

Review on Measles Situation in Ethiopia; Past and Present

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Abstract

Contributing for five percent of under-five mortality, Measles has been one of the major causes of death and sickness of children in Ethiopia. The objective of this review is to evaluate the situation of measles in older and current times in Ethiopia and also to discuss cultural outlooks related with the diseases. Published papers, measles related reports, documents and historical books were reviewed and extracted. Of vaccine preventable diseases, measles is particularly associated with supernatural causes than others. Studies done on the perception of the rural community on causes of measles revealed that both natural and supernatural forces were mentioned as a cause of the disease. Several traditional cures for measles involved certain degree of magic and superstitions are common practices in older times and in the current situation as well. This includes prohibiting or controlling the movement of persons, isolation of a sick child from human contact and applies traditional home treatment and even sending unaffected children out of the village to other outbreak free areas, was reported to be the common practice in ancient Ethiopia.

Through implementation of measles routine immunization program since 1980 and campaign based supplemental measles vaccination activities since 2002, there was steady progress in reducing morbidity and mortality from measles. Despite efforts to implement planned strategies, continuing measles outbreaks, are documented mainly in Sothorn, part of the country from 2010 onwards. In Ethiopia, a seasonal pattern of occurrence of measles outbreak has been observed over the years, with increased number of measles cases during the late-early part of the year (December to February). Due to low sub national routine measles coverage, prevailing poor nutritional conditions, accumulation of unvaccinated children in highly populated areas accompanied by seasonal hot weather condition, frequent measles outbreaks still continue to occur in different parts of the country.

Keywords: Measles; Sickness of children; Morbidity; Mortality

Introduction

Ethiopia is the oldest independent country, located in the Eastern part of Africa, also known as the Horn of Africa, lies between 3 and 15 degrees North latitude and 33 and 48 degrees East longitude. It is the tenth largest country in Africa, covering 1,104,300 square kilometers. Ethiopia is the second highest populated country in sub Saharan Africa. Projections from the 2007 population and housing census estimate the total population for the year 2015 to be 92.08 million. Ethiopia is the home of a variety nations, and nationalities and peoples varying in population size from more than 33.7 million to less than 250 thousand spread across regions of the country and with more than 80 different spoken languages. According to 2007 census, the country is among the least urbanized country in the world with 83.6% living in rural areas whilst 16.4% of the total population living in urban areas [1].

Figures on vital health indicators from UN, 2014 report shows a life expectancy of 64 years and an IMR of 44 /1000. Under-five mortality rate has been reduced to 64/1000 [2] (Figure 1). Measles accounts for 5% of child hood mortality [3]. Ethiopia is implementing strategies aligned with global targets to advance the achievement of MDG 4 in reducing child mortality. The country is committed to achieve the elimination of measles by 2020 in line with African Region resolution AFR/RC61/R1. Through implementation of the recommended strategies including strengthening routine immunization activities and accelerated measles control since 2002, there was steady progress in reducing morbidity and mortality from measles. Continuing measles outbreaks, despite efforts to implement planned strategies are documented especially in SNNP, Amhara, and Oromia regions. Beginning 2010, outbreaks became more frequent with visible age shift affecting infants and children and or youngsters above the age of 5 to 20 years [4].

Objective

The objective of this paper is to review measles situation in

Ethiopia with emphasis on measles immunization activities including its historical perspectives, current trend of measles outbreak and traditional believes regarding the cause and management of measles cases.

Methods

Published papers, measles related reports, Government immunization performance documents, historical books and other relevant resources were reviewed. More than hundreds of related materials were seen and materials which were highly relevant with the topic of interest were included in the review.

Results

Historical context of measles in Ethiopia

References to measles can be found as far back as the 7th century A.D. In fact, measles was described by Rhazes (Persian philosopher and physician) in the 10th century A.D. as “more dreaded than smallpox.” Measles in history was considered to be a life event that almost all children went through. A Scottish physician, Francis Home, demonstrated in 1757 that measles was caused by an infectious agent

