
Honduras 2012	3021	0.196	0.086	0.110***	0.054***	0.056**
				[0.021]	[0.013]	[0.023]
Mexico 2015	1869	0.219	0.176	0.043	0.050***	-0.007
				[0.039]	[0.017]	[0.038]
Peru 2016	16404	0.262	0.154	0.109***	0.081***	0.027***
				[0.010]	[0.007]	[0.011]

Panel C. Unmet need for contraceptives

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Colombia 2015	35884	0.071	0.045	0.027***	0.018***	0.009**
				[0.004]	[0.003]	[0.004]
Honduras 2012	22751	0.068	0.048	0.020***	0.013***	0.007
				[0.006]	[0.003]	[0.007]
Peru 2016	33135	0.041	0.033	0.008**	0.009***	-0.001
				[0.004]	[0.002]	[0.004]

Notes: Oaxaca decomposition linear regression controls for age, education, household proxy wealth quintiles, and residence (urban/rural).

Figure 8. Oaxaca decomposition: Teenage mother (currently age + 25 years)

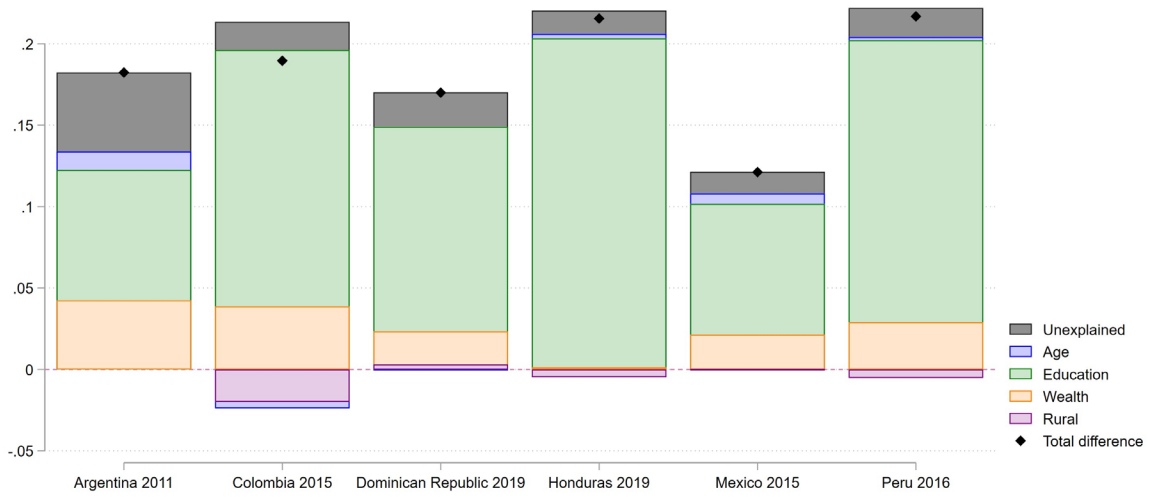


Figure 9. Oaxaca decomposition: Unwanted pregnancy

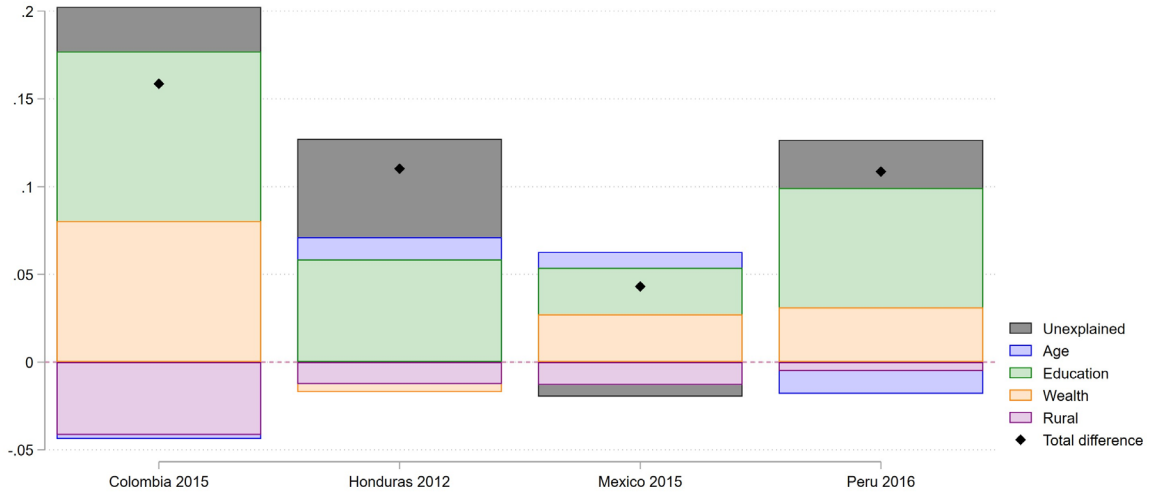
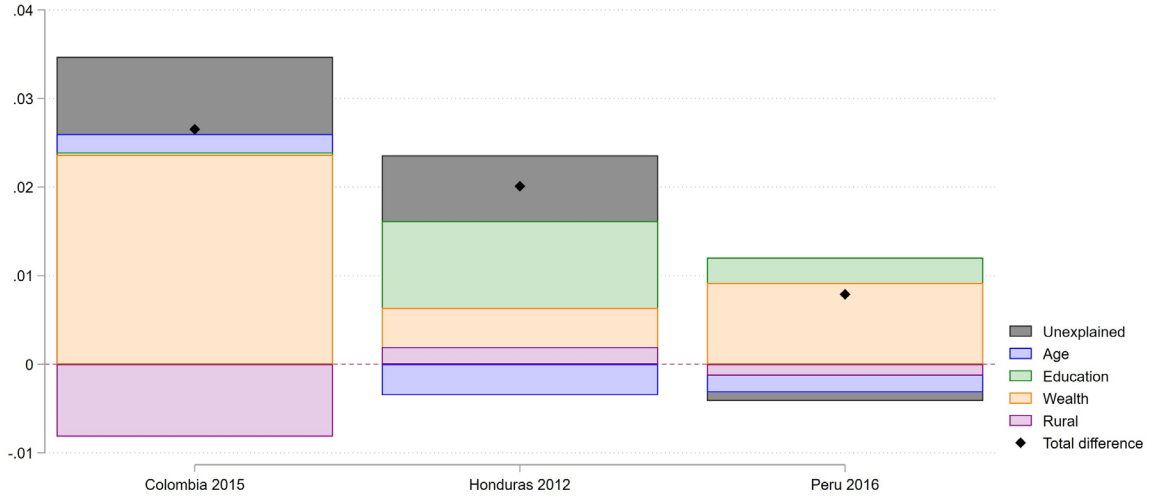


