

# Global child survival initiatives and their relevance to the Latin American and Caribbean Region

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## Suggested citation

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## ABSTRACT

*We review two series of papers published by The Lancet: the Child Survival Series (2003) and the Neonatal Survival Series (2005). Both series drew attention to the nearly 11 million annual deaths of children under the age of five years, and to the fact that almost 4 million of these deaths occur in the first month of life. We show that two thirds of these deaths could be prevented through universal coverage with existing, low-cost interventions that are failing to reach most children in the world. The series also highlighted the importance of reducing inequities both between and within countries. The relevance of these series to Latin America and the Caribbean is examined. Although substantial progress has been made in reducing mortality and improving coverage, two major challenges remain: how to improve the quality of health interventions, and how to reach the most disadvantaged children in the Latin American and Caribbean Region.*

## Key words

Child mortality; socioeconomic factors; Latin America.

In this commentary, we review two widely-publicized series of articles that appeared in *The Lancet* in 2003 (the Child Survival Series) and 2005 (the Neonatal Survival Series). We also review existing information on child mortality levels and trends in the Latin American and Caribbean Region. Because there may be major differences

between the latter Region and other parts of the developing world, it is important to examine how relevant the conclusions from these two series are to children in Latin America and the Caribbean.

Child survival was a clear global health priority in the 1980s and early 1990s. In 1982, the “Child Survival Revolution” (1) was launched by UNICEF with the support of other international organizations and national governments. A centerpiece of the UNICEF-led initiative was the GOBI strategy, which comprised four interventions for reducing mortality: growth monitoring, oral rehydration, breastfeeding and immunizations. At

the same time, the World Health Organization led major vertical programs in areas such as immunizations and the control of diarrhea and acute respiratory infections. Major increases in coverage were documented, particularly for vaccination and oral rehydration, and child mortality declined in many countries (2–4).

Currently, investments in child survival are much lower than two decades ago, for two possible reasons. First, the success of the Child Survival Revolution may have led to the erroneous impression that child mortality was under control. Also, scarce resources have been routed to other major health problems such as HIV/

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AIDS, malaria, tuberculosis, cardiovascular diseases and obesity in low- and middle-income countries. As a result, child survival currently receives limited attention in spite of the fact that over 10 million children under the age of five years die annually.

The fourth Millennium Development Goal (MDG) is to reduce the mortality of children under five years of age by two thirds between 1990 and 2015. Trends in many of the world's poor countries suggest that it will be hard, if not impossible, to meet this target due to slow rates of progress. In fact, most of the world's population lives in a country where under-five mortality decreased more slowly in the 1990s than it did in the 1980s (5).

### **The Lancet Child Survival Series, 2003**

The recognition that child survival had fallen off the global health agenda led to the establishment of an informal group of scientists and policy makers, the "Bellagio Child Survival Study Group." They published a series of five articles in *The Lancet* in mid-2003 calling the attention of the global community to the fact that the world was neglecting issues related to child health.

The first paper in the Lancet Child Survival Series (6) showed that 90% of the estimated 10.8 annual child deaths occurred in only 42 countries, including Brazil and Mexico. Three groups of causes were important in all countries: 40% of deaths were due to neonatal problems, and two diseases believed to be under control—pneumonia and diarrhea—still each accounted for about 20% of all deaths. Malaria, measles and HIV/AIDS were important causes of death in a few countries each. Around 40% of child deaths occurred in sub-Saharan Africa, and 35% in southern Asia.

The second article (7) identified 23 feasible and cost-effective interventions against the major causes of child mortality, and these interventions included breastfeeding and complementary feeding, oral rehydration therapy,

use of insecticide-treated materials, antibiotics and antimalarials. A simulation exercise showed that 63% of under-five deaths in these 42 countries could be prevented by achieving universal coverage with a small number of known measures. Despite the apparent success of the Child Survival Revolution, current global coverage levels for most of these interventions are still below 50%.

