



The Role of Healthcare Universalism in Advancing Human Security

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ABSTRACT

Amid a new generation of complex, interlinked threats in the Anthropocene era, the importance of universal healthcare systems in human security is increasing, not only in safeguarding against infectious diseases but also in addressing wider links between health and social inequalities. This paper examines the relationship between healthcare universalism and human security through an empirical analysis of cross-national variation in universal healthcare outputs across 195 countries from 1995 to 2017. It suggests a novel Healthcare Universalism Index (HUI) that combines three dimensions of universal healthcare provision into a single index: coverage, generosity and equity. The paper employs the index to assess the global development of healthcare universalism since 1995, and explores the association between the HUI and three key linkages through which healthcare universalism might contribute to human security: infectious diseases, poverty and inequality, and violence and conflict. Overall, the analysis leads to four main conclusions. First, healthcare is becoming more universal across the world, with improvements in relative terms that are particularly large in some low-income countries. Despite existing narratives around the marketization of healthcare and a declining role of the State, consistent and substantial improvements are evident in all dimensions of universalism in most countries around the world. Second, significant inequalities in healthcare provision remain with the absolute gap between the most and least universal regions even increasing over time. In many low and medium human development countries, a lack of generosity remains particularly problematic. Third, our regression analysis demonstrates a significant positive correlation between healthcare universalism and all dimensions of human security, including improved health outcomes, reduced inequality, and, to a lesser extent, lower probabilities of conflict. Emphasizing the multidimensional nature of universalism, we find that both generosity and equity play crucial roles across all linkages, particularly in shaping better and more equitable health outcomes. Fourth, variations between countries in the Global North and Global South are significant and demand a closer consideration of the political economy differences across the world, especially concerning the role of equity in garnering political support for the expansion of public healthcare systems.

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Introduction

The COVID-19 pandemic and its global social, political and economic ramifications has tragically highlighted the central role of health for human security—not only with regard to protection from infectious diseases but also with regard to the links between health protection and economic performance. Recent studies have shown that the pandemic is having a disproportionate impact on the most vulnerable, connected to deep-seated inequalities in access to healthcare, exposure to mortality risks and the ability to cope with crises (Ahmed et al. 2020, Blundell et al. 2020, Bamba et al. 2020).

Not surprisingly, the response to the pandemic has also led to a resurgence of global interest in the universalization of healthcare and other social policies. Debates on universal basic income have intensified as countries as diverse as Brazil, the Republic of Korea, Spain and Togo implemented new cash transfer programmes for a growing number of people (*The Economist* 2021, Johnson and Roberto 2020). Similarly, a recent study in the United Kingdom and the United States of America found increasing support for such universal policies, due to respondents' experiences of the pandemic and the relevance to current challenges (Nettle et al. 2021).

In exposing structural inequalities and the interconnectedness of human security risks, the pandemic has also reinforced the need for systemic responses to public health threats—in their absence, excluding groups can put whole populations at risk (Hussain and Arif 2021, Yates 2020). Linking to broader discussions around health as a (global) public good (Abdalla et al. 2020, Smith et al. 2003, Feachem and Medlin 2002), the experience of the COVID-19 pandemic therefore emphasizes the vital importance of *effective* universal access to adequate healthcare as inequalities in access can pose severe threats to both public and individual health. Recognition of this reality was best exemplified through the universal provision of COVID-19 vaccines.

This increased interest in the universalization of healthcare links to a broader international consensus that States should provide comprehensive access to high-quality social services and benefits for the entire population, as expressed, for example, in the commitment by United Nations Member States in the 2030 Agenda for Sustainable Development to leave no one behind. This represents a new global consensus on universalism as the lead concept of social policy (Leisering 2020). Other examples include the World Health Organization's (WHO) call for universal health coverage (UHC) (WHO 2010), the International Labour Organization's (ILO) proposal for social security for all (ILO 2003, 2010) and the Global Partnership for Universal Social Protection launched by the World Bank and ILO (USP 2019).

This paper examines the relationship between universal healthcare provision and human security through an empirical analysis of cross-national variation in universal healthcare outputs across 195 countries. Following

Ogata and Sen (2003), we focus on three key linkages between health and human security: infectious diseases, poverty and inequality, and violence and conflict. With “health security [...] at the vital core of human security,” these three dimensions represent the most critical and pervasive threats to health, understood as “not just the absence of disease, but as a state of complete physical, mental and social well-being” (Ogata and Sen 2003, pp. 96-97). The paper explores how healthcare universalism contributes to the protection of these interrelated threats.

In its discussion of universalism and relation to various dimensions of human development, particularly inequality, the paper builds on insights from the previous co-authored work of one of the authors, including Martínez Franzoni and Sánchez-Ancochea 2016a and 2016b, and Sánchez-Ancochea and Martínez Franzoni 2019. In particular, we extend the previous analysis by proposing an empirical measure of the concept of healthcare universalism applicable to a large number of countries, exploring its evolution across the world in recent decades and studying its connections to various dimensions of human security.

Overall, the paper aims to respond to the following research questions:

- What is healthcare universalism and how can we measure it?
- Have we witnessed a convergence towards healthcare universalism since 1995?
- Empirically, how has healthcare universalism contributed to human security in different parts of the world?

Four results are particularly interesting and should be further explored. First, there have been improvements on the three dimensions of universalism across the world, with advances in relative terms particularly large in some low-income countries. This finding is not fully consistent with dominant narratives about growing marketization and the expansion of targeting instruments. Second, significant inequalities in healthcare provision still remain among different regions, with the gap in absolute levels actually increasing in the period of study. In many low and medium human development countries, a lack of quality care remains particularly problematic. Third, our regression analysis produced some interesting findings, including the strong relationship between universalism and lower inequality in life expectancy and the important role of equity across the board. Fourth, differences between the Global North and Global South are significant and demand a closer consideration of the political economy differences between various parts of the world. Despite these differences, universalism makes a positive contribution to human security everywhere.

The remainder of the paper is organized as follows. The next section provides a brief overview of the universalism concept and the newly developed Healthcare Universalism Index (HUI), a novel global index to

measure healthcare universalism for 195 countries for the years between 1995 and 2017. The third section explores the descriptive statistics of the HUI, focusing both on differences among groups of countries as well as changes over time. The fourth section presents the main empirical findings on links between universalism in healthcare for the three dimensions of human security. A final section offers conclusions.

Defining and measuring healthcare universalism

To empirically explore the evolution of healthcare universalism and its relationship with human security, this paper proposes a new measure: the HUI. Taking inspiration from the Human Development Index (HDI), the HUI combines three subindices tracking the coverage, generosity and equity of healthcare into a summary measure of universalism that covers 195 countries between 1995 and 2017. The details of the newly developed index are presented in Appendix A. This section provides a brief overview of the concept of universalism and the HUI.

DEFINING UNIVERSALISM

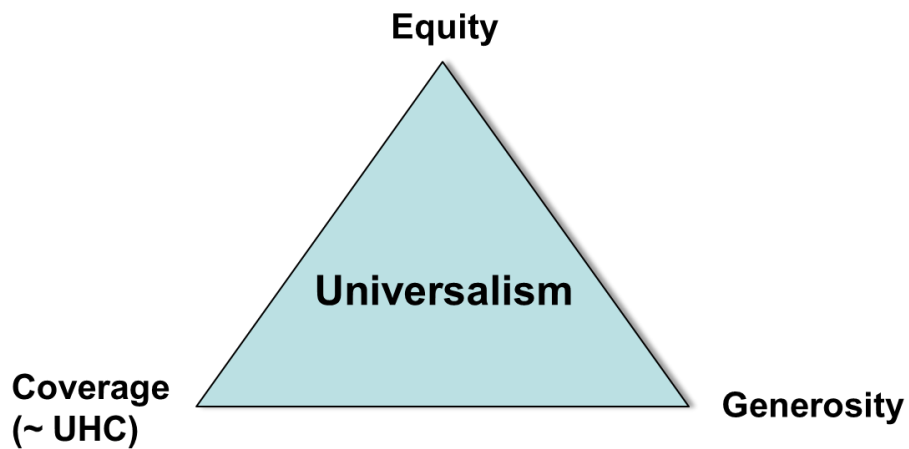
In social policy, universalism generally describes policies that apply equally to everyone within a particular group (for example, citizens of a country) as opposed to targeted programmes that exclude many potential beneficiaries. As Martínez Franzoni and Sánchez-Ancochea (2016a) show, the literature can be broadly divided based on two definitions.¹ A minimalist definition relies exclusively on coverage: It argues that universal policies are those that cover everyone independently of how generous or equitable such coverage is. By contrast, maximalist definitions derive from the Scandinavian welfare state model and refer to social policies that provide tax-funded, generous benefits to the whole population, based on the principle of citizenship.

Neither definition appears satisfactory when considering the realities of most countries, especially in the Global South. The minimalist definition is too narrow, fails to incorporate the quality of benefits and disregards inequalities in access. Social security programmes with benefits below the poverty line or highly fragmented healthcare systems with low levels of public service coverage can hardly be considered universal. Although the maximalist definition appears more useful, it conflates policy instruments (such as taxes) and outputs (such as generosity), thereby limiting the concept to a specific (historic) case of universalism and restraining the focus to a limited set of policy instruments. Additionally, it sets an unachievably high bar for most countries in the Global South and fails to acknowledge ‘varieties of universalism’ around the globe.

¹ The discussion here and in the following section borrows from previous work (Martínez Franzoni and Sánchez-Ancochea 2016a, 2016b; Sánchez-Ancochea and Martínez Franzoni 2019).

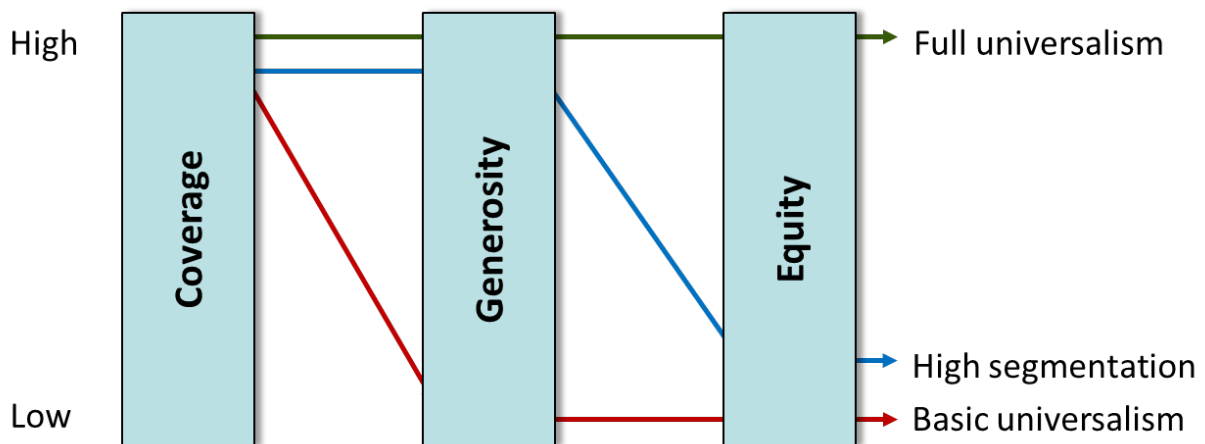
In this paper, we follow Martínez Franzoni and Sánchez-Ancochea’s (2016a) definition of universalism that focuses purely on policy outputs and recognizes that there are many different ways to achieve them. As such, universal social policies can be defined as those reaching the entire population with similarly generous benefits independently of the instruments used, such as eligibility criteria or types of funding. This definition comprises three dimensions: coverage, generosity (in level and quality) and equity (both in access and generosity) (Figure 1). As a multidimensional concept, universalism is therefore a continuous and not a dichotomous variable, with much diversity across countries (Pribble 2013). Based on their performance on the three dimensions, policies can be distinguished as basic universalism, high segmentation and full universalism (Figure 2).

Figure 1. Dimensions of universalism



Source: Martínez Franzoni and Sánchez-Ancochea 2016a.

Figure 2. Types of universal outputs



Source: Martínez Franzoni and Sánchez-Ancochea 2016b.

Basic universalism, similar to many ‘minimalist’ definitions in the literature, describes the case of high coverage but low generosity and equity. This means that the whole population has access to a specific policy but the benefit level and/or service quality are low and significant inequalities exist among individuals. Such inequalities can be formal, due to unequal provision rules by the public sector, or informal, with people relying on private sector provision. High segmentation can result from asymmetries in coverage among different groups and/or differences in the generosity of transfers and services. The optimum scenario of full universalism is characterized by high levels of coverage, generosity and equity, where everyone is receiving the same (generous) benefits through the same providers.

In creating a hierarchy of ‘universalisms’, these cases highlight the combined role of different dimensions of universalism. Coverage can be considered a foundational element of any universal policy and is therefore at the centre—and sometimes the sole focus—of most policy proposals. The ILO’s social protection floor and the WHO’s UHC fall into this category. Even though Sustainable Development Goal (SDG) target 3.8. on UHC also mentions quality and financial protection, its focus is clearly on coverage in enabling “access to quality essential healthcare services”.² In line with authors like Pribble (2013) and Fischer (2012), the presented multidimensional framework of universalism goes beyond coverage as the single policy output and instead highlights the need to widen the perspective of healthcare universalism to aspects of level, quality and equality of access to benefits.

THE HEALTHCARE UNIVERSALISM INDEX

Taking inspiration from the HDI and building on the above framework by Martínez Franzoni and Sánchez-Ancochea (2016a), this paper proposes a new composite index to jointly measure all dimensions of healthcare universalism. Covering 195 countries and territories from 1995 to 2017, the HUI is the geometric mean of three normalized sub-indices of coverage, generosity and equity (Figure 3).

The dimensions of universalism are represented by the following indicators:

- **Coverage:** UHC effective coverage index (GBD 2019 Universal Health Coverage Collaborators 2020)
- **Generosity:** Government health spending as a percentage of gross domestic product (GDP) (Global Burden of Disease Health Financing Collaborator Network 2020)
- **Equity:** Private health spending as a percentage of total health spending (ibid.)

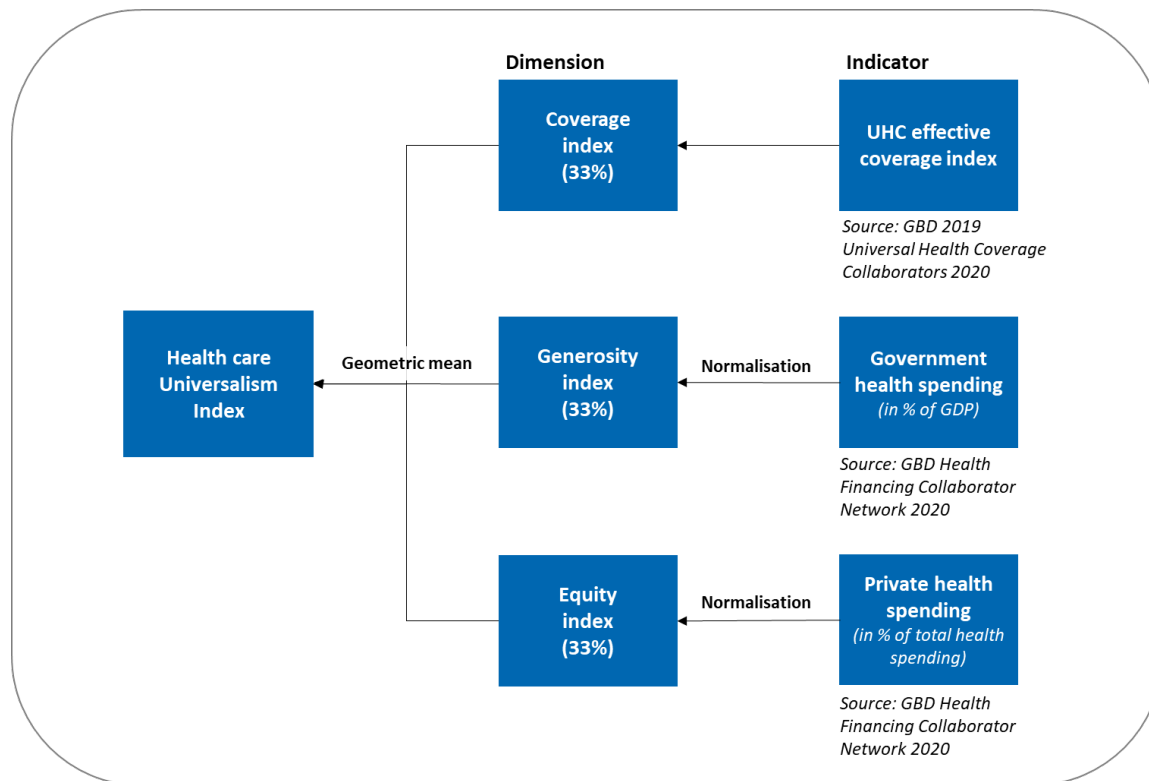
² See: <https://sdgs.un.org/goals/goal3>.

The UHC effective coverage indicator was selected as the best metric for coverage as it measures actual access to quality care across the life cycle on a health system level. With regard to generosity, government spending is a well-established indicator to measure public efforts and commitment as it requires a substantial level of (public) resources to enable comprehensive and accessible services for all (Martínez Franzoni and Sánchez-Ancochea 2018). Lastly, the equity dimension is measured through the proportion of private spending in total expenditure as an indicator for the commodification of healthcare (ibid.). This relies on the assumption that a large private sector reflects weaknesses in public benefits, which in turn leads to high segmentation in healthcare as higher-income groups are able to access higher-quality and more generous services than the rest of the population.

In combining these high-level aggregate indicators into a joint index using a geometric mean, the HUI aims to provide a globally comparable, macro-level measure that emphasizes the joint achievement of all dimensions of healthcare universalism.

