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Successes and challenges of under-five child mortality reduction in West Africa

Abstract *Background:* Under-five mortality rate is an important index for assessing achievements by countries and thus its targeted reduction is adopted as benchmark towards realizing the Millennium Development Goal number 4 by 2015. With less than 24 months to the deadline, West Africa still contributes significantly to the global burden of child mortality, with over half of the deaths caused by infections.

Objective: To review the successes and challenges of reducing under-five mortality in West Africa.

Sources: A search was made in Pub Med and Google Scholar using the key words: *Under-five, Children, Mortality, West Africa, Successes, Progress, Achievements and Challenges*. Relevant publications and reports available at WHO, UNICEF and UN websites were also consulted. Tables and charts were drawn from relevant data for West African Countries obtained from these sources using Microsoft® Excel® for Mac 2011 Version 14.1.0 (110310).

Results: Although significant under-five death reductions have been recorded in countries of West Africa between 1990 and 2012, the reduction falls far short of the expected targets and infec-

tions still remain the leading causes of death. In spite of a five-fold rise of average annual rate of reduction of under-five deaths compared to a 3-fold rise of the global average and a 49.7% reduction in under-five mortality rate, the sub-region trails behind other parts of Africa. While only Liberia achieved the MDG 4 target, Niger, Cape Verde, Gambia, Guinea and Burkina Faso are on track. Nigeria's huge child population, high under-five mortality burden and slow reduction, weighs down the sub-region's averages. Neonatal death proportions are rising, with four countries ranking amongst the world's top ten. With less than 24 months left, the likelihood of achieving the reduction targets for under-five mortality in most of the countries in the sub-region by the end of 2015 remains a mirage.

Conclusion: Numerous daunting challenges have contributed to slow the pace of under-five death reduction in West Africa. Countries in the sub-region need to address their challenges while scaling up proven interventions to accelerate progress towards further reductions of under-five deaths.

Key words: Children, under-five, mortality, West Africa, progress, successes, achievements, challenges

Introduction

At the Millennium Development Summit in September 2000, world leaders and development experts made the famous declaration that committed the global community to the eight Millennium Development Goals (MDGs) to address poverty, hunger, diseases and environmental degradation. The MDG 4 seeks to improve survival of children by reducing under-five mortality aiming at three benchmarks: reduction of under-five and infant mortality rates by two-thirds of the 1990 figures

and achievement of 90% measles immunization coverage for children 12-24 months of age by the year 2015¹. Other health-related MDGs are one (eradicating poverty and hunger), five (improvement of maternal health), six (combating HIV, malaria and TB), seven (environmental sustainability) and eight (forging global partnerships). The fifteen countries in West Africa cover a vast expanse of landmass extending from Senegal in the north-east, to the Gulf of Guinea, the Lake Chad and the highlands bordering Nigeria and Cameroon to the west. The average total population in 2011 was about 316 million

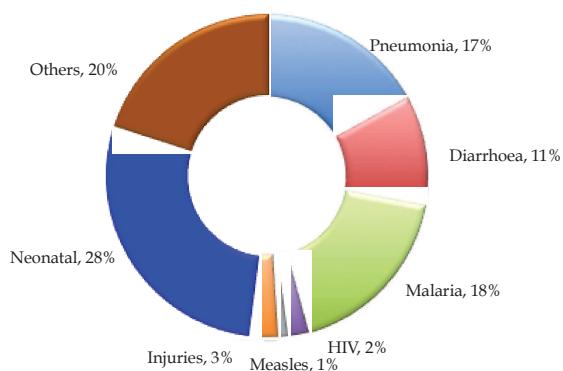
with a range from 0.5 million in Cape Verde to 160 million in Nigeria. Under-5 child proportions range from 10.3% to 19.9% (average of 16.3) and Nigeria has the highest under-5 population of nearly 27.2 million, or 50.2% of the total in the sub-region².

