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RESEARCH ARTICLE

Racial Gaps in Child Health Insurance Coverage in Four South American Countries: The Role of Wealth, Human Capital, and Other Household Characteristics

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Objective. To evaluate the extent of racial gaps in child health insurance coverage in South America and study the contribution of wealth, human capital, and other household characteristics to accounting for racial disparities in insurance coverage.
Data Sources/Study Setting. Primary data collected between 2005 and 2006 in 30 pediatric practices in Argentina, Brazil, Ecuador, and Chile.
Design. Country-specific regression models are used to assess differences in insurance coverage by race. A decomposition model is used to quantify the extent to which wealth, human capital, and other household characteristics account for racial disparities in insurance coverage.
Data Collection/Extraction Methods. In-person interviews were conducted with the mothers of 2,365 children.
Principal Findings. The majority of children have no insurance coverage except in Chile. Large racial disparities in insurance coverage are observed. Household wealth is the single most important household-level factor accounting for racial disparities in coverage and is significantly and positively associated with coverage, followed by maternal education and employment/occupational status. Geographic differences account for the largest part of racial disparities in insurance coverage in Argentina and Ecuador.
Conclusions. Increasing the coverage of children in less affluent families is important for reducing racial gaps in health insurance coverage in the study countries.

Key Words. Health insurance, racial disparities, socioeconomic disparities, child health, South America

Socioeconomic disparities in child health insurance coverage are common in countries without national health care insurance programs. For example, in the United States, race/ethnicity, household poverty, household composition, and parental employment and education are significantly related to public and private child insurance status (Aizer 2007; Pylypchuk and Selden 2008). Such inequalities may increase child health disparities given the positive insurance effects on child preventive health care use that are found in both developed (Currie and Gruber 1996; Aizer 2007; Currie, Decker, and Lin 2008) and less developed countries (Trujillo, Portillo, and Vernon 2005). Many children remain uninsured in both developed countries such as the United States, where 9 percent of children had no health insurance in 2008 (Bloom, Cohen, and Freeman 2009), and less developed countries such as in South America, although national estimates are generally less accessible for these countries. For example, more than 85 percent of children in Ecuador are without health insurance (Lopez-Cevallos and Chi 2010).

Very little is known about the extent of racial gaps in child health insurance coverage in South America. To our knowledge, explanatory studies that have directly evaluated the prevalence and magnitude of racial/ethnic disparities in child health insurance coverage in South America and identified potential contributors to these disparities are rare, likely due to the lack of appropriate data.[1] Descriptive studies, however, have reported large income disparities in child health insurance and racial disparities in adult health insurance in some South American countries. For example, Trias and Gasparini (2004) report large income disparities in child health insurance in Argentina in 2001, with 17.5 and 1.8 percent of the lowest income quintile children having public and private insurance, respectively, compared with 67 and 24.4 percent of the highest income quintile children, respectively. Large racial and socioeconomic disparities in private insurance rates are reported among adults in Brazil (Neri and Soares 2002). For example, the insurance rate among white pregnant women is twice that of black women (18.5 versus 8.5 percent), and the insurance rates in the lowest three income quintiles are about 2.9–6.9 percent compared with 43.5 percent in the highest income quintile (Victora

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et al. 2010). These socioeconomic inequalities suggest that racial disparities in child health insurance coverage are likely to be large in South America.

There are also significant racial and socioeconomic disparities in child health in South America, which further motivate studying racial gaps in child health insurance coverage and suggest that such insurance inequalities may be common. For example, in Brazil, black children have neonatal, infant, and under-5 mortality rates that are about double those of whites (Cardoso, Santos, and Coimbra 2005; Matijasevich et al. 2008). Also in Brazil, black infants have higher low birth weight rates (12.3 versus 9.6 percent) and preterm birth rates (19.8 versus 14.4 percent) than whites (Matijasevich et al. 2008). Further, black school age children have 1.6 times higher risk of untreated decaying teeth than whites in Brazil (Antunes et al. 2006). In Ecuador, one of the poorest countries in South America, indigenous ancestry and lower household wealth and education are related to reduced child probability of receiving antiparasitic medicines (Lopez-Cevallos and Chi 2010). Socioeconomic disparities in infant mortality are also reported in Argentina (Etchegoyen and Paganini 2007). Socioeconomic disparities in neonatal, infant, and child mortality decreased substantially in Chile between 1994 and 2004 but remain significant, with under-5 child mortality still being 45 percent higher among the poorest areas compared with the richest areas in 2004 (Gonzalez et al. 2009).