For further details on the construction of the HUI, please see Annex A.

Figure 3. The Healthcare Universalism Index



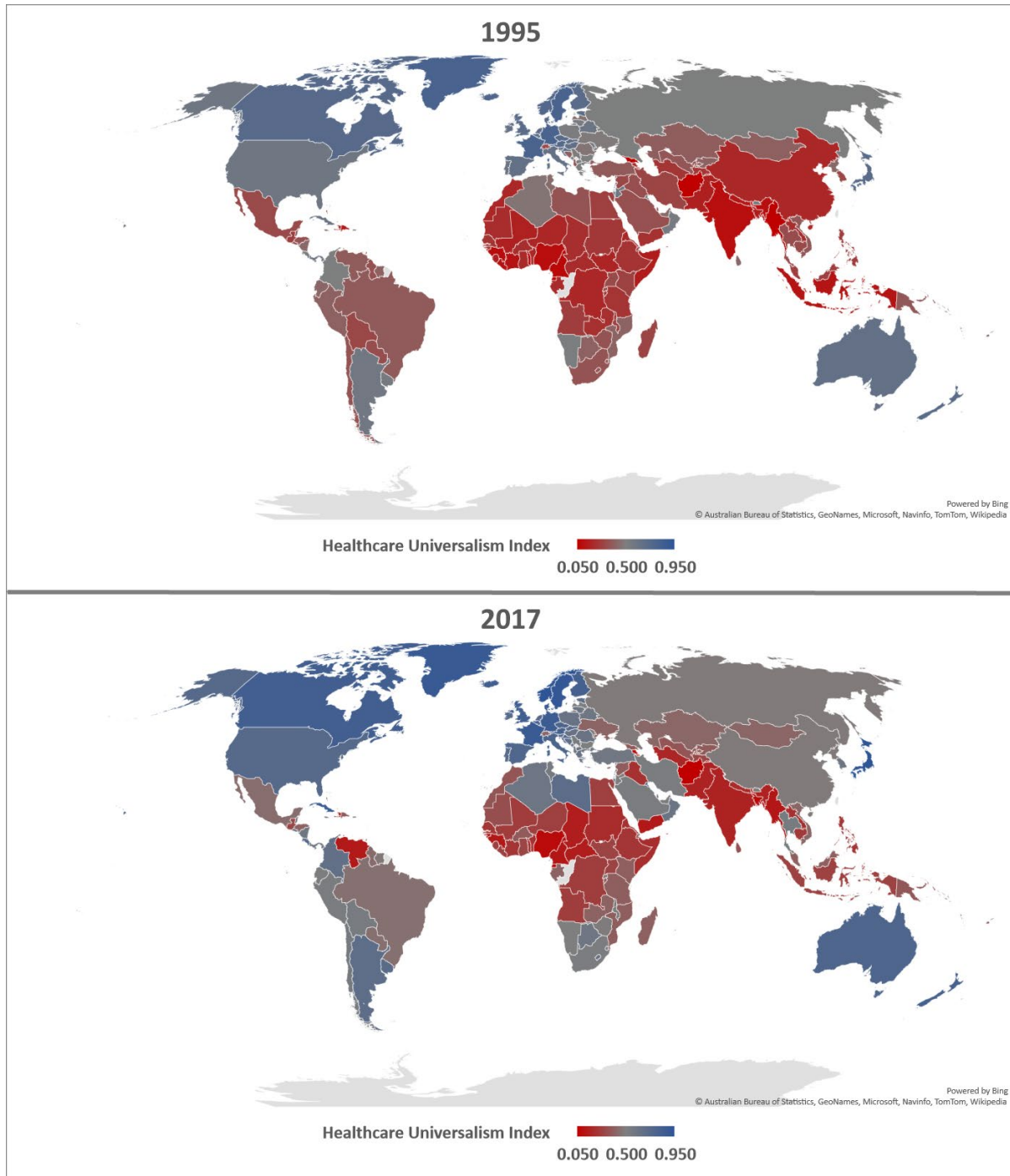
Has there been convergence in healthcare universalism since 1995?

As the first stage of the analysis, this section explores the descriptive statistics of the Healthcare Universalism Index (HUI) and considers whether there was a convergence towards universal results in healthcare across the world between 1995 and 2017.

OVERVIEW AND REGIONAL TRENDS

Figure 4 illustrates the global distribution of the HUI in 1995 and 2017, with the scale reflecting the minimum, maximum and median values for the latest available year. Although showing a substantial improvement over time, the results spotlight high levels of dispersion and strong regional trends in universalism, with (maybe unsurprising) differences between the countries of the Global South and Global North. These trends appear to persist over time, with many countries in Africa, South Asia and South-East Asia remaining at the bottom of the distribution in 2017.

Figure 3. Healthcare Universalism Index, 1995 and 2017

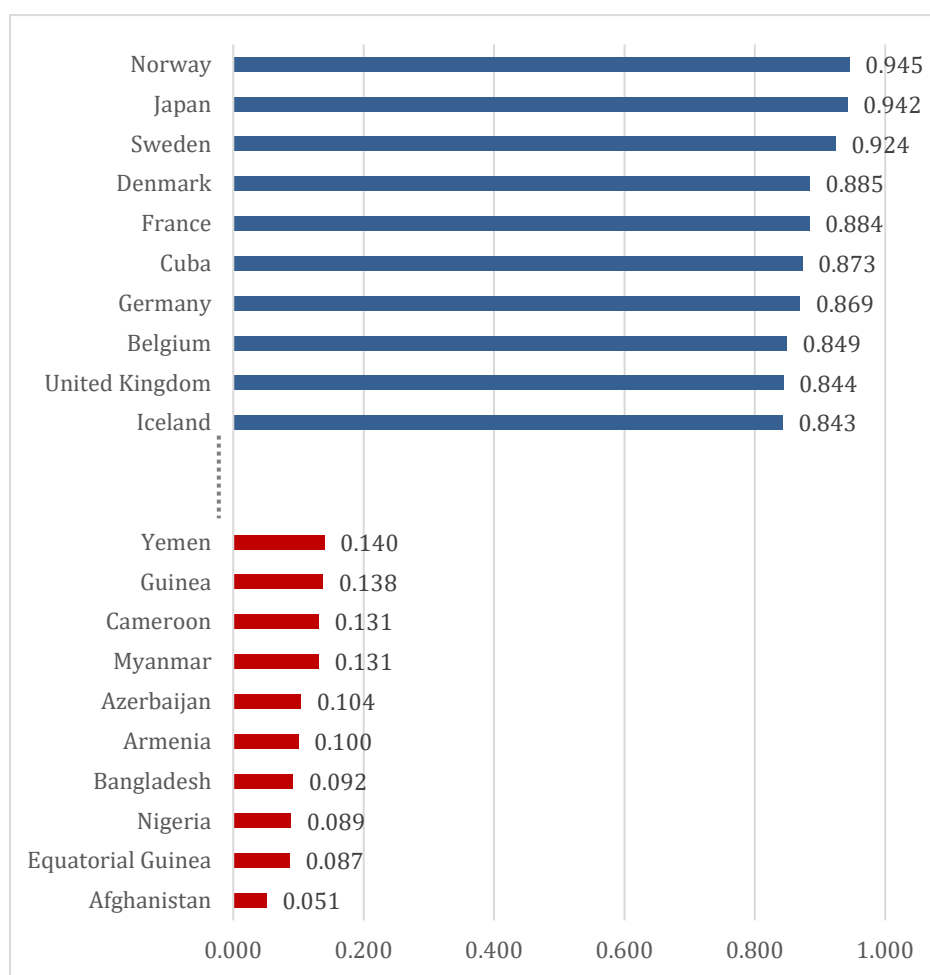


There are prominent exceptions to the divergence between the Global North and the Global South, however. Costa Rica (0.720), Uruguay (0.703), Kuwait (0.691) and Maldives (0.671) have levels of universalism

comparable to those in wealthier countries like the United States (0.727). Cuba ranks sixth in the world, overtaking traditionally universal countries such as Germany and the United Kingdom (see Figure 5).

Low scores among many countries of the Global North are due to imbalances in achievements across the three dimensions of universalism. For example, while Uruguay scores almost equally well across coverage (0.69), generosity (0.72) and equity (0.70), the United States shows vast differences in dimension scores, especially between coverage (0.86) and equity (0.46).³ Due to the structure of the HUI as a geometric mean, these imbalances in achievement are amplified in the overall score, highlighting the importance of all dimensions for achieving true universalism.

Figure 4. Top and bottom 10 countries on the Healthcare Universalism Index, 2017

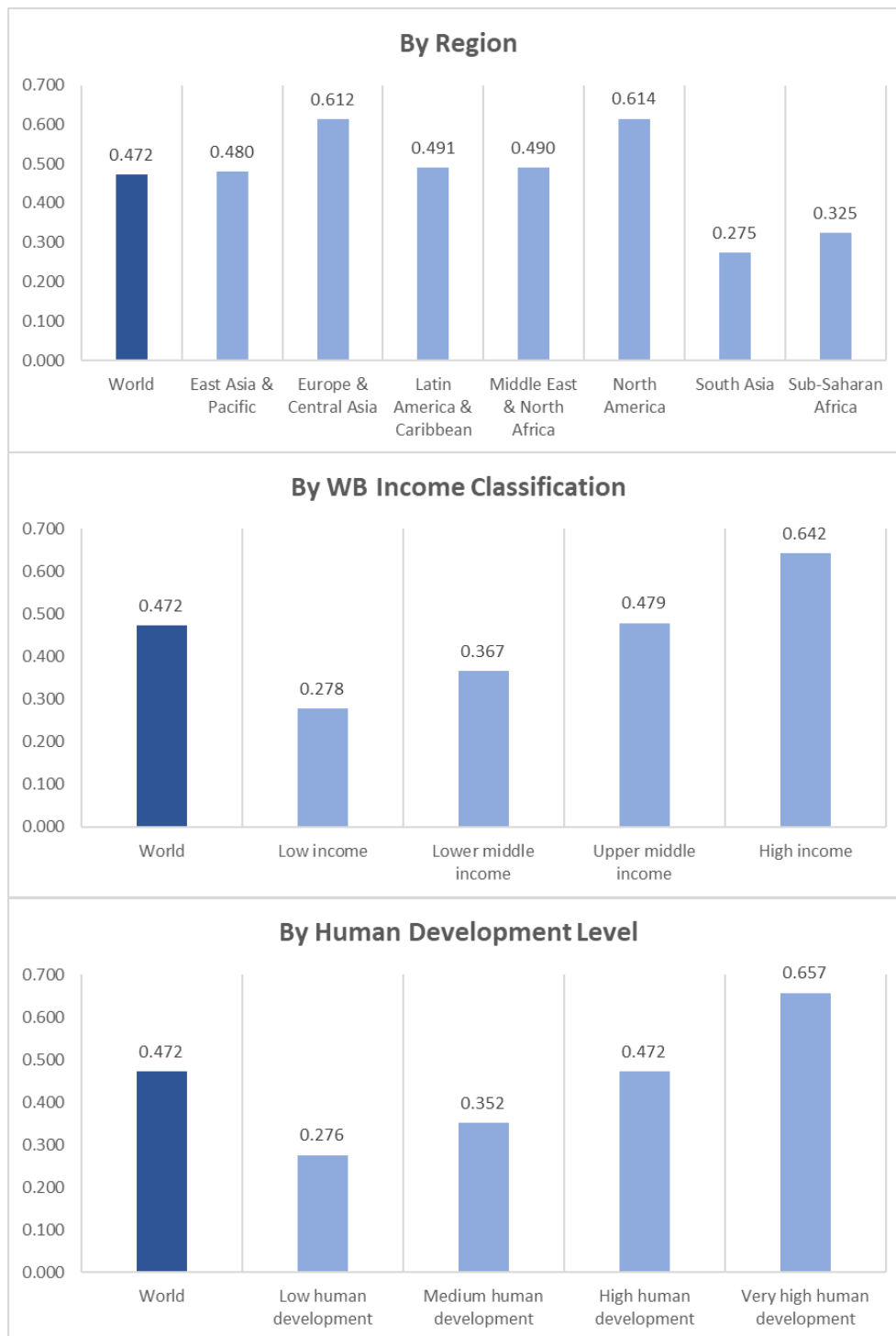


³ We recognize that the negative role of the private sector in healthcare partly depends on the regulatory regime in each country. On average, a large private sector signals equity problems in most countries and is related to inequality in provision in ways that will become even clearer in the next section.

Figure 6 illustrates regional trends in universalism by geography, income classification and human development for the latest available year. It shows that strong disparities in universalism still persist today, with countries in South Asia and sub-Saharan Africa significantly lagging behind. It also highlights how some regions of the Global South, including East Asia and the Middle East, are closing the gap with (historically) more universal regions in the Global North. From a comparative perspective, Latin America and the Caribbean stands out as a region with traditionally high levels of universalism even with historical weaknesses that should also be recognized (see Martínez Franzoni and Sánchez-Ancochea 2018, Pribble 2013 and Filgueira 2007).

In accordance with regional trends, the level of healthcare universalism is increasing in both the level of income and human development classification. Interestingly, differences between levels of development decrease from the highest to the lowest classification. For example, whereas very high human development countries are clearly ahead with an average HUI score of 0.657, the gap between high (0.472), medium (0.352) and low (0.276) human development countries is smaller than could potentially be expected given their relative income levels. The relatively small difference in universalism between low and medium human development countries in particular, together with the experiences of other case study countries like the United States, highlight the complex relationships between levels of development and universalism as well as the potential for truly universal health systems even in less developed countries.

Figure 5. Average Healthcare Universalism Index levels, 2017



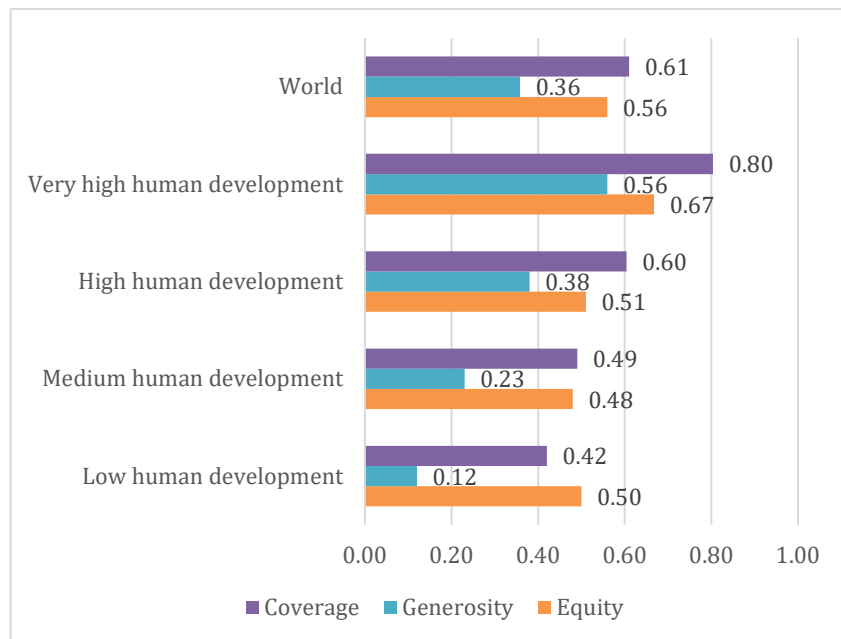
Differences in the level of human development are further emphasized when considering the disaggregation of the three dimensions of universalism, coverage, generosity and equity. Figure 7 shows the average scores

for each of these dimension indices and illustrates several interesting results. Firstly, generosity, the weakest dimension for all, appears to be the main barrier to healthcare universalism across development levels. This emphasizes the key argument that coverage alone is not sufficient for true universalism but instead needs to be accompanied by sufficient investment in quality and accessibility. This issue appears to be especially pressing among countries with low and medium human development, and likely reflects decades of underinvestment in public services.

Secondly, generosity and coverage seem to be the main dimensions that differentiate higher from lower and medium human development countries, as opposed to equity, which is more evenly distributed, potentially indicating a gradual expansion of universalism across time. While underlining the need to strengthen generosity, as the most diverging dimension, this finding also stresses the central role of equity. The small difference in equity levels between very high and lower human development countries shows that market segmentation and the disqualifying role of the private sector may be problematic across levels of development.

Thirdly, the average coverage and equity scores for low human development countries, which are close to the performance of both medium and high human development countries, indicate a convergence in universalism for these groups of countries, potentially reflecting stronger comprehensive efforts to achieve universal healthcare among governments and development stakeholders. As will be shown in the next section, this convergence is mainly driven by a strong increase among low-income countries since 1995.

Figure 6. Dimensions of universalism: average Healthcare Universalism Index scores, 2017



HUI GROWTH FROM 1995 TO 2017

Overall, the state of global healthcare universalism improved substantially between 1995 and 2017, with the world HUI increasing by almost 20 percent from 0.395 to 0.472 (Figure 8). Highlighting the distribution of this growth, Figure 9 presents a scatterplot of index scores for 1995 and 2017 for each of the 195 countries and territories in the sample. The 45-degree line signifies the equality of HUI scores in both years, that is, a state of stagnation of universalism. Consequently, countries above the reference line have delivered more universal outputs over time whereas those below the line have experienced a regression in universalism.

