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The Road to Universal Health Coverage in Latin America: Are We There Yet?

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Abstract

Two commonly-used metrics for assessing progress towards Universal Health Coverage (UHC) involve assessing citizens' rights to health care and counting the number of people in a financial protection scheme. On these metrics most countries in Latin America have already "reached" UHC. Neither metric tells us, however, whether a country has achieved UHC in the now commonly-accepted sense of the term: that everyone - irrespective of their ability-to-pay - gets the health services they need without suffering undue financial hardship. We operationalize a framework proposed by the World Bank and WHO to monitor progress under this definition, and then construct an overall index of UHC achievement. We apply the approach using data from 112 household surveys from 1990 to 2013 for all 20 Latin American countries. None achieves a perfect UHC score, but some (including those with more integrated health systems) fare better than others. All except one have improved over time.

Introduction

The developing world – and some parts of the developed world too, including the United States – is in the midst of a major push toward Universal Health Coverage (UHC).¹ This activity raises two questions: “How can we track progress towards UHC?” and “When can we say a country has reached UHC?” Two commonly-used metrics involve assessing citizens’ rights to health care and counting the number of people in a financial protection scheme; the latter could be social health insurance (SHI) scheme or a National Health Service-type system that pools tax revenues and/or social insurance contributions, and provides access to health services that are zero-priced (or close to zero-priced) at the point of use.² On these metrics many – if not most – countries have already reached UHC. Yet many countries continue to engage in coverage-oriented reforms, suggesting that these two metrics do not fully capture the core ideas of UHC.

The countries of Latin America³, which are the focus of the empirical exercise in this paper, illustrate the point nicely. All 20 countries have explicit provisions in their constitutions or some other legal mechanism that guarantees the right to health.^{4,5} These countries do well on the financial protection scheme membership metric: as early as the 1920s, ministries of health began providing subsidized if not free care to the entire

population.⁶ What neither metric captures is whether people needing health services in practice get them, and how much they pay for them. A country can establish a legal right to free health care, but may not have the policies, resources and enforcement mechanisms in place to ensure that people who need care can obtain it without financial hardship.^{2,7} Likewise, people may be in a financial protection scheme but if the benefit package of their scheme is narrow or shallow they may not get the care they need in a timely fashion, or may get the care but may experience financial hardship as a result of paying for it. These disconnects between policy intent and what actually happens on the ground explain why Latin America has seen so much coverage-oriented health reform activity. After World War II, dissatisfaction with the depth of cover provided by health ministries led to the gradual establishment of parallel SHI schemes for formal-sector workers and their families. However, the resultant inequalities in coverage between SHI- and MOH-covered families subsequently prompted major reform efforts in 10 of the 20 Latin American countries, the aims of which were to reduce and ultimately close the gap in coverage between different parts of the population and move toward a single integrated financing and delivery system. Some countries are farther advanced down this road than others: Brazil, Costa Rica and Cuba have had fully integrated systems

for some time; Chile, Colombia and Uruguay have, in effect, advanced semi-integrated systems; Argentina, the Dominican Republic, Mexico, and Peru have less advanced semi-integrated systems; other countries have yet to start the integration process.^{4,5}

In this paper, we operationalize the indicative UHC monitoring framework proposed recently by World Bank and World Health Organization (WHO)^{8,9} and use the methodology to ask how quickly Latin America is progressing toward UHC. It is the largest UHC assessment to date using over 100 household surveys from 20 countries. In contrast to previous studies^{9,10}, we use the same metrics across all countries, go beyond service coverage indicators covered by the Millennium Development Goals (MDGs), and employ an all-encompassing UHC index.

Methods

The World Bank and WHO^{8,9} define UHC as being achieved when *everyone - irrespective of their ability-to-pay - gets the health services they need without suffering undue financial hardship in the process*. UHC thus has two (what we term) *dimensions*: service coverage and financial protection. Each has two (what we term) *domains*: prevention and treatment; and catastrophic and impoverishing payments. In each domain, our choice of indicators is dictated in part by data availability.

Because we are interested in not only how the population as a whole fares but also how the poor fare compared to the better off, our data come from population-based household surveys rather than from administrative data, which cover only the sub-population using health services and typically lack information on socioeconomic status.

Service coverage

Of the two service coverage domains, prevention is the easier to operationalize. A person's need for a preventive intervention often depends only on their gender and age, and a household survey respondent can reasonably be expected to know whether and when the preventive measure was received. We use four indicators to capture the prevention domain: four or more antenatal visits; full immunization; breast cancer screening; and cervical cancer screening.⁵

Our first two prevention indicators are among the six proposed in the World Bank-WHO monitoring framework⁹ (hereafter "the Framework"). We include the two cancer screening indicators because they speak to the non-communicable disease agenda, and both interventions are recommended despite reservations among experts over breast screening.^{5,11} We exclude four Framework indicators: improved water source and adequate sanitation; fulfilment of family planning requirements; and non-use of

tobacco. While all are important for health, none is a health intervention per se: water and sanitation infrastructure are the responsibility of agencies beyond the health sector whose investment decisions are only partially influenced by health considerations; family planning and tobacco use are household choices, albeit constrained ones, and are also influenced by non-health considerations. More relevant to UHC would be indicators that capture health prevention and promotion efforts, and efforts by the health system to improve access to relevant goods and services, e.g. family planning; such indicators are hard to come by.

The treatment domain is harder to operationalize than the prevention domain, and the data harder to come by. For some interventions, we can investigate treatment given a specific need. We use three such indicators, namely whether a baby was delivered by a skilled birth attendant (SBA), whether a child with diarrhea received the appropriate treatment, and whether a child with acute respiratory infection (ARI) received appropriate treatment. But these three indicators do not go far in capturing the majority of treatment episodes in a typical health system. We therefore resorted to a rather crude indicator, namely whether or not a respondent had been admitted to hospital in the previous year. This indicator has been widely

used in impact evaluations of UHC initiatives¹²⁻¹⁴ and gets at the idea that limited hospital supply and high out-of-pocket costs may lead to under-utilization of inpatient care. However, in contrast to the other indicators, we cannot here identify the subpopulation in need. We therefore use a benchmark to assess whether there is under- or over-utilization of inpatient care, namely the WHO Service Availability and Readiness Assessment (SARA)¹⁵ benchmark of 10 admissions per 100 persons, which is equivalent, we estimate on the basis of World Health Survey (WHS) data, to a rate of 9.03 persons per 100 reporting at least one admission in the previous 12 months.¹⁶

Our SBA indicator is the only treatment indicator from the Framework. We include the diarrhea and ARI treatment indicators because they are core additional monitoring indicators for the child mortality MDG¹⁷, they are health services, and they are widely available in household surveys. We exclude antiretroviral therapy, tuberculosis case detection and treatment success, hypertension treatment, and diabetes treatment. We do so mostly on the grounds that few household surveys collect the necessary data.¹⁸

To better ascertain broad patterns and trends, we have constructed two service coverage composites, both capturing service use only among children and women: a Maternal and Child

Health (MCH) index, equal to the average of the five MCH indicators; and a cancer screening index, equal to the average of the two screening indicators.

Financial protection

We stick closely to the Framework and use catastrophic out-of-pocket spending (defined as spending that exceeds a specific threshold of a household's total consumption), and impoverishing spending (defined as occurring if a household falls below the poverty line because of out-of-pocket payments).¹⁹ The latter gets directly at the question of out-of-pocket payments leading to financial hardship; catastrophic spending need not cause impoverishment; rather this domain captures exposure to financial risk. For the catastrophic spending approach, we need a threshold (we choose 25% of total consumption) and for the impoverishment approach we need a poverty line (given Latin America is a relatively affluent region we use the \$2.00-a-day international poverty line rather than the \$1.25-a-day line).²⁰ As with the service coverage indicators, we also capture the distribution of the catastrophic spending indicator.

A summary index of UHC achievement

To facilitate tracking UHC progress, we aggregate our indicators into an overall summary index of UHC. First, we take the complements of the financial protection indicators so they

capture the fraction of the population *not* incurring catastrophic spending and *not* impoverished. Second, we rescale three indicators so they range from 0 to 100, with 100 being best. Third, we take into account differences across income groups, by using an 'achievement' index²¹; this assigns an achievement score below the population mean to countries that achieve high service coverage rates by disproportionately covering the better-off. This inequality adjustment is applied to all indicators except the (non) impoverishment indicator. Fourth, all indicators are multiplied by 100.