This paper examines the extent of racial disparities in child health insurance coverage in Argentina, Brazil, Chile, and Ecuador and decomposes these inequalities by household wealth, human capital, demographic, health, and geographic characteristics in order to account for these gaps. We chose the study countries because they do not have universal insurance programs (Jack 2000; Drechsler and Jutting 2007). Accurate assessments of the extent of racial gaps in child health insurance coverage in these South American countries and identifying factors that account for these racial gaps are important for informing policies and interventions that aim at reducing them. Therefore, the study significantly extends our knowledge of how race relates to child health insurance coverage in South America.

METHODS

Analytical Framework

Racial gaps in child health insurance coverage may arise due to the association of race with several individual, household, and area-level characteristics that affect coverage. Relevant individual and household-level characteristics include income, preferences over health and risk taking, and expected wealth loss due to illness, which is also a function of illness severity. As described above, there are significant racial disparities in child health and illness severity in the study countries. Furthermore, there are large racial disparities in income. For example, the household income of blacks in Brazil in 2006 was about 44 percent of whites' income (IBGE 2006). The theoretical relationships between these factors and insurance are well known (Ehrlich and Becker 1972), including obtaining more insurance with an increase in (1) income, (2) expected wealth loss (holding probability of illness constant), and (3) risk aversion. The implications for our study are that parents are more likely to obtain health insurance for their children with (1) greater household wealth/income, (2) stronger parental preferences for child health, (3) being more risk averse, and (4) larger expected wealth loss due to the child's health problems, and that these factors may partially account for the racial gaps in insurance coverage.

Another important household-level factor that may relate to both race and child health insurance is parental human capital. More educated parents are expected to have lower costs and higher ability in obtaining and processing information regarding child health and insurance availability. Several studies highlight the importance of education for improving health and health behaviors by increasing one's capacity for information gathering and processing (Grossman 1972; Kenkel 1991; Cutler and Lleras-Muney 2010). Increasing insurance coverage is one of the pathways through which education affects health (Cutler and Lleras-Muney 2010). Parental employment/occupation status also affects eligibility for employer-based insurance programs and time costs for searching for and enrolling the child in insurance programs. Racial disparities in parental human capital are common. For example, black and mixed race mothers are significantly less educated by about 2 years on average than whites in Brazil (Matijasevich et al. 2008). In 2006, about 25.5 percent of adult whites in Brazil had taken undergraduate university courses, compared with 8.2 percent of blacks (IBGE 2006).

Other household factors that are theoretically relevant for child health insurance due to their effect on competition for resources within the household and preferences over resource allocation and that may relate to race include family size and composition, parental health, and household demographics.[2] Racial differences in household demographics and parental health are commonly reported. For example, black and mixed race mothers in Brazil are more likely than whites to be single (23.7 versus 13.9 percent) and to smoke during pregnancy (31.6 versus 22.6 percent) (Matijasevich et al. 2008).

Geographic differences in insurance market structures and performance, including insurance availability, quality, and prices, may account for racial disparities in insurance coverage due to racial residential segregation, which is common in multiracial countries such as in Brazil (Telles 2004). While we are unable to directly study the local insurance market characteristics due to the lack of data, we assess geographic differences in insurance coverage and their contribution to accounting for racial disparities in coverage.

Of course, the extent of racial gaps in coverage and the importance of household- and area-level factors in accounting for these gaps may vary by health insurance type. For instance, public insurance programs may involve eligibility criteria related to wealth and certain demographic characteristics. Therefore, it is important to assess racial gaps and factors that may account for the disparities separately for private and public insurance coverage when relevant.

Data Sample

This paper uses data from a unique sample of 2,365 children from South America, including Argentina (790), Brazil (618), Ecuador (526), and Chile (431). These children participated in a study of child development in South America in 2005 and 2006 at an age between 3 and 24 months, conducted as part of the Global Network for Women's and Children's Research study (A. M. McCarthy, unpublished data). The children were recruited into the study during routine well-child care visits to 30 pediatric care practices that are affiliated with ECLAMC, an epidemiological research and surveillance network in South America that has been involved since 1967 in infant health outcome studies (Castilla and Orioli 2004; Wehby et al. 2009; Wehby, Castilla, and Lopez-Camelo 2010). ECLAMC involves a voluntary collaboration with a network of hospitals and physicians (mostly pediatricians) in South America. These physicians report to ECLAMC on a monthly basis on infants with birth defects and infants without birth defects born in their hospitals using the same subject recruitment and data questionnaires across all hospitals. The ECLAMC-affiliated physicians are routinely involved in collecting data for the ECLAMC program, which has been used in several studies. ECLAMC-affiliated physicians with active pediatric practices were invited to participate in the child development study that provides the data for our study. The physicians enrolled the children and interviewed the mothers for health and household characteristics in one in-person visit using the same data collection questionnaires across all study sites.