Figure 7. Healthcare Universalism Index, 1995 to 2017

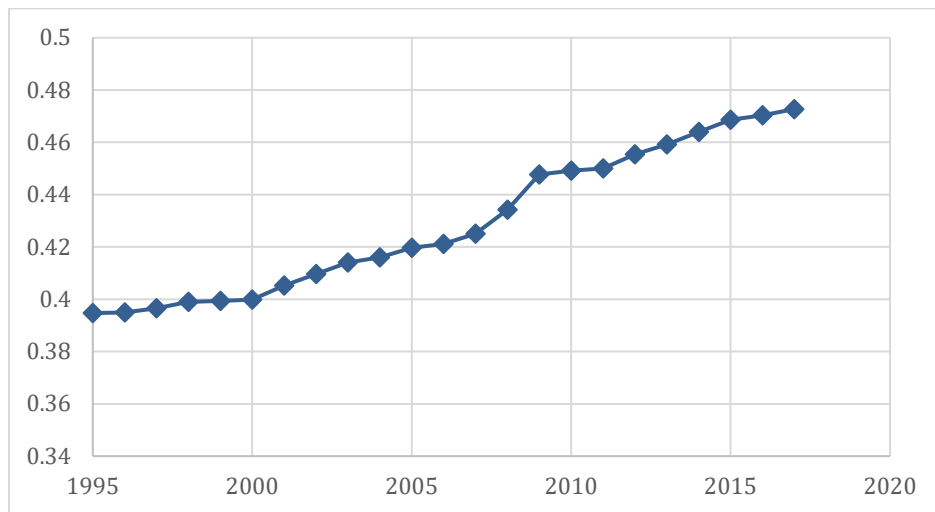
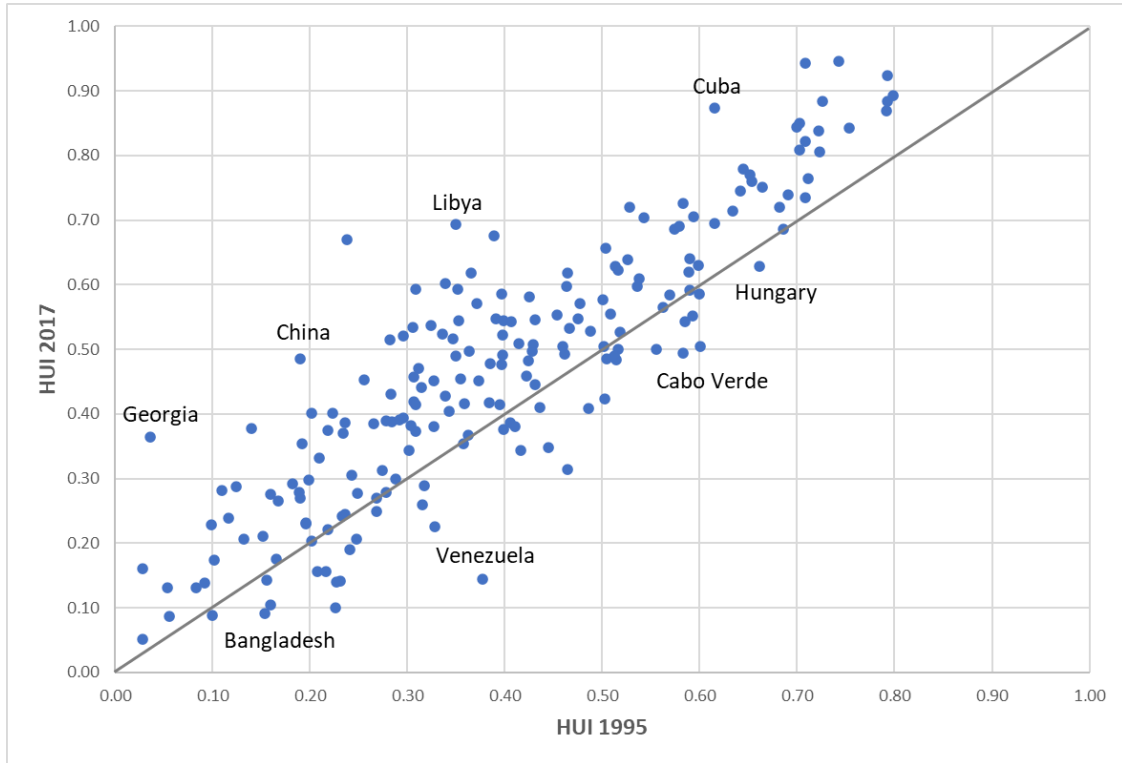


Figure 8. Healthcare Universalism Index, 1995 and 2017



The scatterplot shows that HUI growth has been relatively uniform, with the majority of countries increasing their scores by 0 to 50 percent (see Figure 10). There are several outliers on both sides of the spectrum, however. On the positive side, many countries that started at mid-to-low levels of universalism in 1995 were able to substantially improve their position, partially increasing their HUI scores by more than 100 percent. Examples include populous countries such as China and Indonesia but also many African countries such as Côte d’Ivoire, the Democratic Republic of the Congo, Liberia and Togo.

In an opposing trend, 38 countries experienced a deterioration of universalism that mostly reflects less generous, more unequal and overall more segmented healthcare systems. Most prevalent among countries with medium levels of universalism in 1995, this trend is especially strong in Eastern Europe and Central Asia, potentially reflecting a departure from socialist policy legacies. Some other outliers include the Central African Republic, Iraq, Sudan, Venezuela and Yemen.

Figure 9. Healthcare Universalism Index growth, 1995 to 2017

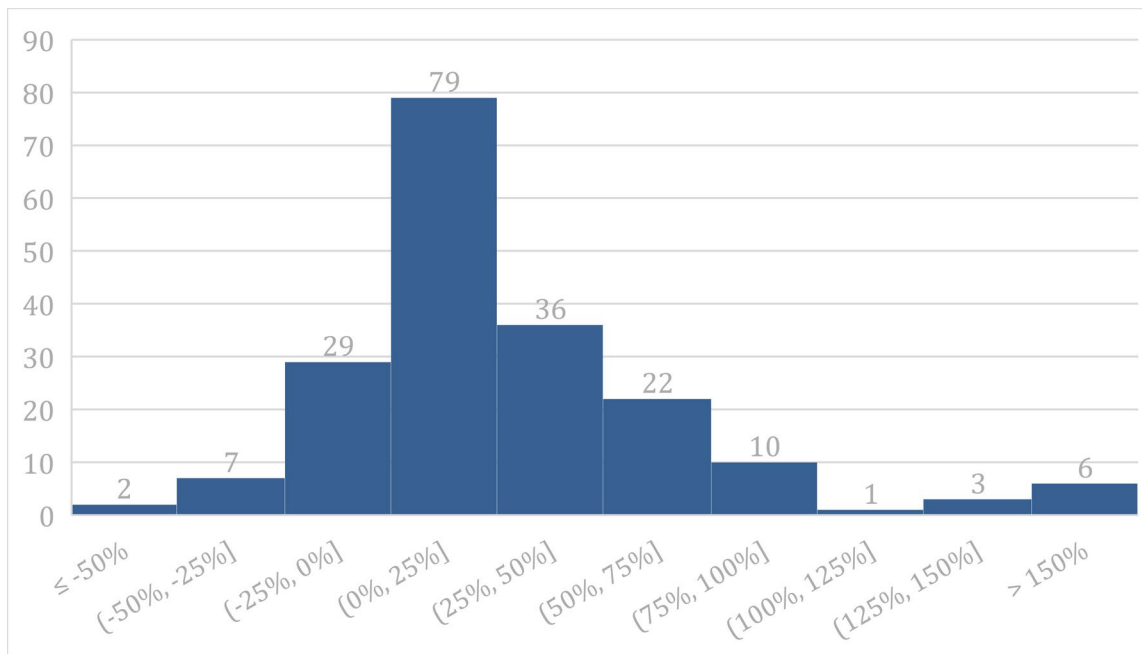
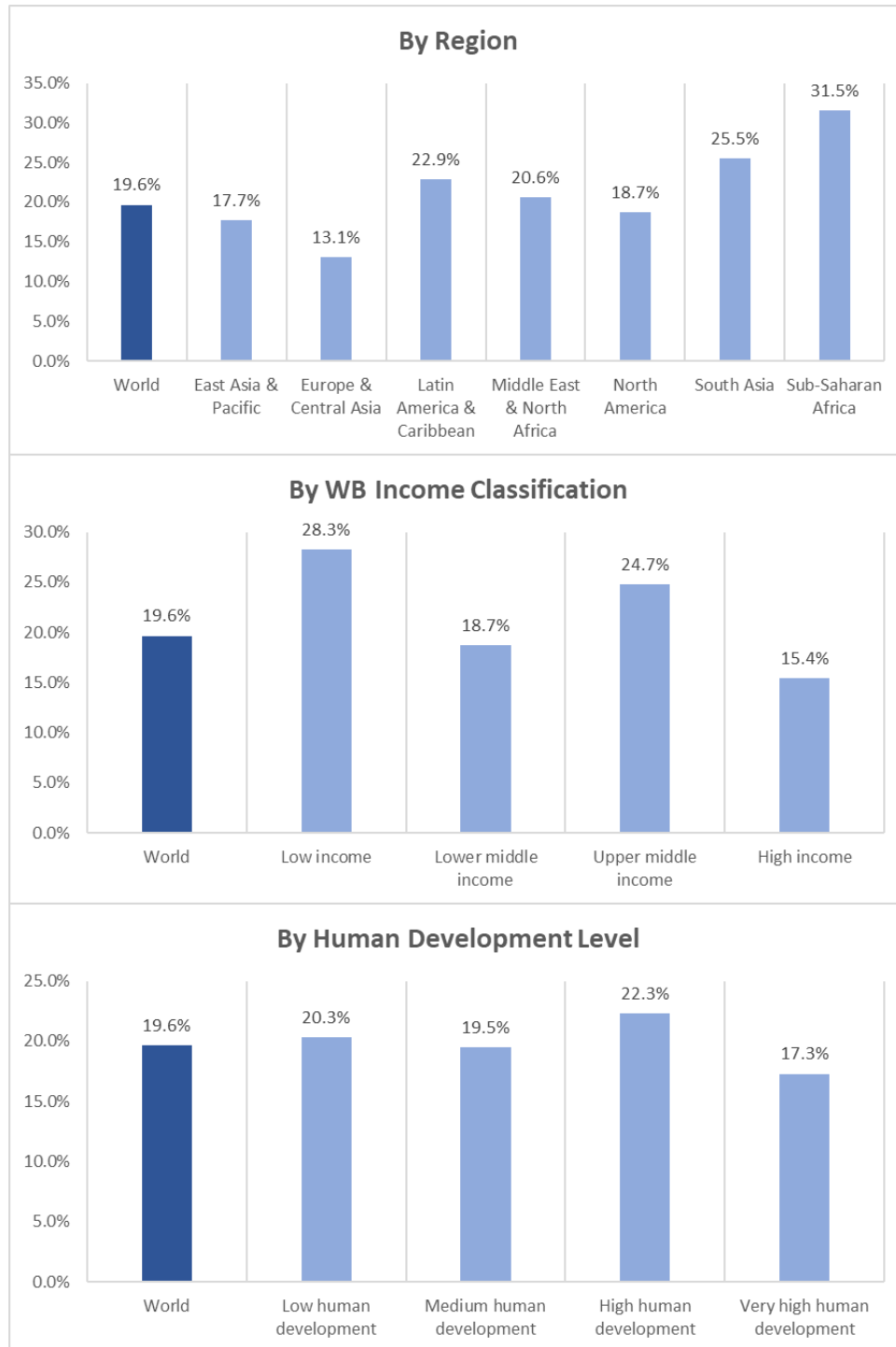


Figure 11 further illustrates HUI growth rates by region, income classification and human development level. Comparing growth rates is important for assessing overall trends in universalism as it reflects the speed of change and the extent of efforts by governments and other stakeholders, given initial conditions. Interestingly, regions with the lowest level of universalism (South Asia and sub-Saharan Africa) experienced the highest growth rates. This notion is supported by the disaggregation based on income levels, with low-income countries growing at a rate of 28.3 percent compared to 22.1 percent for middle-income and 15.4 percent for high-income countries. Likely driven by increased public efforts to expand essential services coverage in low and least developed countries, these growth rates indicate a long-term converging trend in universalism, at least in relative terms. The lower growth rates of lower-middle-income and medium human development countries, however, suggest the existence of specific barriers to universalist development in these groups of countries, in line with the findings from Figure 7. Clearly, this is an area where more research should be welcomed and linked to discussions on both global public health measures and the middle-income trap.

Figure 10. Average growth rates in the Healthcare Universalism Index, 1995 to 2017



Higher growth rates in the low human development group could lead to global convergence over the long run. In the short run, the absolute gaps among countries may still be expanding, a central point that UNDP

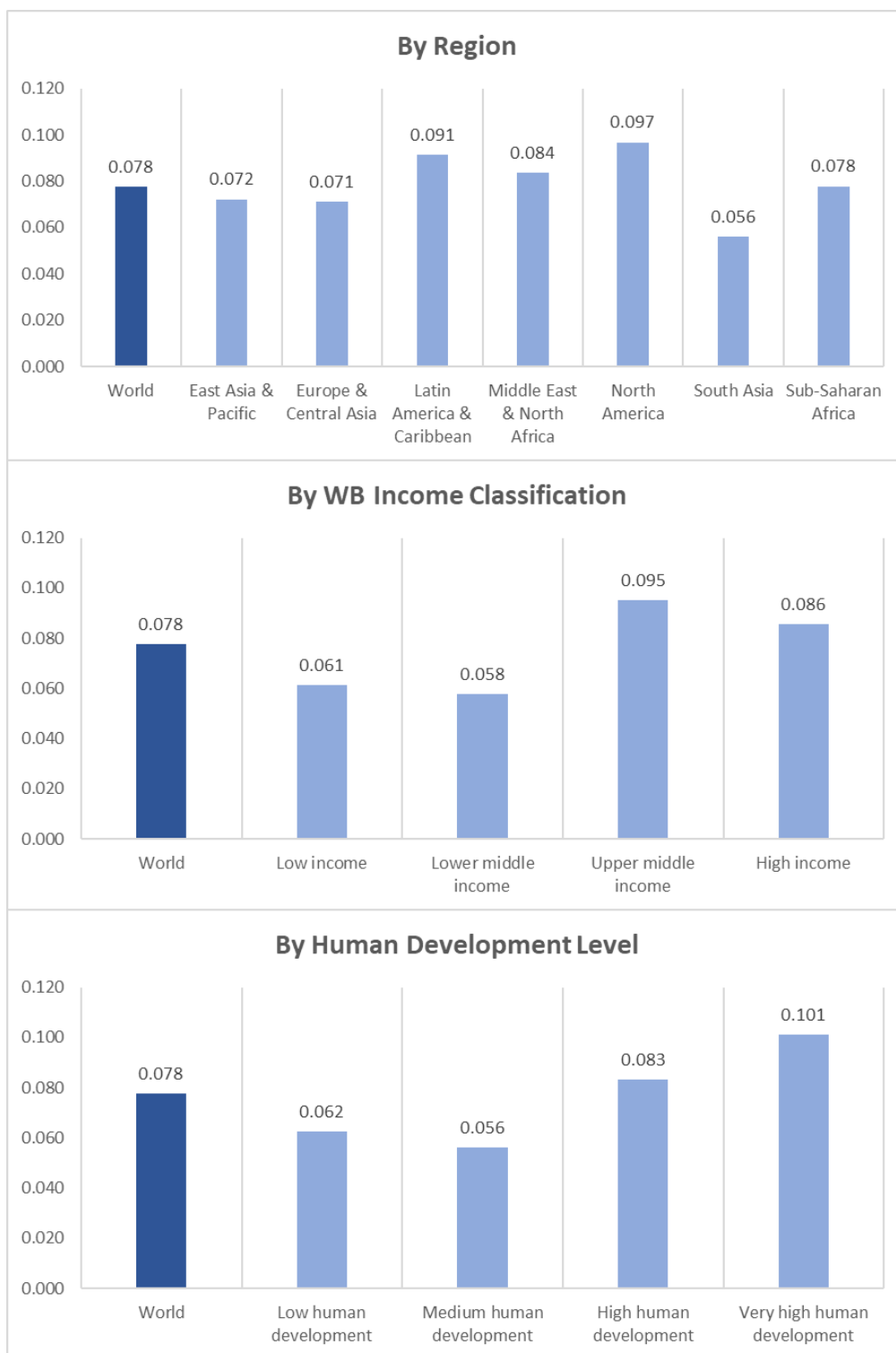
emphasized in its *2019 Human Development Report* (UNDP 2019).⁴ This is exactly what has happened with the HUI, as shown in Figure 12, which reflects the absolute increase in the value of the index between 1995 and 2017 by region, income classification and human development level. The absolute growth for high and very high human development countries has been substantially higher than for less developed countries, thereby even increasing existing gaps in universalism. The disaggregation by income classification shows the same trend with a clear divide between lower- and upper-middle-income countries, again indicating the existence of specific growth barriers for these groups of countries.

On a regional level, the evidence is more positive. Some of the least universal regions have achieved considerable growth in absolute terms since 1995. This applies especially to sub-Saharan Africa and Latin America but also to the Middle East and North Africa, and, to a lesser extent, to East Asia and the Pacific. By contrast, the increasing gap in North America and the low growth in absolute terms in South Asia show that there is still much work to do.

Additionally, disaggregation by income and human development level highlights that even within regions, inequalities in universalism appear to increase as more developed countries continue to advance. So while we overall find some trends towards convergence, at least in relative terms and for individual regions, substantial inequalities in healthcare universalism remain both within regions and between the Global South and the Global North.

⁴ The relative change might obscure divergent trends by focusing on the speed of change (e.g., when comparing a country that increased its score from 0.01 to 0.04 to another country that improved from 0.5 to 0.8).

