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The Child Mortality Disadvantage among Indigenous People in Mexico

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Abstract

This paper compares child mortality rates of Indigenous people with national rates. A long history of discrimination and exclusion experienced by indigenous residents of Mexico has created substantial disadvantage in terms of living conditions, education, and access to state resources. Recent policy efforts have been designed to address issues of poverty and inadequate health care. This paper uses data from the 2000 census of Mexico to examine: 1) the relative risk of child mortality among indigenous people, 2) the influence of living conditions, education and demographic characteristics on mortality differentials, and 3) the role of government programs in reducing mortality differentials. Results indicate that poor living conditions, low education and concentration in rural areas account for higher indigenous mortality. National programs have played a modest role in reducing mortality differentials.

Keywords

Mexico, indigenous people, child mortality

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Indigenous rights movements around the globe have highlighted the continuing disadvantage experienced by native people in societies where colonizing groups have gained political and economic control. Mexico is an important example of this phenomenon. The indigenous peoples of Mexico, as is the case in most of the world, are generally seen as being among the most highly disadvantaged of their society. The goal of this paper is to assess the gap in disadvantage and the success of government programs in narrowing the gap. We use child mortality as an indicator of well-being. High child mortality reflects both the inability of households to provide basic nutrition and sanitary living conditions as well as failure of the health care system to provide medical support. Thus it is a broad based measure of disadvantage. Several questions guide the research. First, how wide is the gap in child mortality between indigenous groups and the non-indigenous population? Second, how much of the gap can be explained by differences in characteristics associated with disadvantage including living conditions, education and rural residence rather than indigenous status? Third, does participation in government assistance programs help to reduce the mortality gap? Finally, are the correlates of child mortality similar in indigenous and Spanish speaking populations. The questions are addressed using the 10 percent sample from the Mexican National 2000 census.

Historical Context

Prior to the arrival of Columbus and the influence of Europe, the region that is now Mexico was populated by a large number of native groups. While reliable population figures are not available, some estimates place the population of the Central Valleys of Mexico at over twenty-five million alone, with other regions also having populations reaching into the millions. Some of the groups developed into impressive empires, especially the Maya and the Mexica or Aztec, and others were well adapted to highly difficult environments requiring significant practical knowledge and skills. They often formed coalitions and engaged in joint projects. They borrowed ideas and technologies and engaged in extensive trade. War and conflict were common. The cultural and linguistic diversity was striking. There is no indication that they thought of themselves as one people or as a population sharing common heritages. Tribal, empire, and linguistic bonds and divisions have been enduring (Burkholder and Johnson 1998).

The conquest by the Spaniards, beginning in 1519 in Mexico, led to many serious challenges. The conquest was characterized by massive and expanding political and social disruption. Christian conversion was linked to legal protection and economic self-preservation. Within a few years of the beginning of the conquest, the native population had declined to 10% of its pre-Columbian level. Serious diseases such as small pox, measles, typhus, and others resulted in the deaths of many without regard for social standing. Many natives were massacred, enslaved, and dispossessed of their land. Their cities were pillaged and buildings, especially temples, destroyed (Diaz Polanco 1997).

The native response varied. For many, the changes led to despair and depression. Others made efforts to make themselves over to mirror their conquerors. Most who survived, engaged in a culture of resistance, where they made conscious efforts to preserve their own traditions, language, and culture, often hidden within the framework imposed on them by the Spanish. Christian symbolism and practice was given dual meanings: one Catholic and the other indigenous. Many of the natives moved to remote regions of the area in which they were protected by geographic features such as deserts, mountain ranges, and jungles. Many groups started by resisting through war and rebellion, but were gradually forced to rely on resistance and isolation (Leon-Portilla 1992; Lockhart 1992).

The conquest was followed by a colonial period in which the natives were the object of proselyting, the victims of official policies of slavery, encomienda, repartimiento, and haciendas with debt servitude. The natives, themselves, became part of a process of cultural hybridization and domination. The people of mixed parentage, the mestizos, became the most numerous and the Spanish the politically and economically dominant. The designation of 'Indian' carried with it implications of inferiority and incompetence (Diaz Polanco 1997).