The study pediatric practices are located in geographically diverse areas within the study countries. The sites were distributed over nine cities and seven provinces in Argentina, seven cities and six states in Brazil, six cities and four provinces in Ecuador, and five cities and five provinces in Chile. ECLAMC-affiliated hospitals and physicians are located in socioeconomically and geographically diverse communities. Because of this diversity and the lack of specific hospital inclusion criteria, there are unlikely to be systematic differences between the communities served by the ECLAMC-affiliated physicians and the overall country populations that bias the evaluation of racial disparities in child insurance. As described below (Table 1), the study sample has significant racial, demographic, economic, and human capital variation. Further, given its focus on normal development, the study enrolled only children with normal birth outcomes and without major neonatal complications such as admission to the neonatal intensive care unit. The large demographic and socioeconomic variation of the sample and the geographic diversity enhance the sample representativeness and the generalizability of the results. Although we cannot formally assess this representativeness because most sample characteristics cannot be directly compared with their population counterparts, the sample and the population appear reasonably comparable on available characteristics. For example, 44 percent of children 0–4 years in 2000 in Brazil had African ancestry (based on the Brazilian census; IBGE 2000), compared with 47.6 percent of the Brazilian study sample. A unique advantage of this sample is that it has the same data across all study sites and countries, which facilitates comparing insurance coverage gaps between the study countries. On practicality grounds, we are unaware of another data source that provides this opportunity with the same data richness and quality.

Empirical Model and Study Measures

We first evaluate the extent of racial disparities in child health insurance status by regressing insurance status on race/ethnicity (*RACE*):

$$C_{i,p=1,2} = \alpha_{0p} + \sum_{r=1}^{R} \gamma_{rp} RACE_{ri} + e_{pi} \qquad (1)$$

where for child i, C indicates private ($p = 1$) or public ($p = 2$) health insurance as reported by the mother.

Measuring race and ethnicity in South America is fairly complicated due to the high racial/ethnic admixture. In this study, we measure race by the ethnic ancestry of the child, as reported by the mother, using three mutually

Table 1: Distribution of Study Variables

	Argentina		*Brazil*			*Ecuador*		*Chile*	
	Native ancestry N = 445*	*Other ancestry* N = 345*	*African ancestry* N = 294*	*Native ancestry* N = 114*	*Other ancestry* N = 210*	*Native ancestry* N = 188*	*Other ancestry* N = 338*	*Native ancestry* N = 238*	*Other ancestry* N = 193*
Child health insurance[†]									
Insured (%)	29.2	53.6				6.4	19.2	89.9	75.1
Private insurance (%)	21.3	47.5	6.8	12.3	26.2	—	—	15.5	23.8
Public insurance (%)	7.9	6.1	—			—	—	74.4	51.3
Child demographics									
Male (%)	49.4	51.3	50.0	50.9	51.9	51.6	50.6	51.3	47.7
Child age [mean (SD)]	11.7	11.5	11.6	11.8	11.6	11.1	11.4	11.5	11.5
	(6.8)	(6.8)	(6.5)	(6.8)	(6.4)	(6.2)	(6.7)	(6.5)	(6.5)
Maternal demographics									
Maternal age [mean (SD)]	26.0	28.1	25.3	27.3	27.7	26.3	27.2	28.9	27.2
	(6.4)	(6.6)	(5.9)	(7.3)	(6.3)	(6.6)	(6.3)	(6.3)	(7.0)
Single mother[‡] (%)	18.7	12.2	24.8	14.0	7.1	16.5	11.5	16.0	25.9
Stable relationship[‡] (%)	47.4	41.4	45.2	37.7	45.7	18.1	24.6	26.9	30.1
Maternal education[§]									
Primary or less (%)	32.6	17.4	49.0	50.0	36.7	28.2	9.8	10.9	18.1
Incomplete secondary (%)	30.8	18.6	20.1	18.4	6.7	21.8	14.5	8.8	29.0
Attended university (%)	11.0	31.3	5.8	11.4	25.7	19.1	49.1	35.3	18.7
Maternal employment/occupation[¶]									
Unemployed (%)	70.3	59.7	73.1	72.8	54.3	73.4	67.8	45.0	66.8
Unskilled blue collar (%)	10.3	3.2	12.9	8.8	9.5	7.4	0.6	3.4	4.7
Skilled blue collar (%)	2.5	1.7	4.8	7.9	10.5	1.6	1.5	6.7	1.0
Independent worker (%)	2.7	5.8	3.7	2.6	5.7	6.4	4.1	5.9	2.6