Figure 10. Oaxaca decomposition: Unmet need in contraceptive use



6.3 Non-communicable diseases

We use information from STEPS and national health surveys that identify risk factors for non-communicable diseases using standardized clinical measurements: body mass index for obesity and blood pressure for hypertension. We also draw on follow-up questions about whether the respondent's blood pressure has even been measured, and well as whether its hypertension is being treated or not. Although the STEP surveys are relatively harmonized, the national health surveys are not, so an important effort was required to harmonize these different health surveys.

Table 10 reports that the rate of hypertension is significantly higher in contributory enrollees than non-contributory ones, in all countries except Chile where the gap is not statistically significant (differences ranging from -0.11 to 0.01). The results for the prevalence of obesity are more nuanced, with higher rates for the contributory in Colombia (2015) and Peru (2016), smaller in Chile (2019), and not statistically significant differences in Argentina (2018) and Mexico (2018).

The balance between differences explained by our covariates (age and sex, education, and rurality) and the unexplained differences also is relatively nuanced. In some countries, the explained differences are larger than the unexplained (Argentina 2018, Peru 2016) while in others the unexplained are larger (Colombia 2015). Although the prevalence of hypertension and obesity largely depend on diet, physical activity and other lifestyle choices that might be affected by socio-economic conditions and type of work, the health system can also contribute to their prevention by providing timely advice and counselling. The associations between diet and type of work and socio-economic conditions might also be country specific.

Table 10: Decomposition of risk factors of cardiovascular disease

Panel A. Hypertension

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2018	16204	0.376	0.487	-0.111***	-0.125***	0.015
				[0.015]	[0.009]	[0.016]
Chile 2019	5401	0.283	0.273	0.010	-0.009	0.019
				[0.023]	[0.013]	[0.021]
Colombia 2015	5371	0.601	0.681	-0.080***	-0.007	-0.073**
				[0.030]	[0.016]	[0.030]
Mexico 2018	14429	0.270	0.351	-0.080***	-0.040***	-0.040***
				[0.011]	[0.007]	[0.011]
Peru 2016	16936	0.181	0.253	-0.072***	-0.049***	-0.023**
				[0.011]	[0.007]	[0.011]

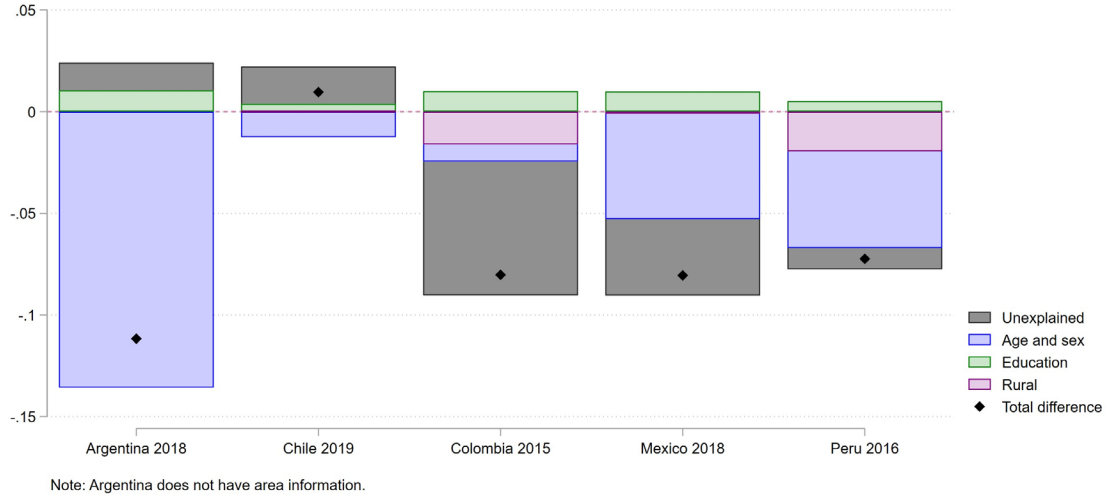
Panel B. Obesity in adults

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2018	16387	0.319	0.325	-0.005	-0.036***	0.030*
				[0.015]	[0.008]	[0.016]
Chile 2019	5371	0.382	0.332	0.050*	0.019**	0.032
				[0.026]	[0.008]	[0.026]
Colombia 2015	20418	0.201	0.266	-0.065***	0.002	-0.067***
				[0.016]	[0.008]	[0.015]
Mexico 2018	12433	0.368	0.369	-0.001	0.002	-0.003
				[0.012]	[0.006]	[0.013]
Peru 2016	16935	0.153	0.275	-0.122***	-0.058***	-0.064***
				[0.011]	[0.006]	[0.013]

Notes: Oaxaca decomposition linear regression controls for age, gender, education, and residence (urban/rural). The values in the table are not standardized by age so care should be taken when comparing across countries. The age ranges are: Argentina 2018 (18-104 years old); Chile 2019 (15-98 years old); Colombia 2015 (60-101 years old); Mexico 2018 (20-105 years old); and Peru 2016 (15-98 years old).

