GLOBAL HEALTH: INSURANCE

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Assessing Latin America's Progress Toward Achieving Universal Health Coverage

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ABSTRACT Two commonly used metrics for assessing progress toward universal health coverage involve assessing citizens' rights to health care and counting the number of people who are in a financial protection scheme that safeguards them from high health care payments. On these metrics most countries in Latin America have already "reached" universal health coverage. Neither metric indicates, however, whether a country has achieved universal health coverage 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 operationalized a framework proposed by the World Bank and the World Health Organization to monitor progress under this definition and then constructed an overall index of universal health coverage achievement. We applied the approach using data from 112 household surveys from 1990 to 2013 for all twenty Latin American countries. No country has achieved a perfect universal health coverage score, but some countries (including those with more integrated health systems) fare better than others. All countries except one improved in overall universal health coverage over the time period analyzed.

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.[1] This aim to achieve universal health coverage raises two questions: "How can we track progress toward universal health coverage?" and, "When can we say a country has reached universal health coverage?" Two commonly used metrics involve assessing citizens' rights to health care and counting the number of people participating in a financial protection scheme that protects them from catastrophic health care costs. The latter could be a social health insurance scheme or a national health service–type system that pools resources, from tax revenues, social insurance contributions, or both, and that provides access to health services that are zero-price (or

close to zero-price) at the point of use.[2] On these two metrics, many—if not most—countries have already reached universal health coverage. Yet many countries continue to engage in coverage-oriented reforms, which suggests that these two metrics do not fully capture the core ideas of universal health coverage.

The countries of Latin America,[3] which are the focus of the empirical exercise in this article, illustrate the point nicely. All twenty countries have explicit provisions in their constitutions or some other legal mechanism that guarantees the right to health care for all citizens[4] (see the "UHC initiatives in Latin America" section in the online Appendix).[5] These countries do well on the metric of membership in a financial protection scheme: As early as the 1920s, ministries of health began providing subsidized if not free care to their entire populations.[6] What neither

metric captures is whether people needing health services actually get them and how much they actually might 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 in practice explain why Latin America has seen so much coverage-oriented health reform activity. After World War II, dissatisfaction with the depth of coverage provided by health ministries led to the gradual establishment of parallel social health insurance schemes for formal-sector workers and their families. (Formal-sector workers have an employer and an employment contract; work [mostly] fixed hours in a place of work that is subject to health and safety regulations; receive a fixed salary that is taxed; and pay social security contributions that carry entitlements to benefits such as health and unemployment insurance and a pension.) However, the resultant inequalities in health coverage between families covered by social insurance and by ministries of health prompted major reform efforts in ten of the twenty 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 further advanced in health reform 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; and other countries have yet to start the integration process[4] (see the "UHC initiatives in Latin America" section in the Appendix).[5]

In this article we operationalized the framework to monitor universal health coverage proposed recently by the World Bank and the World Health Organization (WHO)[8,9] and used the methodology to ask how quickly Latin America is progressing toward universal health coverage. It is the largest assessment of universal coverage to date, using more than 100 household surveys from twenty countries. In contrast to previous studies,[9,10] we used the same metrics across all countries, went beyond health service indicators covered by the Millennium Development Goals (which focus on maternal and child health conditions and communicable diseases common in developing countries), and employed an all-encompassing universal health coverage index.

Study Data And Methods

DEFINITION OF TERMS The World Bank and the WHO[8,9] define universal health coverage 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. Universal health coverage thus has, in our terminology, two *dimensions*: service coverage and financial protection. Each dimension has two *domains*: health service coverage that includes prevention and treatment, and protection from catastrophic and impoverishing payments. In each domain, our choice of indicators was dictated in part by data availability. Because we were interested in not only how the population as a whole fared but also how the poor fared compared to the better-off, our data came from population-based household surveys instead of from administrative data, which cover only those using health services and typically lack information on socioeconomic status.