When the independence movements of the 1820's began to seek the end of the Spanish colonialism, indigenous peoples were rallied to fight for independence and became symbols of the heroic fight against Spain. However, by the time of the forty-year dictatorship of Porfirio Diaz's policies, especially those related to education, promoted the elimination of the Indian (Cajas Castro 1992). Following the removal of Diaz, land reforms and education were expanded to indigenous groups, but the content of the education was designed to make the native peoples Mexican and to integrate them (Diaz Polanco 1997). The period was characterized by continued resistance to integration and assimilation on the part of most indigenous groups. At the same time the living conditions and political power of the indigenous people remained very low.

The processes described here have led to some significant theorizing about the condition of indigenous people in Latin America and Mexico. We can mention two here: Fernando Mires and his discussion of 'Indianidad' and Beltran's work on 'Regiones de Refugio'. Both writers insist that the people who are usually seen as indigenous or Indian do not exist as some sort of independent or pre-existing category, but are a creation of national and international forces that date back to the conquest and continue in new forms today. Indigenous people have been defined by the conquerers, the colonists, the criollos, and modernity. Mires (1992) repeats a common theme. "Antes de Colon no habian los indios: que son algo creado de Colon y la conquista. Colon…primero inventaba al indio, después lo describía y, finalmente, lo clasificaba[1]" (Mires 1992 58).

Fernando Mires (1992) claims that being Indian comes from the interaction of the Europeans, people of the United States, the Spanish, the mestizos, and the indigenous. Historically, a change in the form of the interaction has changed what it is to be Indian. Mires indicates that "La indianidad no es un objeto fijado ni en el tiempo ni en el espacio."[2]During the conquest and colonial period the Spanish and the mestizo created a reality through the use of their power to serve their interests. "No es la existencia del indio lo que determina una definición, sino que la existencia de una definición es lo que determina al indio."[3] One feature of the European definition was its negativity which made the indigenous into a barbarian and an inferior. This has led to isolation and poverty.

Aguirre Beltran (1991) indicated in 'Regiones de Refugio', that most studies of the indigenous juxtapose the national culture of science, rationality, and modern technology to the indigenous cultures of the primitive, simple, backward technology, and belief in the magical. One of Beltran's main points is focused on the existence of a society with dual systems of stratification, economy and government:

> *En el territorio del mismo pais convivian, una al lado de la otra, dos sociedades fundadas en principios y practicas economicas distintas: 1) la sociedad moderna de tipo industrial y cultura compleja, representada por la población extranjera metropolitana y*

[1] Before Columbus there were no Indians. There were no Indians. They were created by Columbus and the conquest. He first invented them, the he described them, and finally he classified them.
[2] What it is to be Indian is not an object fixed in time or space.
[3] The existence of the Indian did not produce the definition, but the existence of a definition determines the Indian.

sus descendientes, constituia la elite gobernante, y 2) la sociedad tradicional o arcaica , representada por los indígenas, formaba la masa sometida.[4]

The indigenous side is not merely an underdeveloped population, but a different ethnic group with a different culture, internal cohesion, and resistant to integration.

Those who live in the indigenous side assimilate their own traditions and conform to them. However they are also subject to forces from outside which is a 'proceso dominical[5]' in which the indigenous are deemed to be incapable of self-governing. Also, the indigenous are reduced to a condition of being an 'instrument to be used' and their territory is for exploitation. The conditions of domination include racial segregation, political control to oppress and limit development, economic dependency, services inferior to the dominated, a social distance based on stereotypes, and efforts to evangelize the natives so they accept their subjugation. The region of refuge is a place of poor land with difficult access.

The current consequence of this history is that indigenous people are differentiated by spatial location, economic class, language, access to services provided by the state such as education and health care, and living conditions. Each of these distinguishing features has the potential to increase health risks faced by children.

Mortality Trends in Mexico

The decline in infant mortality in Mexico has been more accelerated than was the case for developed countries, declining from 178 in 1930 to 24 in 2001 (FAO, 2003). Major causes of death suggest that Mexico is undergoing a mortality transition. Primary causes are conditions originating in the perinatal period and congenital anomalies—both symptomatic of developed countries—but malnutrition is also high on the list (Organización Panamericana de la Salud 2001). Several important causes including infectious diseases and malnutrition are closely associated with poverty (IMSS 2003). Child mortality is higher in rural than in urban areas and higher in the poor southern regions than in the wealthier north (Organización Panamericana de la Salud 2002).