continued

Table 1. *Continued*

	Argentina		*Brazil*			*Ecuador*		*Chile*	
	Native ancestry N = 445*	*Other ancestry* N = 345*	*African ancestry* N = 294*	*Native ancestry* N = 114*	*Other ancestry* N = 210*	*Native ancestry* N = 188*	*Other ancestry* N = 338*	*Native ancestry* N = 238*	*Other ancestry* N = 193*
Clerk (%)	11.2	18.0	2.7	4.4	8.1	9.0	13.6	32.4	18.7
Household wealth[‖] [mean (SD)]	−0.19	0.24	−0.27	0.04	0.35	−0.51	0.28	0.19	−0.24
	(1.12)	(1.06)	(0.96)	(0.76)	(0.98)	(1.08)	(1.2)	(0.91)	(0.9)
Child's health problems** (%)	9.2	10.1	34.7	23.7	21.0	10.1	17.8	16.0	6.2
Maternal health problems (%)[††]	8.1	6.1	11.6	17.5	5.2	22.3	25.7	8.8	5.2
Household characteristics									
Number of child's siblings [mean (SD)]	1.2	1.1	1.1	1.0	0.8	0.8	0.7	0.7	1.0
	(1.7)	(1.5)	(1.3)	(1.3)	(1.0)	(1.2)	(1.0)	(1.0)	(1.2)
Disabled sibling (%)	5.2	1.7	1.7	4.4	1.9	1.1	1.8	3.8	0.5
Number of household members [mean (SD)]	4.4	4.0	4.1	3.8	3.5	4.8	4.5	4.2	4.5
	(2.1)	(1.9)	(2.5)	(1.6)	(1.5)	(2.3)	(2.1)	(1.6)	(1.9)

*The reference is other ancestry (primarily European ancestry).

[†]This variable is used as a multinomial measure for Argentina and Chile and as a binary measure for Brazil (private insurance versus no insurance) and Ecuador (insurance/no insurance). Brazil has only private insurance. Public insurance is combined with private insurance for Ecuador because a very small percentage of the sample has public insurance (2.3%).

[‡]The reference is a married mother.

[§]The reference is completed secondary school, unless indicated otherwise below.

[¶]The reference is the mother reporting her occupational level as an executive, professional, boss, chief, or owner, unless indicated otherwise below.

[‖]Household wealth is based on a PCA index of household assets and quality indicators.

**These illnesses are based on maternal report and abstraction from the pediatric clinic's records.

[††]This measure is based on maternal response to a question about whether she has a chronic physical illness or mental health problems (including depression) that require regular treatment and/or medicine.

exclusive groups: African, Native, and other ancestry, which includes mostly European ancestry.[3] We include African ancestry only for the Brazil sample—47.6 percent of the sample reports such ancestry. Less than 1 percent of the samples from the other countries report African ancestry.[4]

Next, we evaluate the racial gaps after adjusting for several individual and household-level characteristics and for geographic differences as follows:

$$\begin{aligned} C_{i,p=1,2} = \alpha_{0p} &+ \sum_{r=1}^{R} \beta_{rp} RACE_{ri} + \sum_{e=1}^{E} \beta_{ep} WEALTH_{ei} \\ &+ \sum_{s=1}^{S} \beta_{sp} HUMAN\_CAP_{si} + \sum_{d=1}^{D} \beta_{dp} DEMOGRAPHICS_{di} \\ &+ \sum_{h=1}^{H} \beta_{hp} HEALTH_{hi} + \sum_{l=1}^{L} \beta_{lp} HOUSEHOLD_{li} \\ &+ \sum_{a=1}^{A} \beta_{ap} AREA_{ai} + u_{pi} \end{aligned} \quad (2)$$

where *C* and *RACE* are as defined above. *WEALTH is* measured by an index generated using principal component analysis of household asset ownership and quality indicators.[5] A wealth index based on these indicators is expected to provide a reliable measure of long-run household economic well-being in settings where expenditure and income data are less reliable or available, such as the study settings (Filmer and Pritchett 2001). The correlations between latent variables of the observed ordinal index variables are estimated by maximum likelihood (Kolenikov and Angeles 2004). The wealth index is generated using the scoring coefficients of the first principal component, which accounts for the most common variance between the index variables. The scoring coefficients are used as weights for the household asset ownership and quality indicators.[6]