The countries belong to the “Lower Income” and “Lower Middle Income” groups with the lowest GDP per Capita range of \$290 in Liberia to \$2940 in Cape Verde, and half of citizens in eight countries living on less than \$1/day². All are also among the group of “75 Countdown” countries sharing over 95% of the global maternal and child deaths³.

Major causes of child mortality

Infectious diseases have remained the major cause of deaths in children in the sub-region (Figure 1). For instance, amongst fifteen countries with the highest burden of deaths due to pneumonia and diarrhoea, countries in the sub-region had 23% of the 1.3 million deaths shared by these countries by the end of 2012^{4,5}. Nigeria alone has 18% while Niger, Mali and Burkina Faso, share 5%. Morbidity and mortality due to malaria have become largely concentrated in countries of West and Central Africa, together being responsible for 65% of the mortality burden for the top 10 countries or 3.1 million deaths. Nigeria alone has 46% of this figure while Mali, Côte d’Ivoire, Niger and Burkina Faso together share 19%^{4,5}. Neonatal problems account for 28% of all under-five deaths, with birth asphyxia and prematurity causing 57% while neonatal sepsis, pneumonia and meningitis together cause 25%. Countries of West Africa that feature prominently among top ten countries with highest neonatal death rates include Côte d’Ivoire, Guinea Bissau, Mali and Sierra Leone⁴.

Fig 1: Major causes of under-five mortality in West Africa, 2012



HIV/AIDS is responsible for 1-4% of deaths across the countries in the sub-region, and out of the total global under-five deaths of about 103,000 due to the disease in 2012, Nigeria has the highest of 24,000 or 23%. ⁴ At the sub-regional level this burden far outweighs the sum for other countries put together while at the global level Nigeria remains the country with the second lowest anti-retroviral therapy coverage for eligible children (12%) out of the 22 countries with the highest burden of HIV infection. The average prevalence of stunting in West Africa is about 40% and under-nutrition is associated with up to a third of under-five deaths in the sub-region⁴.

Successes in Under-Five Mortality Reduction

Global ranking

There has been a significant reduction of under-five mortality among West African countries from 1990 when eight countries had mortality rates above 200/1,000 live births, while the rest had rates above 100/1,000 live births. By the end of 2012 none has a rate above 200/1,000 live births while seven had rates of less than 100/1,000 live birth^{4,5}. The sub-region however, still remains home to eight of the top fifteen in the global ranking of under-5 mortality (Table 1).

Table 1: Global ranking of under-5 mortality rates (per 1000 live births) for West Africa, 2012

Country	U5MR 1990	U5MR 2012	% Reduc- tion from 1990	U5MR Rank	*AAR R(%)
Sierra Leone	257	182	29	1	1.6
Guinea- Bissau	206	129	37	6	2.1
Mali	253	128	49	8	3.1
Nigeria	213	124	42	9	2.5
Niger	326	114	65	10	4.8
Côte d'Ivoire	152	108	29	11	1.6
Burkina Faso	202	102	49	14	3.1
Guinea	241	101	58	15	3.9
Togo	143	96	33	19	1.8
Benin	181	90	50	22	3.2
Liberia	248	75	70	32	5.4
Gambia	170	73	57	33	3.8
Ghana	128	72	44	36	2.6
Senegal	142	60	58	43	3.9
Cape Verde	62	22	64	88	4.6

*AARR: Average Annual Rate of Reduction of under-5 mortality

Major contribution to under-five mortality decline

The Major decline in deaths was from reduction of deaths due to infectious diseases, of which measles deaths reduction by over 80% was the most remarkable. The average measles immunization coverage in the sub-region is however yet to reach the 90% target for MDG4, improving from an average of 58% to 79% and only five countries reached the 2015 target of 90% by end of 2012⁴.