Authors of the third paper (8) argued that reaching universal coverage in most countries required changing how health interventions are delivered. Delivery channels should be adapted to the relative strength of a country's health-care system. Where health systems are weak—as in most high-mortality countries—relying on health facilities to scale up coverage rapidly will not suffice, and alternative strategies will need to be employed in the short term, without compromising the long-term goal of strengthening health systems. Countries will have to develop their own strategies, taking into account their epidemiologic profile and the feasibility of using different delivery channels.

The fourth paper (9) addressed equity. It showed that the mortality gap between rich and poor countries has been increasing, and that within-country gaps are also important—roughly 40% of child deaths could be prevented if all children in a country had the same mortality rate as the wealthiest 20% of the population. This paper argued that unless the special needs of the poorest were taken into account, child survival strategies would have limited success.

The final paper in the series (10) was a call to action highlighting four major needs: for global leadership in child survival, for strengthening national health systems, for increased resources from the international community, and for increased public awareness. The authors asked for a second Child Survival Revolution to complete this unfinished agenda and to meet the Millennium Development Goal for child survival, which requires a two-thirds reduction in under-five mortality between 1990 and 2015, a target that is

currently very difficult to achieve for most countries (5). Perhaps the most important contribution of the Child Survival Series was showing that 63% of the almost 11 million annual deaths of children under five could be prevented by universal coverage with simple, cost-effective interventions.

The series received wide attention in the press and has arguably led to renewed awareness of child survival. UNICEF named child survival as its number-one priority for 2004, WHO launched the 2005 World Health Report on Maternal and Child Health (11), and a new global initiative, the Partnership for Maternal, Neonatal and Child Health, is about to be launched in 2005. This new global association will be formed from three existing alliances: The Partnership for Safe Motherhood and Newborn Health (PSMNH) based at the World Health Organization in Geneva, the Healthy Newborn Partnership based at the Save the Children USA, and the Child Survival Partnership, with headquarters at UNICEF New York. The new partnership's main objective is to coordinate efforts for scaling up key child survival interventions in high-mortality countries, and to advocate for greater financial investments in maternal and child health.

### **The Lancet Neonatal Survival Series, 2005**

The first Lancet series identified eight interventions to prevent neonatal deaths, but also noted the lack of available information on the efficacy and effectiveness of several similar interventions. Although neonatal deaths are obviously a major and growing component of child mortality, it was widely felt that newborn children had low visibility and that neonatal mortality was ignored by many funding agencies (12). Inspired by this challenge, a separate group of researchers and policy makers prepared a new series of papers that were published recently (13–16).

The authors of the first paper in this series estimated that 38% of all deaths

among children under five years of age take place in the first four weeks, and that this proportion is increasing as post-neonatal deaths and those of one- to four-year-olds decrease. There are 4 million deaths per year, of which 99% occur in low- and middle-income countries, yet most research focuses on the 1% of deaths in rich countries. Countries in the most highly affected areas—Southcentral Asia and Sub-Saharan Africa—have made little progress in the past 10–15 years. Globally, the main direct causes of under-five mortality are preterm birth (28%), severe infections (26%), and asphyxia (23%). Neonatal tetanus causes 7% of all deaths, and low birthweight is an important indirect cause.

The second article (14) drew heavily upon a recent systematic review of the literature (17) that identified 16 efficacious interventions against neonatal deaths. These were combined into packages for scaling up health systems. The authors estimated that universal coverage of these interventions could avert an estimated 41%–72% of neonatal deaths worldwide. The proposed intrapartum and postnatal packages had similar effects on neonatal mortality, being two to three times as efficacious as the antenatal care package. Of the three packages, postnatal care was the most cost-effective. The possibility of delivering these packages through different service delivery modes (outreach, family-community, and facility-based clinical care) was explored. A combination of outreach and family-community care could avert 18%–37% of neonatal deaths, particularly in settings with high mortality and weak health systems; a major component of this strategy would be health education to improve home-care practices, to create a demand for skilled care, and to improve care-seeking.