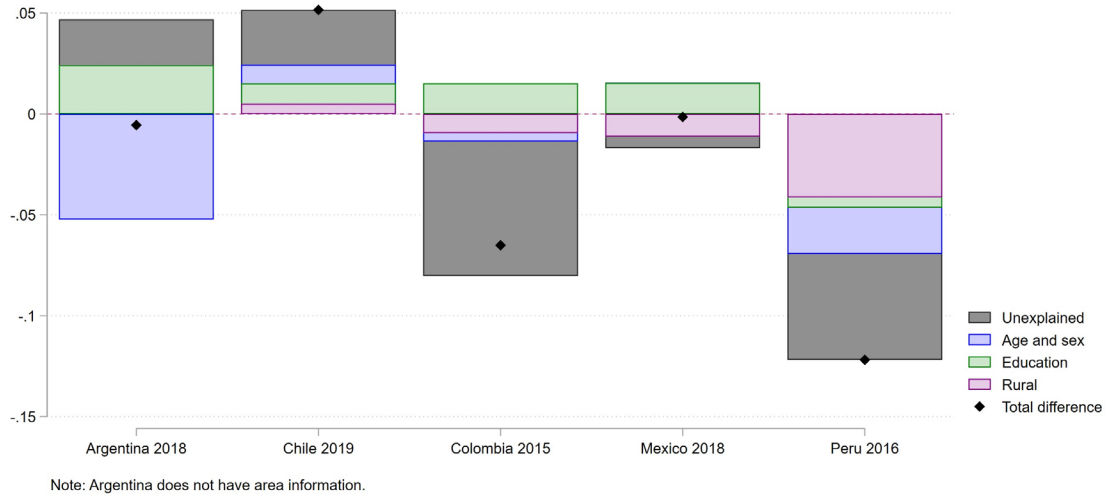
Figures 11 and 12 report the contribution of each covariate to the gap in these risk factors of cardiovascular disease. Age and sex play a very important role in explaining the hypertension gap in Mexico (2018), Argentina (2018), and Peru (2016), and also for obesity in Argentina (2018) and Peru (2016). Education plays a negligible role in the prevalence of hypertension, but seems more important to explain the obesity gap, although in Peru goes in the opposite direction to the rest of the countries.

Figure 11. Oaxaca decomposition: Prevalence of hypertension



Note: Argentina does not have area information.

Figure 12. Oaxaca decomposition: Prevalence of obesity



Note: Argentina does not have area information.

Table 11 reports on the decomposition of whether the individual's blood pressure has ever been measured, as well as for whether those individuals suffering from hypertension whether they are having it treated or not. We find that contributory enrollees are more likely to have had their blood pressure taken than non-contributory enrollees (with differences ranging from -0.026 ppts. in Chile (2019) to -0.286 ppts. in Peru (2016)), and that they are also more likely to have it treated if they suffer from it (gaps from 0.10 ppts. in Colombia (2015) to 0.21 ppts. in Argentina (2018)) with the only exception of Chile where it is not statistically significant. The prevalence of untreated hypertension is worryingly high in the non-contributory schemes of some countries such as Argentina, Peru, and Mexico, where it exceeds 50% and rises to 81% in Argentina.[37]

[37] Alzúa and Pacheco (2021) highlight the difficulties associated with obtaining timely primary care in the non-contributory system in Argentina.

Of the adult indicators analyzed so far in this section, these two indicators are probably the ones in which the health system can have a more definitive effect on. In general, both explained and unexplained factors are statistically significant, and contrary to other indicators so far seen, the size of the unexplained factors tends to be quite important, often larger than the explained factors (which include age, gender, education, and rurality). Although we cannot be certain about it, these significant unexplained differences might be due to the differential features of the contributory vs. non-contributory schemes of each country.

Table 11: Decomposition of the likelihood of detection and treatment of hypertension

Panel A. Hypertension test ever taken

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2018	16554	0.864	0.961	-0.096***	-0.063***	-0.033***
				[0.010]	[0.006]	[0.007]
Chile 2019	5595	0.905	0.931	-0.026*	-0.006	-0.020
				[0.016]	[0.005]	[0.016]
Peru 2016	16920	0.334	0.625	-0.291***	-0.099***	-0.192***
				[0.012]	[0.007]	[0.013]

