XXIII. ICPD RELEVANCE OT THE MDGS: TARGETS AND MECHANISMS FOR THE REDUCITON OF CHILD MORTALITY

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A. ICPD GOALS AND THE MILLENNIUM DEVELOPMENT GOALS

Goal 4 of the Millennium Development Goals is the improvement of child health. The target linked to this goal is to reduce the under-five mortality rate (U5MR), that is, the period probability of dying by exact age 5, by two-thirds between 1990 and 2015. Achievement of this goal would require an average annual decline in U5MR over that period of 4.4 per cent.

The Programme of Action adopted by the 1994 International Conference on Population and Development (United Nations, 1994a) devoted chapter 8 to health, morbidity and mortality. Part B of the chapter focuses on child survival and health. The actions of this part specify some general objectives (paragraph 8.16), such as narrowing the gap between infant and child mortality rates in the developed and developing regions of the world and eliminating disparities within countries. They also establish specific targets for reducing U5MR: by one-third, or to 70 per 1,000, whichever is less, by the year 2000; to below 60 per 1,000 by 2005, and to below 45 per 1,000 by 2015, for all countries. The one-third reduction over 10 years implies an average annual reduction of 4.0 per cent per year, very similar to the pace implied by the MDG target. It is not possible to compare directly the ICPD targets for 2005 and 2015 with the MDG target because the former are expressed in terms of maxima for the country with the highest U5MR. However, given that numerous countries had U5MR's in excess of 250 per 1,000 live births around 1990, universal achievement of the 2000 target of a one-third reduction and then of the 2015 target of below 45 would have required annual average reductions of over 8 per cent from 2000 to 2015 in the high mortality countries.

The Programme of Action asserts that all Governments should extend integrated reproductive health-care (including family planning) and child-health services to all the population (para. 8.17). Specific services mentioned include prenatal care, delivery assistance, neonatal care including exclusive breastfeeding, provision of micronutrient supplementation and tetanus toxoid, and ensuring that all children live in a sanitary environment. Surprisingly, there is no explicit mention of immunization or oral rehydration therapy.

The key actions for the further implementation of the ICPD Programme of Action (United Nations, 1999) make no mention of specific targets but exhort Governments and the international community to continue to support declines in infant and child mortality by strengthening health programmes that emphasize prenatal care and nutrition, breastfeeding, universal immunization, oral rehydration therapy, quality family planning services, efforts to prevent transmission of HIV, and a few other activities.

Available evidence suggests that U5MR declined at approximately 4 per cent per annum, roughly the ICPD and MDG required pace, during the 1970s and 1980s (Hill and others, 1999), but that the pace of decline has slowed in the 1990s, particularly in sub-Saharan Africa (Amouzou and Hill, 2004). The purpose of this paper is not to assess the decline in child mortality *per se*, but rather to assess what the impact on U5MR might have been had the ICPD mechanisms been fully implemented, and also to assess progress during the 1990s in these mechanisms.

A useful framework for exploring child survival interventions is that proposed by Mosley and Chen (1984). Background social, economic, cultural and public policy factors operate through a set of proximate determinants, which and only which influence child survival. The proximate determinants proposed by Mosley and Chen are divided into five categories: maternal factors, environmental contamination, nutrition, injuries, and personal health practices (both preventive and curative). However, in order to correspond to specific elements of the ICPD Programme of Action and the ICPD+5 key actions, the proximate determinants are divided into three groups: (1) indicators of change in fertility behaviour related to child mortality (broadly speaking the Mosley and Chen "maternal" factors); (2) indicators of delivery and post-partum care (part of personal health care practices and of nutrition), and (3) indicators of the reach of child survival programmes (another part of personal health care practices). Not considered specifically are environmental contamination (though included in ICPD, nationally-representative measures are not widely available) or injuries (not highlighted by ICPD).