But the mere availability of interventions is not sufficient. As the first Lancet series noted (8), the vast majority of children in low-income countries fail to receive proven interventions that have been available off-the-shelf for decades. The third neonatal survival paper (15) claimed that 70% of neonatal

deaths (almost 3 million per year) occurred because simple interventions did not reach those most in need. The authors argued that “to scale up neonatal care, two interlinked processes are required: a systematic, data-driven decision-making process, and a participatory, rights-based policy process.” In settings without strong clinical services, programs can start with family-community care and outreach services that integrate newborn care into existing programs such as safe motherhood or integrated management of childhood illness (IMCI).

The scaling up of clinical care is a major challenge, but without functioning health services it will not be possible to achieve full impact on neonatal and maternal survival. A phased approach to implementation can build momentum by reaching achievable targets early on, while building stronger health systems over the longer term. The authors also highlighted the need for special efforts to reach the poorest, and to set up monitoring systems for evaluating and refining strategies.

The first three papers in the Neonatal Series have closely followed the outline of the Child Survival Series—the first on epidemiology and causes of deaths, the second on available interventions, and the third on delivery challenges. In the original series, the fourth paper was on equity (9) but the Neonatal Series coordinators opted to address inequities within the whole series, rather than dedicating a specific paper to this topic. The fourth paper in the Neonatal Series, therefore, corresponds to the fifth in the Child Survival Series, and constitutes a call for action to reduce neonatal mortality. The authors stated that “countries should not wait to initiate action” and that “success is possible in low-income countries and without highly developed technology.” They estimated the running costs of the selected packages at 90% coverage in the 75 countries with the highest mortality rates to be US\$ 4.1 billion per year, in addition to current expenditures of US\$ 2.0 billion. Most of this expenditure would benefit not only newborns, but also mothers and older children. The paper

ended by calling upon international donors and leaders of developing countries, who should be held accountable for meeting their commitments and increasing resources.

## Relevance to Latin America and the Caribbean

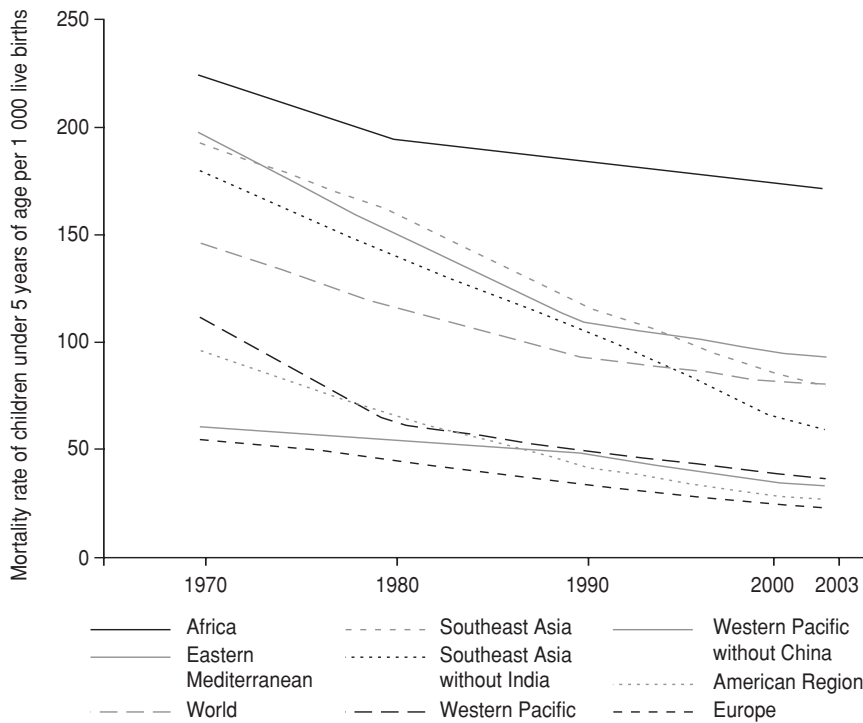
Both Lancet series received wide attention in the press and overall praise for the combination of scientific content with political engagement. A key message from the series (8) is that one-size-fits-all global strategies should be avoided, and child survival interventions should be tailored to mortality levels and cause distributions, as well as to the strengths of specific health services. Thus, it is necessary to interpret their findings and recommendations in the light of the current epidemiological and health systems realities in our Region.

