

# **Health Policy and Mortality Decline in the Province of Neuquén, Argentina**

**James W. McGuire**

Department of Government  
Wesleyan University  
Middletown, CT, 06459-0019

Tel. (860) 685-2487  
Fax (860) 685-2781  
email: [jmcguire@wesleyan.edu](mailto:jmcguire@wesleyan.edu)

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**Before July 31, 2001, Please Use the Following Contact Information**

Woodrow Wilson International Center for Scholars  
One Woodrow Wilson Plaza  
1300 Pennsylvania Avenue, NW  
Washington, DC 20004-3027  
Tel. (202) 691-4000  
Fax (202) 691-4001  
email: [jmcguire@wesleyan.edu](mailto:jmcguire@wesleyan.edu)

## **Abstract**

This article explores the impact of primary health care on infant mortality and other health status indicators in the province of Neuquén, Argentina, from 1970 to 1999. It evaluates the quality of mortality data in Neuquén and in Argentina; assesses the effect of socioeconomic and cultural factors on mortality outcomes in Neuquén; describes the characteristics and impact of the Provincial Health Plan of 1970; and investigates the social and political forces that led to the Plan. It concludes that primary health care contributed heavily to the reduction of premature mortality in Neuquén after 1970; that popular pressure and adversarial politics encouraged primary health care in the province; and that subnational comparisons can complement cross-national analyses in analyzing mortality changes.

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In Argentina from 1960 to 2000, provincial governments were largely responsible for publicly-funded primary health care. For most of this period, the primary care delivered by such governments was seriously deficient (World Bank 1988: 15; Stillwaggon 1998: 145, 166). Partly as a consequence of this deficient primary care, Argentina from 1960 to the mid-1990s did worse than the average Latin American country at reducing premature mortality. It did much worse than Chile and Costa Rica, where energetic primary health initiatives were adopted in the 1960s and 1970s (Foxley, Aninat, and Arellano 1979, Ruíz-Tagle 2000; Rosero-Bixby 1986, Mesa-Lago 2000a); and worse even than Brazil, a notorious laggard at premature mortality reduction (Table 1).

[Insert Table 1 About Here]

A few bright spots existed in this bleak panorama. In 1995, a Maternal and Child Health Project (PROMIN) began to operate in the provinces of Buenos Aires, Córdoba, Mendoza, Santa Fe, and Tucumán (El Cronista 24 February 1995). It is too early to tell how effective this program has been, but an initial evaluation was promising (World Bank 2000: 124). A longer-term positive experience involves the province of Neuquén, in northwest Patagonia. In 1970, Neuquén became the only Argentine province to introduce a sustained and comprehensive primary health care program (Argentina today has 23 provinces and a Federal Capital). The onset of this program coincided with a sharp drop in Neuquén's infant mortality rate. From 1970, when the program was introduced, to 1999, the most recent year for which data are available, Neuquén reduced its infant mortality rate from 108 to 12 per 1000. In percentage terms, this decline exceeded that of any other province, and was much steeper than in Argentina as a whole, where the rate from 1970 to 1998 fell only from 61 to 19 per 1000. Neuquén did well at reducing premature mortality among older persons as well as among infants. This article will explore the hypothesis that Neuquén's primary health care program was largely responsible for its success at premature mortality reduction.

Recent cross-national quantitative research has found that premature mortality rates in developing countries are influenced much more by socioeconomic variables than by health care measures (Kim and Moody 1992; Filmer and Pritchett 1997, Barlow and Vissandjée 1999). In one such study, Filmer and Pritchett (1997) found, using two-stage least squares regression analysis, that per capita GDP alone explained 84 percent of the variance in under-5 mortality across a sample of 104 developing countries in the early 1990s. Four other socioeconomic and cultural factors -- income inequality, female education, ethnolinguistic diversity, and having a population more than 90 percent Muslim -- explained another 10 percent. Because measurement error in the dependent variable drove the maximum explainable variance below 98 percent, all other factors combined could explain no more than 4 percent. Accordingly, two indicators of the intensity of primary health care -- the proportion of public health spending going to local health care, and the proportion of the population with access to local health services -- had no significant statistical influence on cross-national variance in under-5 mortality.

Other studies, by contrast, have suggested that publicly-provided health care has had stronger effects on health status in developing countries, at least among the poor. Anand and Ravallion (1993) found that per capita economic output had a strong positive statistical effect on life expectancy, but also noted that "the significantly positive relationship between life expectancy and income vanishes entirely in a regression of life expectancy against poverty incidence, public health spending, and average income" (1993: 141). They concluded that "average income matters, but only insofar as it reduces poverty and finances key social services" (1993: 143-144). The findings of another study shed additional light on the relation between per capita output and health status. Bidani and Ravallion (1997) statistically decomposed the populations of 35 developing countries around 1990 into "poor" and "non-poor" subgroups using \$2 and \$1 a day poverty lines, and tested the effects of several independent variables on life expectancy, infant mortality, and perinatal mortality among poor and nonpoor subgroups separately. They found that "public health spending and schooling have a significant effect on

the health status of the poor, but not the nonpoor" (1997: 129), and concluded that "cross-country differences in public health spending matter much more to the health outcomes of poor people" (1997: 135).

Case studies can help to reconcile these partially conflicting findings, and can help to illuminate the character of the relations among per capita economic output, the amount and type of health spending, and the health status of the poor and other population groups. Filmer and Pritchett noted that several countries and subnational entities, including Sri Lanka, Costa Rica, China, and the Indian State of Kerala, have attained unusually good health status for their level of per capita output. They acknowledged that primary health care initiatives may have contributed to these achievements, but wrote that it is "equally plausible that [such cases] share non-health characteristics like high levels of female education, better nutrition, and more equal income distribution" (Filmer and Pritchett 1997: 5).

Like Sri Lanka, Costa Rica, China, and Kerala, Neuquén has done better on health status than on per capita output. In 1998, the province achieved an infant mortality rate 26 percent below the national rate, even though its per capita output in 1994 was only 4 percent above the national level. Unlike these other cases, however, Neuquén has done relatively poorly on female education, nutrition, and income distribution. In the 1990s, female education and nutritional status in Neuquén were below the Argentine average, and income distribution was more unequal than in Argentina. The case of Neuquén thus underscores the utility of further research -- qualitative as well as quantitative, and historical as well as cross-national -- to assess the impact of primary health care on infant, child, and adult mortality.

Consistent with the Filmer and Pritchett thesis, Neuquén after 1970 experienced faster-than-average growth, and by 1994 it had attained a slightly higher-than-average per capita economic product. It cannot be concluded from this relatively successful economic performance, however, that the province's primary health care programs had little impact on the infant

mortality rate. Indeed, evidence suggests that if the growth contributed to the rapid decline in infant mortality, it did so more by making new resources available for public health care than by raising the private incomes of the poor. From 1970 to 1972 spending on public health rose by 57 percent, and from 1970 to 1975 the number of persons employed by the provincial health subsecretariat nearly tripled. By contrast, nutrition and housing indicators improved much less in the 1970s than would be expected had a rapid increase taken place in the private incomes of the poor. High income inequality, together with the capital-intensity of much of the growth process (which was based largely on heavy central government investment in the province's energy resources), may have attenuated the effects of rising per capita output on the incomes of the poor.

The hypothesis that primary health care contributed significantly to the reduction of premature mortality in Neuquén will be explored as follows. The first section of the article will assess the quality of mortality statistics in Argentina and in Neuquén. The second will trace Neuquén's progress at reducing infant mortality and compare its record at reducing both infant and adult mortality to that of other provinces. The third will use comparisons to other provinces to analyze the effects of socioeconomic and cultural factors -- economic growth, income distribution, fertility, ethnic fractionalization, urbanization, education, housing quality, and nutritional status -- on premature mortality in Neuquén. The fourth section will examine the characteristics and impact of the primary health care program. The fifth will argue that the province's relatively left-leaning and democratic political traditions help explain why Neuquén has been more persistent and thorough than other Argentine provinces at delivering primary health care in the last decades of the twentieth century. The sixth section will summarize the article's main findings, and conclude with some observations about sub-national comparisons.

