



Review

Optimising the use of routine immunisation clinics for early childhood development in sub-Saharan Africa

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ABSTRACT

There is now ample evidence that factors that account for high infant and child mortality in sub-Saharan Africa and other developing regions are also associated with lifelong developmental impairments in the survivors from early childhood. Of all routine immunisation programmes widely administered soon after birth, bacille Calmette–Guérin (BCG) and diphtheria–pertussis–tetanus (DPT) offer effective platforms to implement a package of interventions that extend beyond child survival to include the early detection and prompt management of developmental disabilities as recently demonstrated in some pilot programmes in sub-Saharan Africa. This paradigm shift is consistent with the Global Immunisation Vision and Strategy (GIVS) of UNICEF/WHO for integrated interventions. It also accords with the current early childhood development policies of all major UN organisations and the World Bank. Such integrated programmes should now be widely encouraged throughout the region by its developmental partners.

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1. Introduction

Every year about 135 million babies are born worldwide and 90% live in developing countries [1]. Given the steady albeit sub-optimum improvement in infant and child mortality rate since 1990, an estimated 112 million or 92% of the 122 million children in developing countries will live past their fifth year for an average of 66 years. On a regional basis, sub-Saharan Africa has the highest under-five mortality rate of 160 per thousand live births and

accounts for about half the deaths of children under 5 years in the developing world. About 84% of the 30 million children born yearly in this region will survive beyond their fifth year with an estimated life expectancy of 50 years. These grim mortality statistics though representing marked improvement compared with the status prior to the launch of the millennium development goals (MDG) project in September 2000 have spurred the current leadership in World Health Organisation (WHO) to benchmark their success in global health till 2015 with the progress achieved in sub-Saharan Africa [2,3]. Unfortunately, the drive to accelerate progress for the region has often tended to shift attention away from the challenge of ensuring that the beneficiaries of the various survival initiatives thrive in the first five crucial years of life for optimal growth and development which is of ethical concern for some health professionals and policy makers.

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Table 1
Typical national immunisation schedule in developing countries.

Vaccine	Recommended age for vaccination				
	Birth	6 weeks	10 weeks	14 weeks	9 months
Bacille Calmette–Guérin (BCG)	x				
Oral polio ^a	x				
Diphtheria–pertussis–tetanus (DPT)		x	x	x	
Hepatitis B ^a		x	x	x	
Haemophilus influenza type b ^a		x	x	x	
Yellow fever ^a					x
Measles					x

^a Not provided in, or applicable to all countries. Source: WHO [14].

2. Why early childhood development?

The importance of early childhood development to human and overall national development has been widely acknowledged [4–7]. The subject has also been of great interest to a broad array of disciplines including developmental paediatrics, behavioural sciences, neurosciences, biology, anthropology, education and economics for many years [8]. The first years of a child's life signify a crucial period when brain development is most susceptible to physiological and experiential influences even as the interactive interplay of both early experience and gene expression has been shown to affect the architecture of the brain and the emergence of life-long capabilities [8,9]. Researchers have argued that subsequent robust or fragile foundation for later developmental achievements in children including overall well-being evolve from birth to age 5 years [8]. A major hurdle in developing countries has always been how to integrate child development initiatives with the current child survival strategies. This need is made more compelling by the recent evidence demonstrating that countries of the world with the highest rates of infant and child mortality also have the highest proportion of developmentally disadvantaged children [10–12]. In fact, excluding children with sensory disabilities, an estimated 219 million children are not likely to reach their developmental potentials in their first five years of life in the developing world and a significant proportion of these live in sub-Saharan Africa. Such evidence suggests that factors that account for child mortality must no longer be viewed solely in terms of improving survival rates but also in addressing the need for the beneficiaries of these programmes to achieve optimal growth and development in early childhood. This is consistent with the early childhood development initiatives of major international institutions like UNICEF, WHO, UNESCO and the World Bank [4–7].

3. Routine immunisation in sub-Saharan Africa

Undoubtedly, routine childhood immunisation has been the longest and most successful survival programme worldwide and has been recognised as a key determinant of progress towards achieving the envisaged two-thirds reduction in child mortality by 2015 [13]. Although not all causes of child mortality are vaccine preventable, immunisation against measles has accounted for a major reduction in child deaths worldwide. For instance, improved routine vaccinations have led to a two-thirds decline in measles related deaths since 1990, surpassing the initial target of a 50% reduction by 2005. In fact between 2000 and 2006, measles deaths in sub-Saharan Africa fell by more than 91% [13]. However, about 60% of child mortality in sub-Saharan Africa occurs in the first year of life while about 28% occurs in the first month of life before the first measles vaccination [1]. Besides measles, various immunisation programmes have been introduced to address a range of vaccine-preventable deaths in the first year of life as shown in Table 1 [14]. Some of these vaccinations and their timing may be modi-

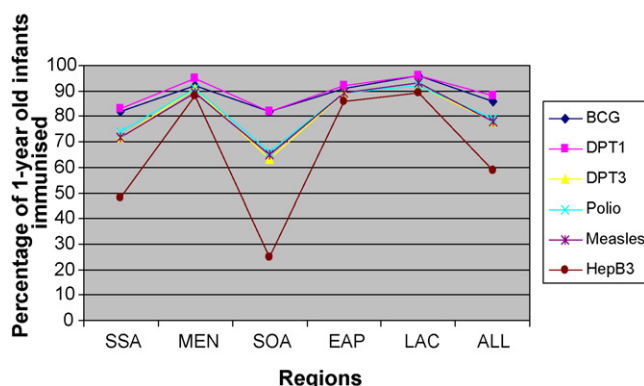


Fig. 1. Expanded programme on immunisation in developing countries. Source: UNICEF [1]. Key: Sub-Saharan Africa (SSA); Middle East and North Africa (MEN); South Asia (SOA); East Asia and Pacific (EAP); Latin America and the Caribbean (LAC); All Developing Countries (ALL).

fied by local circumstances but the WHO/UNICEF schedule is widely implemented in sub-Saharan without modification. A major advantage offered by immunisation programmes is their effectiveness in attracting infants born outside hospitals who cannot be reached by hospital-based programmes. For instance, only 36% of all deliveries in sub-Saharan Africa occur in hospitals [1]. Perhaps more surprising is a recent observation from an inner-city community in Lagos, Nigeria well served by several private and public hospitals which showed that over half of deliveries occurred outside hospitals with traditional maternity homes accounting for over 75% of non-hospital deliveries [15]. However, the over 80% uptake of bacille Calmette–Guérin (BCG) and diphtheria–pertussis–tetanus (DPT1) immunisation in the region clearly demonstrates that majority of infants born outside hospitals are presented for routine immunisations in the first months of life. Of all the immunisation programmes administered shortly after birth BCG and DPT1 have the highest uptake in sub-Saharan Africa and the rest of the developing world (Fig. 1). The proportion of infants who received BCG and DPT1 immunisation in 2006 in the ten most populous countries in the region along with the proportion of infants born in hospitals are presented in Fig. 2. The benefit of routine immunisation is perhaps best exemplified by Ethiopia. Whilst this country has the second largest annual births but only 5% are born in a health facility, which is the lowest in the continent, yet the uptakes for BCG and DPT1 are 72% and 80% respectively.

4. Integrating other health interventions with immunisation

The concept of service integration in healthcare delivery has been at the centre of health policy debate for many years and a full discussion is outside the scope of this review [16,17]. Essentially, distinction is often made between vertical approach to service

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