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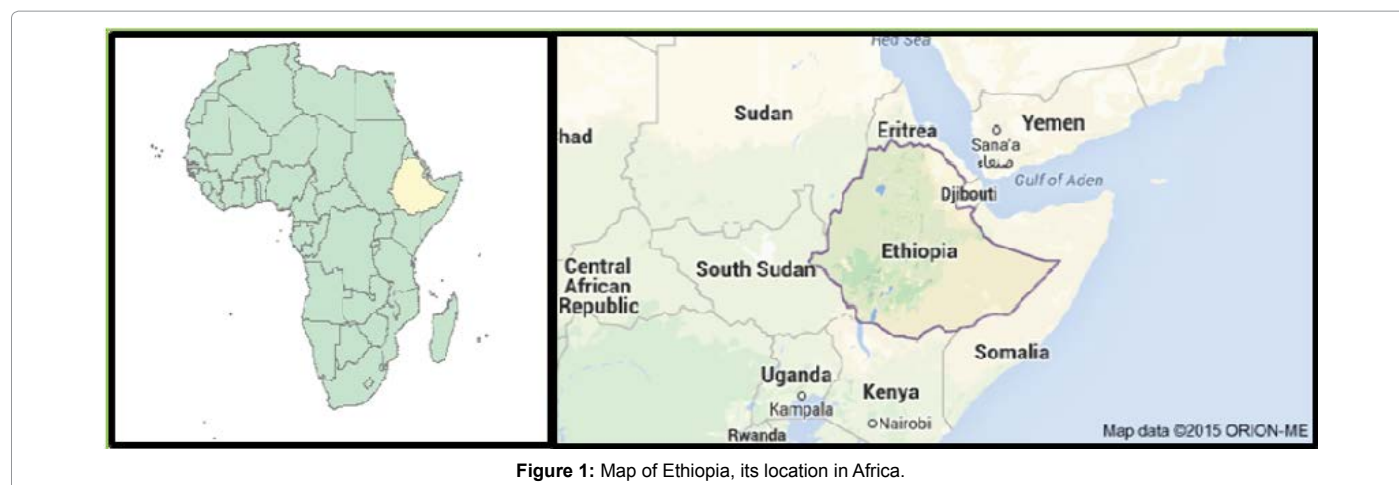


Figure 1: Map of Ethiopia, its location in Africa.

present in the blood of patients. Before the vaccine era, measles affected almost all of the population at some point in their lives. But all that changed in 1963, when the measles vaccine was first licensed in the United State [5].

Measles has been one of the major causes of death and sickness of children in Ethiopia. The disease is known by different names in different localities and languages or Ethnic groups in ancient Ethiopia (such as Kufign, wotetie, ankelis in Amharic, Nifiye in Tigrigna, Shifito, Difira in Oromifa, Himaki in Afarigna). Several traditional cures for measles involved certain degree of magic and superstitions are common practice in older times as well as even in the current situation.

According to Bruce a popular practice in eighteenth century in Gondor developed by a monk of waldiba, consisted of inscribing a tin plate with magical character which were then washed off with medicinal liquor and given to the patient to drink. An element of superstition was also involved in the above mentioned sudoritic treatment in Tegra as much as visitors were not allowed in the vicinity of the patient even male animals due to the belief noted by Pearce, that sexual intercourse even by livestock, would cause the devil to bring the 'shadow of death' up on the patient and kill him [6].

Discussing this superstition Pearce commented "I have often asked what they mean by the shadow and how the shadow would come to house or huts where everything was closed and not a hole or cervices but was stopped up. They said that all connections (i.e. sexual intercourse) done while Alimighty was angry with them would increase their illness and vex God so much as not to show mercy up on them at all" [6].

More socially desirable perhaps were attempts to prevent the spread of outbreaks such as small pox and measles infection by prohibiting or controlling the movement of persons, isolation and even sending children out of the village to other areas where there is no outbreak. The France physician Dr Wurtz reported in 1897 that many children of the capital Addis Ababa had been sent out of the town to avoid the epidemic which was raging and were living under canvas in the mountains some distance away [7].

Perceived cause of measles by the community in Ethiopia

Studies done on the perception of the rural community on causes of measles revealed that both natural and supernatural forces were mentioned as a cause of measles. The distinction between the two

explanations was not clear. Natural explanation of illness is somehow related to a supernatural cause as an ultimate reason. Of the vaccine preventable diseases, measles is more associated with supernatural causes than others. Measles is perceived to come from clouds and hot/cold temperature vapor from ground, bad wind, flies from one child to the others. Many others also related the cause of measles spiritual and magical things and happened when that spirit is not happy about the household doings.