Figure 11. Absolute increase in the average Healthcare Universalism Index, 1995 to 2017



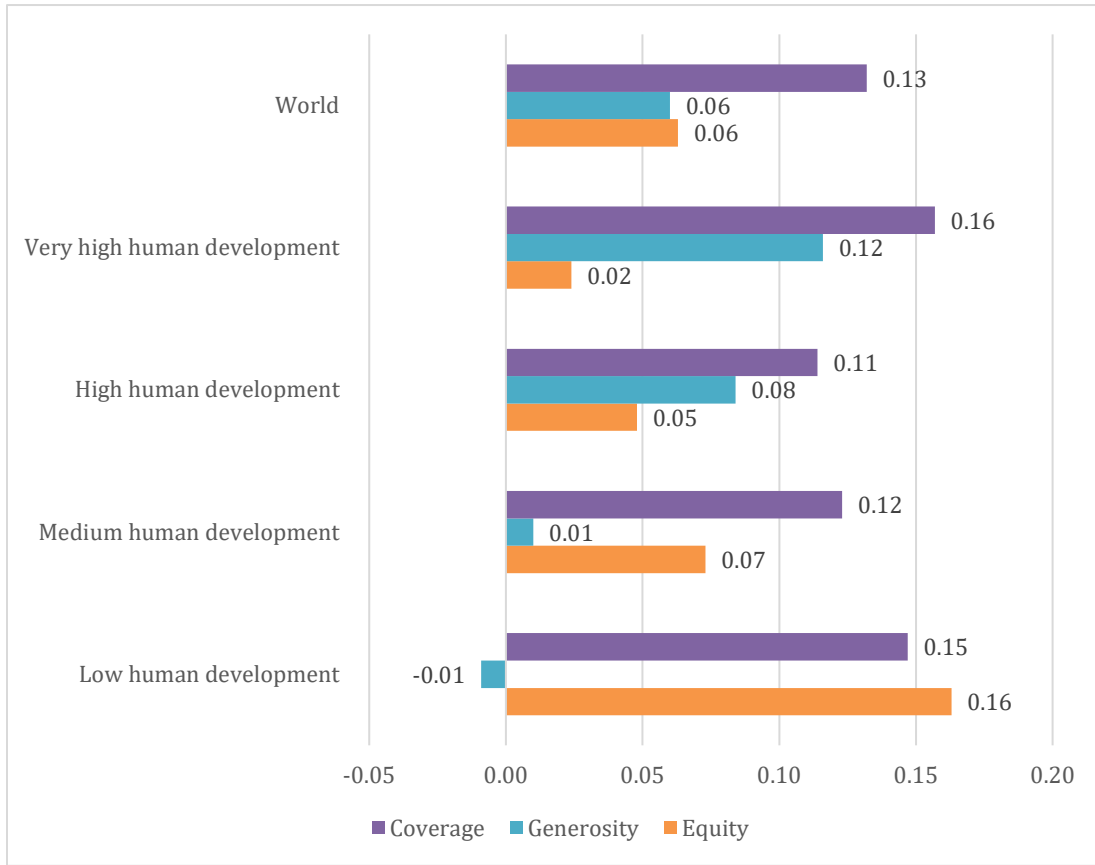
In disaggregating the average (absolute) growth by dimension and human development level, Figure 13 indicates the potential barriers for further universalist growth across different levels of human development. Whereas coverage has expanded substantially and almost uniformly across human development levels, growth in equity and generosity has been highly unequal. Beyond expansions in coverage, high and very high human development countries have mainly advanced universalism through improvements in generosity, that is, an increase in public health spending. Equity has only marginally increased in these countries, which reflects the marketization of healthcare provision and growing segmentation.

In countries of medium and low human development, apart from coverage, improvements in equity have mainly driven universalism since 1995. This is particularly the case in low human development countries, likely reflecting increased public and international efforts to expand health services for all. Despite this substantial expansion of coverage and the declining role of private sector health provision, generosity lags behind and has actually deteriorated in low human development countries. Given already low levels of generosity in these countries (Figure 6) and the large increase in coverage, this development is especially concerning and emphasizes the need to consider both the quality and level of services for truly universal health systems.

Overall, disaggregated analysis highlights two distinct trends. While coverage has expanded almost equally across the world, both in absolute and relative terms, there is a clear convergence in equity with low and medium human development countries catching up to high and very high human development countries. This trend may raise questions about some claims around the marketization of healthcare, at least in some parts of the world. Yet there is also bad news in the data. In particular, the stagnation of public spending (our indicator of generosity) in the low and medium human development group may generate growing social dissatisfaction and lead to underwhelming health outcomes in the future.⁵

⁵ This convergence in equity and coverage and the divergence in generosity appear similar to the divergent relationship between basic and enhanced capabilities, as highlighted in the *2019 Human Development Report* (UNDP 2019).

Figure 12. Dimensions of universalism: average Healthcare Universalism Index growth, 1995 to 2017



CONCLUSION

This section has highlighted several interesting findings on the evolution of universalism in healthcare since 1995. On the positive side, we see consistent improvements in all dimensions of universalism in most countries and regions across the world. This positive trend contrasts to existing narratives around the marketization of healthcare and the declining role of the State, instead reflecting increased public and international efforts to cover the basic needs of more people.

The global improvements in the HUI have been driven, in particular, by a substantial expansion of coverage and accelerated growth in access in many low-income countries in South Asia and sub-Saharan Africa. In many of these countries, we have also witnessed a significant increase in equity, that is, a decreasing role of the private sector. In contrast, the main growth factor in high and very high human development countries has been generosity, that is, increasing public investment in healthcare.

Despite these positive overall trends towards universalism, we still find significant levels of global inequality and even increasing gaps in absolute terms within regions and between the Global South and the Global North. This unfortunate result has much to do with the difficulties of less developed countries in increasing generosity; more needs to be done to increase countries' spending capacity, which may also require shifts in taxation policy.

How has healthcare universalism contributed to human security in the Global South and Global North?

This section presents a cross-country analysis of the relationship between the HUI and health security. Building on descriptive results, the section also focuses on understanding the role of different dimensions of universalism and on assessing variations in the relationships between countries in the Global South and Global North.

METHODOLOGY

To assess the contribution of healthcare universalism to human security, we focus on the three main linkages between health and human security: health outcomes and infectious diseases, inequality, and conflict and violence. As demonstrated by the Commission on Human Security, these interrelated health challenges present the most critical and pervasive threats to health as the 'vital core' of human security—understood as “not just the absence of disease, but as a state of complete physical, mental and social well-being” (Ogata and Sen 2003, pp. 96-97).⁶

To evaluate the strength of these three linkages empirically, we have selected the following indicators and data sources.

Health outcomes and infectious diseases

- Life expectancy at birth (Human Development Data Center, UNDESA 2019)
- Infant mortality (Human Development Data Center, UN Inter-agency Group for Child Mortality Estimation 2019)
- Global Health Security (GHS) Index or (Johns Hopkins Center for Health Security et al. 2019)

⁶ For more details on the links between health and human security, see Ostergard Jr. and Griffin 2020.

Inequality

- Inequality in life expectancy (UNDP 2019, UNDESA 2019)
- Gini index (World Bank 2019)

Conflict and violence

- Global Peace Index (GPI) (Institute for Economics and Peace 2021)
- Homicide rate (UNODC 2019)

With the exception of the GHS Index, which is only available for 2017, all these indicators cover multiple observations for a large sample of countries. Some data availability issues remain, however, especially for the inequality data and the GPI, both of which are slightly skewed towards countries of the Global North. Overall, the sample size varies between 191 (life expectancy) and 141 countries (GHS Index). Table 1 presents the descriptive statistics.

We first consider the bivariate correlations between the outcome of interest and the HUI for the latest available year.⁷ These bivariate associations are presented using scatterplots that distinguish countries from the Global South and the Global North with different colours. This distinction is based on a standard, historic definition of the Global North as Europe, North America, most of Central Asia and a number of individual high-income countries in Asia and the Pacific.⁸

We then regress each of the selected human security indicators on the HUI, its individual dimension indices (coverage, generosity and equity) and jointly on all dimension indices to understand their relative importance. Each of the regressions is conducted separately for countries in the Global South and the Global North to understand the differential impacts and potentially changing role of healthcare universalism and its dimensions.

To avoid spurious regressions, we control for a number of contextual variables. Following Moreno-Serra and Smith (2015), we include controls for the level of economic development (logged GDP per capita, World Bank 2021a), education (gross primary education enrolment rate, UNESCO 2021 and demographic structure (population share aged 0 to 14 and 65-plus, World Bank 2021b, c). In addition, we control for the total

⁷ For the homicide rate, we use 2016 due to better data coverage.

⁸ That is, Australia, Israel, Japan, New Zealand, the Republic of Korea, Singapore and Taiwan Province of China.

population (UNDESA 2019). These variables aim to capture the main socioeconomic and demographic differences among countries, which may influence their capacity to promote public health (Moreno-Serra and Smith 2015). Furthermore, to control for any common shocks to the dependent variables, we also include a full set of year fixed effects in all regressions.⁹ Lastly, we restrict the analysis to countries with a population of at least 100,000 to avoid positive bias from very small countries and territories that might not be reflective of health system capabilities in the wider sample.¹⁰

The regression analysis methodology follows Jacques and Noël (2018) in employing a random effects model that distinguishes the between-countries and within-countries effects of universalism. This regression approach is useful for several reasons. Firstly, the impact of universalism likely differs between countries (more universal countries achieve higher life expectancy) and within countries (universalism leads to higher life expectancy). Given the high institutional persistence and path dependency of health systems, separating these dynamics from the more static, institutional impacts appears to be especially important given our relatively short sample time frame of 22 years. Secondly, the low variation of the HUI for many countries—similar to many other institutional variables—precludes the use of standard fixed effects models that only focus on within-country variation and hence lose a lot of valuable information. Lastly, in contrast to standard random effects models, this specification does not assume the equality of between- and within-country effects, and hence allows a more nuanced interpretation of regression results (Jacques and Noël 2018, Bartels 2015, Bell and Jones 2015).¹¹

To apply this ‘hybrid’ random effects model, we follow Jacques and Noël (2018) and use the *cluster* function in STATA to separate the within- and between-country variation for each covariate (that is for the HUI, the dimension indices and the controls). The between effects are represented by the country means and the within effects describe deviations from this country mean over time.

Table 1 presents the regression results in a condensed form by summarizing multiple regressions for countries in the Global South and the Global North in one table. The full regression tables are available in the appendix (Tables B1 to B7).

⁹ Except for the GHS Index, which is only available for 2017.

¹⁰ For example, many small island states like American Samoa, the Marshall Islands or the Seychelles score relatively high given their development level, which would likely overestimate the results for the Global South.

¹¹ Instead, the separation of both effects makes them uncorrelated and consequently the unobserved country heterogeneity is independent of the variables.

Table 1. Descriptive statistics

	Mean	Standard deviation	Minimum	Maximum	Observations	Countries	Time period
Dependent variables							
Life expectancy	68.6	9.5	31.0	84.1	4342	191	1995-2017
Infant mortality (per 1,000 live births)	32.4	29.7	1.7	164.0	4301	187	1995-2017
GHS Index	40.9	14.4	16.2	83.5	186	186	2017
Inequality in life expectancy	17.3	12.7	2.4	58.8	1111	141	2010-2017
Gini index (World Bank estimate)	38.3	8.9	23.0	65.8	1428	163	1995-2017
GPI	2.1	0.5	1.1	3.6	1609	162	2008-2017
Homicide rate (per 100,000)	8.1	12.3	0.0	141.7	2894	171	1995-2017
Explanatory variables							
HUI	42.9	19.8	2.7	94.5	4485	195	1995-2017
Coverage index	54.2	18.3	15.0	97.0	4485	195	1995-2017
Generosity index	32.0	23.1	1.0	100.0	4485	195	1995-2017
Equity index	52.9	23.7	1.0	100.0	4485	195	1995-2017
Control variables							
GDP per capita (constant 2010 US dollars)	12,657.3	18,508.0	183.5	113,236.1	4283	191	1995-2017
School enrolment, primary (percentage, gross)	101.6	15.7	20.9	165.6	3530	184	1995-2017
Population (in millions)	33.8	129.1	0.04	1386.4	4462	194	1995-2017
Population ages 0 to 14 (percentage of total population)	30.9	10.8	12.2	50.5	4295	187	1995-2017

Population ages 65-plus (percentage of total population)	7.3	5.1	0.7	27.1	4295	187	1995-2017
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HEALTH OUTCOMES AND INFECTIOUS DISEASES

We begin our analysis with the potentially most salient link between health, human security and universalism: (global) infectious diseases and wider health outcomes. To represent this dimension, we use life expectancy at birth as the most aggregate indicator for healthcare outcomes and infant mortality (per 1,000 live births) as an indicator for mortality risks. Furthermore, to capture the narrower definition of health security as the risk of epidemics and pandemics, we also include the GHS Index as an outcome of interest.

The result of a collaboration between the Johns Hopkins Center for Health Security, the Nuclear Threat Initiative and The Economist Intelligence Unit, the GHS Index measures countries' capabilities for preventing and mitigating epidemics and pandemics based on dimensions such as prevention, detection and reporting, and risk environment.¹² Comprising a set of 140 qualitative indicators, the index was scored based on desk research by the GHS Index team for a sample of 186 countries. As the only global index on health security, the GHS Index is informative and relevant for our analysis; however, some of its results might appear ambiguous in light of the recent COVID-19 pandemic. In fact, some of the highest scoring countries are among the most affected by COVID-19 (considering cases and deaths in relation to population), such as the United States (first), the United Kingdom (second), the Netherlands (third), Sweden (seventh) and Slovenia (twelfth). Therefore, some GHS Index results should be interpreted with caution.

Considering the bivariate correlations, we see a significant relationship in the expected direction for all three outcome variables. Across the sample, the level of healthcare universalism is positively associated with life expectancy at birth (Figure 14) and the GHS Index (Figure 16) and negatively correlated with infant mortality (Figure 15). Based on this simple correlation for the year 2017, a 1 percent increase in healthcare universalism is associated with an increase in life expectancy of 0.3 years and a reduction in child mortality of 0.7 deaths per 1,000 live births.

¹² For more details, see <https://www.ghsindex.org/about/>.

Figure 13. Life expectancy and the Healthcare Universalism Index, 2017

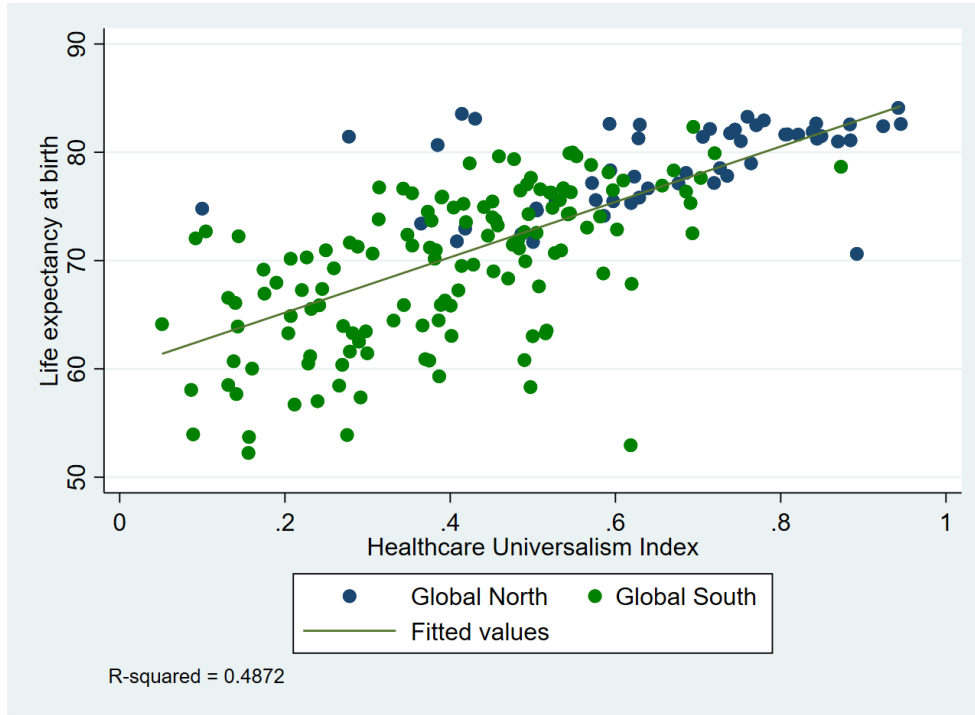
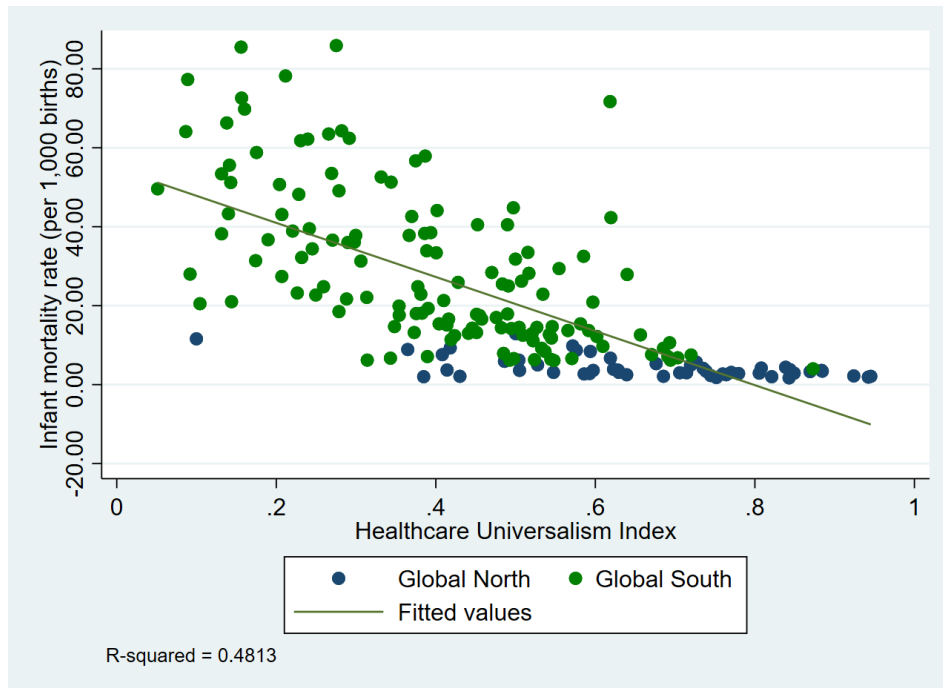


