

# Measles outbreak in Simada District, South Gondar Zone, Amhara Region, May - June 2009: Immediate need for strengthened routine and supplemental immunization activities (SIAs)

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## Abstract

**Background:** Recently measles outbreaks have been occurring in several areas of Ethiopia.

**Methods:** Desk review of outbreak surveillance data was conducted to identify the susceptible subjects and highly affected groups of the community in Simada District, Amhara Region, May and June, 2009.

**Results:** A total of 97 cases with 13 deaths (Case fatality Rate (CFR) of 13.4%) were reported delayed about 2 weeks. Cases ranged in of age range from 3 months to 79 years, with 43.3% aged 15 years and above; and high age specific attack rate in children under 5 and infants (p-value<0.0001).

**Conclusion and Recommendation:** These findings indicate accumulation of susceptible children under 5 and a need to strengthen both routine and supplemental immunization activities (SIAs) and surveillance, with monitoring of accumulation of susceptible individuals to protect both target and non-target age groups. Surveillance should be extended to and owned by volunteer community health workers and the community, particularly in such remote areas. [*Ethiop. J. Health Dev.* 2012;26(2):115-118]

## Introduction

Measles is a highly infectious viral disease that can cause permanent disabilities and death. In 1980, before the widespread global use of measles vaccine, an estimated 2.6 million measles deaths occurred worldwide (1). In developing countries, serious complications may occur in as many as 75% of cases and mortality rate can reach 3-5% (2-4). With improved surveillance and two dose of measles vaccine strategy, the estimated measles deaths worldwide decreased from 733,000 in 2000 to 164,000 in 2008 (5).

The Ethiopian Ministry of Health (MOH) has started implementing an accelerated measles control strategy through supplemental immunization activities (SIAs) since 1998 (2). Between 2002 and 2004, a series of emergency and catch-up measles immunization and vitamin A supplementation campaigns were conducted in phases throughout the country, with average national measles immunization coverage of 92% (2). Since 2005 sub-national level follow-up SIAs have been conducted in phases. Following this nationwide catch-up campaigns, case-based measles surveillance was initiated in 2003 (2, 6), for detection, investigation and control of small and/or limited outbreaks promptly, which can eventually lead to the elimination of measles altogether.

Recently measles has been occurring with increased frequency in several areas of the country. In 2006, widespread outbreaks occurred in 74 districts and in ten of the 11 regions (2). During 2009-2010, Ethiopia was one of the countries in the world that experienced large outbreaks with 4,235 reported cases (1). Such widespread

outbreaks indicate accumulation of susceptible population for different reasons.

Measles outbreak was reported from Simada District on 29 May 2009. This study describes the outbreak and identifies the susceptible population.

## Methods

This is a desk review of outbreak data collected using surveillance reporting formats; preceded by laboratory investigation of serum for measles antigen as part of the outbreak investigation. It was also supplemented with qualitative assessment.

The study was conducted in Simada District, Amhara Region from 30 May to 30 July 2009. The district has 40 *kebeles* with 8 health centers and 39 health posts, and a total population of 236,098 in 2009 (7). Data on clinical features, date of onset of symptoms, laboratory results, and treatment outcome were collected from measles patients by an emergency response team (ERT) with disease surveillance reporting forms using the WHO case definitions. With unstructured questionnaire interview of the respective officials and ERT members background information about the district infrastructure, population size, the health service and EPI coverage; and health – seeking attitude of the community during measles outbreak were assessed. Laboratory confirmation was done at the Ethiopian Health and Nutrition Research Institute with blood samples collected from active cases.

Descriptive analysis with EPI-Info v3.3.2 statistical software (CDC Atlanta, GA); and summary of qualitative data on thematic areas was done.

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**Case definition:** The WHO adopted, national integrated disease surveillance case definition (8) was used.

**Suspected case:** Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) OR any person in whom a clinician suspects measles.