The idea appears to have originated from the general belief that disease is caused by supernatural or outside forces. As explained in many other societies of developing countries, options of the health care services are different consisting of modern health care seeking and traditional/herbal sectors. The professional or modern sector includes the hospitals, clinics, drug stores. Low health seeking behavior, deep rooted traditional believes and in accessibility of these services makes the rural setup in particular not to maximally utilize these sectors. Although the recently started health extension program in Ethiopia however is improving the utilization of modern health services in rural Ethiopia, the folk sector includes a wide range of traditional healers, of which the traditional and religious healers of locally known as Mestehaf Gelach and Kalicha and herbalist (locally known as Medhanit awaki) are still important in the treatment of child illness such as measles. The illness as it is only God who is able to bring all kinds of illness to people and measles is known as once in a life time illness.

The beginning of measles immunization program in Ethiopia

The history of immunization services in Ethiopia prior to 1980 has not been documented very well although small pox eradication activities have left some legendary memories. There is no adequate documented information on the history of immunization before the Era of EPI which started in 1980 in the country. However few available written sources indicated that small pox and BCG vaccines were being provided nationally before 1980. Measles vaccine was available Yekatite hospital (one of the hospitals in Addis Ababa) and in some NGOs as well but these activities were not reported to MOH thus not properly documented [8].

In 1974, as the consequence of the success in the global campaign to eradicate small pox, WHO initiated EPI with the goal of protecting children against the six vaccine preventable diseases namely tuberculosis, measles, poliomyelitis, tetanus, diphtheria, and pertusis. EPI was launched in Ethiopia 1980, and introduced measles vaccination in the same year, as

part of the Expanded Program on Immunization (EPI) [9].

Expanded Program of Immunization (EPI) in Ethiopia, 1980-1992

Ethiopia has been engaged in expanding immunization services against the six childhood diseases since 1980. The goal of EPI in Ethiopia at the beginning was to increase immunization coverage by 10% annually and achieve, universal child immunization i.e. 100% coverage of third round Diphtheria-pertussis-tetanus (DPT3) vaccination by 1990.

At the beginning, the goal of EPI program was to provide immunization services including measles to all children under two years of age. However in 1986 the policy has been changed and targeted only under one surviving infants throughout the country [10]. An average national immunization coverage increase of about 2.9% annually in the previous 30 years has been recorded despite the plan of achieving 10% every year.

The child immunization coverage has never reached even to the level that desired to curtail measles transmission and reduces the morbidity associated with the disease. The immunization activities during 1991 and 1992 were dramatically reduced due to the expansion of the civil war in the Northern part of the country and subsequent new government change in the country. The measles coverage during these years fell to 19% in 1991 and to 12% in 1992, at the same time about 26% of the existing health institution were forced to stop their routine activities. Logistics problem due to the war were aggravated by problems of communication, transportation and spare parts. Also shortage of kerosene due to the Gulf war and internal security problems interfered with the proper operation of the cold chain system [11] (Figure 2).

Measles immunization activities, 1993-2002

After 1993, the coverage started to steadily increase until 1997. For the first time percentage of fully immunized children as measured by measles coverage reached over 50% for two successive years of 1996 and 1997 [10]. In 1998, there was a decrease in coverage of all antigen as compared to 1997, DPT3 and measles coverage have decreased by 4% and 5% respectively. The Ethio-Eritrean war, the unforeseen effect of the health sector reform and focus on polio NIDs and sudden reduction of funds from external partners for routine EPI activities have all attributed for the decline [12,13]. In the following years from 1999 up to 2002 there was again an improvement of EPI coverage as compared with the previous years (Figure 2).

2003-2014

The immunization coverage was not showing significant stagnant from 2001-2003. Following accelerated efforts to improve performance by the FMOH with support from EPI partners, the coverage has progressively improved since 2004. Measles coverage increased from 44% in 2003 to 55% in 2004. The coverage survey done in 2006 and 2012 disclosed that the measles coverage was 54.3% and 68.2% respectively [14-16]. The improvement of performance mainly attributed to, implementation of the Reaching Every District (RED) approach initiated in 2004 and the introduction of AD syringe in the routine EPI in 2003 which brought about significant improvement in the injection safety procedure in the advent of HIV.