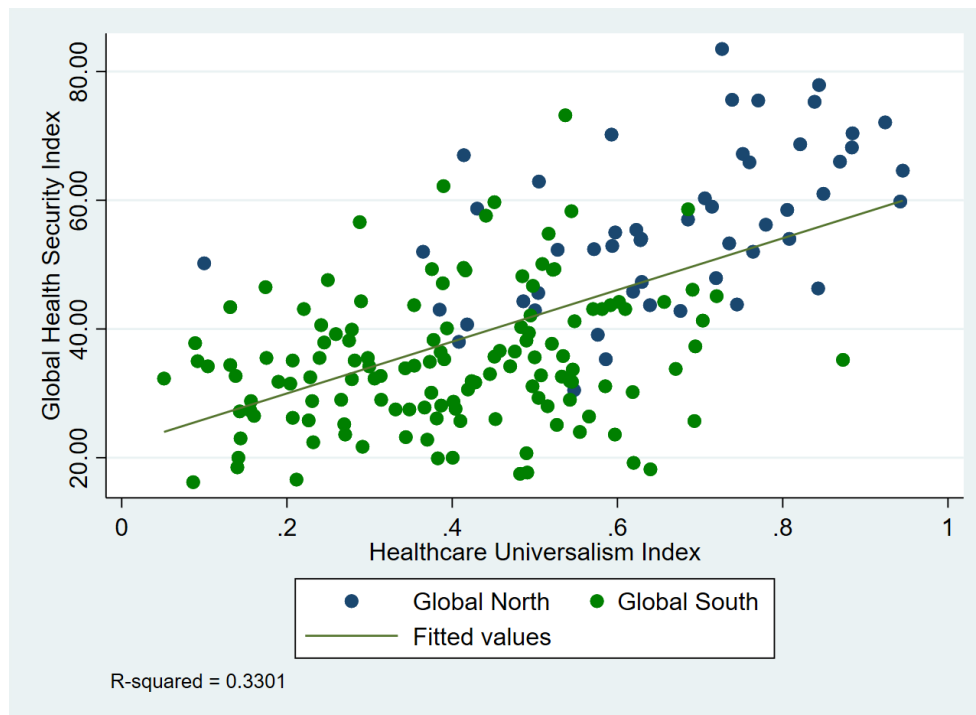
Figure 14. Infant mortality and the Healthcare Universalism Index, 2017



The scatterplots show that this association is much stronger for countries in the Global South than for countries in the Global North. For example, whereas a 1 percent increase in universalism is associated with a reduction of 0.8 in infant mortality in the Global South, the coefficient is reduced to 0.1 in countries of the Global North. As is often the case with health and development-related outcomes, this is due to a difference in variance between the two groups of countries. With many countries of the Global North reaching ‘natural’ limits of life expectancy of around 80 years and infant mortality rates close to 0, their between-country variations are to an extent limited by their level of development. For this reason, we separate the two regions in the following regression analysis and, additionally, focus on within-country variations for both groups.

Interestingly, this divergence is less apparent for the GHS Index, which shows a high variance across the sample. Although there appears to be a positive relationship between the level of development and the estimated preparedness for epidemics and pandemics, there are a large number of outliers. Still, the association between the level of universalism and the GHS Index is strictly positive but stronger and more significant for countries of the Global North. The larger variance in the outcome variable mainly feeds into the lower R-squared—that is, the independent variable’s explanatory power—compared to the life expectancy and infant mortality associations.

Figure 15. The Global Health Security Index and the Healthcare Universalism Index, 2017



To investigate these relations further, Table 2 summarizes the results of the panel regressions for the overall HUI. As previously indicated, the first line shows the results for the between-country variations (similar to the discussed scatterplots) and the second line the results for the within-country variations (that is, the change in individual countries over time). Even when controlling for a broad set of contextual factors, such as GDP, education status, population size, demographic structure and time fixed effects, most identified relationships remain strong and highly significant.

Table 2. Health outcomes regressions in the Healthcare Universalism Index

	Global South			Global North		
	(1) Life expectancy	(2) Infant mortality	(3) GHS Index	(1) Life expectancy	(2) Infant mortality	(3) GHS Index
HUI (between)	0.116***	-0.638***	0.0915	0.0206	-0.131***	0.1808*
HUI (within)	0.0470***	-0.128***		0.0251***	-0.137***	
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	No	Yes	Yes	No
Observations	2,309	2,301	93	1,050	1,051	48

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In the Global South, higher levels of universalism are associated with significantly higher life expectancy and lower infant mortality, both between and within countries. Although we are, of course, aware of the difference between correlation and causation, our result means that both changes in universalism over time and differences in universalism across countries are significant predictors (and likely contributors) to differences in health outcomes. The results for the Global North are similar with only two exceptions: The coefficients are generally smaller, and the between-country effects are not significant in the case of life expectancy. Both distinctions are likely due to the outlined convergence of countries towards a natural limit in life expectancy and infant mortality.

Nevertheless, the size and significance of the remaining coefficients, especially of the within-country variation, emphasizes that healthcare universalism remains a central factor for overall health and mortality outcomes, even at higher levels of development. For example, even when including a broad variety of controls, a 1 percent increase in universalism is associated with 0.64 fewer infant deaths per 1,000 live births in the Global South and 0.13 in the Global North, which translates into an infant mortality reduction of 1.5 and 1.7 percent,

respectively, when compared to the average rate over the sample period.¹³ Furthermore, given the relatively low variation in the HUI over time, it is especially interesting to see that the within-country effects are significant for almost all indicators. These further highlight that improvements in health outcomes are not simply a natural part of an overall development process or driven by global trends but instead are centrally shaped by health system design.

Lastly, another significant difference between the results for the Global South and the Global North is the relationship with the GHS Index. In the Global North, improvements in healthcare universalism are associated¹⁴ with better preparedness for pandemics and epidemics. Given the structure of the index and the recent experience of the COVID-19 pandemic, this result appears plausible as countries with high coverage provided by the public sector are better prepared to rapidly reach large proportions of the population and provide equal protection and care to individuals in need. A good example of this might be the distribution of COVID-19 vaccines, which potentially, unlike any other health intervention, emphasizes the role of equality in access to quality care for strengthening public and global health. Similarly, in line with the experience of the COVID-19 pandemic, this finding also highlights the central role of the State and public service provision for both health and human security.

Interestingly, there is no significant relationship between universalism and health security in the Global South, as shown in Figure 16. There are several possible explanations for this result. Firstly, it is possible that a certain ‘threshold’ level of universalism is required to adequately respond to an epidemic that many countries of the Global South have not yet reached, such as national coverage or high equality of access. Secondly, it is possible that the GHS Index methodology suffers from potential biases or measurement errors when scoring the preparedness of less developed health systems as there appears to be a large clustering of scores around the average index value of 35. Thirdly, and likely most importantly, universalism is only relevant for some aspects of the GHS Index and overall health disaster preparedness: mainly, for treatment, and, in part, for rapid response. Other factors, such as prevention, detection, global cooperation and risk environment, also play important roles that might outweigh the impact of universalism.

To investigate the role of different dimensions of universalism for health security, Table 3 provides a more detailed overview of the infant mortality regressions and shows the results for each of the subindices of the HUI.¹⁵ Here, and in the following sections, these regressions follow the same methodology as before, including

¹³ 7.5 in the Global North and 41.9 in the Global South.

¹⁴ At the 10 percent significance level. This relates to the between-country effects as GHS Index data are only available for 2017.

¹⁵ The results for life expectancy are very similar but less pronounced for the Global North due to lower variation in the outcome variable.

controls and the hybrid random effects model, with the only difference being that the HUI scores are replaced by the respective dimension indices. Here, we should highlight a caveat we detail below: Some level of overlap between the coverage and generosity dimensions due to the construction of the effective UHC Index¹⁶ likely introduces an upwards bias in the coverage coefficients.

Table 3. Detailed results on infant mortality

	Global South			Global North		
	(2) Infant mortality	(2) Infant mortality	(2) Infant mortality	(2) Infant mortality	(2) Infant mortality	(2) Infant mortality
Coverage (between)	-0.978***			-0.295***		
Coverage (within)	-0.815***			-0.0676**		
Generosity (between)		-0.354***			-0.0865**	
Generosity (within)		-0.0131			-0.0116	
Equity (between)			-0.213***			-0.0652*
Equity (within)			-0.103***			-0.172***
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,301	2,301	2,301	1,051	1,051	1,051

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3 shows a number of interesting results that provide further nuance to the previous regression results in Table 2. Firstly, even considering a possible upwards bias, coverage appears to be the most impactful dimension for infant mortality. As in the HUI regressions, the between-country coefficients are very large for both the Global North and the Global South. Considering an average infant mortality rate of 7.5 deaths per 1,000 live births in the North and 41.9 in the South for the sample period, a 1 percent increase in coverage is associated with a reduction in infant mortality of 4 and 2.3 percent, respectively.¹⁷ These substantial effects indicate that coverage can be understood as a foundational dimension or ‘first stage’ of universalism that is a necessary

¹⁶ See GBD 2019 Universal Health Coverage Collaborators 2020.

¹⁷ Dividing the respective coefficients by the average mortality rates between 1995 and 2017.

condition for further development, as without broad coverage, no health system can truly be universal. In this context, coverage can also be interpreted as representing some aspects of ‘essential health services’ that likely have a direct impact on specific mortality risks, whereas aspects of generosity and equity might have a more indirect impact through the long-term quality of care and sustainability of health systems.

Despite the large role of coverage, another central finding is that both generosity and equity matter for universalism. Although their size is slightly smaller, almost all coefficients are statistically significant, confirming the conceptualization of universalism as involving more than just coverage. Interestingly, there appears to be a trend in the roles of the different dimensions. In the Global South, generosity appears to be slightly more important than equity, potentially reflecting already low levels of public health funding in many countries. In the Global North, equity appears to be more relevant, at least when considering within-country effects.

The significance of the equity dimension across all countries is particularly interesting. Across countries and over time, the stronger role of private sector health provision is associated with higher infant mortality.¹⁸ Going against arguments that privatized health services might provide incentives or technology transfers to the public sector, this adverse relationship highlights the risks of market segmentation and the potential role of the private sector in undermining public provision (Martínez Franzoni and Sánchez-Ancochea 2016b). Interestingly, this relationship is especially strong within countries of the Global North for which a 1 percent increase in equity is associated with a 2.3 percent reduction in infant mortality. Given the relatively short time frame and low variation of the sample, this is a remarkable result. Overall, we believe that inequalities in service access and quality can be a threat not only to truly universal health systems but also to essential health outcomes.

INEQUALITY

To investigate the link between healthcare universalism and inequality, we focus on the Gini index as a standard measure of income inequality and on the Atkinson index of inequality in life expectancy as calculated for the Inequality-adjusted Human Development Index. This analysis is not only interesting in the context of persistent life cycle inequalities in health and income but also with regards to the ‘paradox of redistribution’ debate.

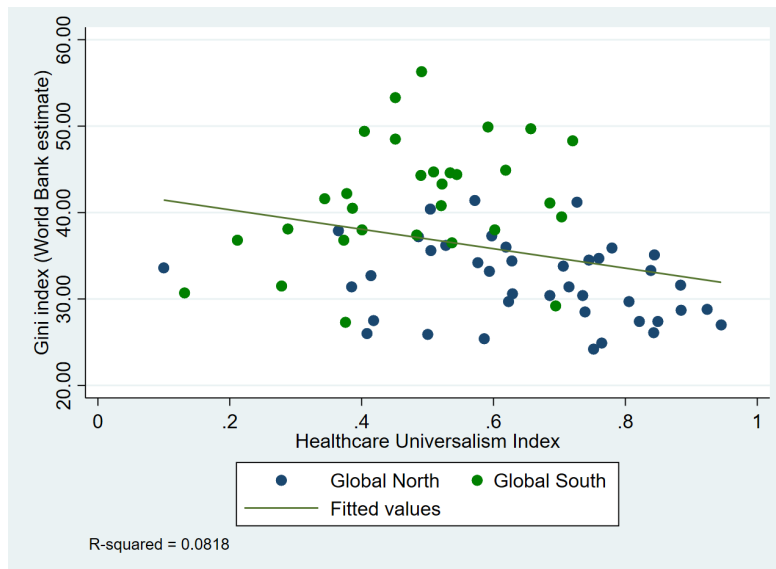
In their seminal contribution, Korpi and Palme (1998) argue that welfare state institutions shape the size of the social budget and that there is a trade-off between the targeting of benefits and the amount of resources spent. By examining the degree of universalism in pension and sickness insurance programmes in a subset of countries in the Organisation for Economic Co-operation and Development in 1985, they find that countries with more encompassing programmes had higher social spending but also achieved lower levels of poverty

¹⁸ Interestingly, these results are not limited to infant mortality but extend to life expectancy (see Table B1 in the appendix), showing that more privatized health systems are associated with lower life expectancy.

and inequality than countries with more targeted programmes. They explain this so-called ‘paradox of redistribution’ with the greater political support for a large welfare state. As the middle class also benefits from generous, encompassing programmes, there is an incentive to further expand services and reduce demand for private alternatives. Under the assumption that universal healthcare contributes to income redistribution, we would expect the argument to hold for our study as well. We should also consider if there are differences between the Global South, the Global North and the individual dimensions of universalism.

Figure 17 shows highly differential results for the Gini index between the Global North and the Global South. While the ‘paradox of redistribution’ relationship holds for countries of the Global North in 2017, there appears to be a positive association with universalism in the Global South—that is, more universal countries display higher levels of income inequality. In this case, the positive correlation is mainly driven by the small sample size and a sample bias towards Latin America and the Caribbean, a region with historically high rates of universalism and inequality. Although the significance of this relationship vanishes with more balanced samples in previous years, it highlights the need to go beyond simple cross-country associations¹⁹ and also focus on within-country changes over time. Overall, data availability is a clear limitation for this analysis of the Gini index as there are only around eight observations on average per sample country, which is especially problematic for the analysis of bivariate associations in individual years. This is also reflected in the low explanatory power of the regression in Figure 17.

Figure 17. The Gini index and the Healthcare Universalism Index, 2017



¹⁹ As is rarely done in the ‘paradox of redistribution’ literature.

In some ways, the relationship between the HUI and inequality in life expectancy is even more interesting. The bivariate associations show the expected relationship: A 1 percent increase in healthcare universalism is associated with a 0.36 percentage reduction in inequality in life expectancy. Figure 18 shows that the relationship with inequality in life expectancy holds across the sample but appears to be much stronger for countries of the Global South. Given low levels of universalism in many countries in this group, this finding seems plausible as highly segmented health systems with low levels of coverage, generosity or equity are likely to exclude large proportions of the population, especially the most vulnerable, and create significant differences in life expectancy between the poor and the wealthy. For the Global North, as discussed previously, we expect smaller coefficients given the very low variance in the sample, with only a single country with an inequality rate of over 10 percent. Overall, this simple bivariate regression fits the data surprisingly well, given the sample size and variety of country characteristics. With the HUI explaining more than half the total variance in inequality in life expectancy, this result reinforces the notion that universalism is much better than more targeted or private systems in securing positive health outcomes for all.

Figure 18. Inequality in life expectancy and the Healthcare Universalism Index, 2017

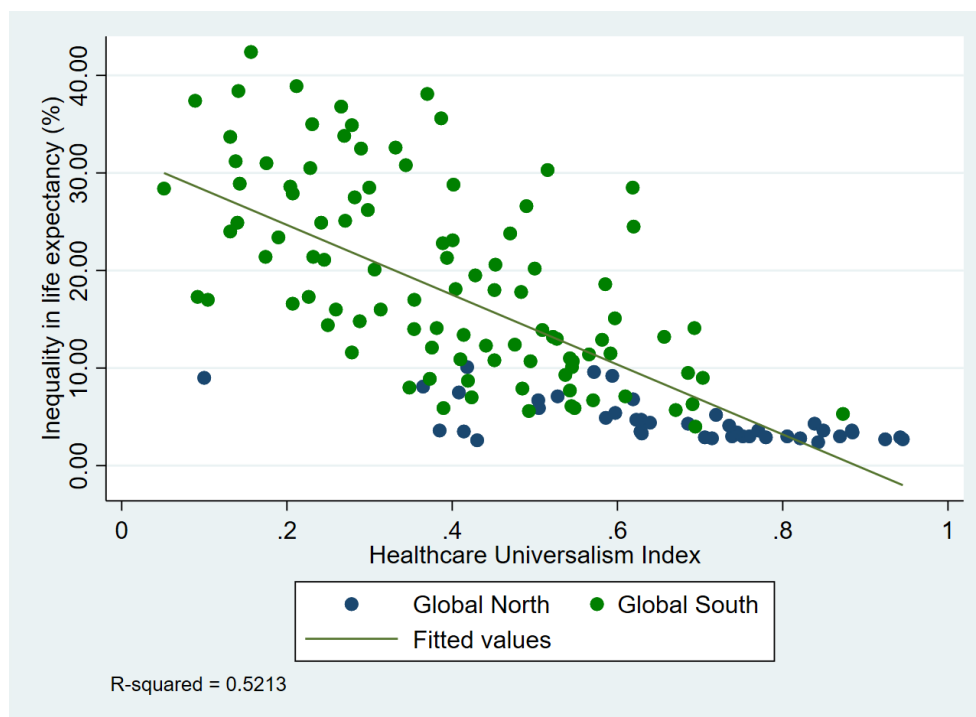


Table 4 summarizes the results of the panel regressions for the inequality outcome variables. Despite some of the outlined shortcomings of the bivariate analysis, the results overall confirm the direction and significance of the relationship with the HUI. When controlling for a variety of contextual factors and potential time trends,

universalism remains a highly significant predictor of inequality in life expectancy and, to a lesser extent, income inequality.