The fifth and final step is to aggregate the rescaled and inequality-adjusted indicators into an overall UHC index. We weight service coverage and financial protection equally. We aggregate using a geometric mean rather an arithmetic mean: this penalizes countries who - for a given arithmetic mean - score very highly on one dimension but very poorly on the other. We weight equally the two domains of financial protection, but we assign a higher weight (25%) to the prevention domain than to the treatment domain (75%) based on relative spending patterns; to put this in context, the OECD countries spend only 5% of their total spending on health services on prevention.²² Within the prevention domain, we weight indicators equally, but within the treatment domain we assign a 50% weight to inpatient

admissions and split the remaining 50% equally across the other treatment indicators; this is roughly in line with the equal spending split between inpatient and outpatient care in the OECD countries.²² We explore the sensitivity of our results to a different set of weights where all eight service coverage indicators are given an equal weight.

Limitations

While our indicators are the best currently available, they are far from perfect, and future work will hopefully be able to present a fuller picture of UHC progress. We have tried to reduce the risk of overemphasizing the more easily measured prevention domain by including inpatient admissions as a treatment indicator and weighting treatment more heavily than prevention. However, as richer surveys become available there will be plenty of scope to improve on the measurement of treatment. Some of our choices vis-à-vis prevention could be questioned. Should indicators such as access to safe water be included in the measurement of the UHC even though they reflect the efforts of actors outside the health system? Should indicators such as breast cancer screening be included when experts are sounding warnings about current practice? In any case, in the future it ought to be possible to capture a broader set of prevention activities and to incorporate information on quality. Finally, in a comparative exercise such as this, data

availability is a major challenge: despite our indicators being fairly unsophisticated and undemanding, of the 20 countries in Latin America only 9 have complete data on our 10 UHC indicators; in only eight of these were we able to get data for two points in time.

Data

Our data come from 112 population-based household surveys.⁵ The first set of surveys we use are from the major global household survey programs: the Demographic and Health Survey (DHS), the Multiple Indicator Cluster Survey (MICS), the Living Standards Measurement Study (LSMS), and the World Health Survey (WHS); in each case, a fairly standardized questionnaire was used across all countries and years. We have used all 51 such surveys that have been conducted in Latin America since 1990.

Many Latin American countries either do not have these surveys or have had only one or two surveys since 1990. Moreover, the DHS and MICS surveys are health surveys, and do not capture out-of-pocket spending and household consumption. We also therefore make use of surveys developed and implemented by national statistical agencies. One disadvantage of these is that they do not have a standardized questionnaire. Another is that they are not all publicly accessible. In 28 cases we have been able to take advantage of the harmonization and accessibility efforts of

the Luxembourg Income Study and the World Bank. In eight countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico and Peru), we sought access to and then harmonized original survey microdata; this yielded another 33 surveys. While we have found at least one survey for each of the region's 20 countries, there is considerable cross-region variation in availability of appropriate data for an assessment of progress towards UHC.

Results

Service coverage

At least as far as MCH interventions, cancer screening and inpatient admissions are concerned, it would appear that while Latin America may have achieved (or may be close to achieving) UHC when assessed on the basis of guaranteed rights and coverage by financial protection schemes, it has not achieved 100% service coverage.⁵ The trend is, however, upwards, at least for MCH and cancer screening. Exhibit 1 shows the results for the MCH composite indicator²³: among the 13 countries for which we have data, the fraction of the target population receiving the five key MCH interventions has increased from an average of 45% in 1990 to an average of 70% in 2012. The news for cancer screening is less good: the population rate is rising about 10 percentage points every 20 years. On average, only 6.8% of the

population had at least one inpatient admission in previous 12 months; while this is 97% of the figure for the uninsured US population in 2002, it is only 75% of the 2002 WHO-SARA benchmark for the developing world, and only 59% of the 2002 OECD average. We have insufficient data to track inpatient admissions over time.

- Exhibits 1 and 2 around here -

At least as far as MCH and cancer screening interventions are concerned, we also find that the receipt of health interventions is almost always lower among the poorest 20% than among the richest 20%. The good news is that the gap between the poorest and richest quintiles is shrinking - at least for MCH interventions.⁵ As shown in Exhibit 2, among the 13 countries for which we have data, the gap on the MCH composite has shrunk from nearly 40 percentage points in 1990 to under 20 points in 2012. The gap in cancer screening between the poorest and richest quintiles, however, shows no sign of shrinking. In the case of inpatient admissions, some Latin American countries have pro-poor gradients. An analysis of the WHS data for other countries shows that this is not uncommon in middle-income countries, and is in fact the norm in high-income countries. This may be a reflection of the greater medical needs of the poor, but may also reflect underuse by or underservicing of the poor in

primary care, and hence an undue reliance on the hospital to treat conditions that could have been prevented or managed by ambulatory providers.

Some Latin American countries are closer to reaching UHC on the service coverage dimension than others. Exhibits 1 and 2 show that Brazil, Colombia, the Dominican Republic, Ecuador, Honduras, Mexico and Uruguay do well on the MCH population average, with Brazil, the Dominican Republic and Mexico also doing well on the gap. Of these, only Brazil, Colombia, Mexico and Uruguay also do well on the cancer screening population average, with Colombia and Mexico having the smallest gaps.

Financial protection

Although all Latin American countries have brought almost everyone into a financial protection scheme of one type or another, we find that no country has managed to eliminate the problems of catastrophic and impoverishing out-of-pocket payments. The trend is, however, downwards. Exhibit 3 shows the results for the impoverishment indicator: among the 14 countries for which we have data, the fraction of households experiencing impoverishment due to out-of-pocket payments fell from 1.2% in 1992 to 1.0% in 2012. We see a similar downward trend for catastrophic spending which fell from around 3.5% to 2.5% over the same period. The rates may seem small, but the implied

number of people affected is large: applying our estimated rates to the total population of each country in the year of the most recent survey, we estimate that across the 14 countries 16 million people incurred catastrophic spending and 5.6 million were impoverished by it.

- Exhibit 3 around here -

Some countries have done better on financial protection than others: just one fifth of one percent of Costa Rica's population was impoverished due to out-of-pocket spending and an even smaller fraction of Panama's was; the figure for the Dominican Republic, by contrast, was 5%. Colombia and Mexico also do well on impoverishment. Focusing on countries with more than two data points on the financial protection indicators, it appears that Guatemala and Mexico have experienced a downward trend, while Colombia and Peru saw deteriorations in financial protection in the mid-2000s but have experienced improvements since then.

Overall UHC performance

In Exhibit 4 we pull the service coverage and financial protection results together using the UHC index. The data are for the earliest and latest year available. The numbers against the country name in Exhibit 4 are the average year the indicators come from and the country's overall UHC score at that date. Unsurprisingly, given the results discussed above, no

country has yet reached UHC. However, we see progress in all countries except Brazil. All but one of the improving countries raised its UHC score by improving its service coverage score without improving its financial protection score. Colombia and Nicaragua improved their overall UHC scores but their financial protection score worsened. Mexico stands out as the only country that has moved further down the road towards UHC by improving both service coverage and financial protection.²⁴

- Exhibit 4 around here -

Some countries have improved their overall UHC score more than others. The countries with the biggest annual improvement in UHC score are Peru (2.2%) and Paraguay (1.5%). Next come the Dominican Republic (0.9%), Guatemala (0.8%) and Nicaragua (0.7%). The three countries with the smallest annual increases in UHC score are Mexico (0.3%), Colombia (0.1%) and Brazil (-0.1%). To some degree, of course, small annual increases are more likely among the latter group of countries because they already had relatively high UHC scores in the 'baseline' year.

While all countries have either improved their overall UHC score or kept it unchanged, we see variations in where countries are today in terms of UHC. Brazil's lack of change reflects in part the fact it already had a very high score (81). Colombia and Mexico are close behind Brazil with 80 and 78 respectively. Four

countries - the Dominican Republic, Nicaragua, Paraguay and Peru - cluster in the high 60s or in Peru's case 70. With scores of just 63 and 59 respectively, Ecuador and Guatemala are the least far down the road to UHC, although as already noted, there is progress in the case of Guatemala.

Conclusions

Our goals in this paper have been to operationalize the WHO-World Bank UHC monitoring framework, to construct an overall index of UHC achievement, and to use the methods to measure progress toward UHC in Latin America.

Inevitably in operationalizing the UHC index idea, we are forced to choose specific indicators and to make specific assumptions. We have tried to avoid overemphasizing the more easily measured prevention domain by giving a higher weight to treatment, and by including inpatient admissions alongside other treatment indicators. We have also tried to avoid overemphasizing MCH indicators by including NCD indicators. However, as already highlighted in the "limitations" subsection above, in our implementation of the UHC index, we capture less than we would have liked of the set of health services delivered by a typical health system, and a key message for policymakers is that tracking progress towards UHC in a more comprehensive way will

require investments in better data, especially household surveys.