HEALTH SERVICE COVERAGE Of the two health service coverage domains, a metric to analyze prevention was the easier to operationalize. A person's need for a preventive intervention often depends only on sex and age, and a household survey respondent can reasonably be expected to know whether and when the preventive measure was received. We used four indicators to capture the prevention domain: four or more antenatal visits, full immunization for children, breast cancer screening, and cervical cancer screening (see "Methods" in the Appendix).[5]

Our first two prevention indicators were among the six proposed in the World Bank and WHO Monitoring Framework[9] for universal health coverage. We included the two cancer screening indicators because they speak to the growing importance of noncommunicable conditions in the global burden of disease, and both interventions were recommended despite reservations among experts over breast cancer screening[11] (see "Methods" in the Appendix).[5] We excluded four Framework indicators from this analysis: improved water source, adequate sanitation, fulfillment of family planning requirements, and nonuse 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,

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albeit constrained ones, and are also influenced by nonhealth considerations. More relevant to universal health coverage would be indicators that capture health prevention and promotion efforts, and efforts by the health system to improve access to relevant goods and services, such as family planning. Data for such indicators are hard to come by.

The health treatment domain metric is harder to operationalize than the prevention domain, and the data are harder to obtain. For some health interventions, we can investigate treatment given a specific need. We used three such indicators: whether a baby was delivered by a skilled birth attendant, whether a child with diarrhea received the appropriate treatment, and whether a child with acute respiratory infection 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: whether or not a respondent to health surveys had been admitted to a hospital in the previous year. This indicator has been widely used in impact evaluations of universal health coverage initiatives[12–14] and gets at the idea that limited hospital supply and high out-of-pocket expenses may lead to underuse of inpatient care. However, in contrast to the other indicators, we cannot here identify the subpopulation in need. We therefore used a benchmark to assess whether there is under- or overutilization of inpatient care: the WHO Service Availability and Readiness Assessment[15] benchmark of 10 admissions per 100 people, which is equivalent, we estimated on the basis of World Health Survey data, to a rate of 9.03 people per 100 reporting at least 1 admission in the previous twelve months.[16,17]

Our skilled birth attendant indicator is the only treatment indicator from the Framework. We included diarrhea and acute respiratory infection treatment indicators because they are core additional monitoring indicators for the child mortality Millennium Development Goals,[18] are health services, and are widely available in household surveys. We excluded antiretroviral therapy, TB case detection and treatment success, hypertension treatment, and diabetes treatment, mostly on the grounds that few household surveys collect the necessary data.[19]

To better ascertain broad patterns and trends, we constructed two service coverage composite scores, both capturing service use only among children and women: a maternal and child health index, equal to the average of the five maternal and child health indicators; and a cancer screening index, equal to the average of the two screening indicators.

FINANCIAL PROTECTION We stuck closely to the Framework and used catastrophic out-of-pocket spending on health care services (defined as spending that exceeds a specific threshold of a household's total consumption) and impoverishing spending on health care services (defined as occurring if a household falls below the poverty level because of out-of-pocket payments).[20] The latter gets directly at the question of out-of-pocket payments leading to financial hardship. Catastrophic spending need not cause impoverishment; instead, this domain captures exposure to financial risk. For the catastrophic spending approach, we needed a threshold (we chose 25 percent of total consumption); for the impoverishment approach, we needed a poverty level (given that Latin America is a relatively affluent region, we used the $2.00-a-day international poverty level instead of the $1.25-a-day level).[21] As with the service coverage indicators, we also captured the distribution of the catastrophic spending indicator.

SUMMARY INDEX OF UNIVERSAL HEALTH COVERAGE ACHIEVEMENT To facilitate tracking universal health coverage progress, we aggregated our indicators into an overall summary index of universal health coverage. First, we took the complements of the financial protection indicators so that they captured the fraction of the population not incurring catastrophic spending and not impoverished. Second, we rescaled three indicators so that they ranged from 0 to 100, with 100 being best protected from financial hardship from health care spending. Third, we took into account differences across income groups, by using an "achievement" index;[22] this assigned an achievement score below the population mean to countries that achieved high service coverage rates by disproportionately covering the better-off. This inequality adjustment was applied to all indicators except the "not impoverished" indicator. Fourth, all indicators were multiplied by 100.