### **1. The Quality of Mortality Data in Argentina and in Neuquén**

Argentina is one of eleven developing countries that the United Nations (1992) regards as having had since 1960 reasonably complete and accurate registration of vital events. As Table 2

shows, vital registration statistics were more complete and accurate in Argentina than in most other middle-income countries in Latin America from the mid-1980s to mid-1990s. They were also much more complete and accurate than in most developing countries outside the region, where international organizations have largely despaired of using vital registration statistics to estimate mortality rates, and have turned instead to census and survey data (United Nations 1992: 3-18).

[Insert Table 2 about here]

Argentine vital registration statistics had flaws, however, and were particularly deficient prior to 1960 or so. In the country as a whole, vital-registration based estimates of overall mortality understated census-based estimates by 10 percent in 1914, 9 percent in 1947, and 3 percent in 1960 (Somoza 1971: 170). In 1960, in four very poor provinces -- Chaco, Formosa, Misiones, and Santiago del Estero -- census-based estimates of infant mortality were two to three times higher than vital registration-based estimates (Arruñada, Hamilton, and Ambrosi 1971: 19, 34). Vital registration statistics apparently became more complete and accurate after 1960, but were still somewhat deficient. Stillwaggon (1998: 162; 2000) argued that the Argentine vital registration system worsened under the 1976-1983 military regime; that it remained in disarray in the early 1990s (despite the best efforts of many health professionals); and that it was especially deficient in registering infant deaths among the poor. Stillwaggon also found that the government apparently manufactured some of the statistics it reported to international agencies, including a 95 percent figure for measles vaccination coverage in 1990, a year when Argentina was the only country in the world to purchase no vaccines. A measles epidemic erupted in 1991 (Stillwaggon 1998: 14).

Most of the strong evidence that Argentine vital registration statistics are seriously flawed pertains to 1960 and earlier, however. Since 1960, the available time series for infant mortality have tracked one another fairly closely. In particular, direct estimates based on vital registration

statistics have been similar to indirect estimates based on census survivorship questions (Table 3). The only highly discrepant estimates (yielding much lower infant mortality estimates than other sources) are those based on the 1980 census, which was taken under the 1976-1983 military regime, during which thousands of people "disappeared." Unlike the censuses of 1960 or 1970, which used enumeration exclusively (Argentina. INDEC 1983: 75-79), the 1980 census used sampling rather than enumeration in areas containing 94 percent of the population: cities with more than 100,000 inhabitants and the entire provinces of Buenos Aires, Córdoba, Entre Rios, and Santa Fé (Argentina. INDEC 1985: 8). The government's rationale for sampling rather than enumerating these areas was to cut costs, permit timely publication, reduce paperwork, and "facilitate quality control of the information collected" (Argentina. INDEC 1985: 5). According to a United Nations study, "data from the 1980 census appear to be flawed, possibly because of high levels of non-response combined with computerized imputation" (United Nations 1992: 34).

[Insert Table 3 about here]

Except in the case of the 1980 census, then, vital registration statistics and census data have produced similar infant mortality estimates since 1960. Other evidence also suggests that Argentina's vital registration statistics are probably fairly complete and accurate. In the late 1990s, age-specific mortality rates based on vital registration data were consistent with provincial cause-of-death profiles, except in the provinces of Santiago del Estero and Catamarca (Verdejo 1998: 56). In 1990 and again in 1995, trained personnel reportedly attended 95 percent of births in Argentina (PAHO 1998: 272), facilitating the initial recording of vital events. The relatively high quality of Argentine vital registration statistics, coupled with the richness of the information they provide, warrant their use in the depiction of infant mortality trends and patterns. Their deficiencies must be borne in mind, however, and they should be used with appropriate caution.



Similar care should be applied to the analysis of mortality data from the province of Neuquén. In a study in the mid-1980s, women about to give birth in a hospital in the department of Huiliches, in western Neuquén, were questioned about the survivorship of their previous child. These women reported 28 infant deaths following 725 live births, an infant mortality rate of 38.6 per 1000, significantly higher than the vital registration-based estimate of 27.4 per 1000. Although the geographical region and time frame of the two estimates were not identical, the authors of the study concluded that the official registries in Huiliches were "greatly affected by omissions" (Mychaszula, Pollitzer, and Somoza 1991: 14-20). Inconsistencies in infant mortality data were also found in preceding years. From 1960 to 1970, the provincial government's estimate of infant mortality in Neuquén was usually higher, and often 40 to 60 percent higher, than the national government's estimate (Table 4). By the 1990s the provincial and national estimates had converged, but still differed by as much as 12 percent. It is not clear why the two sets of estimates differed so radically prior to 1970, but differences in reporting conventions may help explain the discrepancies of the 1990s. The provincial agency counted all births and deaths that occurred within Neuquén, including those of non-residents, whereas the national agency counted all vital events that occurred to residents of Neuquén, even if the events occurred outside the province (Gore 2000, Herrero 2000). In 1999, however, only 111 of Neuquén's 10,046 registered births, and only 1 of its 117 infant deaths, took place outside the province (Neuquén. SS/MDS 2000c: T. 4). It is likely, therefore, that other factors accounted for the discrepancies of the 1990s, as well as for the widely divergent estimates for the 1960s.

[Insert Table 4 About Here]

At least since the 1970s, however, vital registries have probably been more accurate in Neuquén than in most other Argentine provinces. Neuquén has a reputation for being well-run, and public health administrators and professionals have tried to assure the accuracy of the registries. A 1974 resolution by the provincial executive made it mandatory to report within 48 hours to the provincial subsecretariat of health any mother or infant death resulting from

pregnancy or childbirth. This new requirement complemented the existing system of vital registration, and applied to births outside as well as inside medical facilities (Moron 1979: 163-164). In 1979, Neuquén implemented a system of perinatal record-keeping designed by an agency of the Pan American Health Organization. Not until the 1990s was this system widespread in the province of Buenos Aires (Wyszynski et al. 1999; Neuquén. SS/MDS 2000b: 91; Gorosito 2000). In the mid-1980s, doctors in the sparsely populated district of Aluminé "maintain[ed] excellent data on birth rates, birth outcomes, reasons for seeking consults (presenting problems) [sic], and the age distribution of the patients" (Hale 1988: 18). In January 1991, the province's statistical agency employed an economist, a political scientist, a social services expert, an accountant, two statisticians, two computer technicians, a computer programmer, and a petroleum engineer (Gómez Fuentealba 1992: 18). Hence, although infant mortality is probably underreported, Neuquén does not seem to suffer more from this defect than other Argentine provinces.

## **2. The Evolution of Infant and Adult Mortality in Neuquén**

To the extent that infant deaths have been underreported in Neuquén, the proportion of omitted deaths was probably greater before 1970 than afterward. If underregistration of infant deaths declined over time, the actual reduction of infant mortality from 1970 to 1998 would have been even greater than the impressive reduction depicted in official statistics. From 1970 to 1998, according to these statistics, infant mortality fell 87 percent, from 108 to 14 per 1000 (Table 4). Argentina as a whole reduced its infant mortality rate only 68 percent during this period, from 61 to 19 per 1000 (Table 3). In comparative perspective, the reduction of infant mortality in Neuquén between 1970 and 1997 was the greatest of any Argentine province (Argentina. MSPyMA 1983: 93; Argentina. INDEC 2000a), and gave the province an infant mortality rate 26 percent below the national average. Neuquén's reduction of infant mortality from 1970 to 1998 was nearly as great as that of Chile, a renowned infant mortality reducer, where the rate fell 89 percent (from 82 to 10 per 1000); and was greater than that of Costa Rica,

another country famous for its infant mortality reduction progress, where the rate fell 82 percent during the period (from 68 to 12 per 1000) (Figure 1). In 1999 Neuquén reduced its infant mortality rate to 12 per 1000, the level attained by Costa Rica that year (Neuquén. SS/MDS 2000a). Over the 1992-94 period, Neuquén's infant mortality rate of 16 per 1000 was the third-lowest of Argentina's 24 provinces, behind only the Federal Capital (15 per 1000), counted here as a province, and Tierra del Fuego (13 per 1000) (Verdejo 1998: Table 1.14; Cassinelli 1996: 13). The child (1-4 year) mortality rate in Neuquén in 1987-88, 1.3 per 1000, was the lowest of any Argentine province, including the Federal Capital (Stillwaggon 1998: 218).