Despite capturing only a small subset of health service interventions, the results are, nonetheless, of interest from a policy perspective, highlighting differences across health service areas and across countries, as well as changes over time. We see lower rates of coverage on cancer screening than on MCH interventions, and in both cases the poor lag behind the better off. On inpatient admissions, Latin America as a whole reaches only 75% of the WHO-SARA benchmark for the developing world despite being one of the more affluent regions. We see some improvement over time in financial protection but at a slow pace. Our UHC index pulls the data together into a single all-encompassing UHC index: the index takes values between 0 and 100 with larger numbers indicating higher performance. At the top we see Brazil, Colombia and Mexico clustering around the 80 mark, and at the bottom we see Ecuador and Guatemala clustering around the 60 mark.

Comparisons across countries and over time of the UHC index cannot, of course, yield specific policy recommendations. However, the data do reveal an association between UHC attainment and the degree of integration of a country's health system. The two countries (Brazil and Colombia) with fully

integrated or advanced semi-integrated systems do better (UHC=81) than the three countries (the Dominican Republic, Mexico and Peru) with less advanced semi-integrated systems (UHC=72). These, in turn, do better than the four countries (Ecuador, Guatemala, Nicaragua and Paraguay) that have yet to start integrating their health systems (UHC=64). Of course, the more integrated countries also have relatively high per capita incomes, so it cannot be concluded that integration necessarily *caused* the higher UHC index; the association is, however, suggestive. The data also reveal variations in speed of increase in the UHC index over the periods for which we have data. Have these changes occurred following health system reforms? Paraguay and Peru progressed fastest, in Paraguay's case despite the absence of health reforms. Brazil and Colombia progressed very little, but the big reforms had already occurred by the start of the period covered by our data, and both countries started the period with a high score. Mexico, which also started with a high UHC score, *did* progress (albeit slowly) during the period covered, which was also a period of major reforms.

Overall, our results show that while Latin America has made strong political commitments to UHC, and also does well in terms of two narrow UHC metrics, namely legal guarantees to health care and the share of the population in a financial protection

scheme, it is some way from achieving UHC defined in the broader sense, at least on the basis of the indicators we have included in our UHC index. The good news is that almost all countries have improved their UHC score over time. While Latin America may not have yet reached UHC, it is progressing towards it.

List of exhibits

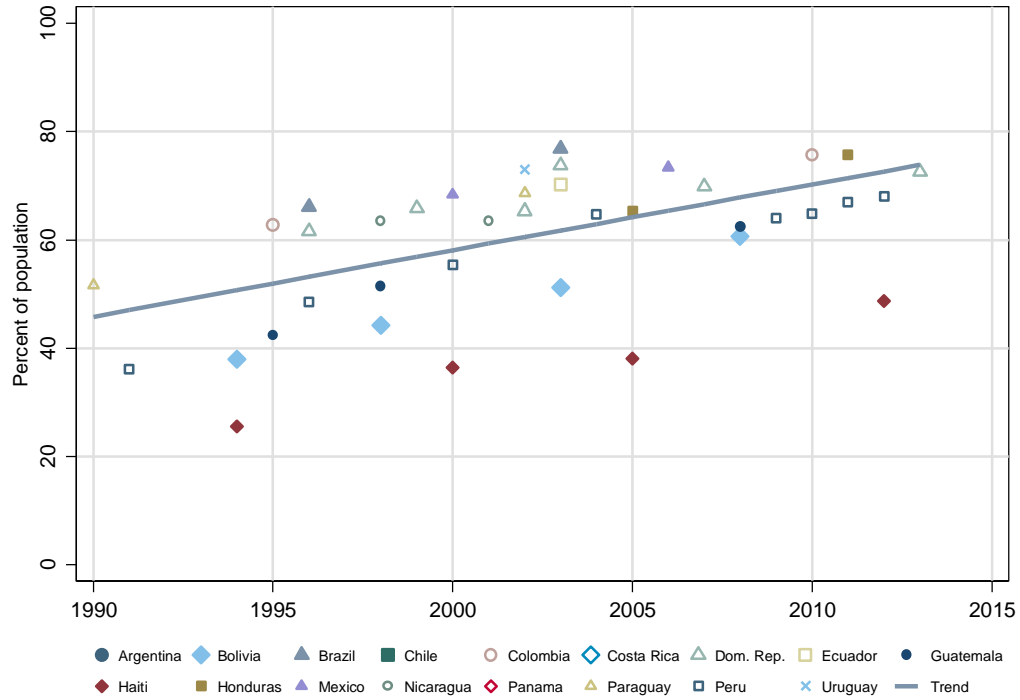
Exhibit 1: MCH coverage

Exhibit 2: Gap in MCH coverage between poorest and richest quintiles

Exhibit 3: Impoverishment due to out-of-pocket payments (\$2-a-day poverty line)

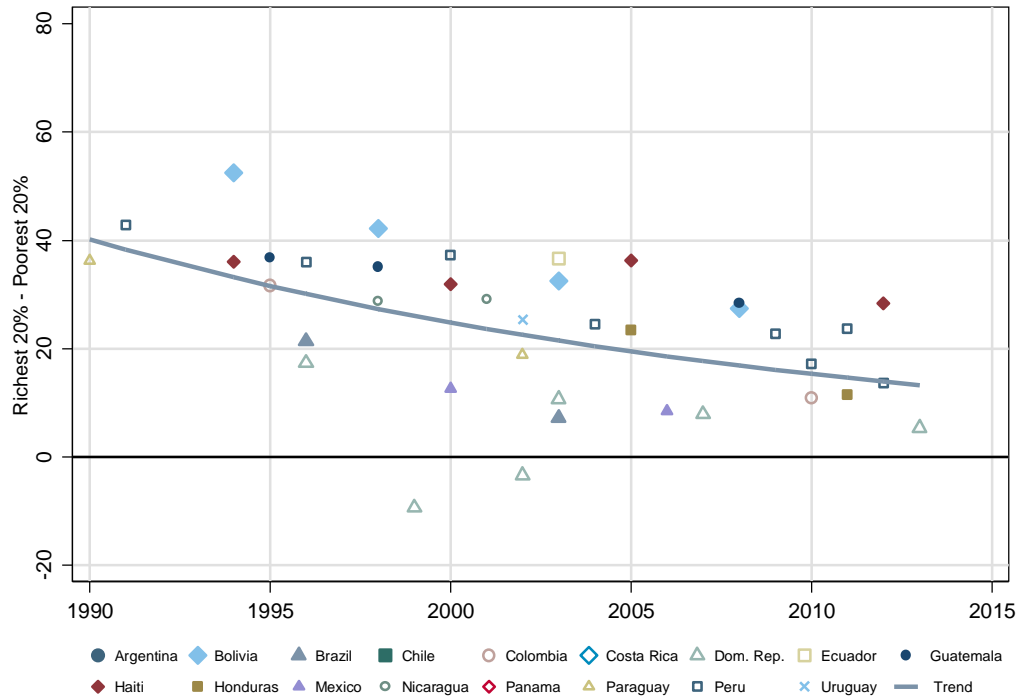
Exhibit 4: UHC index: levels and trends

Exhibit 1: MCH coverage



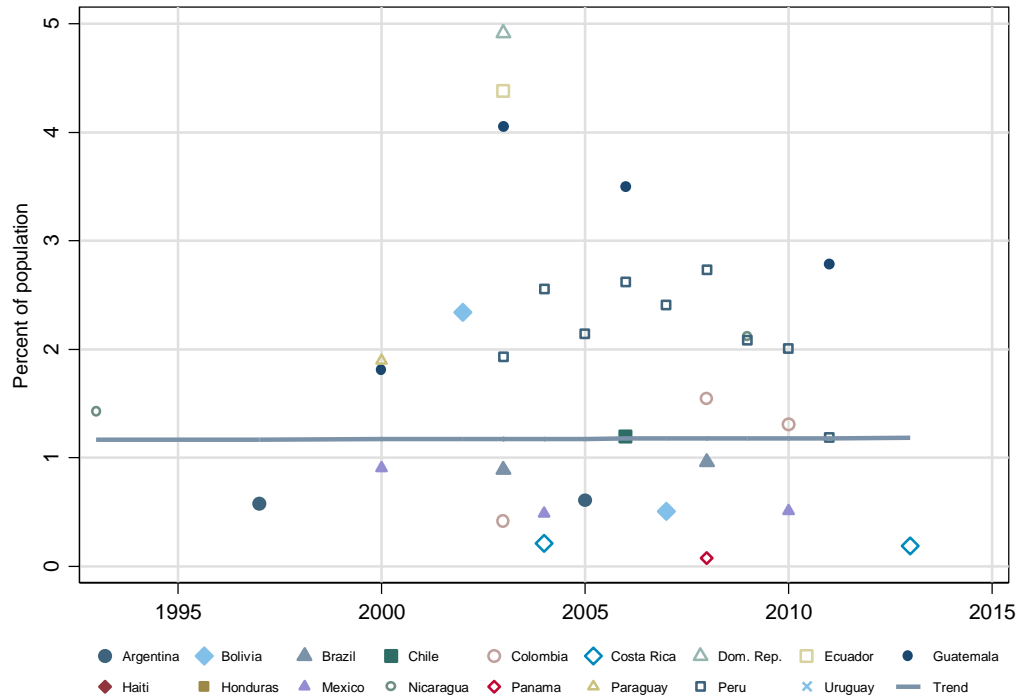
Source: Authors' calculations from surveys listed in the online Appendix.