I first assess the potential for interventions in these three groups to reduce U5MR, and then present data concerning progress over the 1990s, using selected indicators in each group. Indicators of the potential effectiveness of health sector interventions are drawn from a recent review (Jones and others, 2003). The review reports that preventive interventions or treatments exist for which there is "sufficient" evidence showing a causal relationship between the intervention and reductions in cause-specific under-five mortality. It also argues that such interventions can achieve high coverage in low-income settings. Interventions can prevent or treat each of the main causes of under-five deaths: diarrhoea, pneumonia, measles, malaria, HIV/AIDS, preterm delivery, neonatal tetanus and neonatal sepsis. The only exception of birth asphyxia, for which only an intervention whose effect is validated by limited evidence exists (Jones and others, 2003). Data relative to progress in implementing such interventions are drawn from the Demographic and Health Surveys (DHS). The focus here is on selected countries with widely spaced surveys, approximately 10 years apart, that permit an assessment of changes over time. Results relative to these countries are likely to be affected by selection bias: countries with repeated DHS surveys are likely to have Governments that are more proactive in promoting child survival that countries that do not. The advantage of choosing countries with repeat surveys, however, is avoiding problems of changing selection criteria over time.

B. THE ICPD PROGRAMME OF ACTION AND THE REDUCTION OF UNDER-FIVE MORTALITY

1. *Maternal factors*

Rhetoric around the health justification for promoting family planning in the 1970s and 1980s stressed the four "too's": too early or too late childbearing, children born too quickly after a previous birth and too many children. Statistical analysis of birth history data from the World Fertility Survey and the DHS indicated that only two "too's" were major factors in child survival: too early (before the age of 18 years) and too quickly (at birth intervals shorter than 24 months and particularly shorter than 18 months) (Hobcraft, MacDonald and Rutstein, 1984; United Nations, 1994b).

The most recent study across a large number of countries of the effects of maternal factors on child mortality is by the United Nations (1994b). Data from 25 DHS surveys in the late 1980s and early 1990s were analysed using both univariate and multivariate methods. A key component of the analysis was to go beyond the reporting of relative risks to look at attributable risks, the extent to which a particular risk factor affects the population level of U5MR. The report finds substantial similarity across countries in the relative risks of birth intervals shorter than 18 months, or from 18 to 23 months, and births to mothers younger than 18 years, but finds much greater variability between countries in the prevalence of the two maternal factors. The contribution of short birth intervals to child mortality at the population level varies widely by region: 44 per cent in North Africa, 30 per cent in Latin America, and

about 20 per cent in Asia and Sub-Saharan Africa. Estimates from some country studies are smaller: a potential reduction of 19 per cent in India (Setty-Venugopal and Upadhyay, 2002) or 11 per cent in Nigeria (Rutstein, quoted in Jones and others, 2003). The effect on child mortality of births before age 18 is smaller, offering a potential child mortality reduction of only about six per cent.

How much progress has been made since the 1994 study was published? Table XXIII.1 shows proportions of births in the five years prior to an "early" DHS (typically carried out in the late 1980s) and prior to a "late" DHS (typically carried out in the late 1990s) to women after live birth intervals shorter than 18 months and of 18 to 23 months for the 16 countries considered. Table XXIII.1 also shows the proportion of women under age 18 who, at the time of the "early" or "late" survey, had had at least one birth. This proportion is not the ideal measure, since it is not birth-weighted, but is the measure available on STATcompiler.

TABLE XXIII.1. CHANGES IN FERTILITY-RELATED RISK FACTORS FOR CHILD MORTALITY,
LATE 1980S TO LATE 1990S

| Region and country | Year of the survey | | Percentage of births among all births in the five years preceding the survey | | | | Percentage of women who were mothers before age 18 | |
| | | | With a birth interval shorter than 18 months | | With a birth interval shorter than 24 months | | | |
	Early	Late	Early	Late	Early	Late	Early	Late
Sub-Saharan Africa								
Ghana	1988	1998	7.1	5	18.1	13.4	8.4	5.1
Kenya	1989	1998	10.3	8.7	28.1	23.1	7.5	6
Mali	1987	2001	10	7.8	25.7	21.7	25.5	17.3
Senegal	1986	1997	6.1	6	20	17.8	14.5	9.2
Togo	1988	1998	5.1	4.8	16.1	14.4	10.4	7.1
Uganda	1988	2000/01	11	9.7	23.6	27.6	17.6	9.7
Zambia	1992	2001/02	6.5	5.9	18.8	15.9	10.9	11.3
Zimbabwe	1988	1999	6.2	4.1	18.4	11.2	7.6	6.7
Northern Africa								
Egypt	1988	2000	18	11.3	34.5	24.1	3.2	1.7
South-eastern Asia								
Indonesia	1987	1997	10.5	6.1	24.4	15.4	3.5	3.3
Latin America								
Bolivia	1989	1998	12.4	11.7	28.5	28.3	5.7	5.1
Brazil	1986	1996	22.5	16.2	39.3	29.2	6.1	8.4
Colombia	1986	2000	18	12.1	35.9	26.5	5.7	7.4
Dominican Republic	1986	1999	23.5	13.8	42	30.6	6.2	8.6
Guatemala	1987	1998/99	12.5	12.3	30.3	31.8	10	8.5
Peru	1986	2000	17.9	7.3	34.9	20.3	4.5	5

Source: Estimates obtained from the Demographic and Health Surveys STATcompiler, available at www.measuredhs.com.