Another milestone attributable for further improvement of routine immunization 2008 through 2010 includes strengthening of links between health services and the community through the

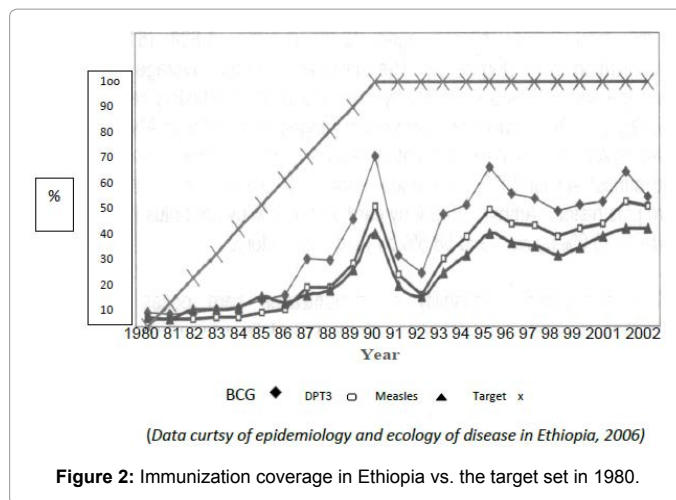


Figure 2: Immunization coverage in Ethiopia vs. the target set in 1980.

Health Extension Program and implementation of Enhanced Routine Immunization Activities (ERIA) in zones with large number of unvaccinated children and pastoralist regions in 2009 (Figure 3).

The DHS, 2011 and the 2012, National immunization coverage survey results have showed a big discrepancy with the national administrative report of FMOH, in that the administrative report claim, national measles vaccination coverage of 81% in 2011 as compared to DHS and coverage survey report of 56% and 68.2% in the same year respectively (Figure 3).

Global measles elimination initiative

Routine measles vaccination giving one dose of vaccine to infants began in developing countries in the mid -1970s. Many industrialized and several developing countries since added a second dose given to children between one and seven years of age (depending on the country). By 2000, 72% of the world's children were receiving at least one dose of measles vaccine (verses 16% 1980); annual reported cases had dropped by 80% (from 4.2 million in 1980 to 853000); and annual estimated deaths had dropped by 70%(from 2.5 million in 1980 to 750,000). By 2002, WHO's entire Americas region had eliminated measles (i.e had no indigenous cases, as distinct from imported cases, for more than 12 months) [17].

Despite these results, in 2000, measles was still the leading cause of vaccine preventable deaths in children, and the fifth leading cause of death from any cause in children under five years old [18]. Responding to this situation, in 2001, the American Red Cross, UNICEF, the United nation foundation, the CDC and WHO launched measles initiative aimed at reducing the death rate from measles in Africa where nearly 60% of measles deaths were occurring [19].

Supplementary mass immunization campaign were to be conducted periodically, targeting all children between nine months and 14 years of age, with follow up campaigns every two to four years targeting children between 9 months and under five years of age. Increased emphasis was also placed on laboratory backed surveillance of new measles cases and monitoring of vaccination coverage.

The initiative efforts gained impetus when in 2003, world health assembly call on WHO member states to half measles deaths by the end of 2005, compared with 1999 estimates. In 2005, the world health Assembly endorsed the even more ambitious GIVS goal, namely a 90% reduction, by 2010, of measles mortality compared with 2000 estimates.

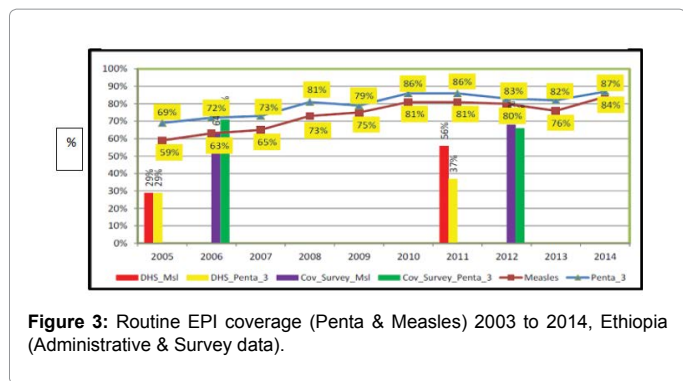


Figure 3: Routine EPI coverage (Penta & Measles) 2003 to 2014, Ethiopia (Administrative & Survey data).

By the end of 2006, the measles initiative had surpassed the goal to half measles death by 2005; end of year estimates for 2005 showed a 60% drop in global measles deaths since 1999 i.e from 87300 to 34500 Deaths) [18].

Estimates for 2007 show a record breaking 82% global vaccination coverage rate up from 72% in 2000, with most of the increase coming from Africa's surge in coverage to 74% up from 56% [19].