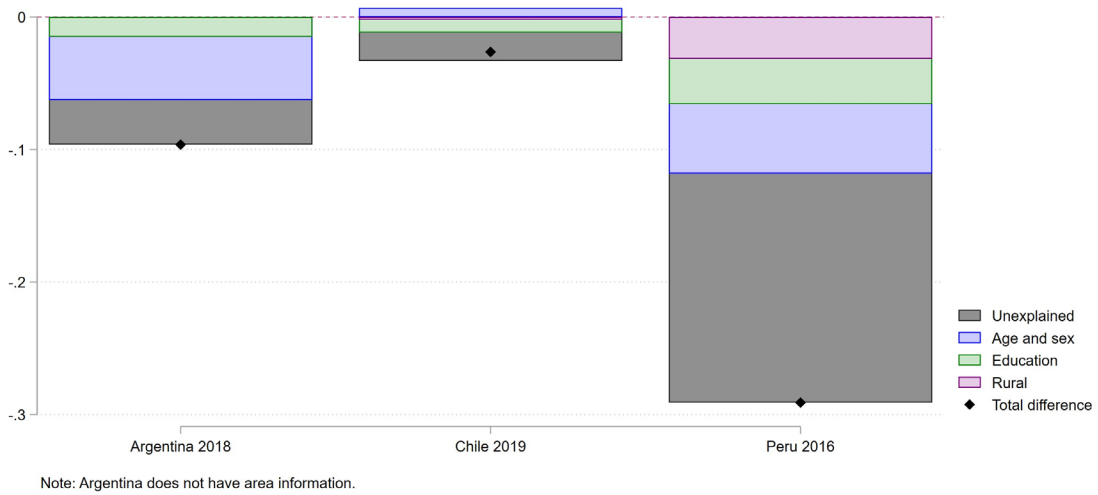
Panel B. Untreated hypertension

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2018	7461	0.816	0.604	0.212***	0.175***	0.037*
				[0.019]	[0.013]	[0.022]
Chile 2019	1941	0.414	0.345	0.069	-0.003	0.072
				[0.049]	[0.020]	[0.046]
Colombia 2015	3514	0.294	0.192	0.103***	-0.003	0.106***
				[0.031]	[0.019]	[0.032]
Mexico 2018	4434	0.589	0.419	0.171***	0.072***	0.099***
				[0.020]	[0.011]	[0.020]
Peru 2016	3212	0.672	0.497	0.176***	0.073***	0.103***
				[0.026]	[0.017]	[0.028]

Notes: Oaxaca decomposition linear regression controls for age, gender, education, and residence (urban/rural). The values in the table are not standardized by age so care should be taken when comparing across countries. The age ranges are: Argentina 2018 (18-104 years old); Chile 2019 (15-98 years old); Colombia 2015 (60-101 years old); Mexico 2018 (20-105 years old); and Peru 2016 (15-98 years old).

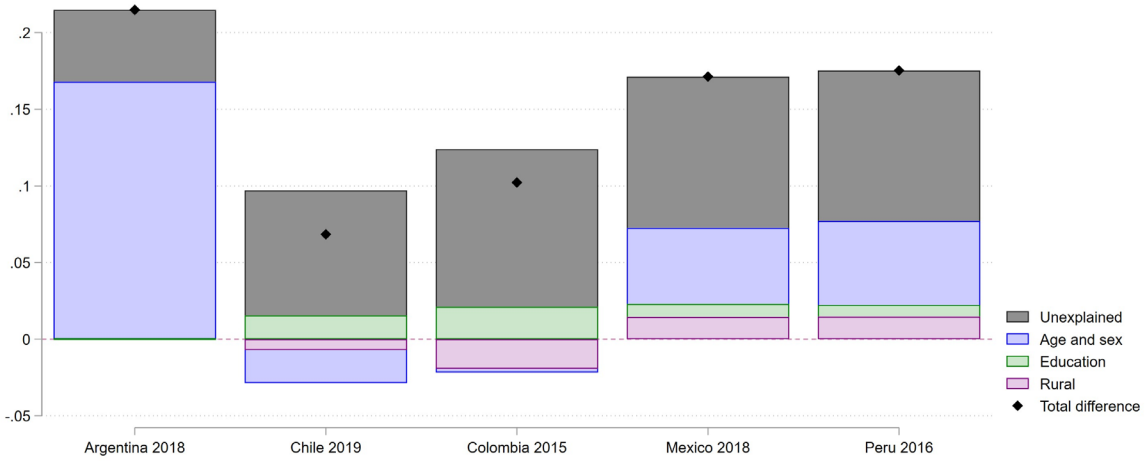
Figures 13 and 14 report the decomposition in these two indicators in their unexplained component and each of the explained ones. Apart from the unexplained one that tends to be the most important, age and gender also play a significant role in most countries, followed by education and rurality although they tend to be far less important.

Figure 13. Oaxaca decomposition: Ever have had their blood pressure taken



Note: Argentina does not have area information.

Figure 14. Oaxaca decomposition: Untreated hypertension



Note: Argentina does not have area information.

Finally, we analyze two preventive care indicators, whether a (20-49 years old) woman has had a cervical cancer screening test (cytology-based tests or HPV DNA-based tests) in the last 3 years, and whether a (50-69 years old) woman has had a mammogram in the last 2 years (Table 12). As the previous two, these two indicators can be greatly affected by the features of the health system. We find that women enrolled in the contributory subsystem are much more likely to have these two tests done than women in the non-contributory system, with some very large differences of up to 26 ppts. The only exception is Chile (2019) in which the differences are not statistically different from zero.