Updated child mortality data were recently presented in the 2005 World Health Report (11). Death rates were estimated on the basis of vital registration, demographic surveys, or, in countries where these were unavailable or unreliable, statistically-modeled estimates. While each of these sources may have limitations for specific countries, it is unlikely that these measurement problems affect the overall patterns that are presented below.

Figure 1 shows time trends in the WHO Regions for under-five mortality (11). The American Region (including Canada and the United States) showed a sharp decline in the last three decades. There are currently 439 000 annual deaths among under-five children, of which 50 000 take place in Canada and the United States. The overall trend in the Latin American and Caribbean Region now places this Region in a position that is second only to Europe. Therefore, the messages on child survival from the Lancet series, which are addressed primarily to high-mortality countries, do not necessarily apply to this Region as a whole.

Nevertheless, the same report also showed that mortality rates varied

**FIGURE 1. Time trends in under-five mortality in different regions of the world, 1970–2003**



Source: Reference 11.

dramatically between countries within the Region (Table 1). Again, data issues may affect comparisons between countries and the validity of some of the estimates, but the large differentials are indisputable. Under-five mortality (deaths per 1 000 births) ranged from 6 in Canada, through 8 in Cuba, Chile and the United States, to 92 in Bolivia and 119 in Haiti. In about half of the countries, the majority of under-five deaths take place in the neonatal period. For reference purposes, the lowest under-five mortality rates in the world—3 per thousand—were reported by Iceland and Singapore, while Sweden, Norway and Finland had rates of 4 per thousand. Most countries in the Latin American and Caribbean Region showed rates that were at least five times as high as in these low-mortality countries. It is also not surprising that—just as in the world in general—countries with the highest mortality levels were those plagued by political instability.

The Lancet messages are particularly applicable to countries with high mortality rates. In addition to Bolivia and Haiti, the *World Health Report* also identified the Dominican Republic, Guatemala, Honduras, Nicaragua and Peru as having under-five mortality rates above 35 per thousand births.

Progress can be assessed by estimating the proportion of countries that are currently on track to achieve the child survival MDG of reducing under-five mortality by two thirds from 1990 to 2015. Most Regions in the world show insufficient progress towards reaching the MDG (Figure 2), although Latin America and the Caribbean are closer to the goal than most other regions in the less developed world. Nevertheless, only four in every ten inhabitants of Latin America and the Caribbean live in a country that is currently on track (5). In two out of three countries, the rate of progress in the 1990s was slower than in the 1980s—a finding that cannot be attributed to low cur-

rent mortality rates, because the rate of mortality decline in rich countries continues to be greater than in poor countries (5, 9). This highlights the need for further interventions in the Latin American and Caribbean Region.

The cause-specific mortality estimates presented in the first Lancet series (6) were recently updated by the World Health Organization (18). Because registration-based statistics on causes of death are often unreliable, the results presented in Figure 3 rely on a variety of sources including verbal autopsy surveys. Compared to the world as a whole, relatively more deaths in the Latin American and Caribbean Region are due to neonatal causes, which is typical of countries where a demographic transition is underway. The findings of the second Lancet series are therefore particularly relevant. However, diarrhea and pneumonia still account for a sizable proportion of deaths in this Region. Malaria causes a small number of under-five deaths, and measles has been all but eradicated in most countries. In summary, although under-five mortality in this Region is lower than in most other regions, there are large inequities between countries, and causes of death that are completely avoidable—such as diarrhea or pneumonia—still account for a sizable proportion of child mortality.

The Lancet series documented low levels of population coverage with child survival interventions. The quality and timeliness of coverage data vary widely between countries and the data are sufficient to allow international comparisons for only a few interventions. Figure 4 shows how Latin America and the Caribbean compared to other parts of the world, based on a few indicators compiled by the World Bank (19). Except for exclusive breastfeeding—a complex behavior influenced by several factors outside the health sector—coverage levels in Latin America and the Caribbean were around 80% for diphtheria, pertussis and tetanus (DPT3) immunization, safe deliveries and antenatal care (one or more visits). Although there was still room for progress, overall coverage was well above that ob-

**TABLE 1. Under-five mortality rates (per 1000) by age according to latest available data from surveys and vital registration records**