Despite improvements, mortality rates are much higher among indigenous people. Mortality rates from several infectious diseases including influenza, pneumonia, tuberculosis, and diarrhea are substantially higher among indigenous populations (Secretaría de Salud 2001). The child mortality rate is particularly high among indigenous people. In 2000, the infant mortality rate for those who speak an indigenous language was 1.55 times higher than for the Spanish speaking population. Major explanations for high indigenous mortality include high fertility, young age at initiation of sexual activity, short birth intervals, low maternal education, unsanitary household conditions, and lack of access to health care (Secretaría de Salud 2001).

Despite recent economic hardship in Mexico, the infant mortality rate has continued to decline (Frank and Finch 2004). However, the decline has not been uniform across all segments of the society. Urban-rural differences in neonatal mortality increased during this period, suggesting that technological advances have had less benefit for rural residents. Educational differentials in post neonatal mortality also increased suggesting that the least educated were less able to cope with economic crisis. The Frank and Finch study did not include effects for indigenous status, but the connection between indigenous status, rural residence, and low maternal education suggest that differentials by ethnicity may have increased.

Possible Explanations for comparatively high Indigenous Child Mortality

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[4] Two societies live side by side in the territory of the same country. They are founded on distinct economic principles and practices: 1) the industrialized and culturally complex modern society represented by the metropolitan foreigners and their descendents who make up the governing elite, and 2) the traditional society represented by the indigenous people who make up the submissive masses.

[5] Dominating process

Many factors are associated with differentials in child mortality (Heaton et.al., 2004). Given their historical experience and current geographic, social, and economic content, it is also likely that these factors are unevenly distributed between indigenous people and Mestizos. Several variables that can be used to assess the mortality gap are available in the census measuring household living conditions and family environment.

Standard of living is measured by an index which sums a set of characteristics including better material for walls, roof, and floors, and presence of a TV, video, refrigerator, washing machine, telephone, water heater, automobile and computer. Families receive one point for each item. Sanitary conditions are also measured by the type of toilet facilities with values of one for flush toilets, two for toilet with a bucket of water, three for toilet without water, and four for no facilities. A higher standard of living should be associated with lower mortality because resources can be used to provide better nutrition, access to health care, and protection from environmental. More sanitary living conditions should reduce exposure to infectious diseases (Aber, Bennett, Conlye, and Li 1997; Defo 1997; Barrett and Browne 1996).

Mother's education ranges from 0 for no education to 8 for masters or doctors degree. Maternal education increases child health through a variety of mechanisms including better knowledge, more positive attitudes toward modern health, increased resources and greater female autonomy (Frost, Forste and Haas 2005).

A variable indicating residence in a rural or urban area is also included. Rural areas have less access to health care, lower economic opportunity and less access to public sanitation (Heaton and Forste, 2003).

Demographic characteristics of the household are indicated by mother's age, whether the mother is single, whether the mother is in a consensual union, and total number of births the mother has had. Young mothers may be less prepared to provide adequate living conditions for children. Marriage is often associated with better outcomes for children such that children with married mothers will fare better than other children. Children born to women with more children may be at a disadvantage because birth intervals are shorter. Children born after short intervals are subject to a mortality disadvantage. A dichotomous variable is also included to indicate whether the mother has any health limitations.

Access to government sponsored programs is measured by two dichotomous variables indicating whether the mother has received any support from Procampo or Progressa and has rights to government sponsored medical service in IMSS, ISSSTE, Pemex, Defensa or Marina. Procampo was introduced in 1993 and was designed to replace agricultural subsidies, while providing income for farmers affected by NAFTA. Progressa was intended to reach the poor. Among the goals were to increase education, health and nutrition (Skoufias, Davis and De La Vega 2001). By it's end in 1999, it had grown to include 40 percent of rural families and one in nine families nationally. Information about Progressa is available on the website: www.progressa.coop.

Data and analysis

Analysis is based on the 10 percent sample from the Mexico Census of 2000. Other sources of data either do not include measures of living conditions and demographic characteristics, or the samples are too small to allow detailed analysis of a relatively uncommon event—child mortality—in a comparatively small subset of the population. Analysis is restricted to women in the child bearing ages (ages 12 through 45) who report having at least one child. Information about the census, including questionnaires and summary results are available on Mexico's official statistical institute website www.inegi.gob.mx.

Child mortality is measured by death of a child in the first five years of life. Cox regression is used to predict mortality for two reasons. First, because mortality declines rapidly in the first few months of life it is important to include the pattern of duration dependence in the analysis.

Second, this procedure allows the inclusion of experience for children who are under age 5 and are still living (censored observations).