[Insert Figure 1 About Here]

Neuquén has not always been a good performer on infant mortality. In 1970, when the Provincial Health Plan was introduced, Neuquén's infant mortality rate, according to the national health ministry, was 102 per 1000, third-highest in the country after Salta (109 per 1000) and Jujuy (129 per 1000) (Argentina. MSPyMA 1983: 93). The provincial health subsecretariat placed Neuquén's infant mortality rate even higher, at 108 per 1000 (Table 4). In the early 1970s, however, with the introduction of the Provincial Health Plan, Neuquén's infant mortality rate began to plummet. Whereas in 1970 the provincial rate had been about 75 percent above the national rate (Tables 3 and 4), by 1975 it had fallen below the national rate. From 1975 to 1985 the provincial and national rates tracked each other closely, but from 1986 to 1989 Neuquén's infant mortality rate again fell faster, such that in 1998 it stood at 14 per 1000, 26 percent below the national rate of 19 per 1000 (Figure 1).

Neuquén's other mortality indicators also experienced sharp improvements in the 1970s. General mortality fell from 10.4 per 1000 in 1970 to 5.6 per 1000 in 1982, although this rapid progress was partly an artifact of the growing youthfulness of the population, owing to a soaring birth rate. More tellingly, Neuquén halved the death rate of 1 to 4 year-olds from 5.2 per 1000 in 1970 to 2.6 per 1000 in 1975 (Moreno 1979: 164). Tuberculosis mortality fell from 26.3 per

100,000 in 1970, above the national average, to 4.2 per 100,000 in 1982, below the national average (Leonfanti and Chiesa 1988: 67). Between 1964-66 and 1980-81, reported life expectancy at birth rose from 57.4 to 68.2 in Neuquén, but only from 66.4 to 69.1 in Argentina (Argentina. INDEC 1997a: 21). The maternal mortality rate fell from about 100 per 100,000 in 1970-1975 to 20 per 100,000 in 1988, and varied from 17 to 95 per 100,000 between 1988 and 1998 (on a small base of 2 to 11 maternal deaths annually) (Gorosito and Heller 1993: 75; Moreno 1979:163). In six of eight years in the 1988-1998 period for which data are available for both political units, Neuquén's maternal mortality rate was lower than Argentina's (Neuquén. SS/MDS 2000b: 26).

Estimates of adult mortality in Neuquén deserve closer inspection. In addition to having the country's third-lowest infant mortality rate and lowest child mortality rate, Neuquén in the early 1990s had the lowest 65 and older death rate among Argentina's 24 provinces, counting the Federal Capital (Verdejo 1998: Table A.2.4). In 1990, age-specific death rates were lower in Neuquén than in Argentina in 12 of 17 five-year age groups (calculated from Argentina. INDEC 1997b: 95, 110). Given such a strong performance relative to the country as a whole on a spectrum of age-specific death rates, Neuquén might be expected to have done better than average on life expectancy at birth. According to the Instituto Nacional de Estadística y Censos (INDEC), however, Neuquén's life expectancy at birth was lower than in Argentina as a whole. In 1980-81 it was reported to be 67.7 years, vs. 68.9 years in the country; and in 1990-92 it was reported to be 71.4 years, compared to 71.9 years in the country (Argentina. INDEC 1997b: 90).

INDEC's estimate of life expectancy at birth in Neuquén for 1990-92 is based on a life table that gives the province's average infant mortality rate as 24.5 per 1000 (Argentina. INDEC 1995: 90). This infant mortality estimate is more than fifty percent higher than any other for the period (Table 4), and to the extent that it is exaggerated, Neuquén's true life expectancy in 1990-92 was longer than 71.4 years -- perhaps considerably longer, for the second-to-last step in the estimation of life expectancy is to add up expected years of life lost, and more years of life are

lost to the death of an infant than to the death of an older person. At any rate, no other estimates suggest that Neuquén's infant mortality rate was anywhere near 24.5 per 1000 in the early 1990s. According to vital registration statistics, Neuquén's infant mortality rate was 18.6 per 1000 in 1990, 17.3 per 1000 in 1991, and 18.1 per 1000 in 1992. INDEC itself, using vital registration statistics, put Neuquén's infant mortality rate in 1991 at 15.7 per 1000, and reported this figure in the same publication in which it published the life expectancy estimate of 71.9 years, derived from the life table with the 24.5 per 1000 infant mortality rate (Argentina. INDEC 1997b: 90-91).

The life table estimate that Neuquén's average infant mortality rate in 1990, 1991, and 1992 was 24.5 per 1000 is based on census as well as vital registration data, reconciled by "various techniques and methodologies" incorporating "certain corrections to the basic information and in some of the resulting values" (Argentina. INDEC 1995: 7, 13). In all but two of the country's 24 provinces, these techniques and corrections produced life tables with infant mortality estimates for 1990-92 that were fairly close to INDEC's 1991 estimates from vital statistics. In the province of Buenos Aires, which contains a third of the country's population, the life table infant mortality rate was 23.9, 2 percent lower than the vital registration-based rate of 24.4. In the province of Córdoba, the life table rate was 21.3, 5 percent lower than the vital registration-based rate of 22.3. The life table rates for the Federal Capital, Mendoza, and Santa Fé were 3 to 7 percent higher than the vital-registration based rates. The only big discrepancies among Argentina's 24 provinces (including the Federal Capital as a province) were for Neuquén, whose life table rate (24.5) was fully 56 percent higher than its vital registration-based rate (15.7), and for Tierra del Fuego, whose life table rate (27.1) was 64 percent higher than its vital registration-based rate (16.5). No other source gives infant mortality rates for Neuquén that are anywhere near 24.5 per 1000 in the early 1990s (Table 4), and no explanation is given as to why the estimates for Neuquén and Tierra del Fuego were so high relative to the vital registration-based rates, whereas those for all of the other provinces were near those rates. By all accounts,

vital registries are more complete and accurate in Neuquén and Tierra de Fuego than in, say, Catamarca, Chaco, Formosa, Jujuy, or Santiago del Estero, all provinces in which the life table rates were close to the vital registration rates.

To create an alternative estimate of life expectancy more in line with the infant mortality estimates for Neuquén found everywhere but in INDEC's 1990-92 life tables, INDEC's own statistics were used to produce abridged 1990 life tables for both Argentina and Neuquén (Tables 5 and 6). This exercise yielded estimated life expectancies at birth of 72.1 years for Argentina and 73.6 years for Neuquén, compared to INDEC's published estimates of 71.9 years for Argentina and 71.4 years for Neuquén. These new and more transparent estimates suggest that Neuquinos born around 1990 could expect to live about 1.5 years longer than the average Argentine. If the new estimates are correct, Neuquén in 1998 was doing better than Argentina as a whole on virtually all important mortality indicators, in addition to having reduced premature mortality faster than any other province from 1970 to 1998. Pockets of high mortality continued to exist in Neuquén in the 1990s (Gorosito and Heller 1993: 76), but the same might be said of all provinces.

[Insert Tables 5 and 6 about here]

### **3. Socioeconomic and Cultural Determinants of Mortality Decline in Neuquén**

Why has Neuquén done better than Argentina as a whole at expanding survival-related capabilities? Socioeconomic and cultural factors may hold part of the explanation, but health policies, it will be argued here, had an even stronger impact. Neuquén did better than Argentina as a whole at improving economic output in the post-1970 period, but had to overcome a number of challenges on other fronts, including, relative to other provinces, a high birth rate, low education, and a low initial level and rapid pace of urbanization. Moreover, to the extent that a relatively good performance on economic growth contributed to the mortality decline, it seems to have done so more by expanding the resources available for public health

programs than by expanding private incomes so as to facilitate the purchase of survival-enhancing goods and services, like food and housing. Capital-intensive growth and a relatively high degree of income inequality may have attenuated the beneficial effect of rapid economic growth on the private incomes of the poor. Even as the infant mortality rate dropped below the national rate, levels of housing and food deprivation remained higher than in the rest of the country.

Neuquén's population grew rapidly in the last part of the twentieth century, from 110,000 in 1960 to 561,000 in 2000. At the end of the 1990s, Neuquén had about 1.5 percent of the Argentine population, up from 0.5 percent in 1960 (Argentina. INDEC 1997a: 13; Neuquén. SS/MDS 2000b: 1). From 1960 to 2000 Neuquén had the second-highest rate of population growth among Argentina's 24 provinces (including the Federal Capital), trailing only Tierra del Fuego (Palermo 1988: 47; Neuquén. SS/MDS 2000b: 2). From 1960 to 1991, the population growth rate in the province was nearly three times the national rate (Argentina. INDEC 1997a: 14).