Table 12: Decomposition of the likelihood of having cervical cancer screening and mammogram

Panel A. Cervical cancer screening in the last 3 years

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2018	5244	0.645	0.806	-0.161***	-0.066***	-0.095***
				[0.024]	[0.011]	[0.025]
Chile 2019	1429	0.689	0.723	-0.034	-0.001	-0.033
				[0.043]	[0.022]	[0.044]
Colombia 2015	26670	0.809	0.899	-0.089***	-0.017***	-0.073***
				[0.008]	[0.005]	[0.008]
Honduras 2012	17529	0.489	0.621	-0.133***	-0.039***	-0.094***
				[0.015]	[0.006]	[0.015]

Panel B. Mammogram in the last 2 years

Country	Obs	Mean Non-contributory	Mean contributory	Difference	Explained	Unexplained
Argentina 2018	2741	0.447	0.705	-0.258***	-0.042**	-0.216***
				[0.043]	[0.021]	[0.046]
Chile 2019	1175	0.517	0.546	-0.029	0.011	-0.039
				[0.060]	[0.020]	[0.061]
Peru 2016	542	0.401	0.654	-0.252***	0.027	-0.280***
				[0.058]	[0.024]	[0.059]

Notes: Oaxaca decomposition linear regression controls for age, education, and residence (urban/rural). The values reported in the table are not standardized by age so care should be taken when comparing across countries. For cervical cancer screening in the last 3 years the age range for all countries is 20-49 years old. For mammogram in the last 2 years the age range in Argentina 2018 and Chile 2019 is 50-69 years old, and for Peru is 50-59 years old.

Figures 15 and 16 decompose the uptake of these two tests (cervical cancer and mammogram) on an unobserved component and each of the observed factors. As in the previous two indicators, we find that the unexplained tends to be dominant. Education tends to play some role, except in Chile (2019) and Peru (2016), which is not surprising because more educated people tend to demand more preventive care, and in average education is higher in the contributory than in the non-contributory. In general, the contribution of rurality tends to be negligible.

Figure 15. Oaxaca decomposition: Cervical cancer screening in the last three years

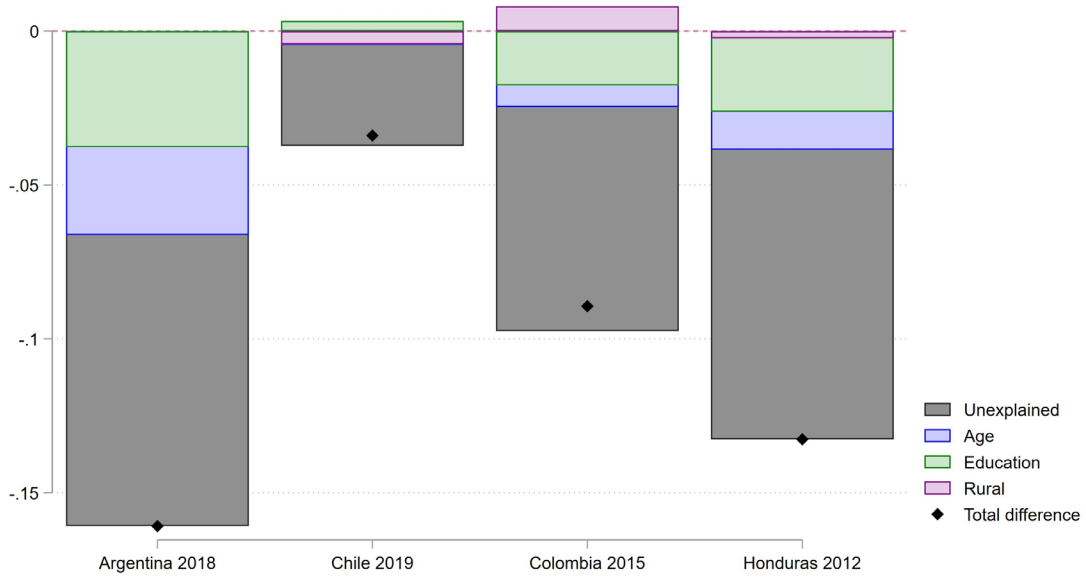
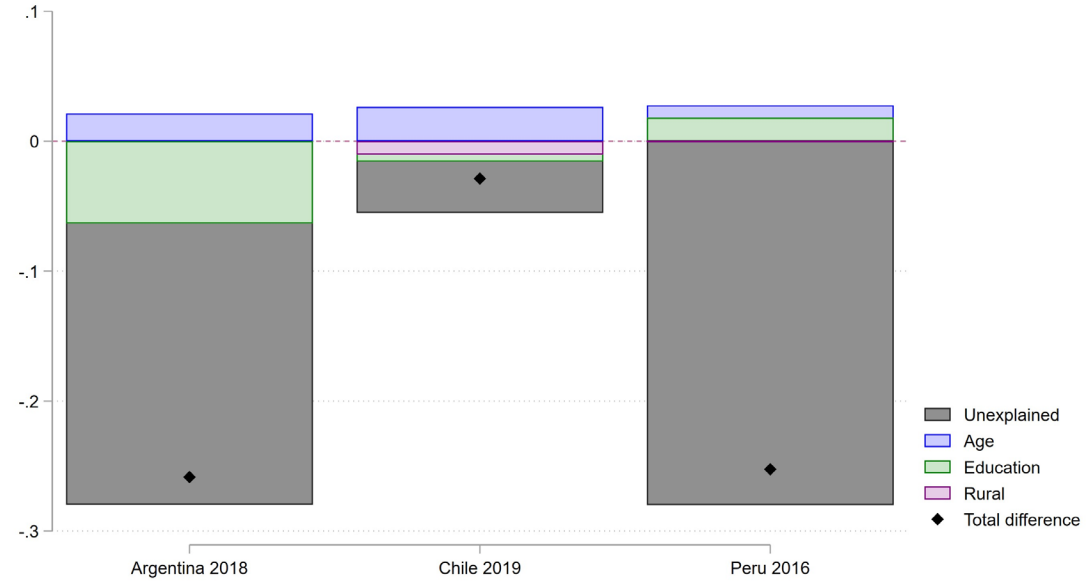


Figure 16. Oaxaca decomposition: Mammogram in the last 2 years



In this section, we have studied the gaps between contributory and non-contributory enrollees on a battery of health and health care indicators, with the objective not only of quantifying the average difference between the enrollees of each group, but also of decomposing the differences between that which can be explained by the covariates of our models (education, quantiles of a household proxy wealth index, basic services, rurality, age

and sex) and that which remains unexplained, and hence might partially be related to the differences in the features of the contributory vs. non-contributory system.