The 2013 UNICEF MDG Report revealed that based on regional group analysis West and Central Africa achieved average reductions of 23% for neonatal mortality, 33% for infant mortality and 39% for under-five mortality from the 1990 rates⁴. When analyzed separately however, West Africa’s progress still fall short of the 2/3rd MDG4 reduction targets, with average reduction of 30.4% for neonatal mortality, 42.7% for infant mortality and 49.7%, for under-five mortality between 1990 and 2013.

Absolute Progress

The MDGs have been argued to be too ambitious for sub-Saharan Africa because although they were set in 2000, their monitoring was backdated to begin from 1990. This makes progress difficult for these countries since

they had poor development indices in the 1990s and were confronted by numerous challenges along the line. While the MDG4 measures relative progress or extent of death reduction from 1990, absolute progress measures the total change made. West African countries fared better by absolute progress ranking than by relative ranking (Table 2)^{6,7,8,9,10}.

Table 2: Under-five mortality (U5MR) global absolute and relative ranking for West African countries, 1990-2007*

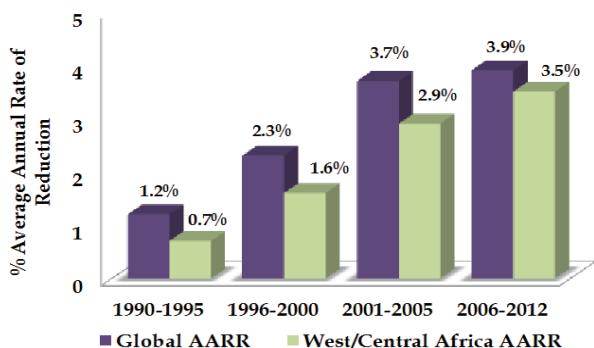
Country	U5MR 1990	U5MR 2007	Absolute Progress Rank	Relative Progress Rank
Niger	304	176	1	60
Guinea	231	150	9	73
Liberia	205	133	13	72
Benin	184	123	16	77
Mali	250	196	26	100
Togo	150	100	30	75
Gambia	153	109	37	89
Guinea-Bissau	240	198	39	106
Nigeria	230	189	41	104
Senegal	149	114	50	97
Cape Verde	60	32	61	41
Sierra Leone	290	262	61	113
Côte d'Ivoire	151	127	71	109
Burkina Faso	206	191	89	116
Ghana	120	115	113	121

*Modified from:

Overseas Development Institute, 2010. The Millennium Development Goals Report Card. Measuring Progress Across Countries. September 2010

The 2013 UNICEF MDG Report that included analysis of United Nation's Inter-agency Group for Child Mortality Estimation (IGME) data demonstrated the faster rate of under-five mortality reduction in West and Central Africa by absolute average rate of reduction from 1990 to 2012 compared to the global average (Figure 2). These sub-regions recorded a five times rise in average annual rate of reduction (AARR) compared to only a tripling of the global average in the period 1990 to 2012^{4,5}.

Fig 2: West/Central Africa's Rise of Under-5 Mortality Reduction*



*Modified from:

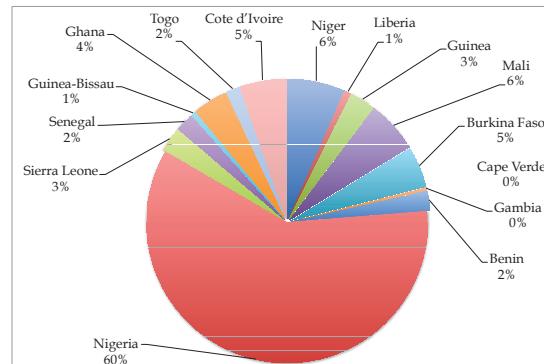
4. United Nations Children's Fund, New York (2013). Committing to Child Survival: A Promise Renewed: Progress Report 2013. Accessed 15 September 2013. Available at, www.apromiserenewed.org.

In spite of these achievements West African countries remain prominent in the global league for under-five

mortality burden, with Nigeria alone responsible for 827,000 deaths or 13% as at the end of 2013, coming second to India's 22%. At the sub-regional level 60% of the burden lies with Nigeria alone, while each of the other countries have less than 10% of the total under-five mortality as at the end of 2012 (Figure 3)⁴.