Maternal human capital (*HUMAN_CAP*) is measured by maternal education and employment/occupation status. We focus on maternal human capital because it is uncertain how important the father's characteristics are for the child's insurance coverage for unmarried mothers and because these are missing for a large percentage of unmarried mothers.

DEMOGRAPHICS include child's gender and age and maternal age and marital status. *HEALTH* includes an indicator for the child's physical health problems, including asthma, allergy, ear infections, and seizures.[7] Also included is an indicator for maternal chronic physical illnesses and mental health problems, including depression. *HOUSEHOLD* includes the number of the child's older siblings,[8] total household members (other than the child),[9] and whether a sibling has chronic physical or development problems requiring regular treatment. *AREA* includes indicators for the study sites where the study children were recruited as proxy measures for the children's communities. Table 1 describes the study variables and their distributions across the four sample countries.

Model Estimation

We estimate Equations (1) and (2) separately for the sample countries. For Argentina and Chile, which have both private and public insurance systems, we estimate the models by multinomial logit. For Brazil, there is no public insurance system but rather a public health delivery system. Therefore, for Brazil, we estimate the models for private insurance using a binary logit function. For Ecuador, only 2.3 percent of the sample report public insurance, while 12.4 percent report private insurance. Therefore, we estimate the models for any health insurance coverage (versus no coverage) using a binary logit function. The variance–covariance matrices are estimated using a Huber-type estimator that is robust for the sample clustering across the study sites (Moulton 1986; Wooldridge 2002).

Decomposition of Racial Disparities in Insurance. A primary goal of the study is to quantify the contributions of wealth, human capital, and other household characteristics and area-level effects in accounting for racial disparities in child health insurance coverage. Therefore, we decompose the racial disparities as a function of these variables. Comparing the associations of race with insurance between equations (1) and (2) provides information about the extent to which these variables as a group account for racial disparities but does not allow for quantifying their individual contributions. Therefore, we use a decomposition model that identifies these specific contributions.

A standard decomposition in linear models is the Oaxaca (1973) and Blinder (1973) approach. In that decomposition model, the contribution of variable k to the outcome difference between two groups, such as African (A) and other ancestries (O) may be represented as follows: $\beta_k(\bar{X}^A - \bar{X}^O)$, where β_k is variable k's regression coefficient and may be estimated from equation (2) if the coefficient is thought not to vary between the two racial groups. However, this approach is restrictive for nonlinear models primarily due to out-of-range probability predictions and the linear-effect restrictions.

An alternative approach that we apply is the Fairlie model for non-linear binary outcomes (Fairlie 2005). For decomposing insurance status differences between two racial groups, this model fits equation (2), obtains predicted insurance probabilities, and rank-orders the observations, within each racial group, by these probabilities. For each observation in the minority racial group, an observation is randomly selected from the larger racial group that is matched by the predicted-probability rank-order. In other words, this approach matches the observation that ranks lowest on insurance probability within the minority group to the observation that ranks lowest on insurance probability within the majority group. The model then estimates the contribution (C) of variable k of j variables (where j ranges from 1 to k) to the insurance status difference as the average change in insurance probability when switching the values of k from the minority group values to those of the matched majority group as follows:

$$C_k = \frac{1}{N^A} \sum_{i=1}^{N^A} F\left(a_0 + \sum_{j=1}^{k-1} \beta_j X_{ij}^A + \beta_k X_{ik}^O + \sum_{j=k+1}^{K} \beta_j X_{ij}^O \right) - F\left(a_0 + \sum_{j=1}^{k-1} \beta_j X_{ij}^A + \beta_k X_{ik}^A + \sum_{j=k+1}^{K} \beta_j X_{ij}^O \right) \quad (3)$$

where N^A is the number of individuals of ancestry A (the minority) and F is the cumulative density function (logit or probit). The values for variables of j between 1 and $k-1$ are set at the minority ancestry group values, while those of j variables $k+1$ through k are set at the majority value. Note that the variable values from the majority ancestry group O are based on the randomly selected subsample that is matched to the minority sample (group A) by the within-sample rank order of predicted insurance probability.