In general, we find that those enrolled in the contributory system enjoy better levels of the indicators that we study. To understand the results of the decomposition of such differences between explained and unexplained, it is useful to consider separately health care use indicators (both curative and preventive) and indicators that measure health outcomes (broadly defined).

With respect to health outcomes, (i.e. children stunting and overweight, teenage motherhood, unwanted pregnancy, adult obesity, and hypertension prevalence), we find that the differences explained by the covariates tend to be larger than the unexplained ones, (with the exception of a hypertension and adult obesity for which the relation is more nuanced). This is somehow expected because, as mentioned in the introduction, the production of health is a complex process that depends on genetic, environmental, and societal factors, as well as an individual's resources and living conditions. Although health care might be an important input in this complex process, several other inputs (diet, physical activity, cultural and gender norms, etc.) are also important and the health system has so far only limited influence on these.

With respect to health care use, it is worth separating them into those related to birth delivery and those related to adult health. With respect to the former, although we found differences between contributory and non-contributory enrollees in the frequency and quality of antenatal care, they are explained by the model covariates, and the unexplained component tends to be fairly small. This is consistent with the important expansions of primary care that took place between the 70s and the 90s into underserved rural and peri-urban areas, which prioritized maternal and child healthcare, considerably narrowed the differences between these two subsystems on prenatal care.

With respect to adult health care indicators (detection and treatment of hypertension, cervical cancer screening, and mammogram), we also find significant differences between contributory and non-contributory enrollees, but in this case the unexplained differences are very important, and tend to be larger than the difference explained by the socio-demographic factors included as covariates in the models. Although we cannot be certain, the result leads us to hypothesize that part of these unexplained differences might be due to differential quality and accessibility between the contributory and non-contributory subsystems.

When it comes to individual countries, it is interesting to note that the disparities on adult health care indicators tend to be relatively small in Chile (2019), including the unexplained component. This is consistent with the integration of both contributory and non-contributory enrollees within the public insurer, FONASA. Still, Table 5 identified an important difference in untreated hypertension between the most and least educated. It might be that this

difference emerges from within the contributory system, due to the option of opting out of FONASA and choose private insurance coverage. When it comes to individual countries, it is interesting to note that the disparities on adult health care indicators tend to be relatively small in Chile (2019), including the unexplained component. This is consistent with the integration of both contributory and non-contributory enrollees within the public insurer, FONASA. Still, Table 5 identified an important difference in untreated hypertension between the most and least educated. It might be that this difference emerges from within the contributory system, due to the option of opting out of FONASA and choose private insurance coverage.

Conclusions

In this chapter we have categorized the health systems of Latin America based on how segmented their health insurance coverage is. Except for Brazil, Cuba, and Costa Rica which conform relatively well to a traditional Beveridge system, the health systems of most countries share characteristics of Bismarckian and Beveridge traditional systems.

Apart from Brazil, Costa Rica, and Cuba, all other countries that we study link, to a larger or lesser extent, the individuals' insurance coverage to their status in the labor market, as it is traditional of Bismarckian systems. In Latin American, the defining factor in terms of labor market status is whether individuals are formal workers and contribute to social security, or informal and they do not. However, there are still substantial differences across countries in how their health systems treat their contributory and non-contributory enrollees, which lead us to categorize them as Bismarckian without explicit non-contributory insurance, Bismarckian with explicit non-contributory insurance, and those with partial integration with the possibility of opting out.

Those countries (Argentina, Ecuador, Honduras, Paraguay, and El Salvador) which do not have an explicit non-contributory insurance offer their enrollees access to a public network of health care providers, but often they are not enrolled in a particular insurance program, and there is no an explicit package of treatments or diagnostic tests to which they are entitled to. This lack of explicit insurance leaves them particularly exposed to whatever offers the particular health care provider that they visit.

Other countries (Colombia, Mexico, Peru, and the Dominican Republic) with a Bismarckian system provide eligible non-contributory individuals with an explicit insurance program, which guarantees a set of services and treatments, strengthening the accountability of the system towards non-contributory enrollees. Chile and Uruguay have a common insurance fund for both contributory and non-contributory enrollees, but contributory ones can make extra payments to opt out all together or "upgrade" to private providers.

As it is evident from the discussions in the chapter, there is no easy predictions on what type of health system should lead to less inequality on health and health care. For instance,

although Beveridge models given the same entitlements to everyone within the public insurance, individuals dissatisfied with the level of quality or access provided by the public insurer will buy private health care, either out of pocket or through private insurance.