Across the sample, more universal health systems are associated with significantly lower inequality in life expectancy. For countries of the Global North, this finding also applies to the within-country effects of universalism, which are almost equal in size to the between-country effects. The significance of these effects is especially remarkable as the outcome variable is strongly trend driven (which we control for with time dummies), the available time frame for this indicator is very short (2010 to 2017) and the national HUI varies relatively slowly over time.²⁰ Based on these factors, we would expect the within-country coefficient to be negligible or insignificant, as it is for the Global South, but this finding strongly emphasizes the central role of universalism for inequality even in more developed health systems.

Table 4. Inequality regressions—the Healthcare Universalism Index

	Global South		Global North	
	(1)	(2)	(1)	(2)
	Inequality in life expectancy	Gini index	Inequality in life expectancy	Gini index
HUI (between)	-0.183***	0.0682	-0.0797***	-0.109**
HUI (within)	0.0404	-0.0689**	-0.0625***	0.0214
Controls	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes
Observations	579	627	311	680

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results for the Gini index confirm the conjecture from the bivariate analysis: The relationship differs substantially between the Global South and the Global North. Confirming the results of Korpi and Palme (1998) and Jacques and Noël (2018), the ‘paradox of redistribution’ persists in the Global North with more universal countries having significantly lower levels of income inequality. Also in line with Jacques and Noël (ibid.), we do not find any significant within-country effects of universalism—again, likely driven by the slow change rate of the HUI and the outlined data limitations.²¹ These results seem plausible, assuming that healthcare universalism is representative of overall welfare universalism. Welfare system design mainly affects persistent

²⁰ As is common for many institutional variables.

²¹ In parallel to Jacques and Noël (2018), we conducted a fixed effects regression that showed a significant within-country effect from universalism.

variables such as political support for redistribution on a cross-national level rather than small in-country changes over time.

By contrast, we do not find the ‘paradox of redistribution’ relationship in the Global South, potentially due to several different reasons. Firstly, the relationship between healthcare provision and income distribution is likely more complex due to the much higher diversity of countries in the Global South. Secondly, it is possible that the political processes around redistribution are shaped by different factors in the Global South than in the Global North. Income inequality is likely affected by a variety of contextual variables, such as labour markets and sociopolitical factors, that might not be represented in our regression model and that may be particularly significant in the Global South.²² Lastly, it seems possible that Korpi and Palme’s (1998) conjectured impact channel through the support for redistribution requires a certain minimum level of universalism. If large parts of the (vulnerable) population remain excluded from the system, political support might be unaffected by changes in welfare provision.

To provide further insights into the role of different dimensions of universalism, Table 5 summarizes the regression results for the HUI dimension indices with respect to inequality in life expectancy, one of the most interesting variables considered in this paper. Similar to the detailed results on infant mortality, coverage appears to be the most impactful dimension; however, generosity and equity also play significant roles in both the Global South and Global North.²³ Comparing the size of the coefficients to the average inequality in life expectancy over the sample period, a 1 percent increase in coverage is associated with a 1.9 percent inequality reduction in the Global South and a 3.5 percent inequality reduction in the Global North. These are very substantial effects, especially for a highly aggregated outcome indicator such as (inequality in) life expectancy.

²² The relatively low explanatory power of the Global South regressions (R-squared around 0.4) points in this direction.

²³ As before, it is important to take into account a potential upwards bias in the coverage coefficient and the short time frame of the inequality data.

Table 5. Detailed results—inequality in life expectancy

	Global South			Global North		
	(1)	(1)	(1)	(1)	(1)	(1)
	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy
Coverage (between)	-0.424***			-0.200***		
Coverage (within)	-0.123*			-0.0742		
Generosity (between)		-0.0804**			-0.0583**	
Generosity (within)		0.00707			-0.0271**	
Equity (between)			-0.0633**			-0.0538*
Equity (within)			0.0992***			0.0203
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	579	579	579	311	311	311

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Still, the significance and direction of the generosity and equity coefficients emphasize that all universalism dimensions matter for more equitable health outcomes. Although the strength of the relationship differs by development level, across all countries, more generous and less privatized health systems are associated with significantly less inequality in life expectancy, a finding that again raises concerns over any future attempts to expand the involvement of the private sector in healthcare provision across the world. Our results reinforce findings from other authors about the importance of all dimensions of universalism. For example, with regards to generosity, Martínez Franzoni and Sánchez-Ancochea (2018) highlight the risk of catastrophic health expenditure as a central regional challenge for Latin America, with a number of countries having more than half of their populations at risk, even after substantial improvements in coverage.²⁴

Interestingly, the relationship among all three dimension indices and inequality appears to be stronger for the Global North, at least when comparing the relative size of the effects. This could be related to a longer

²⁴That is the probability that surgical care represents a cost above 10 percent of household expenditure per year.

institutional history, and hence political dimension, of universalism in the Global North. Similarly, it is possible that some equalizing impact of generosity and equity in the Global South is hampered by pre-existing gaps in coverage.

The latter argument is likely also the driving force behind the significance of the positive within-country effects of equity in the Global South. This result would indicate that, over time, more private sector engagement leads to lower health inequality in the Global South, potentially by addressing gaps in the generosity or coverage of public sector services. This specific result, which goes against many other presented findings, would require further investigation beyond the scope of this paper. A detailed look at the data shows that it is likely driven by the short sample time frame and a substantial deterioration in equity in several low- and middle-income countries that were already at low levels of universalism.²⁵

VIOLENCE AND CONFLICT

As a third link between health and human security, we assess the association between universalism and violence and conflict. To represent violence, we use the national homicide rate, expressed as the number of violent deaths per 100,000 people. Furthermore, we use the GPI as a composite index of various forms of conflict. Published by the Institute for Economics & Peace (2021), the GPI measures the peacefulness of countries along the dimensions of societal safety and security, ongoing domestic and international conflict, and levels of militarisation. This is the least direct link between human security and health; any causal interpretation of the results is therefore particularly difficult. The prevalence of violence and conflict is driven by a multitude of social, political and economic factors. Health system design likely affects only a small proportion of these.

Nevertheless, two potential channels might drive a negative relationship between universalism and violence and conflict. Firstly, universal institutions can play an important role in social cohesion and nation-building, which might affect the likelihood of (domestic) conflict and political violence. For example, Martínez Franzoni and Sánchez-Ancochea (2016a, p. 39) highlight how the Costa Rican Social Insurance Agency “has become a national symbol, intertwined with peace, the rule of law, and social democracy.” Similarly, Kabeer (2014) shows how, during the post-colonial period, many countries of the Global South used universalism as a tool to advance a sense of belonging and national unity.²⁶

Secondly, universalism has an important impact on inequality, which in turn can affect the likelihood of conflict and violence. Although there is a long-standing debate on the relationship between conflict and vertical inequality (see, for example, Cramer 2003), the evidence on horizontal inequalities shows a strong positive

²⁵ Such as Afghanistan, Bangladesh, Iraq, Nigeria and Sudan.

²⁶ A similar process could be observed in Europe. See de Neubourg 2009.

relationship with the likelihood of (armed) conflict (Bahgat et al. 2017). Built on the very notion of equality among groups, universalism can play an important role in reducing such inequalities as an instrument to “shorten social distance and help different socio-economic groups become part of a community and realize their shared problems” (Martínez Franzoni and Sánchez-Ancochea 2016a, p. 40).

Lastly, a potential relationship between universalism and violence and conflict might also be driven by reverse causality. As noted above, several conflict-affected countries experienced a deterioration in the HUI between 1995 and 2017, mostly due to changes in coverage and generosity. These changes were likely affected by the impacts of conflicts themselves, for example, due to the degradation of relevant infrastructure or the reallocation of public funds. While it is important to keep in mind this caveat for the following analysis, it also opens a third interpretation of the results with regard to the potential fragility of universal systems in times of crisis, when they might be most needed.

The bivariate analysis shows some evidence for the indicated relationship: More universal countries appear to be more peaceful and have fewer homicides (see Figures 19 and 20). Based on the latest available year, a 1 percent increase in universalism is associated with a reduction of 0.11 (or 1.36 percent) in the homicide rate and a reduction of 0.013 (or 0.63 percent) in the GPI.²⁷ The strength of this relationship, however, appears to be much weaker than for the other two studied dimensions of health outcomes and inequality, both with regard to the size of the estimators and the explanatory power of the model. While the bivariate regression with the GPI (Figure 19) appears to fit the data reasonably well (although still worse than for most other outcomes), the scatterplot of the homicide rate (Figure 20) displays a high degree of variation and, accordingly, a very low R-squared.

This divergence in explanatory power is also driven by differences between the Global North and the Global South. In terms of the homicide rate, most countries in the Global North appear to converge towards a natural minimum while countries in the Global South display a higher variation, including some extreme outliers. In contrast, the scatterplot of the GPI also shows a significant number of outliers, but the relationship with the HUI seems to hold across the Global North and Global South. Overall, the bivariate analysis does in fact indicate that there might be a negative relationship between universalism and peacefulness, potentially driven by the factors outlined above. For the homicide rate, the evidence is much less clear, requiring further investigation in the panel data analysis.

²⁷ Based on the sample average homicide rate and the GPI of 8.10 and 2.06, respectively.

Figure 19. The Global Peace Index and the Healthcare Universalism Index, 2017

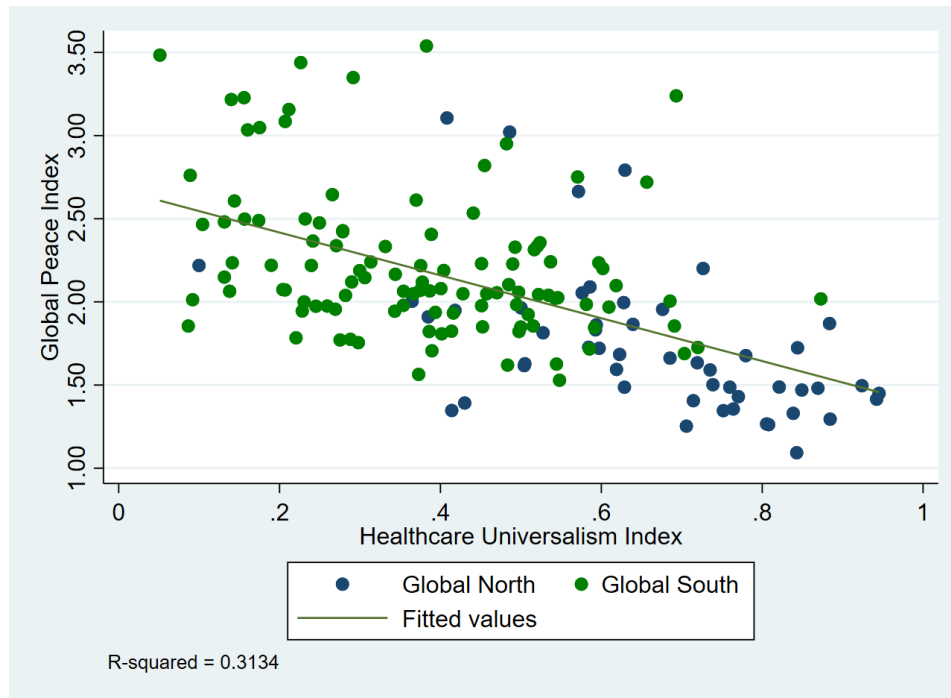


Figure 20. The homicide rate and the Healthcare Universalism Index, 2016

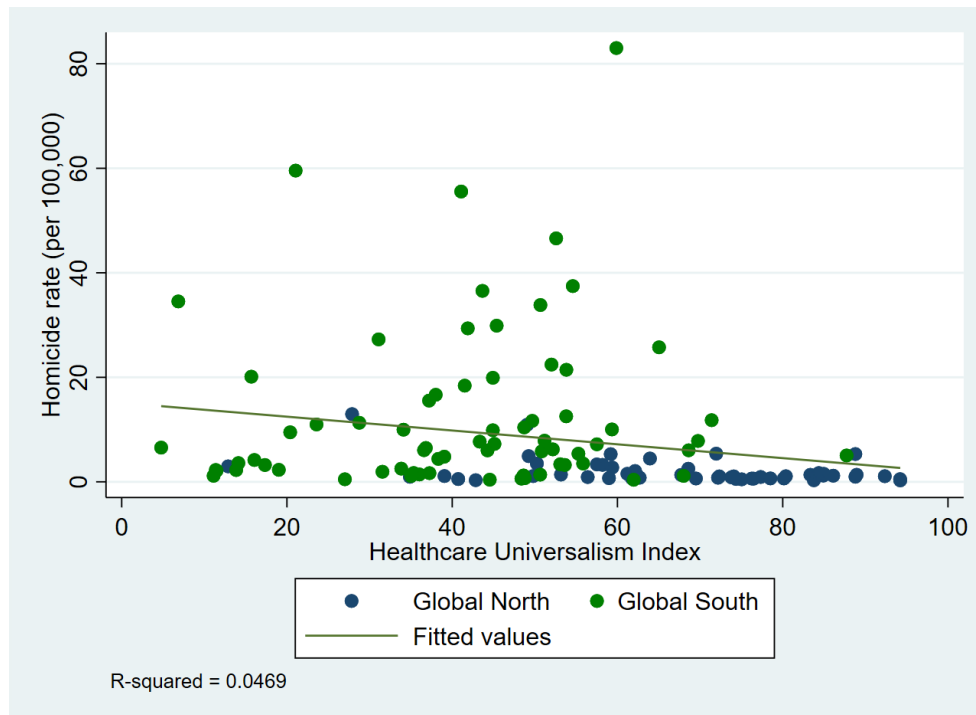


Table 6 summarizes the results of the panel data analysis, which overall confirm the bivariate correlations. Across the Global South and the Global North, universalism is a highly significant predictor of peacefulness but not of the homicide rate. Both in absolute and relative terms, the relationship appears to be much stronger for the Global North, potentially driven by a stronger impact on social cohesion and inequality reduction. This is also reflected in the highly significant and almost equally large coefficient for the within-country effects; that is, national changes towards more universalism are associated with less likelihood of conflict.²⁸

The difference in the GPI relationship between the Global South and Global North is important for two reasons. Firstly, it provides further support to the hypothesis from the inequality analysis that the underlying (political) mechanisms that drive the relationship between universalism and human security are stronger in countries in the Global North. Secondly, it shows that the substantial correlation for countries in the Global North is unlikely to be driven by reverse causality, as they have, on average, a much lower GPI and likelihood of conflict. Consequently, the correlation for the Global South is more likely to be driven by the reverse impact of conflict on universalism, emphasizing the potential fragility of universal development in times of crisis.

The results for the Global South also show a highly significant but small within-country effect of universalism on the homicide rate. Countries that improved their universal healthcare provision over time experienced fewer homicides. Given an average rate of 18.5 in the Global South, a 1 percent increase in the HUI was associated with a 0.7 percent reduction in homicides. There are two potential explanations of this effect. Firstly, although we control for various related indicators and time fixed effects, it is possible that the negative correlation is simply an artefact of an overall process of development—with a negative trend in homicides—that is not fully accounted for by the current methodology. Secondly, the correlation could also be driven by the indicated impact of universalism on social cohesion but only be present in the Global South due to the low variation of the outcome variable in the Global North. At the end, and as mentioned at the beginning, we call for caution in interpreting results in cases with several steps in the causal chain.

²⁸ Although these results should be interpreted with some caution, given the smaller sample size.

Table 6. Conflict and violence regressions—Healthcare Universalism Index

	Global South		Global North	
	(1) GPI	(2) Homicide rate	(1) GPI	(2) Homicide rate
HUI (between)	-0.00600**	-0.0192	-0.0106***	-0.00926
HUI (within)	-0.000731	-0.131***	-0.00951***	-0.0165
Controls	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes
Observations	839	1335	456	1026

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

As the last step in the conflict and violence analysis, Table 7 summarizes the regression results of the HUI dimension indices with respect to the GPI. The regressions show a number of interesting results that complement the existing analysis of the other two dimensions of health security. Firstly, in contrast to previous dimension index regressions, coverage appears no longer to be the single most important dimension of universalism. Instead, taking into account the overlap and likely upwards bias of the coverage coefficients, generosity and equity appear to be at least equally important. This is further supported by the significance of all between- and within-country coefficients in the Global North, confirming the notion of universalism as a multidimensional concept. Considering that generosity and equity go well beyond UHC, this finding strongly indicates that universalism has an impact on peacefulness through the reduction of (horizontal) inequalities, social cohesion and nation-building.

This interpretation is further supported by the significance of equity—that is, the role of the private sector in **health provision**—across both the Global South and the Global North. With an almost equal coefficient in both regions, the results show that countries with more equal (that is, less privatized) health systems have a significantly lower likelihood of conflict. Again, issues of reverse causality need to be considered, but the high significance of this relationship across the world and even within countries of the Global North strongly supports the notion of universalism as an equalizing symbol of national identification and community-building.

Lastly, in line with previous sections, the final regressions show no significant correlations with the GPI in the Global South (with the exception of equity). As discussed before, this likely implies that the relevant mechanisms, such as inequality reduction and nation-building, are weaker in the Global South, potentially due to differences in institutional development or the necessity of a minimum floor of coverage as an enabler for

further universal growth. More comparative quantitative and qualitative research would be useful to corroborate and explain some of these findings.