Because the results may be sensitive to the randomly selected majority subsample, the model involves repeated majority subsample selection and averaging of the decomposition results across selected subsamples (Fairlie 2005). Therefore, we use 2,000 replications of the "majority" subsamples in the insurance decomposition models. The decomposition results may be sensitive to the order in which variable contributions are estimated. Therefore, we estimate the model with random selection of the variable order at the time of random selection of the majority subsamples. With a large number of replications, this approach estimates the average contributions across all potential variable orderings (Fairlie 2005). We estimate the logit regression coefficients based on the pooled sample including *RACE* and adjust the standard errors for clustering across the study sites.

The Fairlie model is limited to binary outcomes, and insurance status is estimated using multinomial logit for two countries. As described below, we find that in Argentina, there is only a racial disparity in private insurance status. The disparity and the other variable effects on private insurance coverage are the same in multinomial and binary logit models.[10] Therefore, we decompose this disparity based on a binary logit of private insurance versus uninsured (no private/public insurance). For Chile, we find overall no significant differences in private and public insurance by race.

In this study, some of the racial groups experiencing lower insurance rates are the majority racial groups. Therefore, in these cases, we decompose the "negative insurance difference" between the "minority" group with the higher insurance rate and the "majority" group with the lower insurance rate. Appropriate designation of the minority and majority groups is needed in order to randomly select observations from the majority group as explained above.[11]

Results

Race

We first describe the "total" (unadjusted in equation 1) and adjusted (equation 2) racial gaps in insurance coverage, which are listed in Table 2. Supporting information Table SA2 reports the full regression results.

Argentina. About 30.8 percent of the Argentinean sample has private insurance, and 7.1 percent has public insurance. Children of native ancestry are less likely to have private insurance compared with other ancestries (odds ratio = 0.3). However, the native ancestry gap in private insurance becomes smaller and insignificant in the adjusted model.

Brazil. About 14.4 percent of the Brazilian sample has private insurance with significant racial disparities. Children of African and Native ancestries are significantly less likely to have private insurance compared with other ancestries (odds ratio = 0.2 and 0.4, respectively). However, these gaps become smaller and insignificant in the adjusted model.

Ecuador. About 14.6 percent of the sample from Ecuador has insurance coverage, with the majority (84 percent) covered under private insurance. A significant racial insurance disparity is observed, with children of Native

Table 2: Odds Ratios of Race in the Child Health Insurance Coverage Regression

	Argentina†		*Brazil*‡	*Ecuador*‡	*Chile*†	
	Private	*Public*	*Private*	*Insurance*	*Private*	*Public*
Race (unadjusted)						
Native	0.29*	0.85	0.39**	0.29***	1.61	3.58
	[0.07,1.18]	[0.41,1.76]	[0.17,0.91]	[0.11,0.73]	[0.51,5.09]	[0.75,17.12]
African			0.21**			
			[0.06,0.75]			
Race (adjusted)						
Native	0.69	0.79	0.74	1.04	0.43*	3.52*
	[0.32,1.51]	[0.51,1.24]	[0.26,2.11]	[0.45,2.36]	[0.16,1.12]	[0.81,15.26]
African			0.73			
			[0.18,3.01]			

Note. The table reports the unadjusted and adjusted odds ratios for race (equations 1 and 2, respectively). The adjusted model includes wealth, human capital, demographic, health, and area-level effects (see equation 2). 95% confidence intervals are in parentheses.

†Model estimated using multinomial logit with no coverage as the reference category.

‡Model estimated using binary logit with no coverage as the reference category. Brazil has only private insurance. Public insurance is combined with private insurance for Ecuador because a very small percentage of the sample has public insurance (2.3%).

*$p<.1$; **$p<.05$; ***$p<.01$.

ancestry being less likely to have insurance coverage compared with other ancestries (odds ratio = 0.3). However, this gap disappears in the adjusted model.

Chile. The Chilean sample has the largest insurance coverage rates among the study samples with 19.3 percent having private coverage and 64 percent having public coverage. There is no significant insurance disparity in this sample between children of Native and other ancestry in the unadjusted model. In the adjusted model, children of Native ancestry have a marginally significant lower likelihood for private insurance coverage and a higher likelihood for public coverage compared with children of other ancestries.