Exhibit 2: Gap in MCH coverage between poorest and richest quintiles



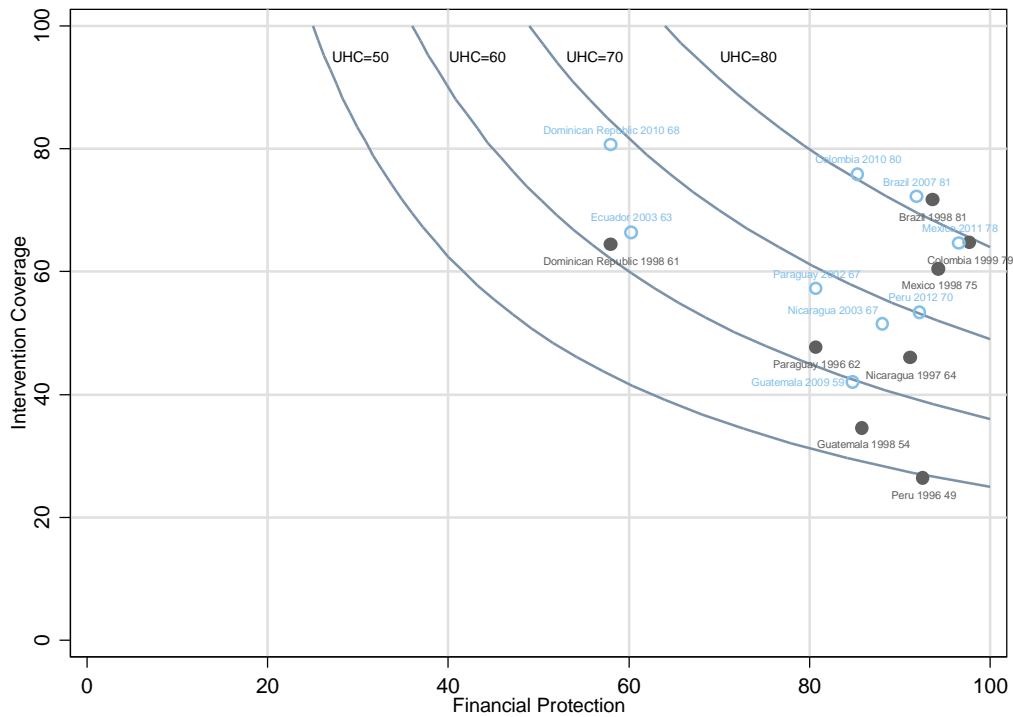
Source: Authors' calculations from surveys listed in the online Appendix.

Exhibit 3: Impoverishment due to out-of-pocket payments (\$2-a-day poverty line)



Source: Authors' calculations from surveys listed in the online Appendix.

Exhibit 4: UHC index: levels and trends



Source: Authors' calculations from surveys listed in the online Appendix.

Note: Numbers to right of country name are the average date for the earliest and latest data, and the country's score on the overall UHC index.

Endnotes

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23. Each data point represents a survey, and the trend line is based on a regression equation that captures not only the slope but also the mix of countries with a survey in each year; this ensures that the trend is not affected by the fact that some countries have surveys in some years but not others.
24. Moving to equal weights reduces the UHC scores of Brazil (new score 79), the Dominican Republic (64), Guatemala (53), Paraguay (62) and Peru (67), and increases the scores of Colombia (81), Mexico (84) and Nicaragua (71).

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APPENDIX

Supplementary materials:

Further details on UHC initiatives in Latin America, methods, data and results

UHC initiatives in Latin America

Seventeen of the 20 countries of Latin America have explicit provisions in their constitutions that guarantee the right to health; the three that do not (Argentina, Colombia and Costa Rica) have signed the International Covenant on Economic, Social and Cultural Rights (ICESCR) to 'create' rights to health;^{1,2} Argentina has, in fact, granted the ICESCR the same legal status as its national constitution.³ In Costa Rica, constitutional courts have used constitutional provisions for other rights, notably the right to life in Article 21 of the constitution, to create rights to health. In Colombia, the right to health was affirmed in a 2008 Constitutional Court ruling and a 2013 statutory law.⁴

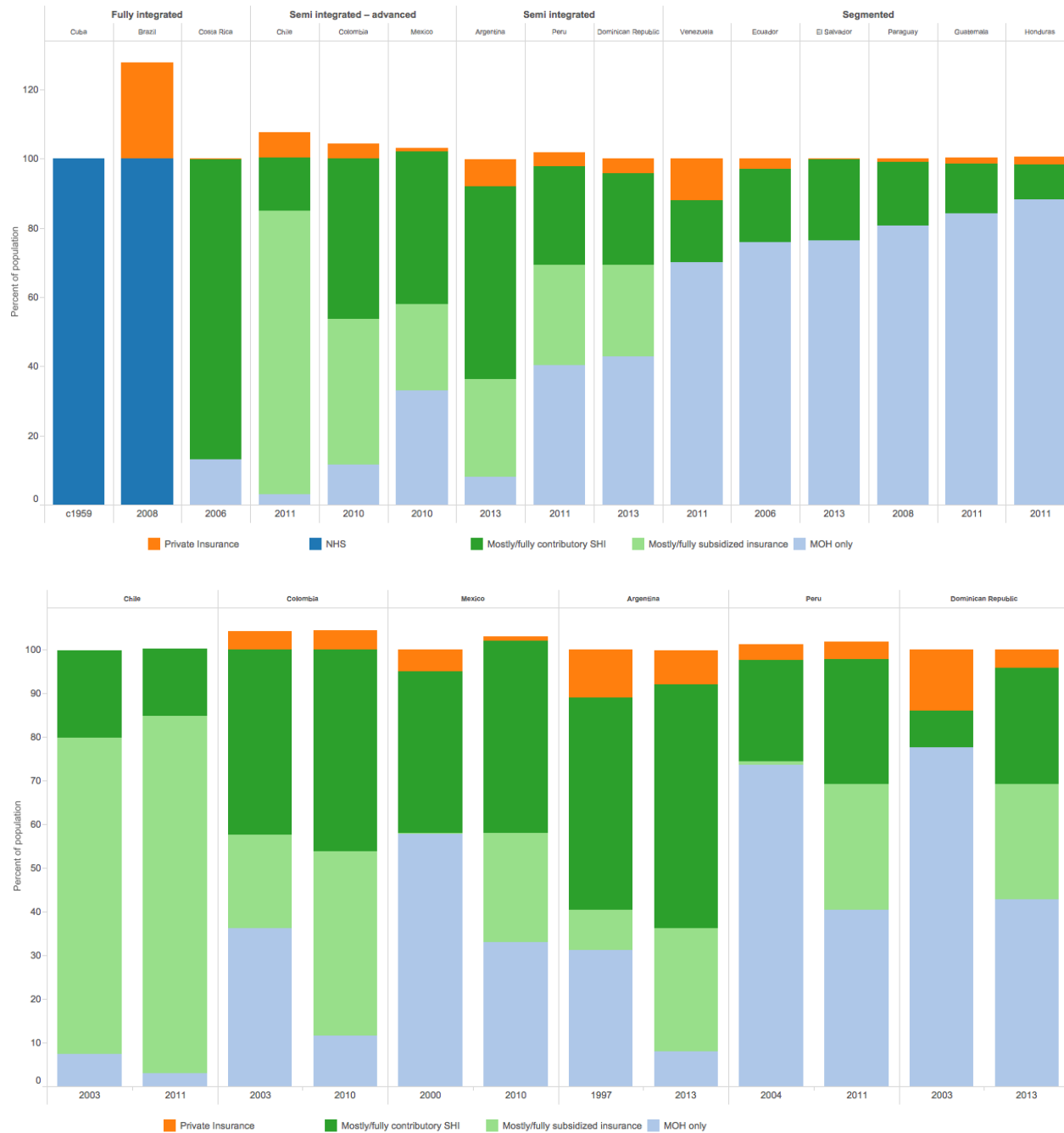
The challenge facing Latin America has been not that segments of the population lack cover altogether, but rather that some segments of the population have had relatively generous cover, notably those in the SHI schemes, while others have had relatively limited cover, notably those outside the SHI schemes especially those living in rural areas.

