

Original article

Small-scale outbreak of measles in the Irewole local government area of Osun State in Nigeria

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Abstract

Objective: An investigation of an outbreak of measles in a district in Nigeria was initiated following confirmation of the outbreak. The objectives of the study were to assess the size and determine the cause of the outbreak. **Methods:** Visits were made to health facilities and affected communities. Cases were line-listed using specified forms and descriptive epidemiology carried out on collected data. **Results:** A total of 18 cases and 0 deaths were identified over a period of six weeks. Two of the cases (11 %) were < 9 months of age. The proportion of zero-dose children was 39 %. **Conclusion:** Low herd immunity was suggested as the cause of the outbreak.

Keywords: Measles; Measles outbreak; Outbreak investigation; Nigeria

INTRODUCTION

Measles has been a major killer of children in developing countries primarily because of poor utilization of vaccine [1]. An estimated 197 000 deaths from measles occurred globally in 2007, of these 136 000 (69 %) and 45 000 (23 %) occurred in the South-East Asian and African Regions respectively [2]. Measles is an endemic disease in Nigeria [3]. It exhibits a seasonal pattern with increasing incidence during the dry season (November to May). Large numbers of susceptible children accumulate every year due to the high birth cohort and low routine im-

munization coverage. Between January and November 2008, of the 13 396 suspected cases that were reported to the National level, 4 823 (36 %) were confirmed by the laboratory. The affected age group was main children below the age of 5 years (Government report). The World Health Organization (WHO) comprehensive strategies for measles mortality reduction have been implemented in Nigeria since 2005, with a measles catch-up campaign and measles case-based surveillance introduced in all 36 states and the federal capital territory [1]. The outbreaks of measles were drastically reduced immediately following the implementation of these strategies. However, many outbreaks were reported in 2008 (254 outbreaks) compared with the previous two years; 2007 (194 outbreaks) and 2006 (30 outbreaks). Most of the outbreaks in 2008 (73 %) occurred in the first 4 months and occurred in the

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Northern part of the country (Government report).

The National measles routine vaccination schedule consists of one dose of vaccine administered to infants between 9 and 11 months, but with all children under the age of 5 being eligible to receive vaccine [4]. There is no routine second opportunity for measles (i. e. a two dose schedule currently in place). The reported estimate for National measles vaccine coverage in 2007 is 86 % [5]. Supplemental mass vaccination campaigns for measles, called Accelerated Measles Campaign (AMC), were implemented in 2005 and 2006 in the Northern and Southern part of the country respectively. The campaigns targeted children 9 months to 15 years. A follow up campaign is scheduled for December, 2008, to target children 9 months to 59 months.

Measles case-based surveillance which includes investigation of every suspected measles case and routine reporting of detailed epidemiological and laboratory data for each confirmed case is an important strategy to detect cases and outbreaks of measles [1,2]. The surveillance instituted shortly before the catch-up campaigns involves reporting of all suspected measles cases, collection of blood specimen for laboratory confirmation and completion of specified case investigation forms for all suspected cases. Surveillance focal persons at the State and Local Government Area (LGA) levels are expected to regularly carry out visits to health facilities and investigate all outbreaks [3]. For this purpose, the following case definitions were adapted. A suspected case of measles is any person with generalized maculopapular rash and fever plus one of the following: cough or coryza (runny nose) or conjunctivitis (red eyes) or any person in whom a clinician suspects measles. A measles outbreak is suspected when 5 or more suspected cases are reported in a health facility or LGA in one month, with a plausible means of transmission. The outbreak is confirmed when 3 or more of the cases are IgM positives. The confirmation is carried out in three National reference laboratories. Collection of nasopharyngeal swabs from cases within 3 to 4 days of the onset of rash is recommended for viral isolation during outbreaks. The guidelines for the surveillance and outbreak investigation have been published and circulated [3].

During the third week of October 2008, 5 cases of

suspected measles were reported from one of the LGAs in the southern part of the country where outbreaks have been rarely reported previously. The laboratory reports of specimens from cases were negatives for measles-specific IgM antibodies. However, during the following two weeks, 7 of the 8 specimens that were collected were positive. An outbreak investigation was then initiated, the objectives of which were to identify and treat additional cases, determine the cause of the outbreak, and prevent further spread of the disease. The findings of the investigation are reported and discussed in this article.

MATERIALS AND METHODS

Study setting

Irewole LGA is one of the 774 LGAs in Nigeria and has a population of 152 936 people based on a 1996 projected census figure. The LGA located in the southwestern part of the country shares borders with Isokan LGA in the south, Ayedaade LGA in the east, and Ayedire LGA in the north all of Osun State. The LGA is bordered to the west by the Lagelu and Egbedore LGAs of Oyo State. There are 11 political wards. About 65 % of the population resides in the rural areas. Ikire, the headquarters, is the major town in the LGA and is densely populated. There are > 400 villages in the LGA. The majority of the people in the area are farmers. The total number of health facilities (private and public) is 27 [6].

Surveillance and immunization coverage performance

No outbreak of measles has been reported in the LGA since 2005 when the measles case based surveillance was instituted. The cumulative routine measles immunization coverage in the LGA between January and October 2008 was 81 % (administrative data). The measles case-based surveillance performance indicator in the LGA showed an annualized non-measles febrile rash detection rate of 5.5 per 100 000 population (Government report). Four suspected measles cases were investigated between January and February 2008 in the LGA during the measles season. The results were negatives for measles-specific IgM antibodies.