Accuracy is a major concern with self reported data regarding child mortality. By restricting analysis to women in the child bearing ages, and to children born in the last five years, we hope to reduce recall error. Moreover, we note that the ratio of infant mortality reported here of 1.47 is close to the vital statistics rate of 1.55 reported above. Even if there is some under-reporting, our assumption is that the difference between the observed rate and the rate controlling for covariates reflects the importance of these covariates in explaining higher mortality among indigenous people.

Results

Table 1 compares characteristics of people who speak an indigenous language with the rest of the population. Several disadvantages are evident. Indigenous speakers score much lower on the socioeconomic index, have less sanitary toilet facilities, and have less education. Indigenous speakers are more likely to live in rural areas. Age differences between the groups are minimal, and differences in marital status are not large. Indigenous mothers are a little more likely to be in consensual unions and a little less likely to be unmarried. They have substantially larger families. In terms of government programs, indigenous speakers are more likely to have medical service and to have participated in Procampo.

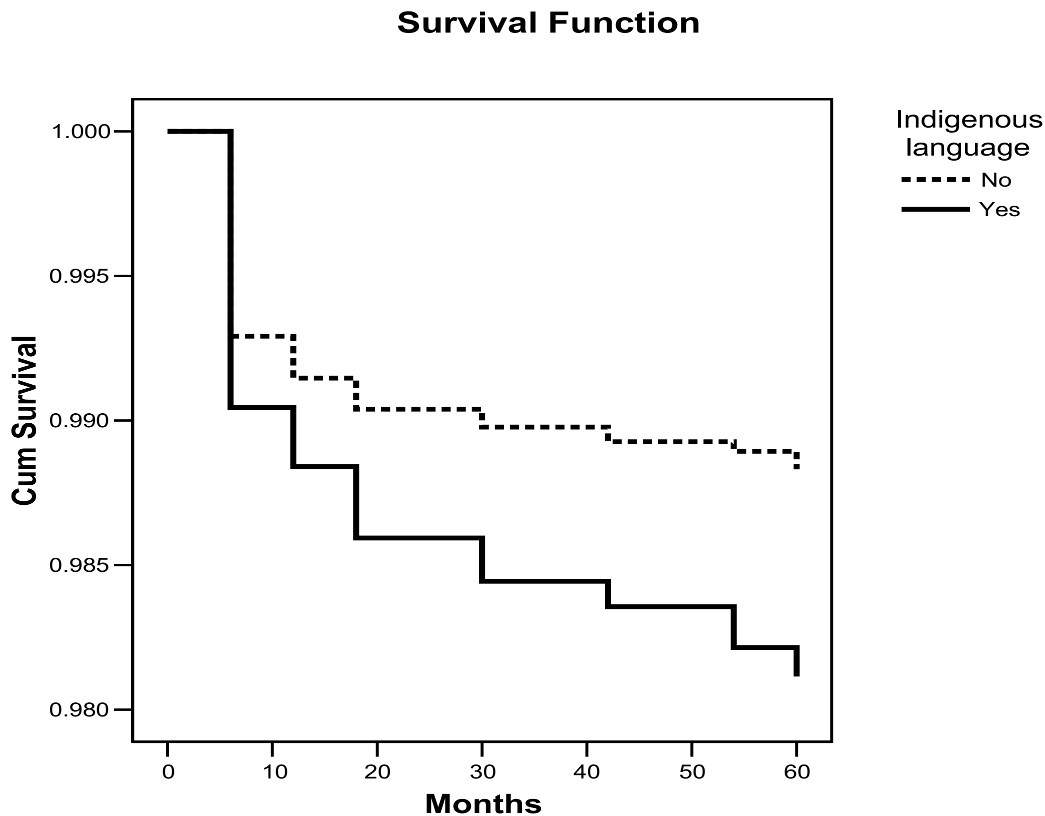
Table 1. Comparison of Characteristics for Women by Indigenous Language Status

	Indigenous language	
	No	Yes
SES index	6.2	2.3
Toilet	2.0	3.0
Rural	.36	.73
Age	28.2	28.8
Consensual Union	.21	.26
Single	.11	.08
Education	3.1	1.9
Total births	2.8	3.9
Health limitations	.01	.01
Medical Service	.63	.87
Procampo/Progressa	.11	.38