**Confirmed cases:** A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an epidemic.

## Results

A total of 97 suspected and confirmed cases with 13 deaths (Case Fatality Rate=13.4%) were reported from four *kebeles* (*Kebele 29, 38, 10, and 14*) during May and June, 2009. The date of onset for the index case was 12 May in *Kebele 29* in which, 83.5% (81/97) of all cases

occurred. The outbreak was reported to the district health office on 29 May 2009 and there was no report after 27 June, 2009 (Figure 1). The ages of the cases reported ranged from 3 months to 79 years; with median age of 10 years and inter-quartile range of 22 years. Of all cases, 88 (90.7%) were above 1 year old and 42 (43.3%) were above 15 years. Age-specific attack rate of infants <1 year of age and children between 1-4 years of age had significantly higher than those aged 5 years and above (p-value<0.0001). The overall attack rate was 41 per 100,000 people (Table1). There was no sex predilection of cases with 50.5% (49/97) males; however a majority of deaths occurred among females (9/13, 69.2%). The vaccination statuses of cases were not unknown, nor the immunization coverage of the affected *kebeles*. However, reported EPI coverage of the district was 73% in 2008-2009 (2001 EFY).

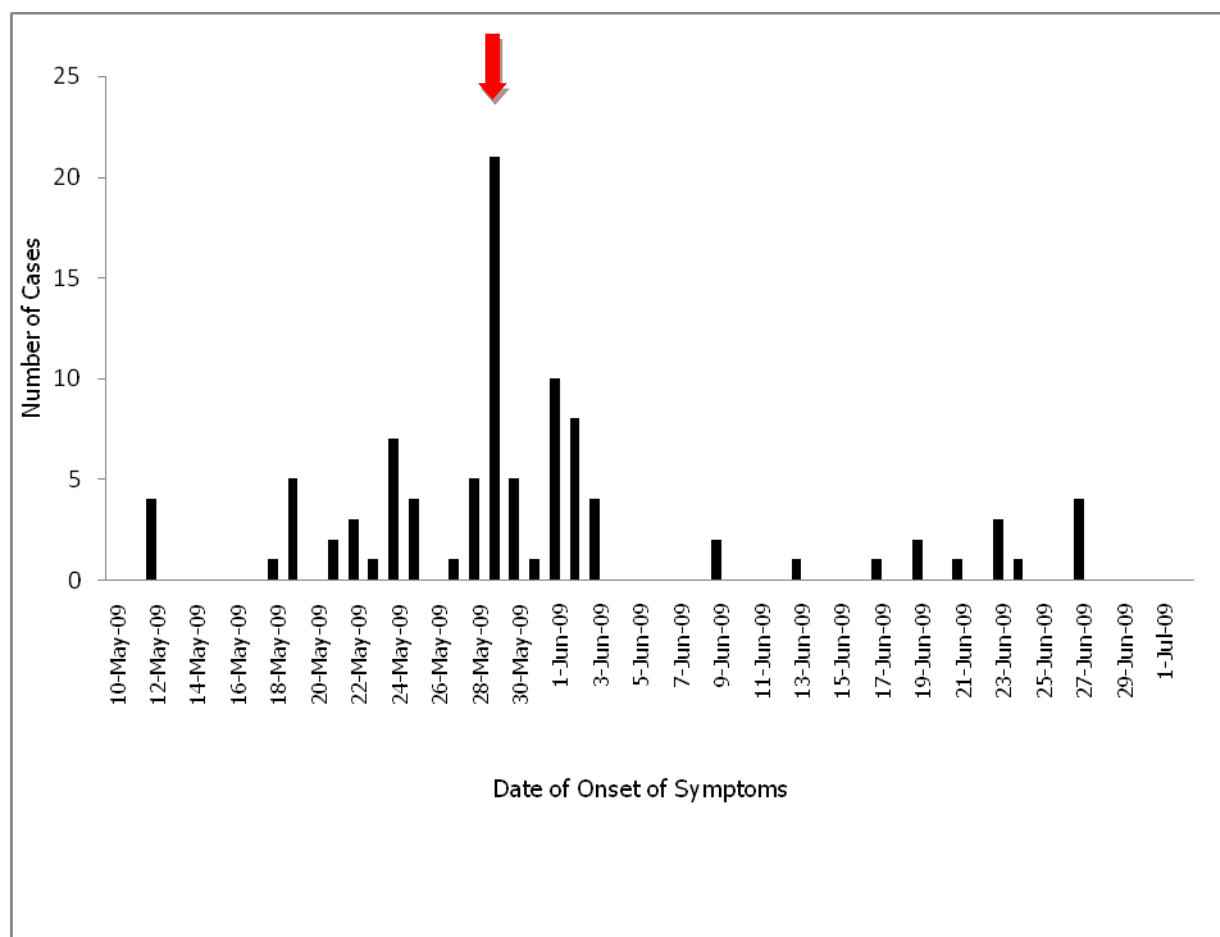


Figure 1: Epidemic Curve of Measles outbreak, Simada Woreda, May – June 2009

→ Date of Report to the District Health Office

Table 1: Age group-specific Attack Rates, deaths and Case Fatality Rate of Measles Outbreak, Simada District, south Gondar, May-June 2009, (Population based on the 2007 Census projection)