The fifth and final step was to aggregate the rescaled and inequality-adjusted indicators into an overall universal health coverage index. We weighted service coverage and financial protection equally. We aggregated using a geometric mean instead of an arithmetic mean: This penalized countries that—for a given arithmetic mean—scored very highly on one dimension but very poorly on the other. We weighted equally the two domains of financial protection, but we assigned a higher weight (25 percent) to the prevention domain than to the treatment domain (75 percent), based on relative spending patterns. To put this in context, the countries of the Organization for Economic Cooperation and Development (OECD), a club of mostly rich countries, spend only 5 percent of their total

health services spending on prevention.[23] Within the prevention domain, we weighted indicators equally, but within the treatment domain we assigned a 50 percent weight to inpatient admissions and split the remaining 50 percent 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.[23] We explored the sensitivity of our results to switching to a different set of weights where all eight service coverage indicators are given an equal weight.

DATA Our data came from 112 population-based household surveys (see "Data" in the Appendix).[5] The first set of surveys we used were from the major global household survey programs: the Demographic and Health Survey, the Multiple Indicator Cluster Survey, the Living Standards Measurement Study, and the World Health Survey. In each case, a fairly standardized questionnaire was used across all countries and years. We used all fifty-one 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 Demographic and Health Survey and the Multiple Indicator Cluster Survey are health surveys and do not capture out-of-pocket spending and household consumption. Therefore, we also made use of surveys developed and implemented by national statistical agencies. One disadvantage of using these surveys is that they do not have a standardized questionnaire. Another is that they are not all publicly accessible. In twenty-eight cases, we were 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 thirty-three surveys. While we have found at least one survey for each of the region's twenty countries, there is considerable cross-region variation in availability of appropriate data for an assessment of progress toward universal health coverage.

LIMITATIONS Our study had several limitations. While our indicators are the best currently available, they are far from perfect, and we hope that future work will be able to present a fuller picture of universal health coverage 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.

Also, 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 universal health coverage even though they reflect efforts 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 the fact that our indicators are fairly unsophisticated and undemanding, of the twenty countries in Latin America only nine have complete data on our ten universal health coverage indicators; in only eight of these countries were we able to get data for two points in time.

Study Results

HEALTH SERVICE COVERAGE At least as far as maternal and child health interventions, cancer screening, and inpatient admissions are concerned, it would appear that while Latin America may have achieved (or may be close to achieving) universal health coverage when assessed on the basis of guaranteed rights and coverage by financial protection schemes, it has not achieved 100 percent health service coverage according to our analysis (see "Results" in the Appendix).[5] The trend is, however, upward, or toward increasing health service coverage, at least for maternal and child health and cancer screening.

Exhibit 1 shows the results for the maternal and child health composite indicator:[24] Among the thirteen countries for which we have data, the fraction of the target population receiving the five key maternal and child health interventions increased from an average of 45 percent in 1990 to 70 percent in 2012. The news for cancer screening (data not shown) is not as good: The population rate for cancer screening is rising about 10 percentage points every twenty years. On average, only 6.8 percent of the population had at least one inpatient admission in the previous twelve months. While this is 97 percent of the figure for inpatient admission in the uninsured US population in 2002, it is only 75 percent of the 2002 WHO Service Availability and Readiness Assessment benchmark for the developing world and only 59 percent of the 2002 OECD average. We have insufficient data to track admissions over time.

As far as maternal and child health and cancer screening interventions are concerned, we also found that the receipt of health interventions is almost always lower among the poorest 20 per-