Measles burden in Ethiopia

Diseases conditions which are very common and perceived as 'inevitable' child illnesses such as measles, diarrhea, scabies, ascariis are not considered as disease but part of growing up by mothers in many rural places in Ethiopia. Several studies done in this regard revealed that among vaccine preventable diseases in rural Ethiopia only measles and pertussis mentioned as the common childhood disease in different areas [8,20].

Measles is the commonest vaccine preventable diseases that occur in Ethiopia; and mothers recognized as a self-limiting common childhood illness of which no medical care is often sought. A response of the mothers in rural setting (during one of studies done in 2000) for the question about measles was 'how can you ask me about the existence of measles and whether I know it or not .you can't suggest I do not know it, since it attacks children everywhere' and is too common [8]. This statement indicates how measles is a very common disease in rural Ethiopia. Traditional homecare remedies of different kinds are available in different ethnic and cultural groups to facilitate rapid recovery and reduce severity.

Epidemiology of measles in Ethiopia

Case-based measles surveillance was initiated in Ethiopia in 2003. The number of reported suspected measles cases has increased through the years and this might be partly due to the increased sensitivity of the surveillance system, rather than a failure of the control efforts. The number of laboratory and Epi linked confirmed measles cases together with routine measles coverage indicated in Figure 4.

Although measles is one of the weekly reportable disease in Ethiopia the number of reported cases represents only a small proportion of the expected cases. Measles case usually comes late to the health facilities and often after they have developed complication. As a result the diagnosis given by the health workers tend to be one of the complication rather than measles itself, which is one of the reasons for under reporting of measles cases. A combination of poor quality of record keeping, failure to identify epidemics and proper filing as well as failure of mothers to bring children affected by measles to health facilities for treatment are among other contributing for under reporting [11].

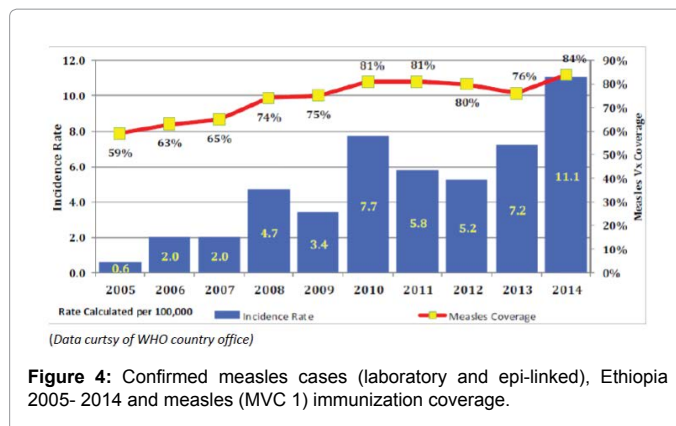


Figure 4: Confirmed measles cases (laboratory and epi-linked), Ethiopia 2005- 2014 and measles (MVC 1) immunization coverage.

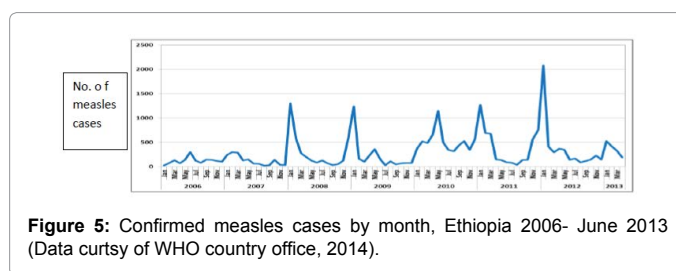


Figure 5: Confirmed measles cases by month, Ethiopia 2006- June 2013 (Data curtsy of WHO country office, 2014).

In 2013, measles incidence was 7.2 cases per 100,000 populations. A total of 243 measles outbreaks were confirmed in 2013 compared to 146 in 2012 with a total of 192 affected woredas (districts) in 2013 compared to 125 in 2012 (Figure 4).

Based on the epidemiology of measles in Ethiopia and burden of disease modeling, it is estimated that more than 1.5 million cases of measles (all age) and 70,000 deaths (assuming 4% case fatality ratio) would occur in Ethiopia annually. For many years the average number of measles cases reported to the Ministry of Health by the region ranged from 500-2000 annually [13].