The relation between consumer cost-sharing and inequality is also far from trivial. Most contributory systems tend to have higher consumer cost-sharing in the contributory than non-contributory schemes. Cost-sharing can also be used in Chile and Uruguay to "upgrade" to private health care providers, which can increase inequality between contributory and non-contributory enrollees, but also within contributory ones. In countries in which the non-contributory insurance is not fully rolled out, those informal workers who are not covered by the non-contributory insurance are subject to higher cost-sharing, increasing inequality within informal workers. And especially in Beveridge countries, out-of-pocket payments can be the manifestation that individuals purchase private health care.

Estimating the per capita funding for each subsystem (contributory and non-contributory) is a challenging task that goes beyond the scope of this review, but relying on in-depth country studies we document clear differences, for a subset of countries, in funding in favors of the contributory system, possibly leading to unequal treatment by the health system of contributory vs. non-contributory enrollees.

We match measures of inequality on health care, estimated through many different household surveys (see our accompanying work, Bancalari et al 2023), with our categorization of health systems. This exercise is done subject to multiple and very important caveats: (i) the data is very sparse (both across countries and measures of health care use) (ii) the availability of indicators varies per country, (iii) the survey year varies per country, (iv) we only consider a very small set of indicators, (v) countries are obviously different in many other dimensions which are not the health system. We emphasize that our results can only be understood as patterns or associations, and not as a causal outcome of the health system per se.

We report inequality measures on antenatal care, teenage pregnancy, hypertension testing and treatment, as well as whether women have had a mammography in the last two years and a cervical cancer test in the last three years. Subject to the very important caveats indicated above, we tend to find that Beveridge countries (Brazil, Costa Rica, and Cuba) are amongst the ones that consistently tend to be amongst the less unequal. Besides this, it is difficult to find any other pattern, partly due to the sparsity of the data.

We then focus on non-Beveridge countries and decompose the inequality on the health indicators between contributory and non-contributory enrollees on that explained by socio-demographic characteristics, and an unexplained component. We find a set of indicators for which socio-demographic characteristics explain most of the inequality between contributory and non-contributory enrollees, and for which the unexplained components are small. The indicators that fall in this category are antenatal care, children's nutritional status, teenage motherhood, and other related reproductive health indicators. It is plausible for the

contributory vs. non-contributory difference not to play a major role for these indicators either because their determinants are much broader than the health system (possibly the case for children's nutritional status and teenage motherhood) or because important expansions of primary care that took place between the 70s and the 90s into underserved rural and peri-urban areas, which prioritized maternal and child healthcare, considerably narrowed the differences between these two subsystems on prenatal care.

We also find another set of indicators for which the unexplained component tends to be sizeable and more important than the explained components. These indicators are whether women have had a mammography in the last two years, cervical cancer test in the last three years, an individual has ever been tested for hypertension, and for those with hypertension, whether it is untreated. It is plausible to think that these are indicators for which the health system can more easily have a direct effect, and hence that if there are important differences between the contributory and non-contributory subsystems, they are reflected in the unexplained component that we estimate.

Health production is a multifaceted process, shaped by a diverse range of inputs influenced by household resources, empowerment, information, and societal norms. While expanding healthcare coverage and addressing disparities in access to care are vital steps towards reducing health inequalities, they may prove insufficient. Effective policies aimed at diminishing health disparities must extend beyond the healthcare sector and work collaboratively to reshape societal norms, enhance information, correct power imbalances, and secure enough resources for households— all of which are integral components in the intricate process of health production

Most countries of the region have segmented contributory and non-contributory insurance schemes, with the former better funded than the latter. We have identified significant disparities among members of these schemes in terms of the prevention and treatment of non-communicable diseases. These disparities do not appear to be solely explained by socio-economic factors; rather, they may partially stem from differences in access and quality between these segmented systems. Enhancing non-contributory schemes poses challenges due to a limited tax base and high levels of informality. However, the alarming surge in non-communicable diseases in the region underscores underscore the need for urgent action.

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APPENDIX

APPENDIX A: DESCRIPTION OF INDICATORS

Children and woman indicators

Indicator	Definition	Sample (denominator)	Construction (numerator)	Age	Source
Infant mortality rate	Percentage of infants dying before the first birthday, per 1,000 live births	Children from birth history who were born in the last 5 years preceding the survey	1 if died before the first birthday, 0 if survived	Child age: 0-5 years Mother age: 12-49 years	DHS and MICS
Stunting	Percentage of children stunted	Children between ages 0 and 59 months before the survey	1 if below -2 SD of height for age according to the WHO standard, 0 if it is over -2SD	Child age: 0-59 months	DHS and MICS
Overweight	Percentage of children overweight	Children between ages 0 and 59 months before the survey	1 if weight-for-height z-score is above plus 2 (+2.0) standard deviations (SD), 0 if it's equal or below	Child age: 0-59 months	DHS and MICS
Antenatal visits for pregnancy: 4+ visits	Percentage of women with a live birth that had 4+ antenatal care visits in their last pregnancy	Women with a birth in the last 2 years	1 if woman had 4 or more antenatal visits in last pregnancy, 0 otherwise	Woman age: 12-49 years	DHS and MICS
High quality antenatal care	Percentage of women with at least one antenatal care visit with blood pressure measured + urine sample taken + blood sample taken	Women with a birth in the last 2 years	1 if women who had blood presure mesured and urine sample taken and blood sample in ANC during last pregnancy, 0 if did not have any ANC or the components were not completed	Woman age: 12-49 years	DHS and MICS
Teenage pregnancy	Percentage of women +25 years who had their first child when youger than 20 years	Women +25 years	1 if woman had a child under 20 years; 0 otherwise	Woman age: 26-49 years	DHS and MICS
Unwanted pregnancy	Percentage of women pregnant or with a child that do not want child	Women +25 pregnant or with a child in the last 2 years	1 if woman not wanted at all pregnancy when became pregnant; 0 if woman wanted or wanted later pregnancy when became pregnant	Woman age: 25-49 years	DHS and MICS
Unmet need for family planning	Percentage of women with an unmet need for family planning	Women married or in a consensual union	1 if unmet need for contraception (for spacing or limiting); 0 otherwise	Woman age: 15-49 years	DHS and MICS