EXHIBIT 1

Trends In Maternal And Child Health Coverage In Selected Latin American Countries
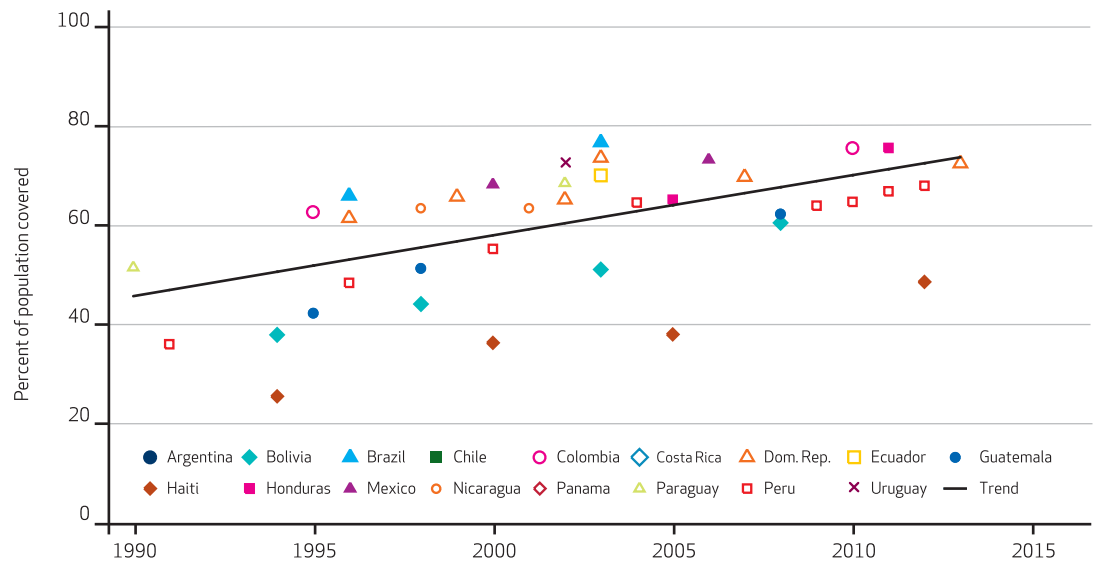
SOURCE Authors' calculations from surveys listed in the online Appendix (see Note 5 in text). NOTES Maternal and child health coverage is defined as the average across five maternal and child health indicators: four or more antenatal visits, full immunization, delivery by a skilled birth attendant, appropriate treatment of a child with diarrhea, and appropriate treatment of a child with acute respiratory infection.

cent of the population than among the richest 20 percent. The good news is that the gap between the poorest and richest quintiles in use of these health services is shrinking—at least for maternal and child health interventions (see "Results" in the Appendix).[5] Among the thirteen countries for which we have data, the gap in the maternal and child health composite indicator shrank from nearly 40 percentage points in 1990 to less than 20 points in 2012 (Exhibit 2). The gap in cancer screening between the poorest and richest quintiles (data not shown), however, shows no sign of shrinking. In the case of inpatient admissions, some Latin American countries have pro-poor gradients. An analysis of the World Health Survey data for other countries shows that this is not uncommon in middle-income countries and is the norm in high-income countries. This may reflect greater medical needs of the poor but may also reflect underuse by or underservicing of the poor in primary care, and 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 universal health coverage on the health service coverage dimension than others. Exhibits 1 and 2 show that Brazil, Colombia, the Dominican Republic, Ecuador, Honduras, Mexico, and Uruguay do well in terms of the maternal and child health population average, with Brazil, the Dominican Republic, and Mexico also doing well

in terms of the gap in maternal and child health coverage between poorest and richest quintiles. Of these countries, only Brazil, Colombia, Mexico, and Uruguay also do well on the cancer screening population average, with Colombia and Mexico having the smallest gaps between poorest and richest quintiles.

FINANCIAL PROTECTION Although all Latin American countries have brought almost everyone into a financial protection scheme for health care costs of one type or another, we found that no country had eliminated the problems of catastrophic and impoverishing out-of-pocket payments. The trend is, however, downward, or toward improving protection from high out-of-pocket payments for health care services. Among the fourteen countries for which we have data, the fraction of households experiencing impoverishment as a result of out-of-pocket payments for health care services fell from 1.2 percent in 1992 to 1.0 percent in 2012 (Exhibit 3). We saw a similar downward trend for catastrophic spending on health care, which fell from around 3.5 percent to 2.5 percent 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 fourteen countries, 16.0 million people incurred catastrophic spending for health care, and 5.6 million were impoverished by out-of-pocket health care payments.