High fertility was one reason for the rapid population growth in Neuquén. The province's total fertility rate in 1955 was 6.2, nearly twice the national average (Argentina. INDEC 1997a: 120). Fertility declined significantly over the next half-century, but the province's 1995/2000 total fertility rate of 3.1 remained above the national rate of 2.6 (Neuquén. SS/MDS 2000b: 2). Because of its high fertility rate, Neuquén had a young population. In 2000, 32.8 percent of Neuquén's population was under the age of 15, compared to 27.7 percent in Argentina. Because Neuquinos were relatively young, mothers under 20, who had a higher-than-average risk of suffering infant deaths, accounted for a higher proportion of births than in the country as a whole. In 1998, mothers under 20 and over 35 accounted for 30.2 percent of births in Neuquén, compared to 28.9 percent in Argentina as a whole (Neuquén. SS/MDS 2000b: 4, 11). In 1999, two-thirds of such births in Neuquén were to women under 20, who had an infant mortality rate

of 15.1 per 1000, compared to the overall rate of 11.6 per 1000 (Neuquén. SS/MDS 2000c: Table 8).

As far as the level of infant mortality goes, high fertility will tend to boost the infant mortality rate by raising the proportion of births to very young women, by reducing spacing between births, by increasing the ratio of higher-order to lower-order parities, by reducing the amount of attention that parents can devote to each child, and by raising burdens on obstetric and pediatric services. Neuquén's fertility rate was higher than the national average in the last quarter of the twentieth century, so Neuquén's success at keeping the infant mortality rate below the national average during this period occurred in spite of rather than because of the fertility rate. As far as the reduction of infant mortality goes, however, the rapid decline of Neuquén's fertility rate may well have contributed to the rapid decline of infant mortality in the province. Whereas Argentina reduced its total fertility rate only from 3.1 in 1960 to 2.9 in 1991, Neuquén's reduction was from 5.6 in 1960 to 3.6 in 1994 (Argentina. INDEC 1997a: 20). Fertility decline cannot, however, explain the rapid reduction of infant mortality immediately after the introduction of the Provincial Health Plan. From 1970 to 1975, as infant mortality fell from 108 to 43 per 1000, the province's birth rate rose from 35 to 42 per 1000 (Gorosito and Heller 1993: 75).

Immigration from other provinces and from neighboring countries, particularly Chile, also contributed to the rapid growth of the population from the 1960s onward. From 1970 to 2000 studies consistently showed that about 35 percent of Neuquinos had been born outside the province, 25 percent in other provinces and 10 percent in neighboring countries (Argentina. INDEC 1997a: 23-24). Job opportunities, particularly in hydroelectric dam construction, attracted immigrants. Energetic construction of public housing and the strong reputation of the province's public health system may also have been a draw (Palermo 1988: 34-35; Bucciarelli, González, and Scuri 1993: 375). The immigrants were economically diverse, including unskilled laborers, skilled workers, and professionals, but those from Chile were mostly poor. In the mid-



1980s, a leftist political party leader reported that 60 percent of the members of the provincial branch of the construction workers' union had been born in Chile (Palermo 1988: 18, 28, 34-37). Large numbers of poor immigrants constituted more a challenge than an advantage for mortality reduction efforts in Neuquén.

The health care needs of indigenous people are often particularly difficult to serve (World Bank 2000: 123-24). Indigenous people made up about 10 percent of Neuquén's inhabitants in the mid-1980s (Currihuinca and Roux 1984: 275), compared to about 1 percent in Argentina as a whole in 1990 (PAHO 1994: 60). In 1983, 10,400 indigenous people in 35 recognized groups, about 4 percent of Neuquén's population, lived in designated areas throughout the province, mostly in the south and center-west (Gómez Fuentealba 1992: 53-4). An estimated 15,200 additional indigenous people lived outside the designated areas. This total of about 25,000 indigenous people in Neuquén in the mid-1980s was much lower than the estimated 60,000 who had lived in the territory a century earlier, when military campaigns associated with General Roca's "Conquest of the Wilderness" caused the deaths of tens of thousands (Currihuinca and Roux 1984: 275). Immigration, notably from Chile, and the strong indigenous presence gave Neuquén much greater ethnolinguistic diversity than Argentina as a whole. Filmer and Pritchett (1997: 8) found that ethnolinguistic diversity was associated with significantly higher child mortality levels. If this is indeed a rule, Neuquén provides a notable exception to it.

Neuquén urbanized rapidly during the second half of the twentieth century. In 1947 only 23 percent of the population lived in localities with more than 2000 persons, compared to 62 percent in Argentina as a whole. In 1980, a decade after the Provincial Health Plan went into effect, 76 percent of Neuquinos lived in such localities, compared to 83 percent in Argentina (Calculated from Argentina. INDEC 1984: 36, 352). By 1991 Neuquén was just as urban as the rest of the country, with 87 percent of its population in localities with more than 2000 persons (Argentina. INDEC 1997a: 39). Even in 1991, however, the province's population density, 4

persons per square kilometer, remained lower than the national average of 11 (Argentina. INDEC 1997a: 51; Argentina. INDEC 2000b).

Before the mid-19th century, urban residence tended to be associated with higher mortality rates. Disease control and curative medicine were still fairly primitive at this time, so the disadvantages of overcrowding and poor sanitation outweighed the advantages of easier access to medical facilities (Easterlin 1998: 12). In the twentieth century, however, with overall modernization and the improvement of medical technology, the advantages of easier service delivery came to the fore, and urban residence came to be linked to lower mortality in most places. For most of the post-1970 years, therefore, Neuquén's relatively low level of urbanization hampered its infant mortality reduction efforts by making services harder to deliver. Moreover, a rapid pace of urbanization, such as Neuquén also experienced, can make service delivery more difficult, particularly if it is accompanied by the growth of shantytowns. By the late 1990s, 12 such communities existed around the capital city, and nearly all of the 20,000 people who lived in them suffered from housing and educational deprivation (Neuquén. SS/MDS 2000b: 9). Thus, although Neuquén at the end of the 1990s had a level of urbanization comparable, by at least one measure, to the rest of Argentina, it was a traditionally rural province that had experienced decades of rapid urbanization, resulting in the growth of shantytowns. Its relatively low level of urbanization prior to the 1990s, together with its rapid pace of urbanization after 1960, again posed more challenges than advantages for mortality reduction in the province.

Literacy and schooling, particularly of women, is usually associated with lower infant and child mortality rates, as well as with longer life expectancies, better child health and nutrition, and lower fertility (Caldwell 1984: 187-191; Hill and King 1993, Schultz 1993: 68-78; Murthi, Guio, and Drèze 1995). In the 1990s, Neuquén was below the national average on all major indicators of educational attainment. Combined primary, secondary, and university enrollment was lower in Neuquén than in the country as a whole, 76.9 vs. 79.0 percent (UNDP-Argentina 1999). Illiteracy in the over-15 population was 6 percent in Neuquén, compared to 4

percent in the country as a whole; among 15-to-24 year-olds it was 2.1 percent, compared to 1.7 percent in Argentina. In 1998, the share of the over-15 population with rudimentary or no education was higher in Neuquén (14.8 percent) than in the country (12.3 percent), and the share of women in this condition was slightly higher than the share of men. In 1991, the proportion of women over the age of 25 with less than a complete primary education, 32 percent, was higher than the national average of 28 percent. Grade repetition in both primary and secondary schools was also above the national average in Neuquén (Neuquén. SS/MDS 2000b 7, 11 T. 8, 9, 10). Neuquén's relatively low level of educational attainment makes it more surprising, not less, that the province has done relatively well at the reduction of premature mortality.