Every one of the 16 countries considered showed a decrease between the late 1980s and late 1990s in the proportion of births during the five years preceding the survey and occurring after an interval of less than 18 months. In some countries the decrease was pronounced: 17.9 per cent to 7.3 per cent in Peru, for example. In others it was small: 6.1 per cent to 6.0 per cent in Senegal, for instance. The median proportion dropped from 10.8 per cent to 8.3 per cent. The largest declines in absolute and percentage terms were in countries with high proportions of short intervals, notably those from Latin America (except Bolivia and Guatemala) and North Africa. Proportions of births occurring after intervals shorter than 24 months fell in all but two countries (Guatemala and Uganda), sometimes by wide margins (34.9 per cent to 20.3 per cent in Peru, for example). The median proportion dropped from 27.1 per cent to 22.4 per cent. Clearly, progress was made with respect to this risk factor, although the median proportion of births at very elevated risk of death as a result of a preceding birth interval shorter than 18 months remained above 8 per cent.

The picture for "too early"—proxied here by the proportion of women under age 18 with at least one child—is less clear. Although this proportion declined in 9 out of the 16 countries considered, it increased in five, four of them in Latin America, and the median proportion only fell slightly, from 7.5 per cent to 7.2 per cent.

2. *Antenatal and delivery care*

Jones and others (2003) identify 10 preventive interventions and two treatments that could be applied during pregnancy or delivery and that are classified as to whether there is "sufficient" or "limited" evidence regarding their effect on the major causes of under-five mortality. Those with "sufficient" evidence include: clean delivery, exclusive breastfeeding and antibiotics, all of which prevent neonatal sepsis; antenatal steroids, insecticide-treated nets, and intermittent antimalarial preventive treatment during pregnancy to prevent preterm delivery; tetanus toxoid and clean delivery to prevent neonatal tetanus; and the use of nevirapine and replacement feeding to reduce the chances of mother-to-child transmission of HIV. Interventions where the evidence is "limited" include the use of antibiotics in cases of premature rupture of membranes as a preventive method to avoid neonatal sepsis and preterm delivery; newborn temperature management to prevent preterm delivery; and newborn resuscitation to reduce deaths by birth asphyxia. Jones and others estimate that universal coverage with the interventions classified as having sufficient evidence to validate them would have prevented 14 per cent of deaths under age five in 2000. In addition, widespread use of the interventions for which the evidence of effectiveness is limited would have prevented a further 5 per cent of all deaths in childhood. All these interventions could therefore have prevented close to one-fifth of the deaths under age five that occurred in the developing world in 2000.

How well are these interventions being adopted and implemented? Unfortunately, data on the use of several of these interventions are lacking and for others, the information available relates to rough proxies. For instance, the proportion of births occurring during the three years preceding a survey and delivered by a "skilled" attendant (physician, midwife or nurse), the proportion of pregnancies during which the mother received a tetanus toxoid immunization, and the median duration of full breastfeeding can be used as indicators of the implementation of some of the interventions listed above. Note, however, that survey statistics on exclusive breastfeeding are extremely unstable, as shown by the results obtained by DHS. For each indicator, the estimates obtained by an early and late DHS are displayed in table XXIII.2.

