

Letters to the Editor

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Declining Child Mortality Rates in Nicaragua

The January 1991 report by Sandiford et al.¹ on the causes of infant mortality decline is timely; their documentation of the rapid decline in Nicaragua has important policy implications. Unfortunately, some of the assumed correlates and putative causes of the decline suggested by Sandiford et al. appear incorrect. As they showed, infant mortality declined approximately 47% (from around 120 to 64 per 1000 live births) during the 12-year period 1974 to 1986. The authors argue that expanded access to primary health care was the main reason for the initiation of the accelerated mortality decline in the 1970s. Yet it is believed that by the end of the 1970s only about a quarter of the population had effective access to these services.² While about half of all services went to those covered by social security, only 16% of the population was eligible.^{3,4} Indeed, reported per capita

medical visits in the country actually declined during that decade.^{5,6} The increase in practitioner-to-population ratios described by the authors yielded an increase of 11% in doctors and 43% in nurses during a 14-year period, but this increase occurred almost entirely after 1978.⁵⁻⁸

The authors argued that primary care developed in the 1970s because of a decrease in access to hospital-based care. Indeed, the bed-to-population ratio declined steadily during the last two decades. However, this does not imply that the hospital sector had less impact or that primary care developed by default. Modernization and intensification of the hospital sector meant that a 45% decline in the bed-per-capita rate between 1970 and 1990 was associated with a remarkable 35% rise in the rate of hospitalizations.^{9,6,10}

Thus, the causes of the mortality decline in the 1970s are less than apparent. While expanded primary and secondary care are closely associated with the continued mortality decline in the 1980s, we must look elsewhere to explain the initiation of the decline in the 1960s and 1970s.

Sandiford et al. noted that income growth was much faster in the 1960s than in the 1970s. This does not necessarily mean that increased income had little impact on infant mortality decline in the 1970s, as they argue. Cross-national studies show that income and income changes sometimes have ambiguous or delayed impacts on health status.¹¹ Although latrine and water system expansion did not accompany the country's growing agricultural affluence, growing access to radios, television, and mechanized transport did.¹² Roads, electricity, and other infrastructure reached much of the country for the first time. Urbanization and paid employment for women increased rapidly. Although these changes resulted in part from unpopular policies forced upon the

populace, they may have improved the health of young children. Increased female employment and the information revolution generated by broadcast media may have led to improved utilization of existing food and other resources. Although rapid urbanization led to crowding, it meant that existing limited water and sanitation facilities in urban areas may have been used more intensively by the population. Slowly improving literacy probably accentuated the cumulative effects of these modernizing processes.¹³

Identifying the correlates of infant mortality decline is important. Even in the current era of severely limited resources in Nicaragua and many other developing countries, there are low-cost opportunities to further reduce infant and young child mortality.¹⁴ These include improved coordination of preventive and curative services, improved prescribing practices, expanded female education, and general health education of the public.¹⁵ □

Richard M. Garfield, RN, DrPH

Requests for reprints should be sent to Richard M. Garfield, RN, DrPH, Columbia University, 617 W 168th St, New York, NY 10032.

Notes

1. Sandiford P, Morales P, Gorter A, Coyle E, Smith GD. Why do child mortality rates fall? An analysis of the Nicaraguan experience. *Am J Public Health*. 1991;81:30-37.
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4. *INSS Memoria 1979*. Managua, Nicaragua: MINSA (Nicaraguan Ministry of Health); 1980.
5. Garfield R, Williams G. *Health Care in Nicaragua: Primary Care under Changing Regimes*. New York, NY: Oxford University Press Inc; 1992.

6. *Compendio Estadístico 1965-1974*. Managua, Nicaragua: Banco Central de Nicaragua; 1975.
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9. *Anuario Estadístico de Nicaragua*. Managua, Nicaragua: Government of Nicaragua; 1976.
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11. Grosse RN. Interrelation between health and population: observations derived from field experiences. *Soc Sci Med*. 1980;14c: 99-120.
12. See Wolfe BL, Behrman I. Determinants of child mortality, health, and nutrition in a developing country. *J Dev Econ*. 1982;11: 163-193.
13. See Caldwell JC. Routes to decreased mortality in poor countries. *Popul Dev Rev*. 1986;12(2):171-219.
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Sandiford and Colleagues Respond

It is understandable that Richard Garfield is skeptical of our suggestion that improved access to health care was the factor most likely to have brought about the sharp fall in child mortality that began in Nicaragua in the mid-1970s. It has proven remarkably difficult to demonstrate such an impact in most parts of the world¹ (although Costa Rica may be an exception²), and despite massive assistance from the United States Agency for International Development, it is generally felt that one of the reasons for the downfall of Somoza's regime was its lack of investment in social programs. Indeed, these were our own prejudices at the time that we embarked upon this work. In fact, it was only after carefully eliminating alternative hypotheses (including most of those put forward by Garfield) that we finally accepted the concept that improvements in child health, at least in recent decades, are not inevitably the outcome of interventions or developments external to the health sector.