Of all the socioeconomic variables considered in the present analysis, per capita product is the only one on which Neuquén did better than Argentina as a whole. In 1994, Neuquén's gross provincial product per capita was 3.6 percent higher than Argentina's gross national product per capita (\$10,674 vs. \$10,300 parity purchasing power US dollars) (UNDP-Argentina 1999). Moreover, Neuquén's rate of economic growth was faster than that of the country as a whole, especially during the period when infant mortality plunged. From 1970 to 1982, Neuquén's gross provincial product grew at an annual average of 10.7 percent, compared to 1.0 percent for Argentina's gross national product. Because of rapid population growth, per capita provincial product grew more slowly (5.7 percent per annum), but still far faster than in Argentina as a whole (0.8 percent) (Gómez Fuentealba 1992: 10). This growth was based partly on the expansion of tourism and fruit production, but more important was the national government's investment in oil extraction and hydroelectric dams. The state petroleum corporation, YPF, alone produced 15 percent of the gross provincial product during the 1970s, while construction projects funded by the national government (particularly hydroelectric facilities) produced a large but varying share, from 24 percent in 1971 to 5 percent in 1979 (Palermo 1988: 117 n. 8).

Neuquén's higher-than-average per capita output probably contributed to its lower-than-average infant mortality rate, and its faster-than-average pace of economic growth probably contributed to its faster-than-average pace of infant mortality reduction. Such contributions do not, however, undermine the claim that primary health care was crucial to the province's infant mortality decline. Economic growth can reduce infant mortality in at least two ways: by raising the private incomes of the poor; or by increasing the resources for public health care (Anand and Ravallion 1993). If the former mechanism had been crucial, Neuquén's nutrition and housing indicators should have risen more than they did. Among plausible immediate inputs to lower infant mortality rates, nutrition and housing indicators were the ones most likely to respond to increases in private income, because other such inputs (e.g., health care, education, and basic infrastructure) were mostly publicly provided. Hence, if economic growth had reduced infant mortality primarily by raising the private incomes of the poor, nutrition and housing indicators should have risen above the national average during the period when infant mortality fell below the national average.

Annual time series for nutrition and housing indicators are unavailable for the 1970s, but some tentative conclusions can be reached by comparing the nutritional and housing status of Neuquinos to that of other Argentines at the end of the decade. In 1980, by which time Neuquén's infant mortality rate was slightly lower than Argentina's, 17 percent of Neuquén's households included more than three persons per room, compared to 9 percent in Argentina; 11 percent occupied precarious dwellings, compared to 9 percent in Argentina, and 8 percent lacked any type of sanitary facility, compared to 5 percent in Argentina (Argentina. INDEC 1984: 21). Meanwhile, 33 percent of Neuquinos suffered from insufficient food, a proportion higher than the national average (Sawers 1996: 279). Despite continuing to suffer more housing and food deprivation than the country as a whole, however, Neuquén between 1970 and 1998 reduced its infant mortality rate from about 75 percent above to about 25 percent below the national rate (Figure 1).

The Argentine government calls a household "structurally impoverished" if it has any one of four deficiencies: more than three persons per room, poor construction materials, no indoor toilet, or at least one 6 to 12 year-old child not attending school (Argentina. INDEC 1984: 11-13; Wiens 1998: 6). In 1991, the share of Neuquén's households with such unsatisfied basic needs (21.4 percent) was higher than Argentina's (19.9 percent) (Verdejo 1998). In 1990, the proportion of preschooler households with unsatisfied basic needs was 49 percent in Neuquén, versus 40 percent in Argentina (Stillwaggon 1998: 210). If an increase in the private incomes of the poor had been the main impetus for mortality reduction, one would have expected better performance on housing and food intake.

Income inequality may have reduced the effect of economic growth on the incomes of the poor. No reliable country-wide income distribution figures have been gathered in Argentina since 1961 (Altmir 1986: 524; Deininger and Squire 1998), but the Instituto Nacional de Estadística y Censos periodically surveys income levels and distribution in Argentina's major metropolitan areas. A 1994 survey of the metropolitan area of the city of Neuquén, which had 47 percent of the province's population, produced a Gini coefficient of .48, second highest among 26 major metropolitan areas (Montoya and Mitnik 1995: 11). In 1997, the income ratio of the richest to poorest 20 percent in the Neuquén metropolitan area was 12:1, compared to 11:1 for Argentina's 28 largest metropolitan areas combined (Neuquén. SS/MDS 2000b 11: T. 13). Hence, any advantage Neuquén derived from its faster-than-average economic growth and, as of 1994, slightly higher-than-average per capita product was partly offset by its unusually skewed income distribution, as well as by its high fertility rates, low level of female education, high rates of food and housing deprivation, high degree of ethnolinguistic division, and initially low but rapidly rising level of urbanization.

#### **4. The Provincial Health Plan of 1970**

Since the mid-1940s, when Juan Perón became president, Argentina's health care system has consisted of a private sector, a contributory social insurance sector, and a public sector. The private sector is financed by consumers who enroll in pre-paid insurance plans or pay directly for health services. The contributory social insurance sector involves the obras sociales, health care funds financed by mandatory payroll taxes paid by workers and employers. The great majority of these funds were controlled by labor union leaders in the latter part of the twentieth century. The public sector is financed out of general revenues. In the late 1990s, 7 percent of Argentina's population was covered by private insurance; another 47 percent belonged to obras sociales; and 46 percent depended exclusively on the public system (Castañeda, Beeharry, and Griffin 2000: 256). Among the poorest income quintile, however, only 4 percent were covered by private insurance and only 29 percent belonged to an obra social; the remaining 67 percent of the depended entirely on the public system (World Bank 2000: 126-27). How the public system allocates its funds, and how efficiently it spends them, is thus important to the health status of Argentina's poor.

The public health care system in Argentina is largely in the hands of its 23 provinces and Federal Capital. The 1853 constitution gave jurisdiction over public health care activities to the provinces, but the central government invested heavily in public hospitals during Perón's presidency (1946-1955), and in 1970 the provincial level accounted for only 51 percent of public health spending. In the 1970s and 1980s, however, most public hospitals were shifted from national to provincial jurisdiction, and by 1986 the provinces accounted for 72 percent of health spending, 74 percent by 1994 (PAHO 1990: Vol. 2, p. 22; Belmartino 2000). The national government in the 1990s remained responsible for most of the country's research, training, and long-term care, but short-term care and preventive initiatives came mostly from the provinces and, in some cases, municipalities.

Neuquén's Provincial Health Plan, implemented in 1970 and sustained through the end of the century, represented an energetic effort by a provincial government to deliver primary health

care to the poor. The goals of the Plan were to monitor the health of school children, to raise the proportion of births attended by trained personnel, to provide checkups and nutritional aid to expectant mothers and young children, to administer vaccinations, to detect, control, and treat tuberculosis and tapeworm infections, and to educate people about health and hygiene (Neuquén. Ministerio de Salud Pública 1990: 32-33; Leonfanti and Chiesa 1988: 64). A key provision of the plan -- strongly resisted by the local doctor's guild -- was a requirement that doctors employed in the public sector not engage in private practice as well. This provision went against the customary regime, whereby doctors would spend the morning treating patients in public hospitals and clinics, and the afternoon treating fee-paying customers in an office or at home (Gorosito and Heller 1993: 92-93).

The provincial government devoted substantial new resources to achieving these goals. Data are unavailable for 1967 to 1969, but real public health spending, after dropping to 91 percent of its 1961 level in 1966, soared to 254 percent of that level in 1970, 391 percent in 1971, and 444 percent in 1972 (Neuquén. Ministerio de Salud Pública 1990: 23). From 1970 to 1975, the number of employees of the provincial health subsecretariat rose from 550 to 1427; the number of nursing personnel rose from 250 to 422, and the number of medical consultations rose from 203,000 to 411,000 (Moreno 1979: 152-54). Between 1970 and 1982, expressed as a ratio per 10,000 population, the number of doctors rose from 6 to 12, the number of nurses from 16 to 21, and the number of health care personnel from 44 to 70. Meanwhile, the proportion of pregnant women receiving care from a physician doubled to 55 percent, the proportion of births taking place in the home fell from 27 to 6 percent, and the proportion of under-two children receiving checkups rose from 51 to 68 percent (Leonfanti and Chiesa 1988: 65-66).

In 1974, in conjunction with the Provincial Health Plan, the largest hospital in the city of Neuquén invited health professionals around the country to participate in a 30-month training course devoted to rural health care. By 1986 the program had graduated 84 physicians, nearly a quarter of the province's total. On graduation, these doctors were guaranteed a job in a rural

hospital or clinic. One rural facility in Aluminé, a sparsely-populated district in the Andean foothills, had four doctors, three of whom had graduated from the provincial training program, as well as a full-time dentist and nurse. Serving about 4,500 people in a region of 4,500 square kilometers, the facility had an ambulance and a radio with which to contact a hospital in the provincial capital, permitting an airplane to be called in for emergencies. The doctors in Aluminé kept a regular schedule of home visits for well-child care, maintained excellent written records, had good career advancement prospects, and were paid well enough to discourage them from seeking other employment (Hale 1988: 18; Leonfanti and Chiesa 1988: 65-66). The provincial government also set up an educational program for nursing personnel, providing scholarships and work-study courses. As a result of this program, the proportion of nursing personnel without formal training fell from 85 percent in 1970 to zero in 1985 (Gorosito and Heller 1993: 80).