TABLE XXIII.2. CHANGES IN PREGNANCY AND DELIVERY RELATED RISK FACTORS FOR CHILD MORTALITY, LATE 1980S TO LATE 1990S

| | | | Percentage of births in the three years preceding the survey | | | | | |
| | Year of the survey | | Attended by a trained birth attendant | | Whose mother got a tetanus toxoid immunization | | Median duration of full breastfeeding | |
	Early	Late	Early	Late	Early	Late	Early	Late
Sub-Saharan Africa								
Ghana.................................	1988	1998	41	45	71.5	81.6	5.6	5.2
Kenya.................................	1989	1998	50.8	44.4	89.9	90.5	4.3	2.1
Mali....................................	1987	2001	22	40.4	18.3	48.8	10.5	11.5
Senegal...............................	1986	1997	28.1	47.1	32.2	84.5	5.5	6.5
Togo...................................	1988	1998	45.4	50.9	72	62.2	9	3.7
Uganda...............................	1988	2000/01	38.2	38.9	61	68.8	12.6	5.2
Zambia...............................	1992	2001/02	50.4	42.5	82.5	74.2	4	6.2
Zimbabwe	1988	1999	70.6	73	82.2	81.5	5.6	3.8
Northern Africa								
Egypt..................................	1988	2000	35.7	63.7	13.6	73.1	17.6	5.1
South-eastern Asia								
Indonesia............................	1987	1997	38	51	..	73.7	23	3.7
Latin America								
Bolivia................................	1989	1998	43.3	59.4	23.7	48.8	4.6	4.1
Brazil.................................	1986	1996	..	89.1	41.7	61.6	1.6	3.6
Colombia............................	1986	2000	71.8	86.9	43.8	83.7	1.9	3.4
Dominican Republic	1986	1999	90	97.7	87.3	95.5	2.4	2.2
Guatemala	1987	1998/99	29.6	42	16.9	55.8	..	3.7
Peru....................................	1986	2000	49.6	59.7	17.4	74.5	3	5.3

Source: Estimates obtained from the Demographic and Health Surveys STATcompiler, available at www.measuredhs.com.

The proportion of deliveries assisted by a trained attendant increased in 12 countries (in 8 of them by more than 10 percentage points), stayed essentially constant in one, and fell somewhat in two other. The median of 15 countries (excluding Brazil, which lacks date for the late 1980s) increased from 43.3 per cent to 50.9 per cent, a solid though unspectacular increase. The proportion of births occurring in the three years preceding each survey for which the mother received at least one tetanus toxoid vaccination during pregnancy varied hugely in the late 1980s, from 16.9 per cent in Guatemala to 87.3 per cent in the Dominican Republic. Variability had dropped by the late 1990s, with the lowest proportion reported being 48.8 per cent and increases in 11 of 15 countries (in 9 countries the increase was higher than 10 percentage points), and small decreases in 2. The median percentage of women getting the tetanus toxoid during pregnancy rose from 42.7 per cent to 74.2 per cent, a very satisfactory improvement.

Breastfeeding has been proved effective to reduce the risk of gastrointestinal infection of young children. It is recommended that mothers use exclusive breastfeeding for 6 months and continue breastfeeding until the child is 12 months old but with food supplementation. Mothers who are HIV positive should not breastfeed at all. The DHS data on exclusive breastfeeding are extremely unstable,

perhaps because of small samples. The indicator used here is the median duration of full breastfeeding (current status) among children born during the three years preceding the survey. Even the medians show instability, but increases and declines are equally balanced, so that the median across the 15 countries considered declines from 5.5 to 4.1 months. The medians for Latin American countries mostly increase, those for sub-Saharan Africa show a mix of trends, and the data for Egypt and Indonesia are not credible indicators of trends.

3. *Child survival programmes*

Jones and others (2003) identify 11 interventions, relevant primarily after the immediate postpartum period, whose efficacy to reduce infant and child mortality is supported by "sufficient" evidence. These interventions are: exclusive breastfeeding in the first 6 months of life and continued breastfeeding from 6 to 11 months to prevent diarrhoea and pneumonia; insecticide-treated materials to prevent malaria; appropriate complementary feeding to maintain adequate nutritional levels and help the child fight infections such as diarrhoea, pneumonia, measles or malaria; water, sanitation and hygiene to prevent diarrhoea; use of *Haemophilus influenzae* type b vaccine to prevent pneumonia; zinc supplementation to prevent and treat diarrhoea, prevent pneumonia, and possibly also malaria; vitamin A supplementation to prevent diarrhea and treat malaria, with possible preventive effects on measles and malaria; measles vaccine; oral rehydration therapy to treat diarrhea; antibiotics to treat pneumonia and dysentery; and antimalarials. Universal implementation of these interventions is estimated to be capable of reducing the number of under-five deaths in the developing world by 43 per cent. The additional reduction associated with the implementation of interventions with limited evidence of effectiveness would be less than one per cent.