Table 7. Detailed results—Global Peace Index

	Global South			Global North		
	(1) GPI	(1) GPI	(1) GPI	(1) GPI	(1) GPI	(1) GPI
Coverage (between)	-0.00362			-0.0160***		
Coverage (within)	-0.00487**			-0.0167***		
Generosity (between)		-0.00122			-0.0105***	
Generosity (within)		0.000727			-0.00298***	
Equity (between)			-0.00572***			-0.00567***
Equity (within)			-0.00111			-0.0123***
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	839	839	839	456	456	456

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conclusion

This paper has explored the empirical relationship between healthcare universalism and different dimensions of human security. After reviewing the concept of universalism and its measurement, we developed a new global measure for healthcare universalism as the basis for our empirical analysis. Covering 195 countries and territories from 1995 to 2017, the HUI builds on the universalism conceptualization of Martínez Franzoni and Sánchez-Ancochea (2016a) in combining indicators of coverage, generosity and equity into a single index. Similar to the HDI, the HUI is constructed as the geometric mean of normalized indices in each of the three dimensions of universalism.

We used the HUI to firstly assess the global state of healthcare universalism and its development since 1995. We then examined the relationship between the HUI and three main linkages between health and human security: infectious diseases and health outcomes, inequality, and violence and conflict. With reference to Ogata and Sen (2003), these interrelated health challenges present the most critical and pervasive threats to health as the vital core of human security.

In the empirical analysis, we focused both on bivariate correlations and on panel regressions employing the HUI and its individual dimension indices (coverage, generosity, equity). Each of the regressions was conducted separately for countries in the Global South and the Global North to understand the differential impacts and potentially changing role of healthcare universalism and its dimensions. To distinguish between the within- and between-country effects of universalism, we followed Jacques and Noël (2018) in employing a random effects model that separates both types of variation.

Overall, the results of our analysis lead to the following five conclusions.

Around the world, healthcare is becoming more universal. Despite existing narratives around the marketization of healthcare and a declining role of the State, we see consistent and substantial improvements in all dimensions of universalism in most countries around the world. Reflecting increased domestic and international efforts to expand universal healthcare, this applies in particular to large-scale improvements in coverage and to the increasing role of the State in healthcare. This finding serves as a hopeful example of positive change and emphasizes that universal healthcare is possible at all levels of development.

Globally and within regions, significant inequalities persist. Despite positive global trends in universalism, substantial inequalities in healthcare universalism remain. Our results show high levels of dispersion and strong regional trends in universalism, with large differences between countries in the Global South and the Global North. These trends appear to be persistent over time, with many countries in Africa, South Asia and South-East Asia remaining at the bottom of the distribution. Although we do find convergent trends in some regions (such as sub-Saharan Africa) and in the rates of growth, the absolute gap between the most and least universal regions has increased over time. This is mainly driven by a strong divergence in terms of generosity. While increased public expenditure has been a key driver of universalist expansion in high and very high human development countries, it appears to be the main growth barrier in low and medium human development countries, with stagnating or even declining public expenditure growth in spite of substantial increases in coverage and equity.

There are systematic differences between healthcare universalism in the Global South and the Global North. Between countries of the Global South and the Global North, the HUI differs substantially in levels, growth and its relationship with different dimensions of health security. While global gaps in equity are closing, generosity

remains the key dimension that differentiates universal healthcare at various stages of development, reinforcing the notion of a gradual expansion in universalism with a changing role in its dimensions over time. This is further supported by empirical analysis that shows that coverage, as a foundational dimension, and generosity tend to have a stronger impact in the Global South. Equity tends to play a bigger role in the Global North. Similarly, the stronger significance of the HUI in the Global North for non-health related outcomes, like income inequality and conflict, indicates the increasing role of political economy factors at higher levels of universalism, one that merits further research in the future.

Healthcare universalism contributes significantly to all dimensions of human security. The empirical analysis has revealed strong associations between the HUI, better health outcomes, lower inequality and, to a lesser extent, a lower likelihood of conflict. Some of these relationships are in line with the existing literature on UHC and might be expected a priori, such the positive association between coverage and better health outcomes. The analysis has also revealed a number of novel results, however, such as the strong negative association between the HUI and inequality in life expectancy, or between the level of privatization and health outcomes. Importantly, these results are not purely driven by the coverage index (the equivalent of UHC). We find significant effects for generosity and equity across all dimensions of health security. In highlighting the role of generosity and equity for key development outcomes, these results represent a strong empirical confirmation of universalism as a multidimensional concept, even beyond its application to human security.

Our contribution is not only empirical but also analytical. Building on the work of Jennifer Pribble, Juliana Martínez Franzoni, Diego Sánchez-Ancochea and others, we demonstrate the usefulness of a multidimensional approach to universalism. We hope that other researchers can improve the HUI by incorporating other indicators of each dimension, particularly in generosity and equity. Our analysis also calls for more systematic, comparative research between the Global North and Global South that recognizes the similarities among different regions but also accounts for persistent political economy differences.

Appendix A: Constructing the Healthcare Universalism Index

This section describes the construction of a new global index to measure healthcare universalism. Taking inspiration from the HDI, the Healthcare Universalism Index (HUI) combines three sub-indices for coverage, generosity and equity into a summary measure of universalism that covers 195 countries between 1995 and 2017.

MEASURES OF UNIVERSAL HEALTH COVERAGE

The measurement and monitoring of UHC implementation has been a key focus in the global health literature at least since the adoption of UHC as target 3.8 of the SDGs in 2015, defined as the achievement of “universal health coverage, including financial risk protection, access to quality essential healthcare services and access to safe, effective, quality and affordable essential medicines and vaccines for all.” The UN Statistical Commission adopted two indicators to measure this target (United Nations General Assembly 2017):

- SDG indicator 3.8.1: Coverage of essential health services²⁹
- SDG indicator 3.8.2: Proportion of population with large household expenditures on health as a share of total household expenditure or income (with thresholds of 10 percent and 25 percent of total household expenditure or income)³⁰

The SDG indicator framework hence defines UHC along two dimensions: service coverage and financial protection. In terms of financial protection, the framework clearly specifies the two relevant indicators in terms of their thresholds of 10 or 25 percent of household expenditure or income. A frequently used alternative metric, which puts more emphasis on the poverty implications, is ‘medical impoverishment’, that is, medical expenditure that pushes households below the poverty line.³¹ Apart from the exact definition of relevant poverty or expenditure thresholds, both indicators are well defined and widely accepted in the policy and academic discourse, which leaves the availability of high-quality panel data as the main barrier to using them in monitoring UHC implementation.³²

In contrast to financial protection, indicators for measuring service coverage are less clearly defined in the SDG framework, which has led to a variety of different proposals in the literature. In general, these approaches

²⁹ See: <https://unstats.un.org/sdgs/metadata/files/Metadata-03-08-01.pdf>.

³⁰ See: <https://unstats.un.org/sdgs/metadata/files/Metadata-03-08-02.pdf>.

³¹ This indicator is less often used in academic literature since the adoption of SDG indicator 3.8.2 in 2017 but remains central for analyses of poverty and UHC.

³² Using a broad sample of household surveys, the two most recent advances in this area are Wagstaff, Flores, Smith et al. (2018) and Wagstaff, Flores, Hsu et al. (2018), which provide comprehensive estimates for both indicators for a large panel of countries.

combine a range of tracer indicators that represent different health service dimensions into a single index to provide a standardized summary measure of essential health service, often inspired by the experience of the Human Development Index (Hogan et al. 2018).

Accepted in 2018 as the official measure for SDG indicator 3.8.1, the UHC service coverage index, proposed by the WHO and the World Bank, is among the most used indices in the literature (WHO and World Bank 2017). It aggregates 14 tracer indicators in four essential service coverage areas: reproductive, maternal, newborn and child health; infectious diseases; non-communicable diseases; and service capacity and access. Calculated for 183 UN Member States based on available household surveys, the service index is constructed as the geometric average of the 14 tracer indicators, both within each category and across all four dimensions.³³

Two recent studies criticize various elements of this approach and propose alternative measures. The GBD 2019 Universal Health Coverage Collaborators (2020) highlight several shortcomings in the methodology of the service coverage index, which similarly apply to most other approaches in the literature.³⁴ The two main criticisms, aside from potential measurement errors based on the use of multi-year household surveys and arbitrary weighting schemes, relate to the choice of indicators. The authors criticize the common use of proxy indicators for health system inputs (such as hospital beds per capita) and risk factors (such as the prevalence of non-smoking) as misleading as these are influenced by external factors and only provide an indirect representation of actual access. For example, given that non-communicable diseases are one of the main causes of early death and disability around the world, the authors argue that “the omission of non-communicable disease indicators beyond risk factor prevalence proxies or cancer screening is at odds with the reality of countries’ populations and health systems.” (GBD 2019 Universal Health Coverage Collaborators 2020, p. 1252). Additionally, the authors note that none of the approaches in the literature explicitly capture the role of potential health gains in their measurement of UHC—that is, the extent to which the expansion of individual health services can contribute to improved health outcomes. For example, an expansion in the coverage of antiretroviral therapy might provide higher health gains in a country with high HIV incidence than in a country with low HIV incidence.

To address these criticisms, the GBD 2019 Universal Health Coverage Collaborators (2020) developed the UHC effective coverage index, which combines indicators that represent healthcare needs over the complete life course while also incorporating potential population health gains. The index comprises 23 indicators, mapped onto a framework of five population groups (such as ‘reproductive and newborn’ or ‘older adults’) and five health service domains (such as ‘promotion’, ‘treatment’ or ‘palliation’). The effective coverage indicators are

³³ See WHO 2019 and Hogan et al. 2018 for more details.

³⁴ Examples include Leegwater et al. 2015, Wagstaff et al. 2015 and Fullman et al. 2016.

based on estimates from the 2019 Global Burden of Diseases, Injuries, and Risk Factors Study. Four are direct measures of intervention coverage and 19 are outcome- or mortality-based indicators as proxies for access to quality care. To construct the index, the indicators are weighted based on their potential health gains given the population structure, hence providing a measure of health system performance relative to individual countries' population health needs.

In another criticism of the official measurement of SDG target 3.8, Wagstaff and Neelsen (2020) emphasize the need to simultaneously measure progress in both dimensions of UHC. They argue that measuring the dimensions separately, as done in most of the literature, can be misleading as countries might have strong achievements in one dimension but not in another. Therefore, they propose a UHC Index that comprises a geometric average of a subindex of service coverage and the standard SDG 3.8.2 financial protection index, both with equal weight. This introduces a level of trade-off between the two dimensions with diminishing substitutability, indicating that achievements in one area (such as coverage) can only compensate for gaps in another (such as financial protection) to a certain degree. Wagstaff and Neelsen (2020) argue that such a comprehensive measurement framework is especially timely as policymakers are increasingly concerned with the trade-off between the two dimensions of UHC.

While these proposals come from the public health literature, social policy scholars who work on universalism have also contributed to the debate. This political economy literature puts less emphasis on measuring coverage, often approximated by legal or crude coverage indicators of individual health services. Instead, it expands the analysis to aspects of equity and the quality of (universal) healthcare.

For example, Martínez Franzoni and Sánchez-Ancochea (2018) use a range of 10 indicators to measure universalism in Latin America across our three dimensions: coverage, generosity and equity. These include diverse indicators, such as coverage for salaried and non-salaried workers (coverage), the proportion of births attended by skilled personnel (generosity), the neonatal mortality rate (generosity), private health spending (equity) and the 20/20 access ratio for salaried, non-salaried and domestic workers (equity). Selected from a vast database of 295 possible indicators, the resulting measurement framework is then employed in a cluster analysis to understand levels of segmentation and output divergence in the region. Using the risk of catastrophic health expenditure as an illustration for lasting segmentation in the market, Martínez Franzoni and Sánchez-Ancochea (2018) emphasize the need to go beyond pure coverage as a policy goal and instead focus on gaps in generosity and equity as key threats to truly universal healthcare.

Giraudy and Pribble (2019) conduct a similar analysis of healthcare universalism at the subnational level. They develop a quantitative measure that captures both aggregate national performance and variation on the subnational level. As the measurement of subnational trends is especially challenging on the global scale, they

focus on a single indicator that combines the coverage, quality and transparency of healthcare services: measles, mumps and rubella vaccination coverage. They argue that, as a core health service included in most national vaccine schedules, it captures the essence of the universalism concept as it measures actual service usage with subnational variation driven by differences in service quality, access or transparent implementation. Giraudy and Pribble (*ibid.*) further argue that other potential measures, such as infant mortality or births attended by a skilled physician, are often affected by external factors, such as welfare regime, wealth or cultural values, and are less meaningful at the subnational level.³⁵ Using this indicator, they then develop a territorial Gini index and employ it to calculate an adjusted measure of healthcare universalism that both reflects national and subnational development.

The comparison of these two literatures highlights important aspects to consider when developing a global index of healthcare universalism. The universalism literature emphasizes going beyond simple measures of coverage and expanding the focus to aspects of equity and generosity in services. The literature also highlights the need to jointly measure these dimensions as true universalism depends on the combined achievement of all individual components. Complementing this, the global health literature stresses the central role of comprehensively measuring all aspects of health system performance, especially with regards to effective access throughout the life cycle, while also balancing the complexities of various data limitations across countries and time.

THE HEALTHCARE UNIVERSALISM INDEX

Drawing from the outlined UHC and universalism literature, while also taking inspiration from the HDI, this paper develops a global index for measuring healthcare universalism. Covering 195 countries and territories from 1995 to 2017, the HUI builds on the universalism conceptualization of Martínez Franzoni and Sánchez-Ancochea (2016a) in combining measures of coverage, generosity and equity into a single index. Similar to the HDI, the HUI is constructed as the geometric mean of normalized indices in each of the three dimensions of universalism. The dimensions of universalism are represented by the following indicators:

³⁵ In a related analysis, Niedzwiecki (2018) measures the level of health policy implementation by averaging the coverage of various medical services, including various health check-ups, vaccine coverage and cancer prevention.

Coverage: UHC effective coverage index (GBD 2019 Universal Health Coverage Collaborators 2020)

Generosity: Government health spending as a percentage of GDP (Global Burden of Disease Health Financing Collaborator Network 2020)

Equity: Private health spending as a percentage of total health spending (ibid.)

The UHC effective coverage indicator was selected as the best metric for coverage as it measures actual access to quality care across the life cycle on a health system level. It hence addresses many shortcomings of existing indicators of theoretical coverage or individual health interventions. With regards to generosity, government spending is a well-established indicator to measure public efforts and commitment as it requires a substantial level of (public) resources to enable comprehensive and accessible services for all (Martínez Franzoni and Sánchez-Ancochea 2018). Lastly, the equity dimension is measured through the proportion of private spending in total expenditure as an indicator for the commodification of healthcare (ibid.). This relies on the assumption that a large private sector reflects weaknesses in public benefits, which in turn leads to high segmentation in healthcare as higher-income groups are able to access higher-quality and more generous services than the rest of the population.

In approaching healthcare from a universalism perspective, the HUI employs methods from the global health literature on measuring UHC but expands it with elements of generosity and equity. Whereas the coverage indicator draws on work from the GBD 2019 Universal Health Coverage Collaborators (2020), the other two indicators are a subset of the measurement framework presented in Martínez Franzoni and Sánchez-Ancochea (2018). Combining the two approaches allows us to better capture the essence of coverage in measuring effective access to quality service, a key issue for many (quantitative) universalism studies, while retaining the analytical focus of inequality and policy segmentation. This has been made possible by the recent release of new, high-quality data sets on these issues.

The reason for focusing on the three outlined indicators and combining them into an index is threefold. Firstly, they all provide high-level aggregates of health systems that are likely to be central representations of universalism across many different countries, compared to individual health interventions or inputs more often driven by national institutions, regimes or cultures, as highlighted by Giraudy and Pribble (2019).

Secondly, like the HDI, the focus on a small number of aggregate indicators with good data availability enables the measurement of health universalism on a truly comprehensive level, across both countries and time. In comparison, even the official SDG indicators 3.8.1. and 3.8.2 suffer from significant data availability gaps. In the most recent analysis period of 2013 to 2017, not a single country had data on more than 70 percent of UHC indicators (WHO 2019).

Thirdly, building on Wagstaff and Neelsen’s (2020) argument, the three dimensions should be jointly measured as only their combined achievement can lead to truly universal outcomes. In isolation, even high achievements in individual universalism domains might lead to problematic policy outcomes, for example, in cases of high inequality in access or quality of services. The aggregation approach of an index further constitutes relationships between the individual dimensions of universalism, hence implying the existence of dependence and substitutability among indices. These relationships are especially relevant in making choices about averaging and weighting.

In accordance with the majority of UHC measurement approaches in the literature, the HUI use a geometric instead of an arithmetic mean for aggregating the dimension indices. A geometric mean favours equal achievement in all dimensions versus high achievements in individual dimensions. Whereas simple averages imply perfect substitution, as reductions in one subindex can be linearly compensated for by equal increases in another, geometric means lower the substitutability between the index components and make the marginal contribution of each component dependent on the level of the others. Although this has been criticized in the context of the *Human Development Report* (Ravallion 2012, Anand 2018), this imperfect substitutability appears to fit well with the conceptual context of universalism. For example, one could easily imagine a scenario where an increase in already high service coverage would be less desirable than the reduction of inequality in access to these services.³⁶

This leads to the last conceptual decision in the design of the HUI: the weighting. Like the HDI, the HUI assigns equal weight to each dimension index based on the theoretical assumption that all are equally important for achieving true universalism. An alternative and equally valid approach would be to use principal component analysis to determine the weights of each dimension based on which explain the largest variation in the original indicators.³⁷ This approach lacks the theoretical justification of the universalism framework, however, and therefore complicates the interpretation of results. Additionally, this method tends to disadvantage indicators with low variation, independent of their theoretical importance, a case that applies especially for relatively ‘slow’ moving indicators like government spending.