EXHIBIT 2

Gap In Maternal And Child Health Coverage Between The Poorest And Richest Population Quintiles Of Selected Latin American Countries
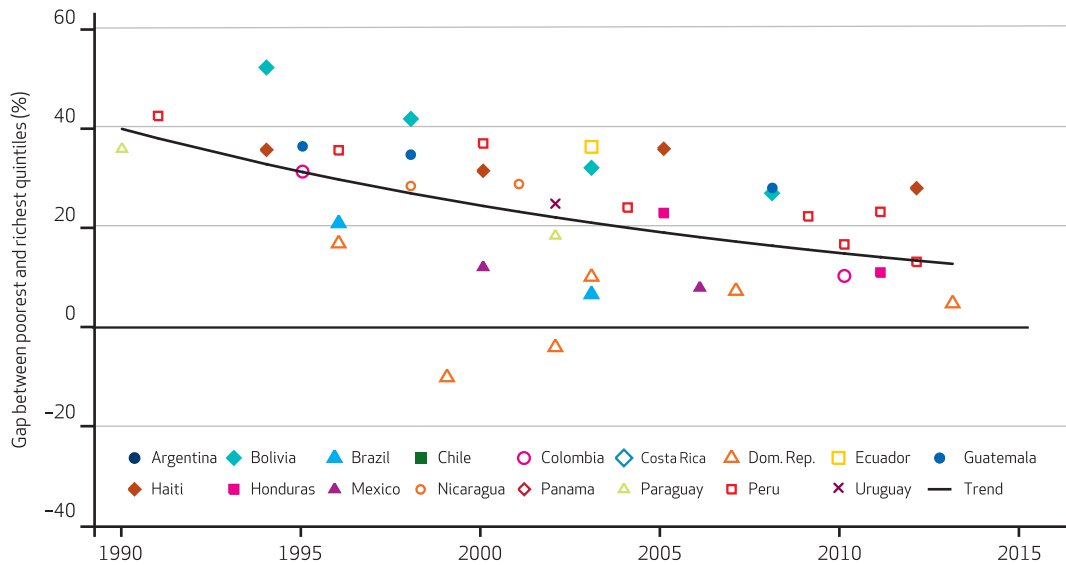
SOURCE Authors' calculations from surveys listed in the online Appendix (see Note 5 in text). NOTES Maternal and child health coverage is defined as the average across five maternal and child health indicators: four or more antenatal visits, full immunization, delivery by a skilled birth attendant, appropriate treatment of a child with diarrhea, and appropriate treatment of a child with acute respiratory infection. The chart shows the excess of the richest quintile's rate over the poorest quintile's rate. Quintiles are as defined in the Demographic and Health Survey and Multiple Indicator Cluster Survey and are based on housing characteristics and the ownership of consumer durables.