The Provincial Health Plan of 1970 was designed to improve the health status of poor Neuquinos, and the evidence suggests that it did so. The inauguration of the Plan coincided with a sharp rise in public health spending, the number of health personnel, and the use of health services, and with a sharp decline in infant mortality and other health status indicators. The simultaneity of these outcomes, coupled with the fact that Neuquén did worse than Argentina as a whole on most of the socioeconomic and cultural variables thought to be conducive to low infant and child mortality, suggest that primary health care made a significant contribution to the reduction of premature mortality in the province. The next question to be addressed is why Neuquén, unlike other Argentine provinces, introduced and sustained a comprehensive primary health care program in the first place.

## **5. Forces Behind the Provincial Health Plan of 1970**

In the late 1960s and early 1970s, primary health care initiatives were tried in a number of Argentine provinces, including Jujuy, Rio Negro, and Misiones. The effort in Jujuy under Dr. Carlos Alvarado was much narrower in scope than Neuquén's, however (Perrone 2000). The Rio



Negro initiative was cut short by the 1976 coup, and the primary health care plan in Misiones was undermined in part by the resistance of the local doctors' guild (Palermo 1988: 120 n. 1). Neuquén, by contrast, had a combination of factors propitious for the success of such an initiative. Foremost among these factors was the popularity of a provincial party, the Movimiento Popular Neuquino (MPN), that was known both for administrative competence and a commitment to social justice. Heavy public investment in energy-related projects contributed to rapid economic growth, expanding the resources available for investment in public health. A big strike at one such facility, the hydroelectric works under construction at El Chocón, contributed in early 1970 to political changes that proved important to the introduction of the Provincial Health Plan. The newness of Neuquén as a political entity made the local doctors' guild and other interest groups relatively weak, increasing the MPN's room to maneuver. The province's geographic isolation and relatively small population softened the impact on the provincial administration of political tumult at the national level, and made it easier for MPN to maintain cohesion and continuity.

From June 1966 to May 1973, Argentina was ruled by a military regime, and the province of Neuquén was governed by military-appointed trustees. Neuquén's Provincial Health Plan was enacted in April 1970, right in the middle of this period. Given this timing, any argument that democracy contributed to the plan gets off to a rough start. It can be argued nonetheless that popular pressure and political party competition contributed to the enactment and maintenance of the plan, and that expectations, expertise, and health care infrastructure built up during a period of competitive politics from 1963 to 1966 contributed to the plan's effectiveness. Neuquén can thus be added to a list of other cases -- including Sri Lanka, Costa Rica, and the Indian State of Kerala -- in which democracy apparently contributed to the enactment of comprehensive primary health care initiatives, and in which such initiatives apparently contributed to a rapid decline of infant mortality.

At the time that the Provincial Health Plan was launched, Argentina's military president, General Juan Carlos Onganía, had just appointed Felipe Sapag, the leader of the Movimiento Popular Neuquino (MPN), as the governor of Neuquén. The MPN, created in 1961, was a neo-Peronist party. Such parties gave broad approval to the doctrines and policies that Perón had promoted during his 1946-1955 presidency, but rejected the guidance or supervision of the former president, who spent 1955 to 1973 in exile, mostly in Madrid. Whereas "orthodox" Peronism -- which did take orders from Perón -- was banned from taking part in elections between 1955 and 1973, many neo-Peronist parties were able to evade proscription by distancing themselves from Perón, and were given particular freedom to operate if they confined their activities to interior provinces, or if they seemed likely to divide the Peronist vote (Arias and García Heras 1993; McGuire 1997: Ch. 4).

Onganía appointed Sapag primarily as a defensive measure. In the wake of the Cordobazo, an uprising in May 1969 in the city of Córdoba that shattered the image of order and stability that Onganía had carefully cultivated, the military government began a search for allies (Brennan 1994; O'Donnell 1988: 158-160; Smith 1989: 128-33). Several months later a major strike broke out in Neuquén itself, involving thousands of construction workers building hydroelectric facilities on the Limay river at El Chocón. In an attempt to resolve the conflict, Onganía offered the governorship to Felipe Sapag, the province's most popular politician. Reportedly, Sapag worried that accepting Onganía's offer would end his political career, but he agreed to assume the office, partly because he felt an obligation to try to resolve the strike, and partly because he saw an opportunity to demand that the electricity produced at El Chocón contribute to the development of Patagonia, rather than being transmitted exclusively to the Buenos Aires metropolitan area, as had originally been planned (Palermo 1988: 25, 111 n. 4; Mansilla 1983: 50, Gorosito 2000). Onganía turned to Sapag not only because of the former governor's popularity, but also because Sapag and the other MPN leaders, despite having been ousted in the 1966 coup, remained on fairly good terms with the military authorities. Like

Onganía and his allies, Sapag and his collaborators held technical planning and efficiency in high esteem. The "profile of technobureaucratic efficiency" projected by the MPN from 1963 to 1966 helped to make Felipe Sapag the only leader connected to Peronism to be appointed to a governorship during the strongly anti-Peronist 1966-1973 military regime (Palermo 1988: 25).

What distinguished Sapag and his allies from Onganía and his collaborators was, above all, a commitment to policies immediately beneficial to the poor. The MPN is well to the left of Argentina's other provincial parties, most of which are quite conservative (Palermo 1988: 42-43). The commitment of the MPN's leaders to social justice derived in part from the party's roots in the Peronist movement, but it also reflected Sapag's long personal advocacy on behalf of the disadvantaged. Together with his brothers Elías and Amado, Felipe Sapag entered political life in the 1930s in the town of Cutral-Có in eastern Neuquén. Their father had operated a small business founded by his own father, who had moved to the province from Lebanon in 1909 (Bucciarelli, González, and Scuri 1993: 415 n. 8). In the mid-1930s, the Sapag brothers became involved in a neighborhood group that lobbied the state petroleum company YPF to supply water, electricity, education, and other services to their largely impoverished community, which grew up around the area's petroleum industry.

After Perón became president in 1946, the Sapag brothers joined the Peronist movement, and in 1952 Felipe Sapag became the president of the municipal council of the town of Cutral-Có, where he continued to lobby the national government to supply the town with basic infrastructure (no provincial government existed until June 1955, when the territory of Neuquén became a province). Sapag's success at this endeavor won him widespread popular support, and foreshadowed his later concern with planning and public works for the poor (Palacios and Paris 1993: 320-331). In 1960, Sapag reportedly provided funds out of his own pocket to support to railway workers who went on strike for forty-two days against the Frondizi government. Such acts of generosity earned Sapag the nickname "Felipe the Good" (Mansilla 1983: 48).

With "orthodox" Peronism banned from taking part in elections, Sapag and his newly-created MPN won the governorship of Neuquén in March 1962, but a military coup two weeks later prevented him from taking office. When new elections were held in July 1963, again with orthodox Peronism proscribed, Sapag won overwhelmingly, and served as the province's elected governor from October 1963 until June 1966, when he was ousted in the coup that installed Onganía. During this period, Elías Sapag served as a national senator from Neuquén, and Amado Sapag served as mayor of Zapala, the province's third-largest city (Mansilla 1983: 49). Under Felipe Sapag's 1963-1966 governorship, the provincial public health agency began to put more emphasis on primary care and preventive medicine. It built and restored health facilities, created centers for the care of mothers and infants, implemented vaccination campaigns, and expanded nutrition programs (Bucciarelli, González, and Scuri 1993: 359). Hospital beds per 1000 increased from 3.0 in 1963 to 5.3 in 1966 (Neuquén. Consejo de Planificación 1968b), and nutritional aid to mothers and infants also rose. Between 1964 and 1965, Sapag's two full years as elected governor, persons employed by health centers rose from 288 to 383, and health spending rose by 50 percent. The year 1965 "marked a point of inflection at which public health activities began to be emphasized" (Neuquén. Ministerio de Salud Pública 1990: 21, 23). The expansion of primary health care under the competitive (but not fully democratic) political regime from 1963 to 1966 created infrastructure, expertise, and expectations that contributed to the initiation and effectiveness of the Provincial Health Plan of 1970.