Decomposition of Racial Disparities in Insurance Coverage

Table 3 reports the decomposition of the racial gaps in insurance coverage by wealth, human capital, health, demographic, and geographic factors for each of the study samples with these gaps. The observed variables account for the majority of the racial gaps—between 87 and 100 percent. For all countries,

Table 3: Decomposition of Racial Disparities in Child Health Insurance

	Argentina *Private insurance versus uninsured*	*Brazil* *Private insurance versus uninsured*		*Ecuador* *Insured versus uninsured*
	Native versus other ancestry	*African versus non-African non-Native ancestry*	*Non-African versus Native ancestry*	*Non-Native versus Native ancestry*
Insurance gap (0–1)	– 0.274	– 0.194	0.225	0.128
Explained gap	– 0.25	– 0.186	0.196	0.129
% Explained	91.2	95.9	87.1	100
% Unexplained	8.8	4.1	12.9	0
Variable contributions				
Household wealth	– 0.0459**	– 0.1193***	0.1229***	0.0268***
	(0.0185)	(0.0227)	(0.0323)	(0.0087)
Maternal education	– 0.0183	– 0.0243	0.0478*	0.0147**
	(0.0127)	(0.0233)	(0.0276)	(0.0066)
Maternal occupation	– 0.0257**	– 0.0299**	0.0574**	0.0031
	(0.0100)	(0.0142)	(0.0285)	(0.0052)
Child demographics	0.0026	– 0.0020	0.0010	– 0.0009
	(0.0023)	(0.0034)	(0.0051)	(0.0017)
Maternal demographics	– 0.0301***	0.0003	0.0049	0.0010
	(0.0069)	(0.0062)	(0.0091)	(0.0020)
Child health	– 0.0001	0.0140**	– 0.0004	0.0042***
	(0.0008)	(0.0058)	(0.0050)	(0.0015)
Maternal health	0.0001	0.0028*	– 0.0246***	– 0.0005
	(0.0006)	(0.0017)	(0.0092)	(0.0010)
Household characteristics	– 0.0010	– 0.0037	0.0232	– 0.0012
	(0.0042)	(0.0059)	(0.0204)	(0.0034)
Area fixed effects	– 0.1319***	– 0.0236	– 0.0367*	0.0831***
	(0.0106)	(0.0197)	(0.0190)	(0.0114)
Observations	734	504	272	526

Note. The table reports the racial gaps in insurance coverage and the contributions of the model variables to accounting for these gaps. The standard errors of the contributions are in parentheses. *$p<.1$; **$p<.05$; ***$p<.01$.

wealth is the most relevant household-level variable accounting for these gaps. A one-standard deviation in household wealth is associated with increased coverage by about two to eight times, with the largest association in Brazil (see Table SA2). Maternal occupational status and education also account for part of the racial gaps in coverage. Below, we summarize the decomposition results for each country.

Argentina. The model variables account for about 91 percent of the 27 percentage-point gap in private insurance coverage between children of

Native ancestry and other ancestries. Lower household wealth for Native children accounts for about 4.6 percentage-points of this gap. Maternal occupational differences, primarily higher unemployment and low-skill blue-collar occupation rates for Native children, account for about 2.6 percentage-points. Maternal demographic differences, including younger maternal age and higher rates of unmarried mothers for Native children, account for about 3 percentage-points. Finally, geographic location accounts for half of the gap (13.2 percentage-points).

Brazil. The model variables account for 96 percent of the 19 percentage-point gap and 87 percent of the 23 percentage-point gap in private insurance coverage between African and Native ancestry children, respectively, on one side, and non-African non-Native ancestry children on the other. Lower household wealth among African and Native ancestry children accounts for more than half of these gaps—about 11.9 and 12.3 percentage-points for African and Native ancestry children, respectively. Maternal occupation differences, primarily higher unemployment rates for African and Native ancestry children, are the second most relevant factors, accounting for about 3 and 5.7 percentage-points for African and Native children, respectively. Lower maternal education accounts for about 4.8 percentage-points for Native children (marginally significant). In contrast, the higher rates of maternal health problems for Native ancestry children and geographic location are associated with reductions in their coverage gap by about 2.5 and 3.7 percentage points, respectively.