In response to this challenge, ten countries in the region have embarked on a reform process aimed explicitly at desegregating their health financial protection systems with the aim of equalizing the generosity of cover across the population and moving toward a single integrated financing and delivery system;

some of the ten are farther advanced in this reform agenda than others. The remaining ten have taken only small steps towards a desegregated financial protection system in health.¹ These differences and changes are captured in Figure A1 which shows the mix of membership and changes therein across the various financial protection schemes in selected Latin American countries.

¹ The 10 countries are Bolivia, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Paraguay and Venezuela. Bolivia has taken some steps towards integration: there is earmarked funding for health and public providers are paid for the delivery of a package of services to mothers, children and the elderly (the *Seguro Integral de Salud*). The most significant difference with Argentina, Mexico and Peru is that 'beneficiaries' are not enrolled.

Figure A1: Financial protection scheme membership



Source: Dmytraczenko and Almeida.⁵ Notes: PHI is private health insurance, NHS is National Health Service, SHI is social health insurance, MOH is ministry of health.

Three countries - Brazil, Costa Rica and Cuba - have had fully integrated systems for some time. In 1988, Brazil adopted a tax-financed unified health system (SUS) although as is clear from Figure A1 a sizable percentage of the population have opted for

supplementary private insurance.^{6,7} In 1973, Costa Rica merged its SHI and MOH hospital networks into a single network managed by the SHI agency (the *Caja*), which later assumed control of the MOH primary care network as well and gradually expanded coverage to the entire population through a subsidized scheme while continuing to require income-related contributions from those who could afford them.^{8,9} After its 1959 revolution, Cuba adopted a tax-financed unified system absorbing all facilities into the public system by 1970.⁸ All three countries have taken steps to limit geographic inequalities in the availability of primary and hospital care.^{7,9}

Two countries - Chile and Colombia - are well on their way to having fully integrated financial protection systems in health; their systems might be described as 'semi-integrated - advanced'. In 1979, Chile established a single public health insurer (*FONASA*) that requires income-related contributions from those who can afford them but allows enrollees to opt out of *FONASA* and put their contributions toward the cost of private insurance. The result was a two-tier system; to counter this Chile introduced in 2004 an Explicit Health Guarantees Plan (*AUGE*) whose aim is to ensure that everyone - whether publicly or privately insured - is covered for the same set of interventions and has the same opportunity to access timely and quality services.¹⁰ In 1993, Colombia introduced a two-scheme SHI system: a mandatory contribution-based scheme for formal sector workers and families, and a subsidized scheme for the rest of the population which has continued to expand (see Figure A1). Although there were explicit cross-subsidies from the contributory scheme to the subsidized scheme, the expenditure per person was lower in the subsidized scheme; to counter this two-tier system, the government in 2012 passed legislation mandating a harmonization of the benefit package across the two schemes.¹¹

Five countries - Argentina, the Dominican Republic, Mexico, Peru and Uruguay - are on their way to becoming fully integrated but their systems are less integrated than those of Chile and Colombia, with limited cross-subsidization, gaps in spending per person, and segregation in the provision of services. These systems might be described as 'semi-integrated'.

Most ambitious are the reforms in the Dominican Republic and Uruguay, both of which have plans for fully integrated systems. In 2001, the Dominican Republic passed the Family Health Insurance (SFS) law that envisaged a three-scheme financial protection system rather along the lines of Colombia's two-scheme system, with a fully subsidized scheme for the poor and those employed in the informal sector, and a contributory scheme for formal sector workers and their families.¹² The reform has not yet been fully rolled out, however, and while enrollment in the subsidized scheme is evident in Figure A1, as of 2010 the gap in spending per person was actually widening. In 2008, Uruguay legislated both a national health fund that pools SHI contributions and government transfers for the poor and unemployed, and an integrated public-private health care delivery system that provides an integrated package of care to all Uruguayans irrespective of the provider selected.⁴ However, there appears to be little cross-subsidization between mandatory payroll contributions pooled into the national health funds and tax-revenues used to finance public providers.

The other three countries in the 'semi-integrated group' have all taken steps to reduce the spending gap between those covered by the SHI system and those not covered, to have beneficiaries not covered by the SHI system enrolled in a scheme with clear entitlements, and to incentivize providers to deliver the corresponding services. In 2004, Argentina introduced a noncontributory *Plan Nacer* program aimed at 2 million poor and vulnerable people within the population not enrolled in the social security system.¹³ The program conditions transfers to provinces on numbers enrolled and achievement of targets and finances the public delivery of maternal and child health services. Recently the program was replaced by the more ambitious *Plan Sumar* which also covers NCD services and coverage for the elderly and adolescents. In 2003, Mexico introduced *Seguro Popular* aimed at ensuring that those not in one of Mexico's SHI schemes could access, free-of-charge, a defined set of services, in public facilities, that is not too dissimilar to the set available to those enrolled in SHI schemes.¹⁴ *Seguro Popular* officially levies income-related contributions but in practice few people contribute, and while the per-capita spending gap with the SHI system has narrowed considerably it

has not been eliminated. In 2002, Peru established its *Seguro Integral de Salud* (SIS) aimed at those not enrolled in a SHI scheme.¹⁵ Rather like Mexico's *Seguro Popular*, this eliminated user fees for a limited package of services, with an enrollment fee only for those able to afford it (as in Mexico few pay the enrollment fee). SIS has played an important role in improving Maternal and Child Health (MCH) outcomes in Peru, but otherwise is considered to have been a fairly marginal reform. As a result a more ambitious *Universal Health Insurance* (AUS) reform was approved in 2009, but limited progress has been made to date implementing the reform. The growth of these subsidized financial protection schemes is evident in the lower panel of Figure A1.

Methods

Table A1 provides definitions of the service coverage and financial protection indicators, and the weights used in the UHC index.

Table A1: Indicator definitions and weights in UHC index

UHC Dimension	UHC Domain	Indicator	Definition	Weights in main UHC index	Equal weights in sensitivity analysis
Service coverage	Prevention	ANC4+	Proportion of mothers aged 15 to 49 who received at least four antenatal care visits from any skilled personnel (as defined in the country's survey) while pregnant with children born in last two years	3.1%	6.3%
		Full immunization	Proportion of one year-old children who are fully immunized	3.1%	6.3%
		Breast cancer screening	Proportion of women aged 40 to 49 who received a mammogram (past 3 years) ^{2, 3}	3.1%	6.3%
		Cervical cancer screening	Proportion of women aged 18 to 49 who received a pap smear during last pelvic examination (past 3 years) ^{4, 5}	3.1%	6.3%

² The 40-49 age range was chosen in part because of data availability. The WHS uses the 40-69 age range; however, the DHS uses the 15-49 or 40-49 age range. We have therefore worked with the lowest common denominator - the 40-49 age range. In the US, there is divergence of view over whether screening should start at 40 or 50, with the American Cancer Society and the Mayo Clinic continuing to recommend starting at age 40, and the U.S. Preventive Services Task Force in 2009 recommending starting only at age 50 instead of at age 40 as it had recommended in its 2002 recommendation.

³ The recall period for Mexico is one year, so the rate is adjusted to a 3-year basis using the formula for the probability of an event over multiple trials $(1-(1-x)^3)$, where x is the probability of having breast cancer screening in the last year. The same approach is used for surveys where recall period is 2 years, 5 years and unlimited (in which case mean age for the quintile / population is used to make the adjustment).

⁴ The 18-49 age range was chosen in part because of data availability. The WHS uses the 18-69 age range; however, the DHS uses the 15-49 age range. We have therefore worked with the lowest common denominator - the 18-49 age range. The WHS age range is more in line with national screening guidelines - currently screening is recommended (every three years) for the 21-65 age group in the US.