Country	Year or period	Source	Neonatal	Post-neonatal	Infant	12–23 months	24–59 months	Under 5 years
Argentina	2002	VR <sup>a</sup>	11	6	17	1.1	1.5	19
Bahamas	2000	VR	5	4	8	1.5	1.6	12
Barbados	2000	VR	11	5	16	0.9	0.6	17
Belize	2000	VR	14	9	23	3	2	30
Bolivia	1994–98	DHS <sup>b</sup>	34	33	67	15	11	92
Brazil	2000	VR	13	8	20	1.7	1.8	23
Canada	2000	VR	4	1.7	5	0.3	0.5	6
Chile	2002	VR	4	3	7	0.6	1	8
Colombia	1996–2000	DHS	15	7	21	1	2	25
Costa Rica	2002	VR	8	4	11	0.9	1	12
Cuba	2002	VR	4	2	7	0.6	1	8
Dominican Republic	1998–2002	DHS	22	9	31	3	3	38
Ecuador	2000	VR	8	8	16	4	7	26
El Salvador	1999	VR	4	7	11	2	1.7	15
Guatemala	1995–99	DHS	23	22	45	8	6	59
Guyana	1996	VR	14	10	25	4	3	31
Haiti	1996–2000	DHS	32	48	80	20	22	119
Honduras	1981	VR	7	16	23	9	9	40
Jamaica	1991	VR	3	4	6	1.6	1.2	9
Mexico	2001	VR	8	5	13	1.5	1.6	20
Nicaragua	1997–2001	DHS	16	15	31	5	4	39
Panama	2002	VR	8	6	14	2	2	17
Paraguay	2000	VR	6	5	10	1.6	1.5	14
Peru	1996–2000	DHS	18	15	33	7	7	47
Saint Lucia	1999	VR	15	2	17	1.4	3	25
Saint Vincent and the Grenadines	1999	VR	14	8	21	3	4	26
Suriname	1992	VR	7	6	13	2	2	19
Trinidad and Tobago	1983–87	DHS	23	5	28	3	1	32
United States of America	2001	VR	5	2	7	0.5	0.8	8
Uruguay	2000	VR	8	6	14	1	1.3	16
Venezuela	2000	VR	12	6	18	2	1.9	21

Source: Reference 11.

<sup>a</sup> VR; Vital registration.

<sup>b</sup> DHS; Demographic and Health Survey.

served in most countries included in the Lancet analyses.

A high level of coverage in the population as a whole, however, may hide important differentials between countries. It has long been recognized that the Latin American and Caribbean Region harbors unacceptable levels of inequality in health. Table 2 shows information collated by PAHO (20) on coverage for skilled antenatal and delivery care and immunization in Latin American and Caribbean countries. Although coverage rates were generally high, low rates were seen in some countries, particularly Haiti.

Differences between rich and poor countries within Latin America are

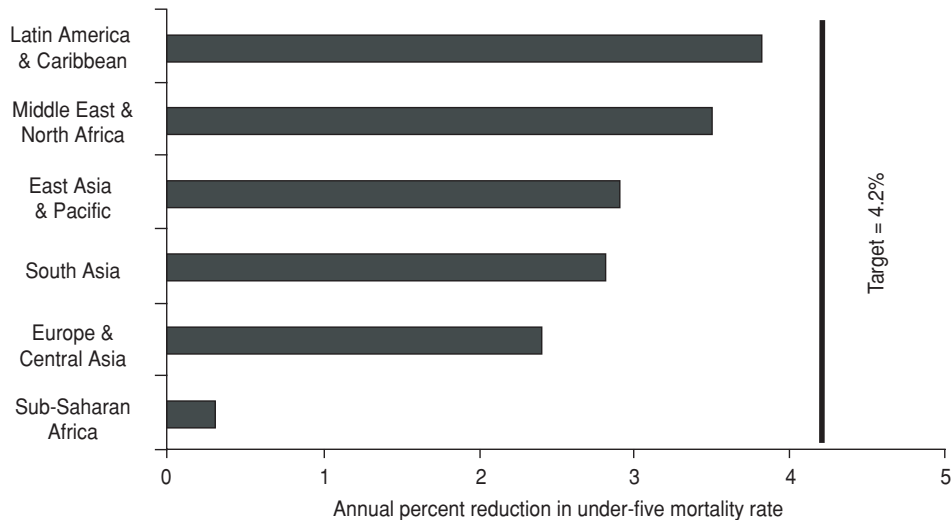
often as large as, if not larger, than between-country differences (9, 21).