Child Mortality Rates

Patterns of child mortality for the nation are shown in Figure 1. About one percent of non-indigenous children have died before reaching age 5 (60 months). In contrast, nearly two percent of indigenous children have died before they reach age 5. Also, the risk of mortality after the first ten months is very low for those who do not speak an indigenous language. Results of the statistical analysis are presented in Table 2. The first model indicates that the rate of child mortality is 1.466 times higher among indigenous groups than among other Mexicans. This gap in Mexico can be explained by differences in socioeconomic status, and household conditions included in Model 2. Coefficients for other variables indicate that higher SES, more sanitary services, urban residence, formal marriage, higher maternal education, smaller families, and absence of limitations in physical activity are all associated with lower mortality. Indeed, when all of the control variables are included, indigenous people actually have a somewhat lower rate of mortality. Perhaps this is because they have more physical activity or are less likely to be exposed to infectious diseases.

Figure 1. Child Survival in Mexico



It is not possible to partition the share of the ethnic difference that is due to each other variable because there is substantial covariance among several variables. However, separate regressions were calculated including indigenous status and each of the covariates. The standard of living index (SES) is clearly the most relevant. It alone can account for 97 percent of the mortality gap. Maternal education is also quite important, explaining 73 percent of the gap. Number of children could account for 57 percent of the gap. Access to a toilet, rural residence and insurance are also relevant, each accounting for 30 to 40 percent of the gap. On the other hand, age, marital status

and health limitations are not relevant, either because their effects are relatively small, or because there is little ethnic variation in these characteristics.

Table 2. Cox Regression Models for Child Mortality

	Model 1	Model 2	Model 3
Indigenous	1.466*	.923*	.942
SES		.948*	.949*
Toilet		1.043*	1.043*
Rural		.945*	.961
Age		.996	.997
Consensual Union		1.252*	1.228*
Single		1.264*	1.239*
Education		.926*	.932*
Children		1.129*	1.130*
Limitation		1.267*	1.285*
Medical Service			1.155*
Procampo/Progressa			.846*
N=828,783			
X^2 (d.f.)	155.8 (1)	1789.8 (10)	1836.7 (12)

Model 3 indicates that access to government medical services is associated with higher mortality. This may be because people with more health problems are more likely to take steps to gain access. In contrast, participation in Procampo is associated with lower mortality. Greater access to these services, however, does not account for the gap in mortality. When these two variables are included, the coefficient for indigenous language only changes from .923 to .942. As a final step in the analysis, we compare coefficients for indigenous and Spanish speaking populations. If covariates have different effects in the two groups, then it cannot be assumed that policies that are effective in one group are transferable. The influence of government programs is of particular interest. If indigenous people do not benefit as much from these programs, then more specialized programs may be required for Indigenous people. Results are shown in Table 3. Coefficients are generally similar for the two groups. Being single or in a consensual union appear to be a little less problematic for indigenous people, and education may have a somewhat greater benefit. Of particular importance, coefficients for health insurance and income from Progressa or Procampo have somewhat larger benefits among indigenous people. Tests of statistical significance for these differences indicate that none of them are significant. In short, the model appears to be more similar than different for the two groups.

Table 3. Comparison of Effects on Child Mortality for Indigenous and Spanish Language Groups.

	Indigenous	Spanish
SES	.959*	.949*
Toilet	1.027	1.043*
Rural	.922	.965
Age	.994	.998
Consensual Union	1.133	1.248*
Single	1.160	1.253*
Education	.904*	.936*
Children	1.119*	1.133*
Limitation	1.262	1.291*
Medical Service	1.209	1.146*
Progressa/Procampo	.769*	.878*
n	93618	735165
X^2	177.6	1555.8

Conclusion

Our analysis documents clear disadvantages for the indigenous speaking population of Mexico. This disadvantage is evident both in child mortality rates that are nearly 50 percent higher among those who speak an indigenous language, as well as in the conditions associated with higher mortality such as socioeconomic disadvantage, rural isolation, and household demography. Fortunately, indigenous groups are more likely to participate in governmental programs designed to improve living conditions of the disadvantaged.

To some degree, participation in government programs such as health service Progressa have reduced inequalities in outcomes, but the programs are far from sufficient to eliminate differences in mortality. Given the long history of inequality, it seems unlikely that recent programs, however well conceived and executed, would eliminate long established differences. Still, the success of existing programs should not discourage policy makers from continuing to improve on recent efforts. Further encouragement for continued action comes from the evidence that participation in governmental programs is at least as likely to benefit indigenous groups as it is to benefit the Spanish speaking majority.

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