⁵ For Mexico, the age group is 20-49. The recall period for Mexico is one year, so the rate is adjusted to a 3-year basis using the formula for the probability of an event over multiple trials $(1-(1-x)^3)$, where x is the probability of having cervical cancer screening in the last year. The

	Treatment	SBA	Proportion of births in last two years to mothers aged 15-49 that were attended by skilled health personnel	6.3%	6.3%
		Treatment for Acute Respiratory Infection (ARI)	Proportion of children born within 5 years of survey with a cough and rapid breathing for whom medical treatment was sought for acute respiratory infection (past 2 weeks)	6.3%	6.3%
		Treatment for Diarrhea	Proportion of children born within 5 years of survey who had diarrhea were given oral rehydration salts (ORS) or home-made solution (past 2 weeks)	6.3%	6.3%
		Inpatient adult admission in previous 12 months	Respondent reported being admitted to hospital at least once during previous 12 months	18.8%	6.3%
Financial protection	Impoverishment	Impoverishment at \$2-a-day ⁶	A household is classified as impoverished by out-of-pocket payments if its consumption <i>including</i> out-of-pocket payments is above the poverty line while its consumption <i>excluding</i> out-of-pocket payments is below the poverty line	25.0%	25.0%

same approach is used for surveys where recall period is 2 years, 5 years and unlimited (in which case mean age for the quintile / population is used to make the adjustment).

⁶ The international \$2-a-day poverty line was computed using 2005 purchasing power parity rates, and converted into prices prevailing at the time of the survey using a consumer price index (CPI) specific to the country. If L is the number of dollars per day in 2005 PPP dollars, the corresponding poverty line in local currency for a survey undertaken in year t is equal to $365 \times L \times (CPI_t / CPI_{2005}) \times PPP_{2005}$, where CPI_t is the consumer price index (CPI) for year t for the country in question, and PPP_{2005} is the PPP for that country in 2005. PPP values are obtained from the 2005 International Comparison Program. The 2005 ICP data are [downloadable](#) from the Web. The PPP series used is "11A Individual consumption expenditure by households". These are not the numbers in the World Development Indicators (WDI) online database after May 2014, as the WDI after that date included the 2013 ICP data which are not yet being used in the World Bank's dollar-a-day poverty data. We used IMF CPI data as data for Venezuela were not available in the World Bank's WDI data.

	Catastrophic payments	Catastrophic payments using 25% of total consumption	Household's out-of-pocket payments exceeded 25% of its total consumption in previous year	25.0%	25.0%
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Our UHC index adopts many of the principles of the UN's Human Development Index (HDI).¹⁶ The HDI also uses minimum and maximum values to transform indicators expressed in different units into indices with values between 0 and 1, which are then converted into a single index using a geometric mean. Our rescaling is done as follows. The original catastrophic and impoverishment indicators do not, in practice, in our experience working with datasets from across the world, ever reach anywhere near one: the impoverishment indicator has a maximum globally around 15 % and the catastrophic payment indicator has a global maximum around 20%. So we subtract 0.85 and 0.8 from the (reversed) impoverishment and catastrophic payment indicators, and then divide the result by the theoretical maximum (1) and the assumed minimum (0.85 and 0.8). We also rescale the inpatient admission variable since the target – unlike with, say, immunization – is not 100%. We divide the inpatient admission variable by the WHO-SARA benchmark (0.0903) and use this value or 1 whichever is smaller (a country with more than 9.03% of respondents reporting at least one admission gets a score of 1). The HDI also makes an adjustment for inequality, but the adjustment does not take into account whether high values occur among the poor or better off. Our use of the achievement index captures the socioeconomic dimension of coverage. The weighting system in the achievement index is such that the poorest person is assigned a weight of two and then weights fall linearly until the richest person who receives a weight of zero. This gives an achievement index equal to the (rescaled) population mean multiplied by the complement of the concentration index. Recent incarnations of the HDI have also used geometric weights in response to earlier criticisms.¹⁷

Data

We were not able to find surveys for both UHC dimensions for all countries – see Figure A2 and Tables A2-A3.

For four countries we were unable to get a survey containing data on out-of-pocket payments. Data were also patchy on the service coverage dimension - some surveys have no MCH data at all, and others have only some intervention indicators. In addition, the public-release version of the Cuba MICS contains no data on the wealth index or on the indicators used to construct it. Aside from gaps in data, we also encountered challenges in comparability. On the service coverage indicators, we were mostly able to retrofit the data to a lowest common denominator question format. The data on out-of-pocket payments and household consumption are, we suspect, less comparable; the WHS seems especially problematic¹⁸⁻²⁰ and where possible we have opted for other sources of data to measure financial protection.

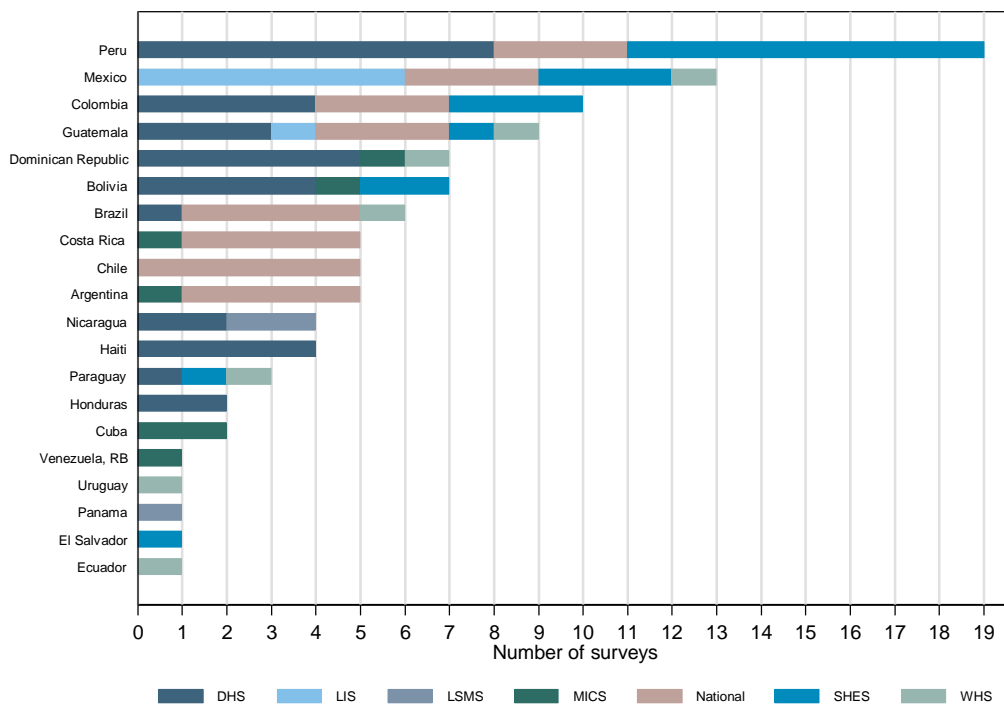
We found multiple versions of some household expenditure surveys. For Colombia 2008 and 2010, we chose the SHES version in preference to the unstandardized national statistical agency version, and did the same for Mexico in 2000 and 2010, and Peru in 2004 and 2008. In the case of Guatemala 2006, we rejected the LIS data in favor of the unstandardized national statistical agency version because the results from the LIS data were implausible compared to those obtained using the version from the statistical agency and using Guatemala datasets from other years. We also found years when we had more than one survey available for the same country. Sometimes we found a WHS was available the same year as another survey - usually a national survey; in such cases, we dropped the WHS as the WHS is a multipurpose survey and results from it were not as plausible - given data from other surveys - as the alternative. We did not make use of the LIS data for Mexico, as they gave very different numbers from the SHES and unstandardized version of the national surveys.

Mostly, we faced a shortage of data rather than a surfeit. The shortages were surprising in some cases. For Chile, which was one of our eight target countries, we were, surprisingly, able to find just three suitable surveys. While the country has many surveys, they are often not suitable for an exercise such as this: the annual CASEN survey, for example, asks whether people incurred out-of-pocket spending but not how much they spent.

Some retrofitting of data was necessary – see Table A1. The cancer screening results for Mexico, for example, had to be adjusted to make them comparable with other countries.

Indicators come from different surveys undertaken at different dates. We find the earliest year for each of the 10 indicators and the latest year for each indicator. In a few countries, where survey data are sparse, the same data point is included in the earliest and the latest group. Only countries with data for all 10 indicators are included in Exhibit 4.

Figure A2: Number of surveys 1990-2012, by country



Notes: LIS is the Luxembourg Income Study, SHES is the World Bank's Standardized Household Expenditure Survey program.