Partisan competition for the votes of the poor probably did not serve as a major incentive for the health initiatives of the early 1960s. With orthodox Peronism proscribed, the MPN established electoral hegemony in 1963, winning three times as many votes for the governorship as the second-place party (Bucciarelli, González, and Scuri 1993: 420 n. 83). Partisan competition may have done more, however, to encourage the MPN to expand its initiatives in the early 1970s. In 1972, the military government lifted the ban on the "orthodox" Peronist Partido Justicialista (PJ) and allowed it to campaign for major executive offices, including the

presidency, in elections scheduled for March 1973. With this decision, intense competition, including occasional acts of violence, erupted between the MPN and the provincial branch of the PJ. Whereas the provincial PJ accused Sapag and his allies of betraying Perón by collaborating with the military government, the MPN leaders reminded voters of their economic and social achievements and accused the provincial PJ of subordinating the needs of the province to those of the national Peronist leadership. One of the ways in which the MPN appealed for votes in the March 1973 election was by highlighting its achievements in medical care (Bucciarelli, González, and Scuri 1993: 377-378; Mansilla 1983: 52-53). It is not clear how much such appeals contributed, but the MPN won. Of 65,000 votes cast for governor in the March 1973 election, the MPN won 30,000 and the provincial PJ won 21,000 (Palermo 1988: 133). After Sapag took office in May 1973, the Provincial Health Plan expanded in scope and coverage (Moreno 1979).

Popular pressure, particularly the strike at El Chocón that led Onganía to appoint Sapag governor in 1970, and adversarial politics, notably competition between the MPN and the PJ in the 1973 election campaign, thus do seem to have contributed impetus to the primary health care initiatives in Neuquén. Also important, however, was the province's political culture, which was characterized by pragmatism, an emphasis on personal relations, and high expectations of the state (Alvarado, Busqueta, and Gingins 1993: 367). Moreover, the political left had stronger influence in Neuquén than in most Argentine provinces. Sectors of the provincial union movement, notably the construction workers, were to the left of their national counterparts. The Catholic Church in Neuquén was among the most progressive in the country. Liberation theology influenced Neuquén's neighborhood associations, indigenous communities, and human rights movement, and Jaime de Nevares, the province's bishop, was one of a handful of top clerics to speak out forcefully against the human rights abuses of the 1976-1983 military regime. Neuquén's PJ was among the first of the party's provincial branches to support "renewal" Peronism in the mid-1980s, which challenged the more conservative "orthodox" branch of the

movement after a Peronist candidate unexpectedly lost the 1983 presidential election to the Radical Party's Raúl Alfonsín (Palermo 1988: 42-43). Two of Felipe Sapag's sons "disappeared" during the 1976-1983 military regime (Currihuinca and Roux 1984: 269 n. 385).

Popular pressure, adversarial politics, a pragmatic political culture, and the strength of the left all gave impetus to the Provincial Health Plan of 1970. Facilitating the effective operation of the plan was the province's rapid economic growth, which, as noted in the previous section, permitted a rapid rise in public spending on health care. Other factors that permitted the plan to operate effectively were the concentration of authority in the provincial executive (Bucciarelli, González, and Scuri 1993: 357) and the newness of the province as a political entity (Palermo 1988). The dominance of the executive over the legislature limited the points of access available to pressure groups, which can resist as well as promote the delivery of primary health care to the poor. Such pressure groups as did emerge were comparatively weak, moreover. The local doctors' guild (*colegio médico*) failed in its efforts to block the Provincial Health Plan's requirement that doctors employed by the public sector dedicate themselves exclusively to that sector, forgoing private practice of any sort. More broadly, Neuquén never developed "a critical mass of economic interests capable of sustaining a conservative ideological nucleus distinct from and independent of political-statal logic of the Movimiento Popular Neuquino" (Palermo 1988: 120 n.1).

## **6. Conclusion**

The expansion of capabilities, our ability to live the lives we choose, is among the most important ends that humans can seek (Sen 1985, 1999; Nussbaum 2000). Among these capabilities, those related to physical survival, as reflected in life expectancy and infant mortality rates, are particularly important. Survival is necessary for the exercise of any capability, and premature mortality indicators like life expectancy and infant survival measure indirectly the degree to which a society is meeting the most basic needs of its inhabitants. A society's failure to

meet these basic needs not only increases the risk of early death; it also constricts the capabilities of those who survive. Because life expectancy and infant mortality are such important indicators of development, it is important to analyze how well they are measured, to observe how they change over time, to study how they differ across geographical units, to identify the contextual factors and public policies that influence their levels and rates of change, and to examine the social and political conditions that contribute to the implementation of such policies. The task of this article has been to undertake such an analysis for the Patagonian province of Neuquén, Argentina.

Vital registration statistics in Neuquén are reasonably complete and accurate, and those in Argentina produce estimates of infant mortality close to those obtained from census and survey data. According to these statistics, infant mortality fell much faster in Neuquén than in Argentina as a whole from 1970 to 1998. In 1970 Neuquén's infant mortality rate was third-highest in the country, about 75 percent above the national average; by 1998 it was third-lowest in the country, about 25 percent below the national average. By 1999 it had declined to 12 per 1000, the same rate as in Costa Rica. Neuquén achieved this impressive reduction of infant mortality, as well as a rapid decline in child and adult mortality, despite relatively high levels of fertility, ethnolinguistic fractionalization, and income inequality, and despite relatively low levels of urbanization and female education. Per capita economic growth was somewhat faster in Neuquén than in other Argentine provinces, and per capita economic output in 1994 was about four percent higher than in the rest of the country. Despite this good performance on output, nutrition and housing conditions remained worse in Neuquén than in the country as a whole, in part because of Neuquén's high level of income inequality, which may have been associated in turn with the capital-intensive character of a growth process led by heavy central government investment in petroleum extraction, hydroelectric power, geothermal energy, and heavy water production.

Neuquén's economic growth did provide additional resources for public health care. After 1970, when the Provincial Health Plan was introduced, public health spending skyrocketed, the number of public health personnel tripled, the use of health services soared, and infant mortality plunged. These improvements in public health services, which resulted in part from popular pressure (the strike at El Chocón), set in motion a series of political changes that led to the Plan's implementation. In late 1972 and early 1973, the province's civilian governor, Felipe Sapag of the Movimiento Popular Neuquino, made the successes of the Provincial Health Plan a centerpiece of his electoral campaign. Sapag won, and after he took office in May 1973, primary health care services expanded further and the infant mortality rate continued to decline rapidly. The little-known case of Neuquén thus supports the proposition, advanced by Jean Drèze and Amartya Sen (1989), that public action and adversarial politics can make critical contributions to policies aimed at meeting the basic needs of the poorest sectors of the population. It also underscores the importance of continued research into the possibility that primary health care can promote the rapid decline of premature mortality.

It has long been recognized that the state of Kerala, India, has made exceptional progress on mortality decline relative to other Indian states (Franke and Chasin 1989; Ramachandran 2000). Considerable attention has been given more recently to the notable development achievements of the state of Ceará in the generally impoverished region of Northeast Brazil (Tendler 1997; Cufino Svitone et al. 2000). A goal of this article has been to draw similar attention to the Argentine province of Neuquén. Such subnational comparisons provide useful complements to cross-national comparisons by reducing contextual variation, thereby permitting a sharper focus on the variables of interest. Moreover, if development indicators are available for one state or province, they are usually available for all of them, so subnational comparisons usually suffer less than cross-national analyses from problems of missing and incomparable data.

Subnational comparisons also involve distinctive complexities. In particular, most types of comparison assume that the units being compared are independent of one another. As world-



system and dependency analysts noted two decades ago, and as theorists of globalization emphasize today, this assumption -- dubious enough when one compares countries to one another -- gets even more dubious when one compares subnational units within a country. Subnational units, as Kurt Weyland has pointed out (McGuire and Campos 1997: 16), are generally more interdependent and interactive than national units. All comparisons have distinctive strengths and weaknesses, however, so the more diverse the types undertaken, the greater the chances of uncovering useful development lessons. It is in this spirit that the province of Neuquén has been compared here to other Argentine provinces, and highlighted as an instructive "model" of development.