Adult indicators

Indicator	Definition	Sample (denominator)	Construction (numerator)	Age	Source
Obese	Percentage who are obese (BMI ≥ 30 kg/m2)	People with weight and height measures	1 if BMI>=30; 0 if BMI<30	min: 15 max: 108	Health Surveys and STEPS
Hypertension	Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)	People with hypertension measures	1 if SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised blood preasure; 0 if does not have hypertension with anthropometric measures and is not in currently on medication for raised blood preasure	min: 15 max: 111	Health Surveys and STEPS
Ever have had their blood pressure taken	Percentage of people who report have ever had their blood pressure taken	People who were asked if their blood pressure was taken ever	1 if person report had ever the blood pressure taken; 0 otherwise	min: 15 max: 105	Health Surveys and STEPS
Hypertension untreated	Hypertensive people who does not have medication for their condition	Hypertensive people (bp_HBP==1)	1 if does not take medications to control hypertension or not know have hypertension; 0 if take medications to control hypertension	min: 15 max: 105	Health Surveys and STEPS
Cervical cancer screening in the last 3 years	Percentage of women 20-49 years who have had a cervical cancer screening in the last three years. Note: For a few countries is in the last 2 years for the question construction (e.g. Guyana)	Women 20-49 years	1 if take a cervical cancer screening in the last three years; 1 if have not taken a cevical cancer screening or the last exam was more than three years	min: 20 max: 49	Health Surveys, DHS and STEPS
Mammogram in the last 2 years	Percentage of women 20-49 years who have had a mammogram in the last two years. Note: For a few countries is in the last 3 years for the question construction (e.g. Ecuador, Guyana)	Women 50-69 years	1 if take a mammogram in the last two years; 1 if have not taken a mammogram or the last exam was more than two years	min: 50 max: 69	Health Surveys, DHS and STEPS

APPENDIX B: CLASSIFICATION INTO CONTRIBUTORY AND NON-CONTRIBUTORY INSURANCE SCHEMES ACCORDING TO INFORMATION AVAILABLE IN SURVEYS

Country	**Year**	**Source**	**Contributory schemes**	**Non-contributory schemes**
Argentina	2018	ENFR	• *Obra social* or *prepaga*	• Only public coverage
Colombia	2015	SABE	• *Régimen Contributivo* • *Especial* • *De excepción*	• *Régimen Subsidiado* • None
Chile	2019	ENS	• Public system Fonasa grup B • Public system Fonasa grup C • Public system Fonasa grup D • FFAA y de orden • ISAPRE • Public system Fonasa, ngroup unknown	• Sistema público Fonasa grupo A • None
Mexico	2018	ENSANUT	• *Seguro Social* (IMSS) • ISSSTE • ISSSTE Estatal • Pemex • Defensa • Marina • Private insurance for health care expenditures • Other institution	• *Seguro Popular* or *Seguro Médico Siglo XXI* • *IMSS PROSPERA (*before *Oportunidades)* • None
Peru	2016	ENDES	• ESSALUD / IPSS • *Fuerzas armadas o policiales* • *Entidad prestadora de salud* • Private insurance	• *Seguro Integral De Salud* (SIS) • None
Colombia	2015	DHS	• *Régimen Contributivo* • *Excepción* • *Especial*	• *Régimen Subsidiado* • None
Colombia	2010	DHS	• *Régimen Contributivo* • *Especial (fuerzas armadas, Ecopetrol, universidades públicas, magisterio)*	• *Régimen Subsidiado* • None
Honduras	2011	DHS	• Have health insurance	• Don't have health insurance

Peru	2012	DHS	• ESSALUD *(Seguro Social de Salud)/ Entidad Prestadora de Salud* • *Especial* (IPSS, *Instituto Peruano de Seguridad Social; Fuerzas Armadas o Policiales, otro*)	• *Seguro Integral de Salud* (SIS) • None
Argentina	2012	MICS	• *Obra social o prepaga a través de obra social* • *Prepaga por contratación voluntaria*	• State health programs or plansNone
Dominican Republic	2019		• An insurance paid by the company or organization where the policyholder works, as per Law 87-01 • Private health insurance • An insurance deducted from the policyholder through a pensionOther	• An insurance but not paid because the policyholder is affiliated with SENASA as per Law87-01 • None
Honduras	2019	MICS	• Have health insurance coverage	• Don't have health insurance coverage
Mexico	2015	MICS	• *Seguro Social* (IMSS) • ISSSTE o ISSSTE Estatal (ISSEMYM, ISSSTEZAC, etc.) • *Pemex, Defensa o Marina* • Private insurance • Other	• IMSS-*Solidaridad-Oportunidades-Prospera* • *Seguro Popular*

Note: STEPS, Step towards a healthier world: monitoring noncommunicable diseases and their risk factors; ENFR, National Survey of Risk Factors; ELSI, Longitudinal Study of Aging; ENS, National Health Survey; SABE, Survey on Health, Well-Being, and Aging; CRELES, Longevity and Healthy Aging Study; ENSANUT, National Survey of Health and Nutrition; ENDES, National Survey of Demography and Health