Table A2: Number of years of data 1990-2012, by country and indicator

Country	ANC4	Immunization	Breast cancer screening	Cervical cancer screening	SBA	ARI treatment	Diarrhea treatment	Inpatient admission last 12 months	Improving out-of-pocket payments	Catastrophic out-of-pocket payments	Data available for all indicators?
Argentina	0	0	2	2	0	1	1	2	2	2	No
Bolivia	4	5	0	2	4	5	5	0	2	2	No
Brazil	3	2	3	3	3	3	3	3	2	2	Yes
Chile	0	0	2	2	0	0	0	4	1	1	No
Colombia	4	4	2	2	4	2	4	3	3	3	Yes
Costa Rica	1	2	1	2	0	2	1	1	2	2	No
Cuba	0	2	0	0	0	1	1	0	0	0	No
Dominican Republic	6	7	6	6	6	7	7	1	1	1	Yes
Ecuador	1	1	1	1	1	1	1	1	1	1	Yes
El Salvador	0	0	0	0	0	0	0	0	1	1	No
Guatemala	4	4	2	4	5	5	5	3	4	4	Yes
Haiti	4	4	0	0	4	4	4	0	0	0	No
Honduras	2	2	2	2	2	2	2	2	1	1	Yes
Mexico	4	4	4	4	3	4	3	4	9	10	Yes
Nicaragua	2	2	2	2	2	2	2	1	2	2	Yes
Panama	0	0	0	0	0	0	0	0	1	1	No
Paraguay	2	2	1	1	2	2	2	1	1	1	Yes
Peru	8	8	7	7	8	8	8	3	9	9	Yes
Uruguay	1	1	1	1	1	1	1	1	0	0	No
Venezuela, RB	0	1	0	0	0	1	1	0	0	0	No

Table A3: Surveys used and availability of variables

Country	Year	Survey	Type	ANC4	Immunization	Breast cancer screening	Cervical cancer screening	SBA	ARI treatment	Diarrhea treatment	Inpatient admission last 12	Impoverishing out-of-pocket	Catastrophic out-of-pocket
Argentina	1997	National Household Expenditure Survey (ENGH)	Other									Yes	Yes
Argentina	2003	Argentina 2003	Other								Yes		
Argentina	2005	National Household Expenditure Survey (ENGH)	Other									Yes	Yes
Argentina	2005	National Risk Factor Survey	Other			Yes	Yes				Yes		
Argentina	2009	National Risk Factor Survey	Other			Yes	Yes						
Argentina	2011	MICS	MICS						Yes	Yes			
Bolivia	1994	DHS	DHS	Yes	Yes			Yes	Yes	Yes			
Bolivia	1998	DHS	DHS	Yes	Yes			Yes	Yes	Yes			
Bolivia	2000	MICS	MICS		Yes				Yes	Yes			
Bolivia	2002	Bolivia - Encuesta Continua de Hogares 2002, MECOVI	SHES									Yes	Yes
Bolivia	2003	DHS	DHS	Yes	Yes		Yes	Yes	Yes	Yes			
Bolivia	2007	Bolivia - Encuesta de Hogares 2007	SHES									Yes	Yes
Bolivia	2008	DHS	DHS	Yes	Yes		Yes	Yes	Yes	Yes			
Brazil	1996	DHS	DHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Brazil	1998	Brazil 1998	Other								Yes		
Brazil	2003	Household Budget Survey (POF)	Other									Yes	Yes
Brazil	2003	National Household Sampling Survey	Other			Yes	Yes						

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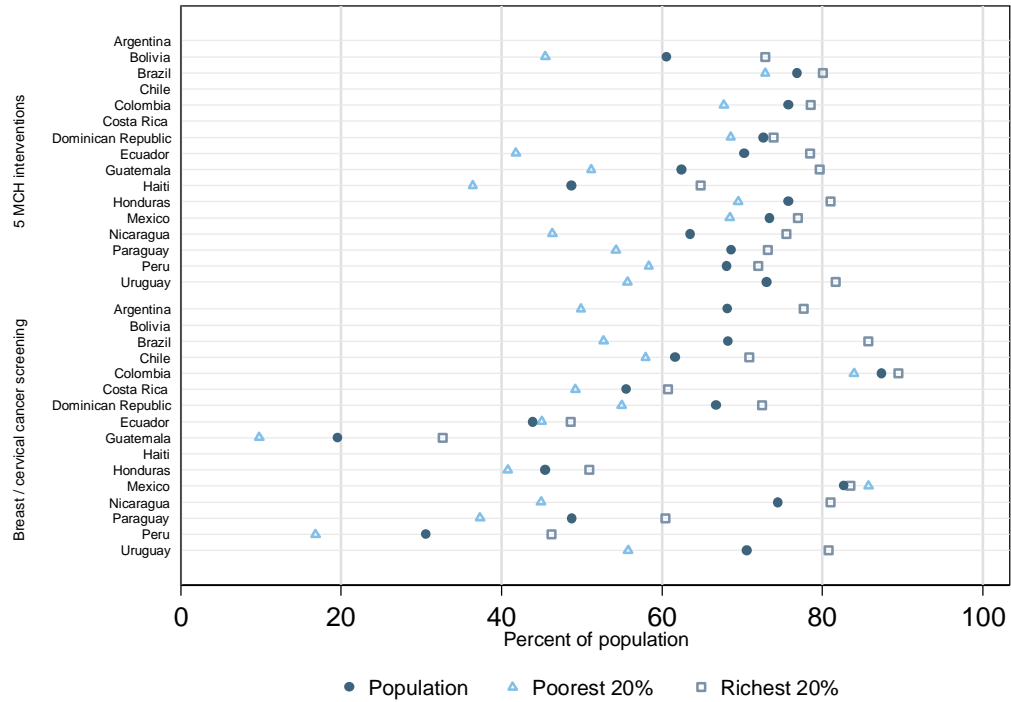
Country	Year	Survey	Type	ANC4	Immunization	Breast cancer screening	Cervical cancer screening	SBA	ARI treatment	Diarrhea treatment	Inpatient admission last 12	Impoverishing out-of-pocket	Catastrophic out-of-pocket
		sobre Condiciones de Vida y Pobreza 2009											
Peru	2010	DHS	DHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Peru	2010	Peru - Encuesta Nacional de Hogares sobre Condiciones de Vida y Pobreza 2010	SHES									Yes	Yes
Peru	2011	DHS	DHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Peru	2011	National Household Survey (ENAH0)	Other									Yes	Yes
Peru	2012	DHS	DHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Uruguay	2002	WHS	WHS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Venezuela, RB	2000	MICS	MICS		Yes				Yes	Yes			

Notes: LIS is the Luxembourg Income Study, SHES is the World Bank's Standardized Household Expenditure Survey program.

Results

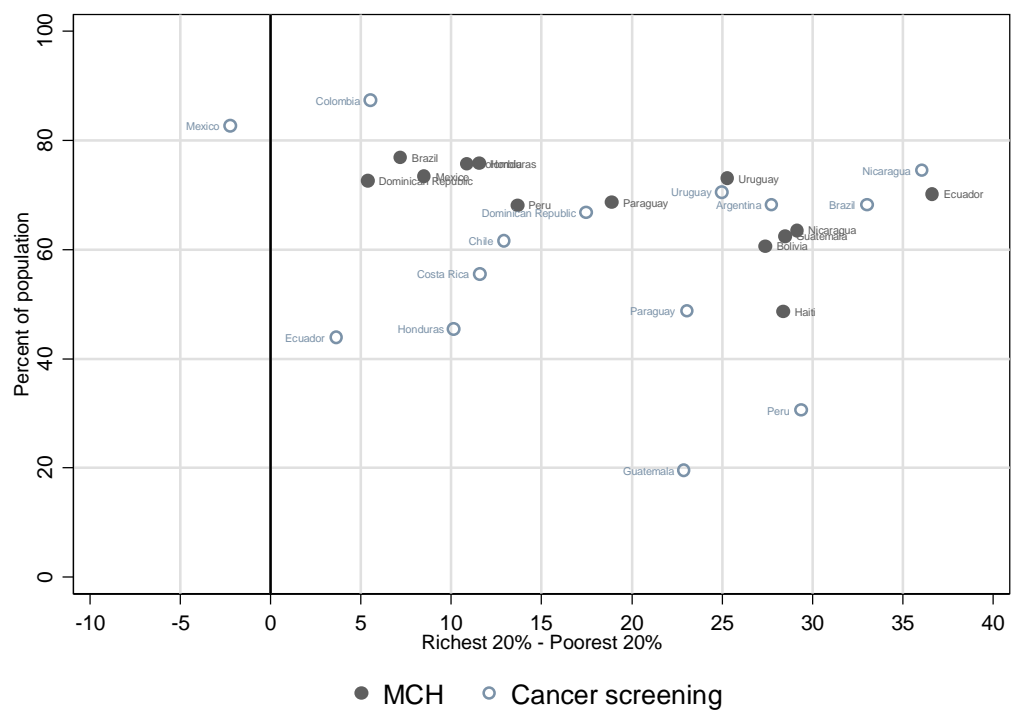
Figures A2-A6 present supplementary results to those in Exhibits 1-4.