To check how much progress has been made in adopting this interventions, the indicators of child survival selected are the proportion of children aged 12 to 23 months that have been immunized against measles and the proportion of children aged under age 3 with an episode of diarrhea in the two weeks before the survey who were treated with oral rehydration therapy.

Appropriate data for estimating measles coverage were not collected in Phase 1 of the DHS, so values are missing for the late 1980s for all countries except Zambia, which shows a slight increase from 77.0 per cent to 84.4 per cent coverage. Coverage by measles vaccination in the late 1990s was quite high, however: the lowest coverage was in Togo (42.6 per cent) and the median across 15 countries was 72.6 per cent. Despite concerns of recent declines in immunization coverage, this intervention seems to remain at reasonable levels.

Use of oral rehydration therapy shares the pattern of convergence shown by measles vaccination: great variability in the late 1980s (ranging from a low of 0.6 per cent in Mali to 62.2 per cent in Kenya) but greater homogeneity in the late 1990s (22.8 per cent in Togo to 68.7 per cent in Kenya). More countries show improvements than declines, but the median stays essentially the same: 35.4 per cent in the late 1980s to 35.5 per cent in the late 1990s.

TABLE XXIII.3. CHANGES IN CHILD SURVIVAL INTERVENTIONS FOR CHILD MORTALITY,
LATE 1980S TO LATE 1990S

Region or country	Year of the survey		Percentage of children aged 12 to 23 months who received a measles immunization		Percentage of births in the three years preceding the survey who received oral rehydration therapy for a diarrhoea episode during the previous two weeks	
	Early	Late	Early	Late	Early	Late
Sub-Saharan Africa						
Ghana..............................	1988	1998	..	72.6	36.6	32.5
Kenya..............................	1989	1998	..	79.2	62.2	68.7
Mali.................................	1987	2001	..	48.7	0.6	30.2
Senegal	1986	1997	..	N/A	4.6	32.7
Togo................................	1988	1998	..	42.6	22.4	22.8
Uganda............................	1988	2000/01	..	56.8	15.6	43.4
Zambia............................	1992	2001/02	77	84.4	65	54.6
Zimbabwe	1988	1999	..	79.1	..	67.9
Northern Africa						
Egypt..............................	1988	2000	..	96.9	..	37.6
South-eastern Asia						
Indonesia.........................	1987	1997	..	70.9	..	45.4
Latin America						
Bolivia	1989	1998	..	50.8	35.4	47.6
Brazil	1986	1996	..	87.2	11.9	54.3
Colombia	1986	2000	..	70.8	49.7	32.3
Dominican Republic	1986	1999	..	82.6	41.7	44.3
Guatemala.......................	1987	1998/99	..	80.6	18.8	35.3
Peru.................................	1986	2000	..	71.9	49.2	35.5

Source: Estimates obtained from the Demographic and Health Surveys STATcompiler, available at www.measuredhs.com.

C. DISCUSSION

Jones and others (2003) conclude that "about two-thirds of child deaths could be prevented by interventions that are available today and are feasible for implementation in low-income countries at high levels of population coverage (p. 15)."

This estimate excludes any additional benefit that would be accrued by reducing the proportion of births that occur too soon after another birth or too early in a woman's life. It also excludes possible additional effects of distal factors such as education of women or better service provision to densely-populated urban agglomerations (both included as recommendations in the ICPD Programme of Action).

The review above of indicators for selected developing countries suggests some progress has been made since the late 1980s, particularly with respect to increasing the coverage of immunization and increasing birth intervals. Although sub-Saharan Africa has generally under-performed the rest of the developing world in reducing mortality under age 5, the region seems to have made substantial strides,

particularly in the worst-served countries. However, much remains to be done to improve intervention coverage in Africa and elsewhere.

Paragraph 8.17 of the ICPD Programme of Action enjoins Governments to extend services to their entire populations, specifying that such services should include: "prenatal care and counseling, with special emphasis on high-risk pregnancies, ….; adequate delivery assistance; and neonatal care, including exclusive breast-feeding, …, the provision of micronutrient supplementation and tetanus toxoid … [and the] promotion of longer intervals between births."

Although medical research since 1994 has produced new technologies and proven the effectiveness of others, the full implementation of the ICPD Programme of Action can certainly reduce under-five mortality by the two-thirds suggested as possible by Jones and others. Such a reduction would lead to the achievement of the target associated with MDG 4, namely, to reduce under-five mortality by two thirds between 1990 and 2015.

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