Data

The HUI mainly relies on data from the Institute for Health Metrics and Evaluation at the University of Washington: the UHC effective coverage index and the Global Health Spending 1995-2017 database. The UHC effective coverage index builds on 23 life cycle indicators of healthcare that use data from the Global Burden of Diseases, Injuries, and Risk Factors Study 2019. Available for 204 countries and territories for all years from

³⁶ As is the case in many countries of the Global South.

³⁷ This approach has been used in the context of UHC measurement, for example, by Leegwater et al. 2015.

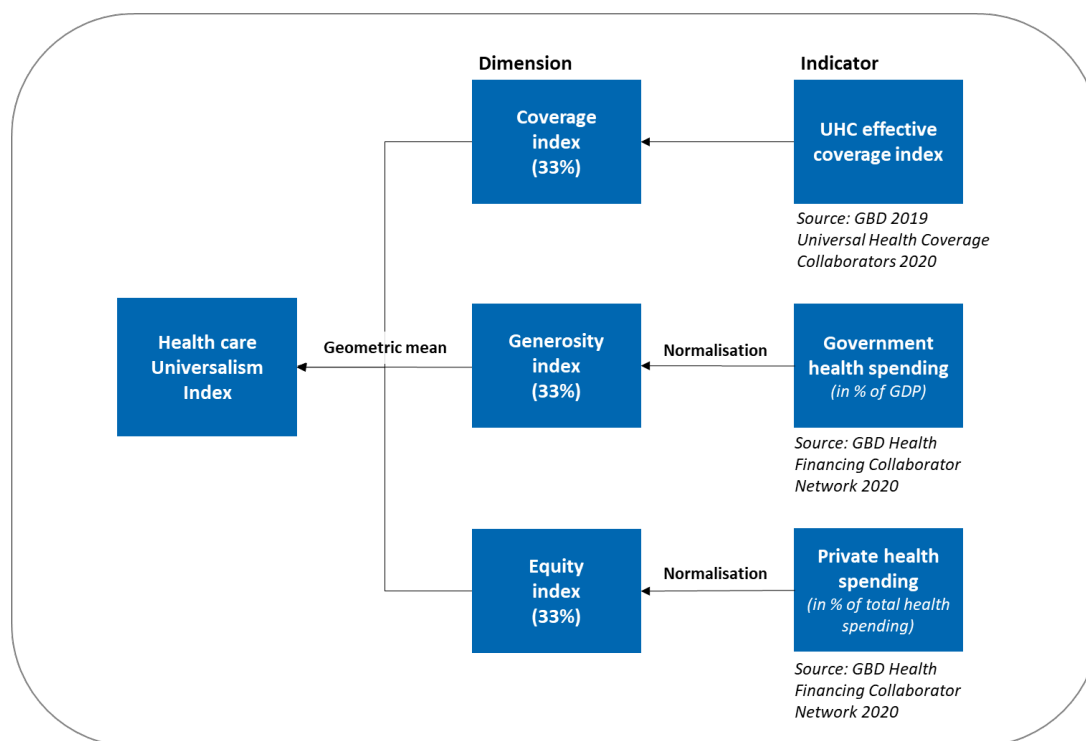
1990 to 2019 (GBD 2019 Universal Health Coverage Collaborators 2020, Bill and Melinda Gates Foundation 2020), the indicators are divided in a matrix of five health service types (promotion, prevention, treatment, rehabilitation and palliation) and five population age groups (reproductive and newborn, children under age 5 years, children and adolescents, adults and older adults). Each indicator is weighted by its potential health gains, measured as disability-adjusted life years, for each location year and population age group, hence providing a measure of effective service coverage across different settings and country contexts.

The two indicators of government spending as a percentage of GDP and private spending as a percentage of total health spending are taken from the Global Health Spending 1995-2017 database. Available for 195 countries and territories for all years from 1995 to 2017 (Global Burden of Disease Health Financing Collaborator Network 2020), the database provides modelled estimates of domestic health expenditure based on the WHO’s Global Health Expenditure Database. For the equity indicator, the data on out-of-pocket and private prepaid expenditure are aggregated as private expenditure.

Calculation

The calculation of the HUI closely resembles the construction of the Human Development Index.

Figure A1. Construction of the Healthcare Universalism Index



To construct the HUI, the generosity and equity dimension indices are calculated by normalizing the corresponding variables based on their minimum and maximum values. To avoid the impact of extreme outliers, the minimum and maximum values are defined as the first and ninety-ninth percentile of all country-year observations, given as:

Table A1. Limits of the generosity and equity indices

<i>Indicator</i>	Minimum (first percentile)	Maximum (ninety-ninth percentile)
<i>Government health spending as a percentage of GDP</i>	0.3 percent	9 percent
<i>Private health spending as a percentage of total health spending</i>	5 percent	85 percent

Alternatively, the relevant minimum and maximum values could have been based on the HDI's approach of setting 'natural zeros' or 'aspirational targets' (UNDP 2020). Given that almost all health systems will have at least some residual level of government and private expenditure, however, independent of the overall development of the health system, a 'natural zero' limit appears to be difficult to define in practice.

Similar to the HDI, the dimension indices are then simply calculated as:

$$I_{D,ij} = \frac{x_{ij} - x_{min}}{x_{max} - x_{min}}$$

Where $I_{D,ij}$ is the dimension index D for country i and year j and x_{ij} is the corresponding observation. As the equity indicator of the proportion of private health spending in total expenditure measures the level of (negative) market segmentation, the resulting index is additionally transformed by subtracting it from 100 percent.

Lastly, the two resulting generosity and equity dimension indices are aggregated with the UHC effective coverage index³⁸ to create the HUI as the geometric mean of all three sub-indices.

$$HUI_{ij} = (I_{Coverage,ij} * I_{Generosity,ij} * I_{Equity,ij})^{\frac{1}{3}}$$

³⁸ As the UHC effective coverage index is already normalized, no further rescaling is necessary.

LIMITATIONS

Our proposed HUI is not without problems. Effective coverage includes measures of health gains that are influenced by factors beyond healthcare provision. Government spending may be high because of inefficiencies, waste or excessive use of technology. Additionally, the HUI does not capture subnational differences in coverage, generosity and equity. Although the coverage index does incorporate some regional differences, it is still possible that service access and quality differ widely within sample countries. Similarly, private spending considers a particular dimension of equity and fails to consider the extent to which different groups are covered.

Furthermore, in measuring an institutional variable as a composite index, the HUI displays relatively little variation over time, which likely limits the significance of the panel data analysis, especially of within-country effects. Lastly, due to the construction of the UHC effective coverage index, there is a level of overlap between the coverage and generosity dimension of the HUI. In measuring access to quality care, the UHC effective coverage index also captures some elements of generosity that go beyond the simple coverage of services. This overlap likely introduces an upwards bias in the empirical analysis of the role of coverage compared to the other dimensions of universalism.

Nevertheless, use of the three indicators simultaneously contributes to solving some problems. For example, the shortcomings of public spending as a measure of generosity are reduced by the inclusion of the effective coverage indicator and the choice to aggregate the scores using a geometric mean.³⁹ Of course, more indicators could be included in the future to better reflect the three dimensions, particularly equity and generosity, but we believe the HUI is a meaningful way to start building a large comparative agenda on universal outputs.

Appendix B: Regression results

Table B1. Regression results—life expectancy

	Global South				
	(1)	(2)	(3)	(4)	(5)
	Life	Life	Life	Life	Life
	expectancy	expectancy	expectancy	expectancy	expectancy
HUI (between)	0.116***				
	(3.02)				

³⁹ Which makes the marginal contribution of each component dependent on the level of others. For example, a 1 percent increase in generosity has a higher impact on the HUI score if coverage is high rather than low, which might indicate a potential misallocation of resources.

HUI (within)	0.0470*** (5.46)				
Coverage (between)		0.353*** (7.63)		0.347*** (7.15)	
Coverage (within)		0.341*** (28.65)		0.333*** (28.01)	
Generosity (between)			0.0595* (1.79)	0.0139 (0.42)	
Generosity (within)			0.0142** (2.19)	0.0262*** (4.33)	
Equity (between)				0.0186 (0.89)	-0.00132 (-0.07)
Equity (within)				0.0322*** (6.20)	0.0300*** (6.10)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	2309	2309	2309	2309	2309
Global North					
	(1) Life expectancy	(2) Life expectancy	(3) Life expectancy	(4) Life expectancy	(5) Life expectancy
HUI (between)	0.0206 (0.62)				
HUI (within)	0.0251*** (4.22)				
Coverage (between)		0.268*** (10.10)		0.268*** (10.30)	
Coverage (within)		0.182*** (22.19)		0.180*** (22.01)	
Generosity (between)			0.0245 (0.87)	0.0186 (1.07)	
Generosity (within)			-0.00372 (-1.05)	-0.00430 (-1.39)	
Equity (between)				-0.0182 (-0.78)	-0.0400*** (-3.03)
Equity (within)				0.0132*** (2.85)	0.0116*** (2.84)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	1050	1050	1050	1050	1050

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B2. Regression results—infant mortality

Global South					
	(1) Infant mortality	(2) Infant mortality	(3) Infant mortality	(4) Infant mortality	(5) Infant mortality
HUI (between)	-0.638***				

HUI (within)	(-6.51) -0.128*** (-4.62)				
Coverage (between)		-0.978*** (-7.23)			-0.889*** (-6.71)
Coverage (within)		-0.815*** (-19.77)			-0.789*** (-19.13)
Generosity (between)			-0.354*** (-3.90)		-0.113 (-1.22)
Generosity (within)			-0.0131 (-0.63)		-0.0549*** (-2.62)
Equity (between)				-0.213*** (-3.81)	-0.138** (-2.48)
Equity (within)				-0.103*** (-6.21)	-0.0955*** (-5.60)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	2301	2301	2301	2301	2301
Global North					
	(1) Infant mortality	(2) Infant mortality	(3) Infant mortality	(4) Infant mortality	(5) Infant mortality
HUI (between)	-0.131*** (-2.80)				
HUI (within)	-0.137*** (-7.04)				
Coverage (between)		-0.295*** (-5.00)			-0.273*** (-6.04)
Coverage (within)		-0.0676** (-2.02)			-0.0458 (-1.42)
Generosity (between)			-0.0865** (-2.19)		-0.00127 (-0.04)
Generosity (within)			-0.0116 (-0.99)		-0.0359*** (-2.96)
Equity (between)				-0.0652* (-1.81)	-0.0513** (-2.25)
Equity (within)				-0.172*** (-11.85)	-0.185*** (-11.58)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	1051	1051	1051	1051	1051

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B3. Regression results—Global Health Security Index

Global South					
	(1)	(2)	(3)	(4)	(5)
	GHS Index	GHS Index	GHS Index	GHS Index	GHS Index
HUI (between)	0.0915 (1.45)				
Coverage (between)		0.136 (2.00)			0.107* (2.54)
Generosity (between)			0.0311 (0.44)		-0.150 (-0.20)
Equity (between)				0.0462 (1.35)	0.0360 (0.80)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	No	No	No	No	No
Observations	93	93	93	93	93
Global North					
	(1)	(2)	(3)	(4)	(5)
	GHS Index	GHS Index	GHS Index	GHS Index	GHS Index
HUI (between)	0.181* (2.59)				
Coverage (between)		0.484** (5.07)			0.412** (4.49)
Generosity (between)			0.219** (3.67)		0.237** (4.72)
Equity (between)				-0.0189 (-1.21)	-0.249*** (-8.47)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	No	No	No	No	No
Observations	48	48	48	48	48

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ **Table B4. Regression results—inequality in life expectancy**

Global South					
	(1)	(2)	(3)	(4)	(5)
	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy	Inequality in life expectancy
HUI (between)	-0.183*** (-3.80)				
HUI (within)	0.0404 (1.07)				
Coverage (between)		-0.424*** (-6.08)			-0.412*** (-6.33)
Coverage (within)		-0.123* (-1.75)			-0.0896 (-1.28)
Generosity (between)			-0.0804**		-0.0133

				(-1.96)	(-0.33)
Generosity (within)			0.00707	(0.22)	-0.0412
					(-1.18)
Equity (between)				-0.0633**	-0.0366
				(-2.47)	(-1.37)
Equity (within)				0.0992***	0.127***
				(3.71)	(4.35)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	579	579	579	579	579
Global North					
	(1)	(2)	(3)	(4)	(5)
	Inequality in	Inequality in	Inequality in	Inequality in	Inequality in
	life expectancy	life expectancy	life expectancy	life expectancy	life expectancy
HUI (between)	-0.0797***				
	(-4.10)				
HUI (within)	-0.0625***				
	(-2.93)				
Coverage (between)		-0.200***			-0.189***
		(-6.27)			(-5.88)
Coverage (within)		-0.0742			-0.0814
		(-1.57)			(-1.67)
Generosity (between)			-0.0583**		0.00797
			(-3.09)		(0.31)
Generosity (within)			-0.0271**		-0.0219
			(-2.42)		(-1.78)
Equity (between)				-0.0389***	-0.0298
				(-2.75)	(-1.65)
Equity (within)				-0.0334	-0.0151
				(-1.51)	(-0.63)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	311	311	311	311	311

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B5. Regression results—Gini index

Global South					
	(1)	(2)	(3)	(4)	(5)
	Gini index	Gini index	Gini index	Gini index	Gini index
HUI (between)	0.0682				
	(1.08)				
HUI (within)	-0.0689**				
	(-2.00)				
Coverage (between)		-0.0713			-0.122
		(-0.79)			(-1.34)
Coverage (within)		-0.0382			-0.0474
		(-0.62)			(-0.76)
Generosity (between)			0.0906		0.133*

			(1.49)		(1.81)
Generosity (within)			-0.0548**		-0.0622**
			(-2.13)		(-2.05)
Equity (between)				0.0140	-0.0178
				(0.44)	(-0.50)
Equity (within)				-0.0181	0.0101
				(-0.87)	(0.41)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	627	627	627	627	627
Global North					
	(1)	(2)	(3)	(4)	(5)
	Gini index	Gini index	Gini index	Gini index	Gini index
HUI (between)	-0.109**				
	(-2.41)				
HUI (within)	0.0214				
	(0.87)				
Coverage (between)		-0.123			-0.0405
		(-1.44)			(-0.42)
Coverage (within)		-0.160***			-0.157***
		(-3.74)			(-3.66)
Generosity (between)			-0.116***		-0.121*
			(-2.98)		(-1.89)
Generosity (within)			0.0234*		0.0194
			(1.72)		(1.39)
Equity (between)				-0.0538*	0.0127
				(-1.67)	(0.27)
Equity (within)				0.0203	0.00199
				(0.95)	(0.09)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	680	680	680	680	680

z statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table B6. Regression results—Global Peace Index

Global South					
	(1)	(2)	(3)	(4)	(5)
	GPI	GPI	GPI	GPI	GPI
HUI (between)	-0.00600**				
	(-2.04)				
HUI (within)	-0.000731				
	(-0.64)				
Coverage (between)		-0.00362			-0.00359
		(-0.87)			(-0.86)
Coverage (within)		-0.00487**			-0.00503**
		(-2.36)			(-2.45)
Generosity (between)			-0.00122		0.00692**

				(-0.42)	(2.05)
Generosity (within)			0.000727		0.00165
			(0.77)		(1.60)
Equity (between)				-0.00572***	-0.00747***
				(-3.70)	(-4.12)
Equity (within)				-0.00111	-0.00168**
				(-1.47)	(-2.04)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	839	839	839	839	839
Global North					
	(1)	(2)	(3)	(4)	(5)
	GPI	GPI	GPI	GPI	GPI
HUI (between)	-0.0106***				
	(-3.64)				
HUI (within)	-0.00951***				
	(-5.61)				
Coverage (between)		-0.0160***			-0.00935*
		(-2.79)			(-1.70)
Coverage (within)		-0.0167***			0.0121***
		(-5.32)			(3.98)
Generosity (between)			-0.0105***		-0.0108***
			(-4.30)		(-2.81)
Generosity (within)			-0.00298***		-0.000165
			(-3.29)		(-0.18)
Equity (between)				-0.00567***	0.000694
				(-2.64)	(0.24)
Equity (within)				-0.0123***	-0.0110***
				(-7.65)	(-6.32)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	456	456	456	456	456

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B7. Regression results—homicide rate

Global South					
	(1)	(2)	(3)	(4)	(5)
	Homicide rate	Homicide rate	Homicide rate	Homicide rate	Homicide rate
HUI (between)	-0.0192				
	(-0.17)				
HUI (within)	-0.131***				
	(-3.22)				
Coverage (between)		-0.264			-0.303*
		(-1.63)			(-1.86)
Coverage (within)		-0.0447			-0.0110
		(-0.60)			(-0.15)
Generosity (between)			0.0790		0.198*

			(0.85)		(1.87)
Generosity (within)			-0.0530*		-0.00400
			(-1.80)		(-0.12)
Equity (between)				-0.0760	-0.124*
				(-1.27)	(-1.86)
Equity (within)				-0.102***	-0.101***
				(-3.97)	(-3.46)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	1335	1335	1335	1335	1335
Global North					
	(1)	(2)	(3)	(4)	(5)
	Homicide rate	Homicide rate	Homicide rate	Homicide rate	Homicide rate
HUI (between)	-0.00926				
	(-0.44)				
HUI (within)	-0.0165				
	(-0.82)				
Coverage (between)		-0.106***			-0.0782**
		(-2.82)			(-2.10)
Coverage (within)		-0.129***			-0.120***
		(-3.97)			(-3.70)
Generosity (between)			-0.0296		-0.0666***
			(-1.61)		(-2.68)
Generosity (within)			0.0234**		0.0355***
			(2.05)		(2.96)
Equity (between)				0.0168	0.0557***
				(1.16)	(2.98)
Equity (within)				-0.0415***	-0.0533***
				(-2.65)	(-3.25)
Controls	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes
Observations	1026	1026	1026	1026	1026

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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