Outbreak investigation

The measles outbreak was investigated on the 25th of November 2008 by a team comprising the LGA surveillance focal person, the State surveillance focal person, a clinician from the State hospital management board and the lead author. All health facilities in Ikire, the headquarters of the LGA, were visited and the records were reviewed. An active case search was also conducted in the neighborhoods of cases, which were reported earlier through the surveillance system. The laboratory results were shared with some family heads and enquiries were made of the other cases that might not have been previously reported. A follow-up visit was made on the 27th of November. The surveillance focal person in the LGA was advised to continue the active case search and community members were encouraged to make reports of cases. Five additional cases were line-listed with key variables including age, vaccination status, address, date of the rash onset and outcome of case management. Throat swabs for viral isolation could not be collected because the onset of rash among cases found was > 5 days. Enquiries on the documentation of case management of all treated cases were made at each health facility. Health workers were advised on the need for reporting and enhanced case management with vitamin A^[1,3].

RESULTS

A total of 18 cases were identified during this outbreak, 7 of which were confirmed by the laboratory. The index case had its onset of rash on the 18th of October corresponding to the 42nd of the 2008 epidemiologic calendar. The epidemic curve showed two peaks: one in the 43rd week (3 cases) and the other, the most prominent in the 46th week (6 cases). The last 2 cases had their onset of rash during the 47th week. All cases were located in the Ikire township, the head-quarter of the LGA. Cases were identified from 3 health facilities: Star Clinic, General hospital and Ayedaade Health Centre. Two of the 11 wards in the LGA were affected. The ages of those infected ranged from 8 months to 14 years; 2 children (11%) were <9 months old, 14 children (78%) were between 9 and 59 months, and 2 children (11%) were > 5 years old. Females com-

prised 56% of the cases. There were no deaths; all cases were treated as outpatients. The vaccination status of those infected was as follows: zero doses, 7 children (39%); and ≥ 1 dose, 11 (61%).

DISCUSSION

Eighteen cases of measles with no deaths were identified during the current outbreak. The size of this outbreak is far less than the outbreak reported from Demsa LGA of Adamawa State in 2005 from the North Eastern part of Nigeria, where 1 062 cases and 80 deaths within 30 days of onset of rash were found^[7]. The outbreak, however, occurred before the country started implementation of the WHO/United Nations Children's Fund (UNICEF) measles mortality reduction strategy^[1]. The size of the current outbreak is, nevertheless, close to the size reported in 2003 in a boarding school in Pennsylvania, USA, where 11 confirmed cases with no deaths were identified^[8]. The report underscores the importance of high measles immunization coverage in limiting the size of an outbreak.

Furthermore, 7 of the current cases were confirmed by the laboratory. The remaining cases were epidemiologically linked because they occur within 30 days of the occurrence of the laboratory confirmed cases and within the same LGA^[3]. There are 3 family clusters among cases reported and no case was linked to any child care institution. The WHO measles surveillance guideline adapted for use in Nigeria recommended collection of samples in the first 5 cases in a cluster of suspected cases^[3,9].

A change in the epidemiology of measles in the south-western part of Nigeria which this outbreak may have illustrated is the short duration of the outbreak. All cases occurred within a duration of 6-weeks. This is in contrast with the epidemic reported in Delma LGA of Adamawa State in 2005, which spanned a period of 25 weeks, from the 45th week of 2004 to the 18th week of 2005^[7]. Also, there is no complication reported among cases in the present outbreak. These and the limited spread of the outbreak to only two of the 11 wards of the LGA suggest that some progress might have been made in the measles mortality reduction strategy implementation in Nigeria.

Majority of cases are less than 5 years old. This is comparable to the findings of the epidemic in Delma LGA where an attack rate of 24.3% among those less than 5 years was the highest^[7]. This age group included the cohort who did not benefit or eligible for immunization during the catch up campaign in the southern part of the country. This suggests a gap in the routine immunization schedule and an accumulation of those susceptible since the last catch-up AMC in 2006. This makes the follow up campaign planned for the December 2008 and targeted children 9 months to 5 years, timely.

The high proportion of zero-dose children, among cases suggested that cluster of missed children abounds despite high administrative measles vaccine coverage reported in the LGA. Population immunity in limiting the spread of measles is extremely high, especially in communities where people are in daily contact with high numbers of people^[8,10]. However, the high level of population immunity that is needed to prevent further outbreak could be achieved through the follow up campaign.

The outbreak was self-limiting. Outbreak immunization response was not carried out in the current outbreak. This is in line with the WHO and National guidelines for measles outbreak response^[3,8]. However, an enhanced case management with vitamin A was stressed to health workers. The LGA surveillance focal person was advised to continue an active surveillance for the disease and community members were encouraged to report all cases. The LGA and the wards were suggested to be identified as high risks, for close monitoring and supervisory activities during the Integrated Measles Campaign (IMC) in December 2008; a follow-up campaign to the 2006 AMC. A good quality IMC in the LGA coupled with strong routine immunization coverage in the affected areas will go a long way in forestalling further outbreaks in the LGA in the future.

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