Ecuador. The model variables account for the entire 13 percentage-point insurance gap between Native and non-Native ancestry children. Lower household wealth among Native children accounts for 2.7 percentage-points of this gap, followed by lower maternal education, which accounts for 1.5 percentage-points. The lower rate of child health problems accounts for 0.5 percentage-point of the gap. Finally, geographic location accounts for 8.3 percentage-points of this gap.

Discussion and Conclusions

We identify large racial disparities in child health insurance coverage in Argentina, Brazil, and Ecuador in South America. To our knowledge, this is the first study to evaluate racial disparities in child health coverage in the four study countries using the same analytical approach and similarly collected data across all countries. Lower household wealth is inversely related to coverage and significantly accounts for the racial gaps in child health insurance coverage, especially in Brazil, where wealth accounts for more than half of these gaps. Lower maternal human capital, especially very low education and unemployment, may also be involved in racial disparities in child health insurance coverage. Unlike developed countries, the majority of children in the study countries are without insurance coverage, except in Chile.

The large racial gaps in child health insurance coverage observed in this study highlight the importance of evaluating the costs and returns of alternative policy interventions for reducing these disparities. Decomposing the racial gaps in coverage identifies those factors that account for most of these disparities. Accounting for these factors is important for the efforts aiming at reducing racial disparities in child health insurance coverage to be effective. Identifying the effects of insurance on children's health care use and health is beyond the scope of this study. However, several studies in both developed and less developed countries have reported positive effects of child health insurance on preventive health care use (Currie and Gruber 1996; Trujillo, Portillo, and Vernon 2005; Aizer 2007; Currie, Decker, and Lin 2008). While some health care may be obtained at public health care institutions at minimal or no cost in the study countries, these institutions are generally focused on ambulatory or primary hospital care and are unlikely to provide all needed care. For example, in Brazil, the majority of hospitals (79 percent) and multipractice clinics (74.5 percent) are privately owned (Lobato 2000).

Differences in geographic residential distributions by race are highly related to the lower insurance coverage rates among Native ancestry children in Argentina and Ecuador. This suggests racial geographic clustering with Native ancestry groups living in areas and communities with lower insurance coverage rates. Residential segregation has been found to relate to racial disparities in health insurance coverage in other multiracial countries such as in the United States (Saver et al. 2003). Future studies are needed to identify the contribution of insurance market characteristics such as insurance plan availability, competition, and prices to the racial disparities in child health insurance coverage in the study countries. Unfortunately, data on insurance market characteristics are not readily available for the study areas in order to directly evaluate their contributions.

In conclusion, while the majority of children in Argentina, Brazil, and Ecuador have no health insurance coverage, this study identifies large racial disparities in child health insurance coverage in these countries. Household wealth is highly and positively related to coverage and is the single most relevant household-level factor accounting for racial gaps in child health insurance, which highlights the importance of extending coverage to poor children for reducing racial disparities.

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NOTES

1. The literature search included English, Spanish, and Portuguese papers on PubMed, Econlit, Google Scholar, and Scielo.
2. See further discussion in the supporting information in Appendix SA2.
3. Children may have multiple ancestries. Following Lopez Camelo et al. (2006), the child is considered of African ancestry when reported and of Native ancestry when reported without African ancestry. The child is considered of "other" ancestry if neither African nor Native ancestry is reported.
4. 0.13, 0.96, and 0 percent of the samples from Argentina, Ecuador, and Chile, respectively, report African ancestry.
5. These included the following: owning a radio, TV, fridge, and car; having a domestic worker in the household; working on family's agricultural land; drinking water source; toilet/sewage facility type; house flooring type; wall material; roofing material; and number of household members per sleeping room.
6. The first principal component explained 33.5–45.6 percent of the variance. Supporting information Table SA1 reports the scoring coefficients and explained variance.
7. These conditions are unlikely to be reversely caused by insurance status at this very young age.
8. Very few study children had younger siblings.
9. Conditional on the number of siblings, this variable mainly reflects the number of household adults.

10. Supporting information Table SA3 shows the results of the binary logit model.
11. The signs of the gap and the variable contributions will be reversed.

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Supporting Information

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Appendix SA2: Additional Notes on Other Household Characteristics in the Analytical Framework Section.

Table SA1: Principal Component Analysis Scoring Coefficients of the Wealth Index.

Table SA2: Model Variable Odds Ratios in the Insurance Coverage Regression.

Table SA3: Model Variable Odds Ratios in the Binary Logit Regression of Private Health Insurance Coverage Regression in Argentina.

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