With a 2011 population of 162 million, Nigeria's under-five population of about 27.2 million is over half the region's under-five population², partly accounting for its relatively higher burden.

Fig 3: Under-five mortality burden in West Africa, 2012 (% of 1.5 million)



Countries with the Most Impressive Progress

The countries with the most impressive under-five mortality decline were Niger and Liberia with average annual rate of reduction (AARR) of 4.8% and 5.4% and reductions of 65% and 70% from the 1990 rates respectively⁴. These lower income countries successfully scaled up major interventions that improved universal access for the leading killer diseases of children including malaria, pneumonia, diarrhoea, malnutrition and HIV^{2,3,4,5,11}.

In Niger 22% of under-five death reductions were attributed to improved care-seeking for pneumonia and diarrhoea, 25% due to provision of insecticide treated mosquito nets (ITN) to under-five children and 19% to nutrition intervention programmes^{11,12,13}. In Liberia by the end of 2010 ITN provision for under-five children was raised to 73% thereby halving malaria prevalence, prevalence of severe malnutrition fell to 2.2% due to enrolment of 50% of severely malnourished children in a *basic care package*, PMTCT and ART coverage have improved to 69% of eligible women and to 44% of eligible children while neonatal tetanus has also been eliminated by the end of 2010^{11,12,14}.

Nigeria's under-five mortality burden

Nigeria's performance in under-five death reduction apparently weighs down both West Africa's and sub-Saharan Africa's averages, with a population of about 51.4% of West Africa's total as at 2011. While Nigeria's under-five population of 27.2 million is equivalent to about half (51.6%) of the total under-five population in the sub-region, its under-five mortality proportion of 60% by the end of 2012 is disproportionately higher than the country's contribution to the total under-five

population in the sub-region². The country had a 1990 under-five mortality rate of 213/1,000 live births an AARR of 2.0% and its total reduction of 42% from the 1990 rate is amongst the six lowest in the sub-region.⁴ Nigeria's rapid population growth is faster than the pace of scale-up of services. For instance, as the annual number of births rose from 4.3 million to 6.1 million between 1990 and 2008 and the number of births attended to by skilled providers doubled from 1.3 million to 2.7 million, the service coverage rose by only 8% (31% to 39%). Had the number of births remained stable the coverage could have reached 63%, much higher than the 8% rise^{2,3,17}.

The Challenges of Reducing Under-five Mortality in West Africa

Several challenges have contributed to slow down the progress of West African countries towards reduction of under-five deaths, many of which are common to all the countries while a few are unique to each country. Foremost among the common challenges are:

Funding constraints

Both domestic and external funding (MDG 8 targets) for the implementation of MDG interventions are falling short of expectation. For instance funding from the Overseas Development Assistance (ODA), which commits developed countries to set aside 0.7% of their Gross National Income (GNI) towards MDG funding has been dwindling especially due to the global economic crisis in the last decade. Similarly, commitments made by African leaders in the "2001 Abuja Declaration" were not being fulfilled, with only five of the countries in the sub-region keeping their promise of setting aside 15% of their national budgets for health as at 2011^{15,20}.

Poverty, hunger, malnutrition and poor maternal education

West African countries are among those with the highest under-five death rates in the poorest households. Mortality analysis by household wealth quintiles has revealed that under-five children of the poorest 20% of households have at least a two-fold risk of mortality than those in the richest quintile¹⁹. There is also a three times higher risk of under-five mortality in children of uneducated mothers compared to those of mothers that had secondary level of education¹⁹. Countries like Niger, Mali and Guinea Bissau have serious to alarming levels of hunger as rated on the *Global Hunger Index*. The lingering poverty coupled with food insecurity is aggravated by adverse climatic changes, as well as civil unrest, all of which have contributed to high rates of malnutrition and increased vulnerability of children to infections^{11,12}.