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**Table 1**  
**Survival-Related Indicators**  
**in Argentina, Brazil, Chile, and Costa Rica, 1960 and 1990s**

	Infant mortality			Under-5 mortality			15-60 mortality			Life expectancy		
	1960	1995	Chg	1960	1995	Chg	1960	1990	Chg	1960	1997	Chg
Argentina	60	23	61%	72	25	65%	177	139	21%	64.9	72.9	40%
Brazil	115	41	64%	177	48	72%	259	164	37%	54.7	66.8	40%
<b>All LAC</b>	<b>96</b>	<b>31</b>	<b>68%</b>	<b>143</b>	<b>39</b>	<b>73%</b>	<b>270</b>	<b>164</b>	<b>39%</b>	<b>56.3</b>	<b>70.2</b>	<b>48%</b>
Chile	118	11	91%	155	12	92%	198	130	34%	57.1	74.9	64%
Costa Rica	87	12	86%	123	14	89%	225	98	57%	61.6	76.0	62%

#### Definitions, Notes, and Sources

Infant mortality: Infant deaths per 1000 live births. Hill et al. 1999.

Under-5 mortality: Under-5 deaths per 1000 live births. Hill et al. 1999.

15-60 mortality: Probability of dying between ages 15 and 60 per 1000 persons reaching age 15. Wang et al. 1999. Figure for each country is the simple mean of separate figures for males and females, unweighted for the exact proportion of each gender in each population.

Life expectancy: Life expectancy at birth. UNDP 1996: 148-149; UNDP 1999: 168-171.

Chg. Percent change. The percent change or "reduction of shortfall" indicator is a standard way to correct for floor and ceiling effects, whereby absolute improvement must tail off as a maximum or minimum is approached (Sen 1981: 292, UNDP 1994: 90-96, Dasgupta 1993: 117). For infant mortality, the percent reduction indicator measures the proportion of distance each country had travelled by 1995 from its 1960 infant mortality rate to a stipulated minimum, set here at 0 infant deaths per 1000 live births. For infant mortality, under-5 mortality, and 15-60 mortality, the stipulated minimum is 0; for life expectancy, the stipulated maximum is 85 years.

All LAC: All Latin American and Caribbean countries for which data are available. For infant mortality and under-5 mortality, these are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela. For 15-60 mortality, they are Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Suriname, Trinidad and Tobago, Uruguay, and Venezuela. For life expectancy they are Argentina, Bahamas, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.

**Table 2**  
**Mortality Underregistration in the Americas**

	1986	1990	1996
Argentina	9.3	8.1	4.4
Brazil	25.3	27.8	19.0
Chile	12.5	9.4	0.1
Colombia	36.4	21.7	16.4
Costa Rica	5.0	5.0	0.1
Mexico	15.5	14.3	7.2
Peru	53.3	52.9	47.0
Uruguay	25.3	3.9	2.1
Venezuela	18.5	18.9	3.7
USA	1.0	1.1	2.8

Definition: "The lack of registry of a vital event, even late, is called underregistration. Underregistration of mortality is the ratio of all deaths not registered to total estimated deaths, expressed as a percentage" (PAHO 1999, Country Health Profile for Argentina).

Sources: 1986 data: PAHO 1990: Vol. 1, 37 (Brazil figure is for an "information area" within the country; Peru figure for 1983; Colombia figure for 1984; Chile, USA, and Venezuela figures for 1987, Costa Rica figure for 1988). 1990 data: PAHO 1994: 433 (Brazil figure for 1987; Argentina, Chile, Peru, and Venezuela figures for 1989). 1996 data from PAHO 1999 (Brazil and Venezuela figures for 1995).



**Table 4**  
**Estimates of Infant Mortality in Neuquén, 1960-1999**

Source	Neuquén. SS/MDS 2000a	Argentina. MSPyMA 1983: 67-93	Neuquén. Min. de Salud Pub. 1990: 13-15	Gorosito and Heller 1993: 75	Mychaszula & Acosta 1990	Verdejo 1998	Argentina.M SyAS 2000	Gore 2000
Data	Vital Reg. (Provincial)	Vital Reg. (National)	Vital Reg. (Provincial)	Vital Reg. ?	Vital Reg. (Provincial)	Unknown	Vital Reg. (National)	Vital Reg. (National)
Note	10	11	12	13	14	15	16	17
1960	117.9	117.9	165.3					
1961	120.2	120.2	160.1					
1962	101.4	101.4	124.0					
1963	114.2	114.2	152.3					
1964	113.0	113.0	160.3					
1965	103.7	103.7	125.2					
1966	92.3	92.3						
1967	94.5	94.5						
1968	110.1	110.1						
1969	85.5	85.5	97.1					
1970	108.4	102.1	108.4	108.4				
1971	69.7		69.7					
1972	74.3		74.3					
1973	61.7		61.7					
1974	56.5							
1975	42.7			42.3				
1976	44.0				45.3			
1977	41.2				42.3			
1978	39.9				38.0			
1979	29.0				30.1			
1980	32.5			34.9	31.8			
1981	31.6				30.4			
1982	28.9							
1983	27.0							
1984	32.6							
1985	26.4			26.4				
1986	27.4							
1987	23.6					22.9		
1988	22.1			22.2				
1989	18.0							
1990	18.6					18.1		
1991	17.3						15.6	
1992	18.1						16.2	
1993	18.2					15.9	16.2	
1994	15.6						15.3	
1995	14.1						14.1	
1996	15.1						15.7	
1997	13.0							
1998	14.4							
1999	11.7							12.4

### Notes to Tables 3 and 4

1. Based on vital registration statistics. Data kindly provided by Fernando Gore, Subsecretario de Salud, Provincia del Neuquén. Figures for 1960 to 1970 identical to Argentina. MSPyMA 1983: 67-93. Figures for 1980 to 1995 identical to those calculated from United Nations 2000, which were kindly provided by Peter D. Johnson, International Programs Center, U.S. Census Bureau. Figures for 1960-1989 very close to those from government sources in United Nations (1992).
2. Original data from monographs on vital statistics in each province.
3. Estimates based on knotted regression line fitted to IMRs recorded in vital registries and estimated from national life tables, 1970 census, and 1991 census.
4. "Combines data from country sources (especially censuses and surveys) with the Census Bureau's International Programs Center's estimates and projections"
5. Based on national life tables. 1960 figure actually 1959-1961; 1970 figure actually 1969-1971; 1980 figure actually 1979-1981.
6. Based on 1970 census figures in Schkolnik (1975).
7. Based on data from the 1980 census that appear to be flawed, possibly because of high levels of non-response combined with computerized imputation (United Nations 1992: 34).
8. Original data: UN Economic Commission on Latin America. 1978 figure actually 1975-1980; 1983 figure actually 1980-85, 1993 figure actually 1990-1995. Lloyd-Sherlock 1997: 30.
9. Original data from Argentina, Instituto Nacional de Estadística y Censos.
10. Based on provincial vital registration statistics. Includes all infant deaths that occurred within Neuquén, including those of infants of non-resident mothers. Data kindly provided by Fernando Gore, Subsecretario de Salud, Pcia. del Neuquén, and Ana Carolina Herrero, Programa de Mortalidad y Envejecimiento, Facultad de Ciencias Económicas, Universidad de Córdoba.
11. Based on national vital registration statistics. Original source for 1960-1965 data: Argentina. Ministerio de Bienestar Social (1971): 22. Original source for 1969-1973 data: Subsecretaría de Salud Pública de la Provincia del Neuquén, Programación de Actividades, 1973.
12. Based on an older set of provincial vital registration statistics.
13. Original source: Ministerio de Salud Pública de la Provincia del Neuquén.
14. Original data from monographs on vital statistics in each province.
15. "1987" in table is actually 1986-88; "1990" is actually 1989-91, "1993" is actually 1992-94.
16. Based on national vital registration statistics.

17. National government IMR estimate for Neuquén for 1999 includes deaths of infants outside Neuquén if they are born to legal residents of Neuquén who were outside of the province at the time of birth. Unpublished data, Ministerio de Salud y Acción Social, República Argentina, reported in a personal communication from Fernando Gore, Subsecretario de Salud, Provincia del Neuquén, 29 November 2000.