Of course, Garfield's problem, like ours initially, is to find a more plausible explanation for Nicaragua's breakthrough in child mortality. He starts by suggesting that it may be a delayed effect of economic growth in the 1960s. The trouble with such explanations is that, unless there is a lag

period that can be justified a priori, it is not possible to explain any change on this basis. Nicaragua's last period of rapid economic growth ended in 1965.³ While it is true that the impact of income growth on health status may be delayed, it is difficult to see how the boom of the early 1960s was still improving infant mortality 13 or 14 years later. The same is true of transport, communications, electricity, and potable water supplies, whose growth and decline in supply closely matched that of the overall gross domestic product.³ Nor does urbanization account for the phenomenon. As our original article showed, the fall in mortality was apparently as rapid in rural as in urban areas and commenced at approximately the same time.

In contrast to the supply of energy, water, transport, and communications, the supply of government social services rose steeply in the 1970s and 1980s. This is in accord with our impression that the resources available to primary health care were increasing. That this spending was not entirely soaked up by expansion of hospital-based care is clear from the simultaneous increase in the number of health centers and decrease in the number of hospital beds per capita.

Some of Garfield's data should be viewed with caution. Particularly suspect are the data for the number of medical visits per capita. Not only are the figures different from those that we obtained from original sources in Nicaragua, but they also imply that each doctor in Nicaragua was seeing only about six patients per day. It is difficult to see how the number of visits almost tripled between 1978 and 1980 while the number of doctors in the country fell by almost 10%. Because all of these data depended upon the aggregation of statistics between different institutions, there was obviously plenty of scope for omission and overlap. In fact, the number of patients seen by doctors is probably not the most valid indicator of health care delivery, because it neglects the work of nurses and auxiliary nurses who were staffing most of the ambulatory care units in the country.

Regarding Garfield's assertion that only a quarter of the population had access to health care by the end of the 1970s, it should be pointed out that a single estimate gives no indication of whether coverage was improving or not. Using Garfield's own figures, the number of births in health institutions (in our opinion one of the better indicators of health service coverage) grew by an average of 6.0%

per year from 1974 to 1978 but "only" by 4.2% per year from 1980 to 1986.⁴(p224)

Given the limitations in the available information, any explanation for Nicaragua's interesting trend in child mortality must rely to some degree on speculation, based hopefully on sound theory. However, our study and Garfield's response to it do illustrate both the potential in and the pitfalls of analyzing and interpreting routinely collected health information. □

Peter Sandiford, MBChB, MSc, MMedSci
George Davey Smith, MB BChir, MA, MSc
Edward Coyle, MBChB

Requests for reprints should be sent to Peter Sandiford, MBChB, MSc, MMedSci, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA England.

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1. Department of International Economic and Social Affairs. *Mortality and Health Policy: Proceedings of the Expert Group on Mortality and Health Policy, Rome, 30 May to 3 June 1983*. New York, NY: United Nations; 1984. Document ST/ESA/SER.A/91.
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4. Garfield R, Williams G. *Health and Revolution: The Nicaraguan Experience*. Oxford, England: OXFAM; 1989.

Intimidation of CTR-Funded Scientists Claimed

The July 1991 Journal carried a Policy Forum discussion by Warner¹ and a paper by Cummings et al.² berating scientists whose work is supported by the Council for Tobacco Research (CTR) for unspecified ethical failures and claiming that the work of those scientists only serves to reinforce doubts in the public mind about the severity of hazards of smoking.

Like many others, my associates and I accept research grants from government, unions, and industry, including CTR. We reported results, with acknowledgments to special grants from CTR when appropriate, in more than a dozen leading public health, statistics, epidemiology, and other journals well known for the thoroughness of their reviews, including the *American Journal of Public Health*. Obviously, we had something to say that the reviewers and editors of these journals found worthy of publishing despite scarce journal space and despite acknowledgment to the source of funds.