This is illustrated by an analysis of co-coverage, that is, the proportion of children who have received several health interventions. This analysis, based on data from Demographic and Health Surveys, compared the proportions of Brazilian and Haitian children aged 1 to 4 years who had ever received six or more of eight essential child-survival interventions, i.e., four or more antenatal visits; tetanus toxoid in pregnancy; skilled delivery; tuberculosis (BCG), measles and DPT3 vaccine; vitamin A supplementation; and a safe water supply (22). Brazilian children in the lowest fifth of family

wealth were clearly disadvantaged relative to the rest of the population, for whom coverage was high. In Haiti, on the other hand, overall coverage was low and although the poor were again the worst off, simultaneous coverage with six interventions was lower than 50% even among the rich. Social differentials, therefore, are important both in high- and low-coverage countries (21).

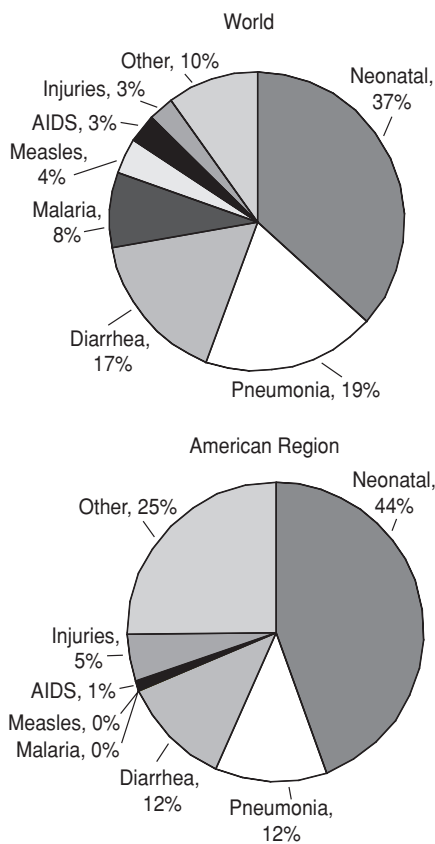
The existence of marked inequities shows that, while the findings of the Lancet series may not be applicable to the Latin American and Caribbean Region as a whole, there are subgroups of the population in most countries in which coverage with essential child survival interventions is still clearly