Poor utilization of health services

There is generally poor health seeking behaviour for children across the sub-region. For instance, less than

half of children with suspected pneumonia are taken to a health care provider and there is sub-optimal use of antibiotics among those attended to. Similarly there is poor utilization of oral rehydration salts (ORS) and zinc for children in Nigeria, Mali and Niger that have the highest diarrhoeal disease burden and deaths in the sub-region^{11,12}.

Sub-optimal routine immunization

While routine immunizations coverage improved in Liberia and Niger, sub-optimal routine immunization coverage and inconsistent immunization campaigns in some parts of Nigeria have contributed to resurgence of outbreaks of measles¹⁶. Meanwhile the global annual burden of measles was reported by WHO to have reduced from 853,500 cases in 2000 to 355,000 cases in 2011 with a decline of mortality globally by 71% between 2000 and 2011, from 542 000 to 158 000 deaths.^{26,27} The WHO has estimated that about 1.7 million out of the 20 million unprotected children live in Nigeria with up to 18,843 cases reported in measles outbreaks in the country in 2011 alone²⁶.

Human resource constraints

The sub-region has the severest shortage of health care personnel with a density of less than two health workers per 1,000 persons, much lower than the WHO standard of 2.3 per 1,000. Health care workers are much fewer in rural, remote and hard to reach areas and where available, they often have inappropriate skill mix, performing jobs not suited for their competencies^{17,18,19}.

Inadequate water supply and poor environmental sanitation

There is generally poor access to safe potable water resulting in high diarrhoeal disease prevalence and higher burden of diarrhoeal disease mortality. There is generally slow progress in realizing the environmental sustainability targets (MDG 7) in most countries in the sub-region, with less than 50% of citizens having access to supply of safe water. There is also poor environmental sanitation with the effect of contamination of surface water^{4,25}.

High out of pocket expenses for health

The countries in West Africa generally have high out of pocket expenses for health from family income for their citizens. For instance these expenses make up above 50% in half of the countries and is up to 88% in Guinea and 94% in Cape Verde. The Governments' per capita expenditure on health is also quite low, being less than 15% across the sub-region^{2,6}.

Slow rate of maternal mortality reduction

Maternal mortality ratio ranks amongst the highest in the world due to poor progress in reduction of peripartum deaths across the sub-region. Nigeria has one of the

highest maternal mortality rates in the sub-region, with a national average of 545/100,000 live births and nearly twice this in the north east and north west zones (1000/100,000). Maternal deaths consequently increases vulnerability of orphans, further predisposing them to inadequate care and malnutrition, with negative impact on their chances of survival^{3,4,19}.

Slow rate of neonatal mortality reduction

Reduction of neonatal deaths lags behind under-5 mortality decline as a result of which the average share among total under-5 deaths rose from 36% to 40% from 1990. The absolute number of neonatal deaths rose above the 1990 figures in some countries like Nigeria^{3,4,5}. A large proportion of neonatal deaths are attributable to birth asphyxia following high rates of home deliveries that are often unsupervised by skilled attendants.

Rapid population growth

West African countries have about the highest population growth rates constituting a huge challenge for adequacy of health service coverage. The rate of population growth is faster than the rate of scale up of services as typified by Nigeria where there was marginal increase in births attended by skilled personnel despite a two-fold increase in number of skilled birth attendants over the period from 1990 to 2008^{2,3,17}.

Armed conflicts

Most countries of the sub-region have had their share of one type of conflict or another ranging from civil wars and sectarian/ethnic clashes to military take-over of power in coup d'états, which has disrupted equitable service delivery. Civil wars were fought in Sierra Leone, Liberia, Guinea-Bissau and Côte d'Ivoire, Coups d'états occurred in Gambia, Niger and Guinea while ethnic and sectarian clashes occurred frequently in Nigeria, Mali, Benin since 1990. These have caused displacement of populations and movements of people across borders leading to vulnerable refugee settlements where child malnutrition and infectious disease incidence contribute to increased morbidity and mortality especially amongst under-five children⁴.