Age group	Estimated population	Number of cases (%)	Attack rate/100,000	Death (n)	Overall death rate/100,000	Case fatality rate (%)
<1 year	5666	9 (9.3)	159	3	52.9	33.3
1-4 years	26207	23 (23.7)	88	2	7.6	8.7
5-14 years	68705	23 (23.7)	33	1	1.5	4.4
>=15 years	135520	42 (43.3)	31	7	5.2	16.7
Total	236098	97 (100)	41	13	5.5	13.4

The outbreak occurred in remote *kebeles* [about 7 hour on foot from the main road] in which scheduled immunization delivery was challenging. Health Extension Workers deliver immunization by using vaccine carrier for 1-2 days. In the last 4-5 years, there were financial and trained staff shortages for cold chain maintenance in the District.

As ERT members described, the communities in these *kebeles* believed that measles should be treated at home with shading and no need of medical consultation. All collected blood samples (5/5) were positive for measles virus-specific immunoglobulin M (IgM), which is enough to confirm measles outbreak according to the MOH- WHO guideline.

#### Discussion and Conclusions

The District had conducted measles follow up campaign in 2008 for the age group 6 months to 5 years, with additional biannual Extended Outreach Strategy (EOS) measles vaccination (11). The current outbreak occurred in the remote pocket of the district where there was non-reassuring immunization services, with considerable delay in reporting, affecting a wider age range with a high proportion [43.3% (42/97)] of non-programmatically covered age group (age 15 years and above), and a high attack rate of under 5 children. Measles is one of the first diseases to reappear when vaccination coverage falls (9). Studies have shown that, with proportion of unvaccinated individuals as low as 4.3%, minor outbreaks are expected to occur with increasing attack rate around this threshold (10). The overall high attack rates, with wider age range, are good indicators for accumulation of susceptible population within the target age groups, with an undiluted immunity gap in the non-target population. Such remote areas are usually difficult to reach with routine immunization services (with regular schedule and appropriate cold chain system and so on) so they are prone to be overlooked during SIA campaigns; and have low contact with other measles endemic/epidemic areas. These might have created the conditions to develop pool of susceptible population, and may have resulted in the high under five attack rate. Hence, calls for strong routine and supplemental immunizations. During 2009-2010, Ethiopia was one of the countries experiencing large outbreaks, which were primarily associated with low routine measles vaccination coverage and with suboptimal or delayed SIAs (1).

The district being drought prone and food insecure, associated with low health seeking practice and delayed report, may contributed to the higher fatality rate (CFR=13.4%); with which much higher rates of complications cannot be ruled out. Data on risk factors, complications of measles and vaccination status of cases were not documented. Hence, we were unable to determine how measles was introduced to this area, risk factors for the outbreak, and burden of complications.

In conclusion, remote corners of the country with little access to the health facilities and suboptimal immunization coverage, coupled with low concern of the community for measles medical care (2, 6, 11) increase the pool of susceptible individuals and lower the sensitivity and timeliness of measles surveillance. These factors may result in multiple pockets of hot spots throughout the country and call for accelerated measles control effort.

Therefore, strengthening routine and SIA, monitoring of accumulation of susceptible groups, immunization coverage, and program and technical management of the cold chain should be done at lower administration levels to ensure that pockets of measles susceptibility do not develop (14). This monitoring is essential even where immunization coverage is high, as a substantial proportion of children remain susceptible to measles (due to a high rate of primary vaccine failure (11-13).

Besides, a robust surveillance system is needed, particularly in such areas with low vaccination coverage and hence, surveillance activities should be strengthened and extended to health extension workers (HEW), volunteer community health workers (VCHW) and to the community, and be made vigilant to report early. Finally, the identification of patients as young as 3 months of age warrants further study to determine the optimal age for initial measles vaccination and the feasibility of second dose vaccine.

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