EXHIBIT 3

Impoverishment As A Result Of Out-Of-Pocket Payments For Health Care Services In Selected Latin American Countries
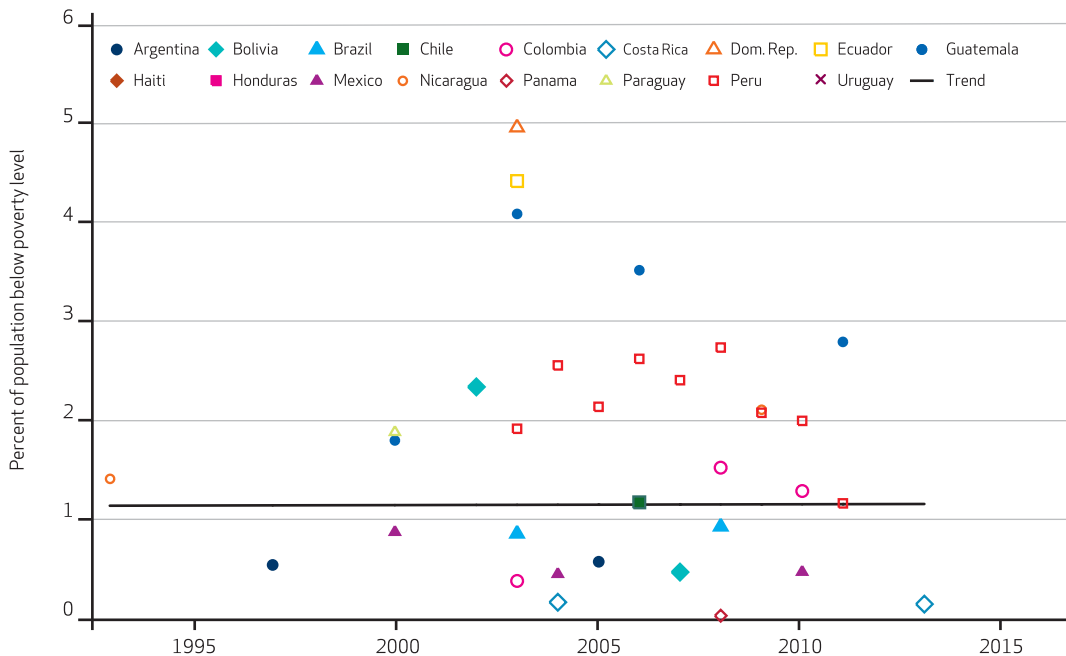
SOURCE Authors' calculations from surveys listed in the online Appendix (see Note 5 in text). NOTES *Impoverishment* is defined as occurring if a household falls below an income threshold of $2 per day because of its out-of-pocket payments—that is, if adding a household's out-of-pocket payments to its consumption of nonmedical goods places the household above the poverty level but not otherwise. The $2-a-day poverty level is the higher of the two internationally recognized poverty levels used to track progress on poverty in the developing world. See the Appendix for more details.

Some countries have done better on financial protection than others: Just one-fifth of 1 percent of Costa Rica's population was impoverished as a result of out-of-pocket spending on health care services, and an even smaller fraction of Panama's was; the figure for the Dominican Republic, by contrast, was 5 percent. Colombia and Mexico also did well on protecting their populations from impoverishment as a result of out-of-pocket payments for health care services. 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, as these countries provided better protection from impoverishment in recent years than in earlier years, while Colombia and Peru saw deteriorations in financial protection in the mid-2000s but have experienced improvements since then.
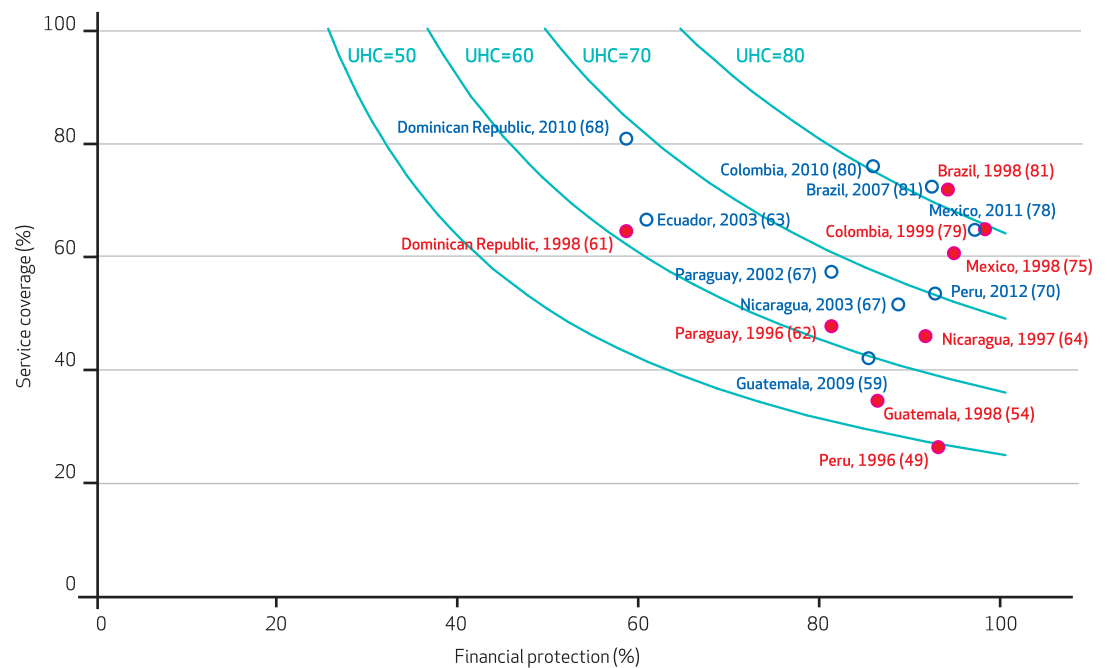
OVERALL UNIVERSAL HEALTH COVERAGE PERFORMANCE In Exhibit 4, we pulled the service coverage and financial protection results together using the universal health coverage index. The data are for the earliest and latest years available in each country. Unsurprisingly, given the results discussed above, no country has yet reached universal health coverage according to the overall universal health coverage performance measure. However, we see progress in all countries except Brazil. All but one of the improving countries raised its universal health coverage score by improving its health service coverage score without improving its financial protection score. Colombia and Nicaragua improved their overall universal health coverage scores, but their financial protection scores worsened. Mexico stands out as the only country that has moved further toward universal health coverage by improving both health service coverage and financial protection.[25]