The Outlook for Reduction of Under-five Mortality in West Africa

With less than 24 months to the end of 2015, up to nine countries including the most populous are unlikely to achieve significant under-five death reductions, and therefore may not be able to reach their 2/3rd reduction targets at their current average annual rates of under-five mortality reduction (AARR). Although up till the end of 2013 only Liberia has attained the 2/3rd under-5 mortality reduction from the 1990 rate, but with sustained progress at the current AARR of 3.8-4.8% Niger, Cape Verde, Senegal, Guinea and Gambia are likely to attain their two-thirds reduction targets. At their current AARR counties like Togo and Sierra Leone may not be

able to reduce their under-five mortality to the expected level till up to two decades after 2015 (Figure 4)⁴. As a sub-region therefore, even though West Africa has recorded undisputed successes in child death reductions over the last decade, it is unlikely to achieve the desired global benchmark for under-five mortality reductions in the remaining period to the end of 2015.

Fig 4: Year at which West African Countries would Achieve MDG4



Some development experts have disputed the current methodology for the measurement of success in achieving reduction of under-five mortality, proposing that measurement is more objective when made by assessing for pace of progress than by achievement of fixed targets¹⁰. The official reports of the UNDP, World Bank, UNICEF and other UN agencies on successes of MDGs placed much emphasis on achieving set targets and these have portrayed sub-Saharan Africa as either being "off-track", "missing the target" or having a "grossly insufficient rate of reduction". It is further argued that as performance measures, MDG success should equally focus on pace or acceleration of progress relative to pre-2000 period rather than achieving projected targets¹⁰. They further observed that the current reported MDG achievements do not differentiate between background non-MDG country developmental performance from achievements solely attributed to MDG efforts, and so any observed progress could as well have been at least partly as a result of efforts unrelated to MDG. In this context, a proposed alternative method of analysis of data from the period preceding 1990¹⁰, revealed empirical findings suggesting that Africa's MDG progress is even faster than the global average¹⁰. Other findings in this regard include:

1. A 63% acceleration (post-2000) of Africa's under-5 mortality reduction against a global average of 32%.
2. Nigeria, Burkina Faso and Senegal emerged among the world's top 10 for under-5 mortality reduction and among the top 15 improvers of reduction by absolute pace of improvement.
3. When rated by AARR and comparing progress from 1970 to 2010, 75% of sub-Saharan Africa had accelerated its AARR in the period between 2001 and 2010 over previous rates¹⁰.

Recommendations for the Way Forward

With obscure prospects for achieving global reduction

goals and targets, West African countries need to focus on strategies to further accelerate their progress beyond just a focus on 2015 targets, specifically to:

1. Improve political will and commitment to adopt and implement innovative health policies, strategies and interventions^{4,19,21,23}.
2. Review terms of development partnerships with stakeholders through country-led selection of needs, taking the lead in setting their own national goals and targets and channeling partner support towards the most essential interventions⁹.
3. Implement strategies to further address poverty alleviation and reduce family out-of-pocket expenses for health^{4,19}.
4. Increase universal access to basic services and supplies (drugs, vaccines) and rehabilitate physical infrastructure by increase in budgets for the health sector^{13,14,15,20}.
5. Accelerate efforts to address human resource gaps through task shifting, mentoring and deployment of skilled personnel to under served areas^{3,4,11,17}.

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Conclusion

West Africa continues to have a huge burden of under-five mortality in spite of considerable successes that were achieved by absolute progress a disadvantaged status in 1990 and daunting challenges along the line. By the current MDG benchmarks, realizing the two-thirds under-5 mortality reduction target is unlikely for West Africa. Countries in the sub-region would need to further strengthen and scale up successful strategies and interventions, address the challenges, and take more ownership and responsibility towards combating infectious diseases and neonatal deaths.

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