Figure A2: Key MCH intervention and cancer screening rates, latest year



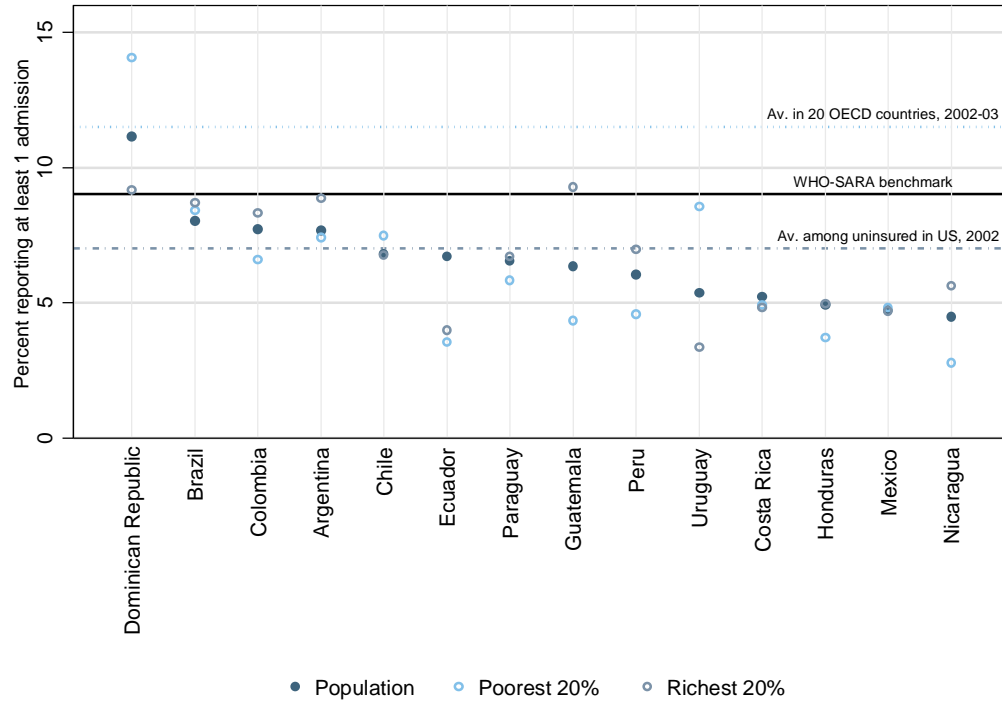
Source: Authors' calculations.

Figure A3: MCH and cancer screening: levels and gaps



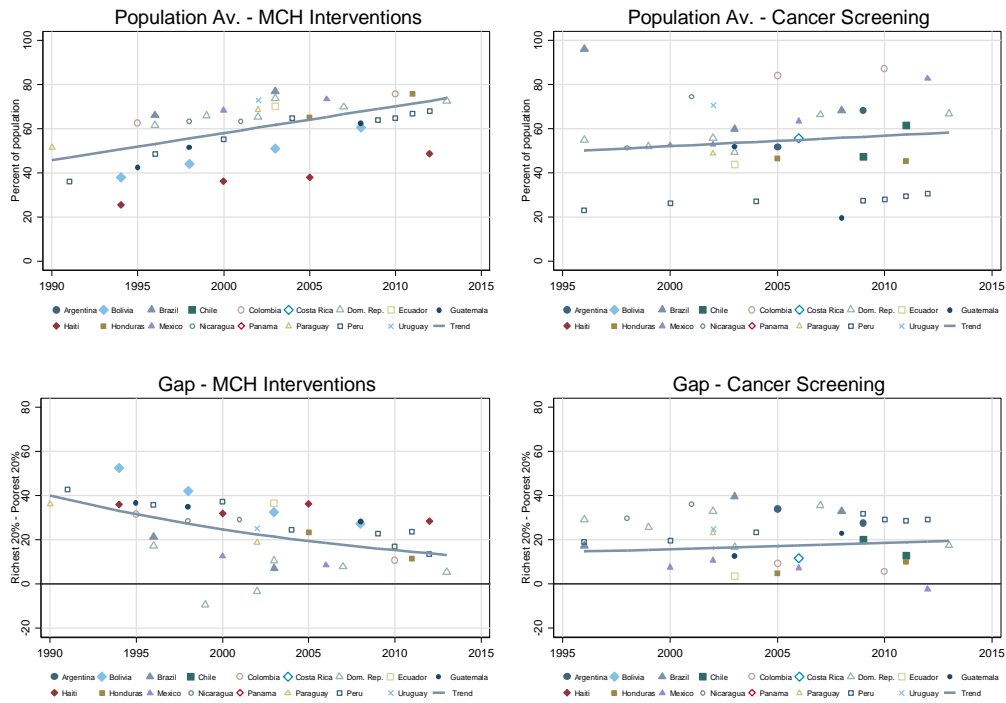
Source: Authors' calculations.

Figure A4: IP admission last year, latest year



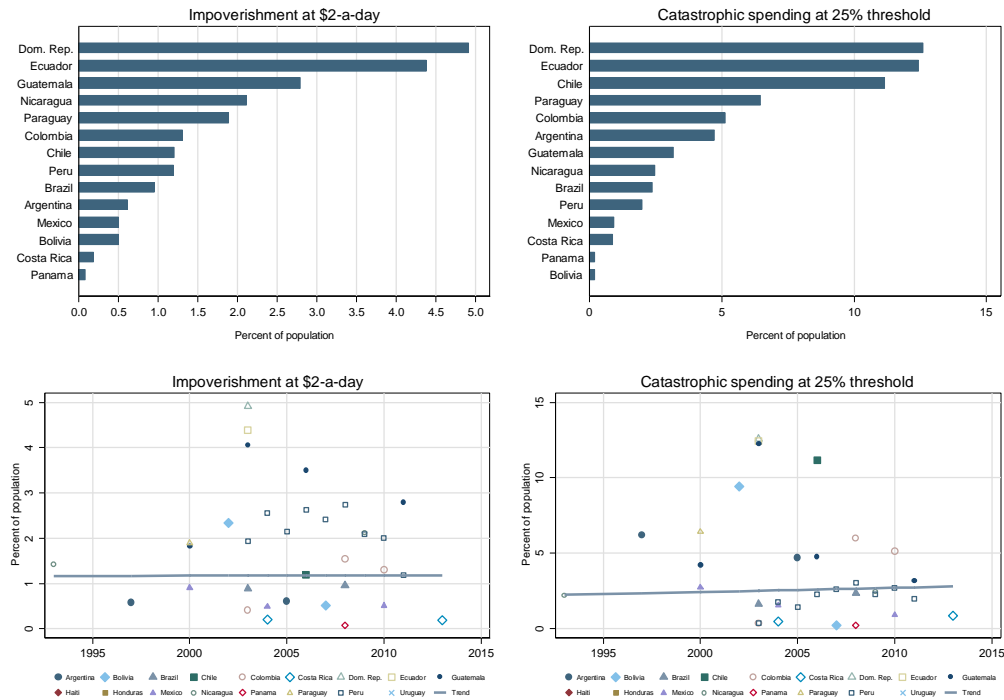
Source: Authors' calculations. Note: OECD average computed by authors using WHS data. US figure from US Department of Health and Human Services (2004) Table 16. WHO SARA figures from World Health Organization's Service Availability and Readiness Assessment (SARA)²¹ Table 1.9.1.

Figure A5: Trends in MCH and cancer screening – levels and gaps



Source: Authors' calculations. Note: y-axis in bottom two charts shows excess of the richest 20% average over the poorest 20% average. Trend line in top charts is based on a regression of population rate on reciprocal of year and a series of country fixed effects and in bottom charts on a regression of log of gap on year and a series of country fixed effects. Trend is computed in each case using the mean country fixed effect.

Figure A6: Rates of and trends in impoverishment from out-of-pocket expenses



Source: Authors' calculations. Note: Charts show percent of population pushed below \$2-a-day poverty line by out-of-pocket expenses and percent of population incurring catastrophic spending. Trend line is based on regression of log of impoverishment rate on year and a series of country fixed effects. Trend is computed using the mean country fixed effect.

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