Some countries improved their overall universal health coverage scores more than others did. The countries with the biggest annual improvement in universal health coverage scores were Peru (2.2 percent) and Paraguay (1.5 percent). Next came the Dominican Republic (0.9 percent), Guatemala (0.8 percent), and Nicaragua (0.7 percent). The three countries with the smallest annual increases in universal health coverage score were Mexico (0.3 percent), Colombia

EXHIBIT 4

Universal Health Coverage (UHC) Index: Levels And Trends In Selected Latin American Countries

SOURCE Authors' calculations from surveys listed in the online Appendix (see Note 5 in text). **NOTES** The universal health coverage index is the geometric mean of a country's performance on health service coverage and financial protection. The contours show combinations giving the same universal health coverage index value. Health service coverage captures performance—in terms of population average and inequality across the income distribution—on ten indicators. Financial protection captures performance on two. All are scaled from 0 (worst) to 100 (best). See "Definition of Terms" in the text and "Methods" in the Appendix for further details. Numbers to right of each country's name indicate the date to which the data refer (multiple surveys are typically used, and the date is the average date of the surveys used), and the country's score on the universal health coverage index. Points shown in red type and filled-in circles denote earlier data points. Points shown in blue type and outlined circles denote later data points.

(0.1 percent), and Brazil (-0.1 percent). To some degree, of course, small annual increases were more likely among the latter group of countries because they already had relatively high universal health coverage scores in the baseline year.

While all countries have either improved their overall universal health coverage score or kept it unchanged, we see variations in where countries are today in terms of universal coverage. Brazil's lack of change reflects in part the fact that it already had a very high score (81). Universal coverage scores for Colombia (80) and Mexico (78) are close behind that of Brazil. The scores of four countries—the Dominican Republic, Nicaragua, Paraguay, and Peru—cluster in the high 60s or, in Peru's case, 70. With universal coverage scores of just 63 and 59, respectively, Ecuador and Guatemala have made the least progress toward universal coverage, although, as already noted, there is progress in Guatemala.

Discussion

Our goals in this article were to operationalize the WHO and the World Bank universal health coverage Monitoring Framework, to construct an overall index of universal health coverage achievement, and to use the methods to measure progress toward universal health coverage in Latin America.