**FIGURE 2. Observed annual percent reductions in under-five mortality rates, by region, 1990–2000**



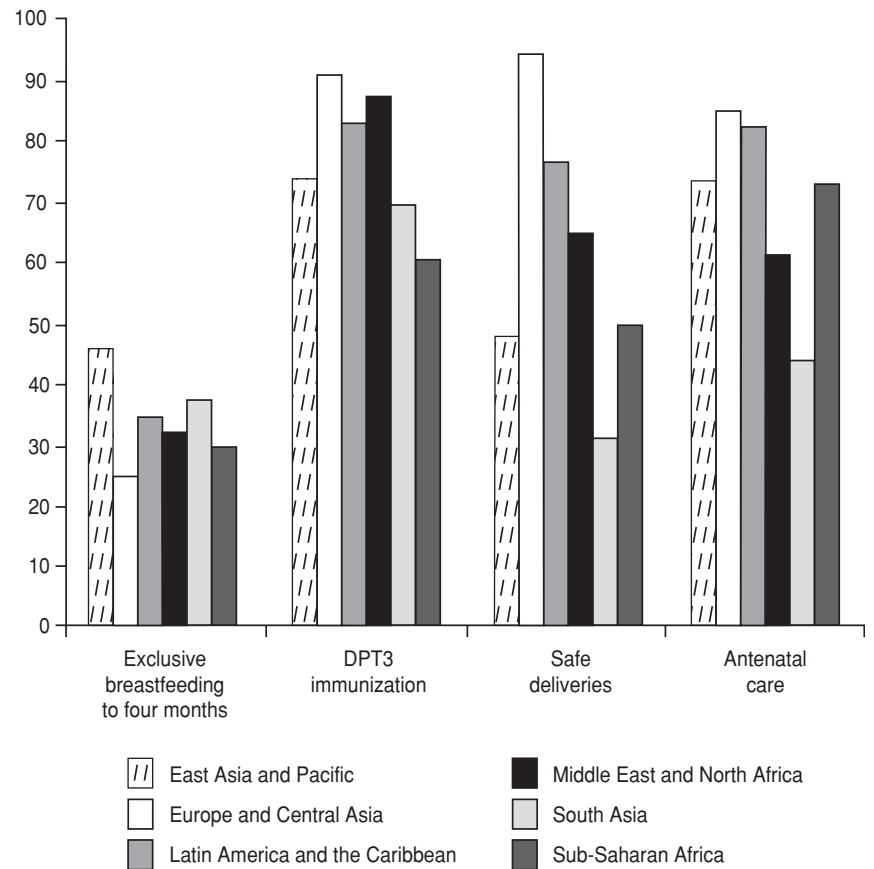
Source: Reference 5.

**FIGURE 3. Distribution of the main causes of deaths in children under five in the world and in the American Region, 2003**



Source: Reference 18.

**FIGURE 4. Coverage levels of selected child survival interventions in different regions, around 2000**



Source: Reference 19.

**TABLE 2. Antenatal care and delivery by skilled attendant, and immunization coverage in countries of Latin America and the Caribbean**

Country	Antenatal care by skilled personnel 1996–2003 <sup>a</sup> (%)	Skilled attendant at delivery 1996–2003 <sup>a</sup> (%)	1-year-old children immunized 2003 (%)			
			DPT3 (diphtheria, pertussis, tetanus)	OPV3 (poliomyelitis)	BCG (tuberculosis)	Measles
Anguila	100	100	99	99	99	96
Antigua and Barbuda	95	99	99	99	NA <sup>b</sup>	99
Argentina	84	98	93	94	99	95
Aruba	100	96	79	79	NA	90
Bahamas	94	99	92	93	NA	90
Barbados	100	100	89	90	NA	90
Belize	98	97	96	95	99	96
Bolivia	79	61	95	94	94	99
Brazil	46	97	96	99	99	99
British Virgin Islands	100	100	99	99	98	99
Cayman Islands	99	100	92	92	75	83
Chile	84	98	96	96	95	99
Colombia	91	94	93	92	97	93
Costa Rica	82	98	88	88	87	89
Cuba	100	100	73	99	98	99
Dominica	100	100	99	99	99	99
Dominican Republic	98	98	75	73	90	80
Ecuador	83	69	89	99	99	99
El Salvador	53	70	88	87	90	99
French Guyana	73	100	NA	NA	NA	NA
Granada	99	100	97	98	NA	99
Guadalupe	84	100	NA	NA	NA	NA
Guatemala	90	26	94	94	97	94
Guyana	95	95	90	91	95	89
Haiti	79	24	50	48	54	52
Honduras	85	62	92	92	91	95
Jamaica	70	95	81	81	88	79
Martinique	99	100	NA	NA	NA	NA
Mexico	96	91	91	92	92	96
Montserrat	100	98	99	99	99	99
Nicaragua	86	74	85	85	93	98
Panama	94	94	86	83	87	83
Paraguay	75	86	85	86	88	91
Peru	84	59	94	95	94	95
Saint Kitts and Nevis	71	99	99	99	99	98
Saint Lucia	48	98	90	91	95	90
Saint Vincent and the Grenadines	99	100	99	99	87	94
Suriname	90	90	74	74	NA	71
Trinidad and Tobago	84	99	91	91	NA	88
Turks and Caicos	100	88	96	96	92	91
Uruguay	94	99	91	91	99	95
Venezuela	26	99	67	83	88	81
Virgin Islands (U.S.)	90	98	NA	NA	NA	NA

Source: Reference 20.