In Ethiopia, a seasonal pattern of occurrence of measles has been observed over the years, with increased number of measles cases during the late-early part of the year (December to February) (Figure 5). Due to the low sub national routine measles coverage and prevailing poor living and nutritional conditions, measles outbreaks continue to occur frequently in different parts of the country, most especially in Oromia and SNNPR (southern) Regions where the density of the population is relatively high . The number of confirmed measles cases steadily increased from 73 in 2003 to a peak of 3,511 in 2008, following which there was a decline to 1,944 cases in 2009. Even though measles incidence rate has showed significant increase in the country since 2010 a dramatic increase is observed from 2012 up to 2014 (Figure 4).

Case based measles surveillance in a few selected administrative zones of Ethiopia in 2002 revealed that a shift of measles cases from children under five to those above five years of age. A total of 931 measles cases were registered during the surveillance period, of which 52.4% were children 5 to 14 years and the remaining 42.5% being a children under five years [21,22]. This indicates the effectiveness of the vaccination campaigns which mainly focused on providing and boosting immunization in under five children. Based on this fact subsequent measles supplemental immunization activities broadened the age range to children under 15 years of age.

Measles outbreaks continue to occur in most parts of the country

with nearly 70% of the reported cases among children less than 15 years. Epidemiologic data from the past several years show a decreasing proportion of measles cases in children under 5. This age group made up 56 % of measles cases reported in 2008 but only 30% of cases in 2014 [23].

Traditions of measles case management in Ethiopia

Regarding measles case handling, the traditional means is the most frequently used in majority of rural areas and limited urban settings in the country as it is easily available and convenient in many ways as well as due to strong conviction of most people that modern treatment option could worsen the illness. In many areas, it is customary that once the kid develops measles, mothers confined the sick child at home even hide for days and avoid any contact from the outsider. Home care with consultation of experienced women from neighbor family or traditional healer or kalicha is done with dietary changing, herbal bathing, with special coffee ceremony is the frequently used traditional ways of management of measles cases. If the child becomes seriously sick one of the family member will go the nearest kalicha or traditional healer to seek further advises to cure the child.

During the time of measles outbreak, even in current days such practice of hiding the sick child increases the likely hood of developing secondary complications of measles which can worsened the case fatality rate and also measles related morbidity. Due to this wide spread harmful practices, it is becoming the usual trend of outbreak investigation and surveillance team in both rural and semi urban localities visiting every household where measles cases is suspected/ reported and forcing mother and other family members to permit access to visit the sick child confined at home and convince or push them to take the sick child to the nearest health facility for treatment.

Traditionally, mothers often don't seek medical care when their child develops measles unless the children develop complication. If at all appeared to the health facilities, it could be recorded as case of pneumonia or diarrhea not as a case of measles. Consequently, there is considerable under reporting of measles cases. A study done in 2005 by FMOH and WHO on measles case fatality survey in Ethiopia indicated that there is still a high tendency not to seek treatment for measles and low belief in modern health services. The most common reason (38%) for not visiting health facilities for measles cases in those areas where health facilities are relatively accessible was, lack of belief in modern health services. The same study found that out of 1206 measles cases identified a total of 16 deaths were reported resulting a total case fatality ratio of 1.2% which lower than WHO African regional estimates of 5-15%. The assessment finally concluded that measles cases and deaths are highly underreported [13].

Conclusion

Between 2000 and 2007 the number of children dying from measles dropped by 74% worldwide, from estimated 750,000 to an estimated 197,000 children. In addition, immunization prevents sickness as well as lifelong disability including measles related deafness, blindness, and mental disability. But a lot remains to be done in order to achieve the global targets to reduce global measles mortality by 92% percent in Africa by 2010 as compared to 2000 level.

Ethiopia has done well in improving routine immunization coverage particularly starting from 2004. Significant improvement in routine EPI coverage including measles vaccination has been shown due to the combine effect of RED approach, Health extension program and implementation of Enhanced Routine Immunization activities

(ERIA). The implementation of measles supplementary immunization activities has also contributed a lot in the reduction of measles related mortality.

Despite considerable improvement in measles immunization coverage in Ethiopia, Measles outbreaks continue to occur in most parts of the country and becoming a cause of significant number of under-five mortality and morbidity. Low sub national routine measles coverage , prevailing poor nutritional conditions, accumulation of unvaccinated children in highly populated areas accompanied by seasonal hot weather between December and February have contributed for the frequent measles outbreaks occurring in different parts of the country.

Major efforts needed to be done in the coming years will significantly reduce measles related death by working towards measles elimination and introduction of second dose measles vaccine in routine immunization program integrated with improvement of nutritional conditions of children ensures that hard won gains in immunization are protected.

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