Inevitably, in operationalizing the universal health coverage index, we were forced to choose specific indicators and to make specific assumptions. We 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 also tried to avoid overemphasizing maternal and child health indicators by including noncommunicable disease indicators. However, as already highlighted in the "Limitations" subsection above, in our implementation of the universal health coverage index, we captured less than we would have liked of the set of health services delivered by a typical health system. A key message for policy makers is that tracking progress toward universal health coverage 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 saw lower rates of coverage on cancer screening than on maternal and child health interventions, and in both of these interventions the poor lag behind the better-off. On inpatient admissions,

Latin America as a whole reaches only 75 percent of the WHO Service Availability and Readiness Assessment benchmark for the developing world despite being one of the more affluent regions. We saw some improvement, albeit slow, over time in financial protection. Our universal health coverage index pulls the data together into a single all-encompassing index: The index takes values between 0 and 100, with larger numbers indicating higher performance. At the top levels of performance, Brazil, Colombia, and Mexico cluster around the universal health care score of 80, and at the bottom, Ecuador and Guatemala cluster around the universal health coverage score of 60.

Comparisons across countries and over time of the universal health coverage index cannot, of course, yield specific policy recommendations. However, the data do reveal an association between universal health coverage 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 (score of 81) than the three countries (the Dominican Republic, Mexico, and Peru) with less advanced semi-integrated systems (72). These countries, in turn, do better than the four countries (Ecuador, Guatemala, Nicaragua, and Paraguay) that have yet to start integrating their health systems (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 universal health coverage index; the association is, however, suggestive.

The data also reveal variations in speed of increase in the universal health coverage index over the periods for which we have data. Paraguay and Peru progressed the fastest over the time period we analyzed—in Paraguay's case, despite the absence of health reforms. Brazil and Colombia progressed very little, but their big reforms had already occurred by the start of the period covered by our data, and both countries started the period with a high universal health coverage score. Mexico, which also started with a high universal health coverage score, did progress, albeit slowly, during the period covered, which was also a period of major health reforms.

Conclusion

Latin America has made strong political commitments to universal health coverage and also does well in two narrow universal health coverage metrics—namely, legal guarantees to health care and the share of the population in a financial protection scheme. However, Latin American

countries are still some distance away from achieving universal health coverage, defined in the broader sense, at least on the basis of the indicators we included in our universal health coverage index. The good news is that almost all countries have improved their universal health coverage score over time. While Latin America may not have yet reached universal health coverage, it is making progress toward it. ∎

NOTES

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5 To access the Appendix, click on the Appendix link in the box to the right of the article online.

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15 World Health Organization. Service Availability and Readiness Assessment (SARA): an annual monitoring system for service delivery—reference manual. Geneva: WHO; 2013 Sep.

16 The rate among the US uninsured in the early 2000s was 7.02 (see Note 17). The average among OECD countries with a World Health Survey was 11.5, equivalent to 16.5 admissions per 100 people (authors' computations).

17 Schiller JS, Bernadel L. Summary health statistics for U.S. population: National Health Interview Survey, 2002 [Internet]. Hyattsville (MD): National Center for Health Statistics; 2004 May. Table 16, Crude frequency distributions of number of overnight hospital stays during the past 12 months, by selected characteristics: United States, 2002 [cited 2015 Aug 31]. Available from: http://www.cdc.gov/nchs/data/series/sr_10/sr10_222.pdf

18 Wagstaff A, Claeson M. The Millennium Development Goals for health: rising to the challenges. Washington (DC): World Bank; 2004.

19 The World Health Survey contains some relevant information. A better source, however, is the World Health Organization's (WHO's) STEPS survey. This has been fielded in only three Latin American countries (Colombia, Paraguay, and Uruguay), and the WHO is unable to make the microdata publicly available.

20 Wagstaff A, van Doorslaer E. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. Health Econ. 2003;12(11):921–34.

21 Chen S, Ravallion M. The developing world is poorer than we thought, but no less successful in the fight against poverty. Q J Econ. 2010;125(4):1577–625.

22 Wagstaff A. Inequality aversion, health inequalities, and health achievement. J Health Econ. 2002;21(4):627–41.

23 This figure was calculated by the authors using data from Organization for Economic Cooperation and Development. OECD health statistics 2015 [Internet]. Paris: OECD; 2015 [cited 2015 Sep 14]. Available from: http://www.oecd.org/els/health-systems/health-data.htm

24 Each data point represents a survey, and the trend line is based on a regression equation that captures the slope and 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.

25 Moving to equal weights reduces the 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).