<sup>a</sup> For Peru, coverage data refer to 1996–2000; for all other countries the corresponding period is 1999–2003.

<sup>b</sup> NA: not available.

inadequate, and for which the Lancet messages are directly relevant.

Finally, even though overall coverage levels in many countries in the Latin American and Caribbean region are reasonably high, effective coverage requires high-quality interventions. Although data on the quality of deliv-

ery of interventions are scarce, two recent examples from Brazil suggest that inadequate coverage is having serious consequences. In a health facility survey in four states in Northeastern Brazil, the performance of primary care doctors was compared to that of a “gold standard” examiner. Only half

of the under-five children who needed an antibiotic were actually prescribed such a drug correctly. On the other hand, 13% of the much larger number of children who did not need an antibiotic were inappropriately prescribed one (23). Antenatal care in Pelotas, Southern Brazil, was assessed

in two separate studies. Although the mean number of attendances was greater than eight per pregnancy, one in four women did not have a pelvic examination during any of these visits, one in three nonimmunized women failed to receive tetanus toxoid (24), and another one third of the women did not undergo serological screening for syphilis (25).

Although the above examples may not represent the Region as a whole (we are unaware of comprehensive surveys on the quality of care), they are in line with the results of larger studies. The Pan American Health Organization estimates an overall prevalence of syphilis among pregnant women in Latin America of 3.1%, with rates as high as 6.2% in Paraguay. The incidence of congenital syphilis ranges from 1.4 per 1 000 live births in El Salvador to 12.0 per thousand in Honduras. This maternal and congenital syphilis study (26) highlighted the need to improve quality of care by of-

fering universal point-of-care testing and treatment of this disease during pregnancy.

The above discussion on the quality of care highlights another important contribution of the Lancet series, which is directly relevant to the Latin American and Caribbean Region. The second papers in each of the two series constituted state-of-the-art systematic reviews, identifying which—among the many neonatal and child survival interventions available—are actually evidence-based. Unfortunately, many unproven interventions (two examples of which are growth monitoring and multiple ultrasounds in pregnancy) still seem to be widely used in our Region.

## CONCLUSION

In conclusion, the two Lancet series have shown that simple and affordable measures, if universal coverage and

good quality are achieved, could prevent around two thirds of all global deaths in children under five years of age. Although the situation in Latin America and the Caribbean is generally better than in other parts of the world, a large proportion of our under-five deaths could be avoided through simple measures as proposed in these series. This is particularly the case for the poorest subgroups in the Region.

Even within countries that have generally high levels of coverage, two major challenges remain. How can we reach children from the poorest families, who are consistently less likely to receive life-saving interventions? And how can we deliver these interventions at high levels of quality, to ensure that coverage is effective? Answers to these questions will define whether or not we are successful in further reducing under-five mortality levels in Latin America and the Caribbean and other parts of the developing world.

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**RESUMEN**

**Iniciativas para mejorar la supervivencia infantil y su importancia en la Región de América Latina y el Caribe**

Hemos revisado dos series de trabajos publicados en *The Lancet*: la Serie sobre Supervivencia Infantil (2003) y la Serie sobre Supervivencia Neonatal (2005). Ambas dirigen la atención hacia la defunción de casi 11 millones de niños menores de cinco años anualmente en el mundo, así como al hecho de que casi 4 millones de ellas tienen lugar durante el primer mes de vida. Demostramos que dos terceras partes de estas defunciones se podrían evitar si todos los niños, sin excepción, tuvieran cobertura con intervenciones que ya existen pero que en muchos países no están al alcance de la mayor parte de los niños. Las series también resaltaron la importancia de reducir las faltas de equidad, tanto entre países como dentro de un mismo país. Aunque ha habido notables adelantos en lo que respecta a la reducción de la mortalidad y al mejoramiento de la cobertura, aún quedan por delante dos retos importantes: cómo mejorar la calidad de las intervenciones de salud y cómo alcanzar a los niños más desfavorecidos en la Región de América Latina y el Caribe.

**Palabras clave**

Mortalidad infantil, factores socioeconómicos, América Latina.