MEDICO RESEARCH CHRONICLES
ISSN NO. 2394-3971
DOI No. 10.26838/MEDRECH.2020.7.3.520
Contents available at: www.medrech.com

REPORT OF MEASLES OUTBREAK INVESTIGATION IN DAN MANAU COMMUNITY OF BAKURA LGA, ZAMFARA STATE, NORTHWEST NIGERIA

[*1]Rabiu, M., [2]Mohammed, R., A.,[3] Dr. Liman, B., [4]Dr. Alayande, A., [5]Dr. Obinna, O., [6]Dr. Ibrahim D.

1. Department of Medical Laboratory Services Ahmad Sani Yariman Bakura Specialist Hospital, Gusau, Zamfara State, Nigeria.
2. Health Development Guild of Nigeria(HDg-N) Abuja Nigeria
3. Department of Public Health Services, Ministry of Health Zamfara State, Nigeria
4. United Nations Population Fund (UNPF) Nigeria
5. Excellence and Friends Management Care Centre Abuja, Nigeria
6. State House Medical Centre, Federal Capital Territory Abuja, Nigeria

ARTICLE INFO

Article History
Received: July 2019
Accepted: July 2020
Keywords: Outbreak, Measles, Prevalence, ELISA

ABSTRACT

ORIGINAL RESEARCH ARTICLE

Background: Measles is a disease that belongs to the RNA virus of the genus Morbillivirus within the family paramyxoviridae, and its infection accounts for many deaths particularly in children.
Objective: The study's aim to establish the existence of the measles outbreak at Dan Manau village in Bakura LGA, Zamfara State.
Methods: Both descriptive and analytical studies were used in the outbreak investigation. In the descriptive analysis a 2-tiered standard case definition (suspected and confirmed) were used: **Suspected case**: any person with fever and rash or any person in whom a clinician suspects measles **Confirmed case**: A suspected measles case that has serological confirmation test of recent measles virus infection using measles IgM antibodies ELISA method and had not received measles vaccination in the 30 days preceding the specimen collection.
Result: A total of 169 cases and 34 deaths were reported with Case Fertility Rate (CFR) of 20.1%. Male shows a high prevalence of 100 (59.1%) than female 69(40.9%). Most of the cases were less than 3 years old. The majority (85%) of the cases were < 5years old. It was also noted that (68%) of the cases were 0-36months old. Nevertheless, the age groups most affected were 13-24 months (26%). The occurrence of the cases peaked at week 10 with smaller peaks at weeks 6, 14, 16 and 19 respectively. Blood samples from 5valunteer suspected cases were analyzed using Enzymes Linked Immunosorbent Assay (ELISA). Serological tests of the above samples were conducted at the WHO accredited laboratory in Kaduna State reveal 3 positive IgM out 5 with a

prevalence of 3(60%)
Vaccination with one dose of measles vaccine was lower among the positive cases 38(39%) than the Negative cases 68(68%). Although the odd of this association was less than 1, it was statistically significant (P < 0.05). **Conclusions:** Measles outbreak is still a common occurrence during the hot session in most communities with poor utilization of routine immunization services. The impact on the community morbidity and mortality rates is high due to some factors like delay in reporting, inadequate local response capacity, weak surveillance system, and weak laboratory services.

Corresponding author*
Dr. Rabiu M.*

INTRODUCTION

Measles is one of the viral diseases that are highly transmissible infectious to human. In 1980, before the use of measles vaccine 90% of children come down with the disease within the age of 15, an estimated 2.6 million deaths due to measles occurred annually worldwide (Peter *et al.,* 2011). even though there is an effective vaccine but measles becomes one of the leading cause of death in children (WHO, 2015). The incidence of measles reduced in another part of the world, the World Health Organization (WHO) recommends that countries should institute case-based surveillance with laboratory testing as a significant confirmatory component. Specifically, the WHO recommends the collection from clinically suspect measles cases of a serum sample for IgM testing upon presentation to the health center sample for detection of measles virus genome The highly infectivity of measles virus and the need for rapid and accurate laboratory confirmatory test to diagnosed measles, a suitable assay should detect measles cases early in the course of illness is required, To meet these needs, current methods have focused on serologic testing for the earliest appearing serum immunoglobulin, IgM, and to a lesser extent, IgG. ELISA and EIA for measles IgM and IgG also the PCR, which fulfills the basic criteria for the rapid, accurate, reproducible, and efficient methods of detecting measles (William and Rita, 2003).

MATERIALS AND METHODS

Several materials and methods were used in this study. On the 19th week of 2008 which is equivalent to 7th May 2008, a report of suspected measles outbreak was received from the Bakura LGA DSNO at Zamfara State Ministry of Health in Department of Public Health Services and Epidemiology Unit, when about 21 children were reported to the health facilities of Dan Manau having rash and febrile illness with 4 deaths. Furthermore, by the following week, the number of cases rose to 23 with an additional one death. Further information obtained during the outbreak investigation revealed that several suspected measles cases and deaths had occurred right from week 5 in February 2008. Although no proper documented data was available on previous suspected measles occurrence in the community, oral evidence from the community members showed that this had been an annual occurrence but of a lower magnitude since the 2005 national measles campaign. On the 4th of June, the Zamfara State Nigerian Field Epidemiology and Laboratory Training Program (NFELTP) team comprising State Epidemiologist, Laboratory Scientist State Focal Person, World Health Organization (WHO) Cluster Surveillance officer, State Inspectorate officer, Local Government Disease Surveillance Notification Officer (DSNO), Local Government Population officer and Data clerk, visited the settlement of Dan Manau for the outbreak

investigation and the following activities took place:

Advocacy visit to the Bakura LGA chairman and health department after which we proceeded to Dan Manau Village, the team were received by the head of the village and head of the dispensary further more advocacy was paid to the village head. In efforts to verify the diagnosis, more patients were identified and interviewed for additional information.

More cases were detected in the health facility register and by the house to house active case search in the community FMOH and WHO (2006). A total of 169 cases and 34 deaths were reported, a Blood specimen was collected from 5volunter cases for IgM serology and sent to the Yusuf Dantsoho memorial Hospital Kaduna state, WHO Measles reference laboratory, data was analyzed using Epi info version 7 and Microsoft excel 2007. (Gerald *et al.,* 2012). **Epidemiological Method:** Both descriptive and analytical studies were used in this outbreak investigation. In the descriptive analysis a 2 tiered standard case definition (suspected and confirmed) was used as follows: **Suspected case definition**: any person with fever and rash or any person in whom a clinician suspects measles **Confirmed case**: A suspected measles case that has serological confirmation of recent measles virus infection (measles IgM positive) and had not received measles vaccination in the 30 days preceding the specimen collection. Also a suspected case that meets measles case definition and has contact history with a laboratory-confirmed measles case whose rash onset was within the preceding 30 days (*epidemiological linkage*) Using the above suspected case definition the number of cases in the health facility register and the community were counted, after which a line-list was obtained (copy attached at the back of the report).

RESULT

The result of outbreak data obtained was characterized in terms of person, place and time (i.e. bar chart, spot map, and line graph).

A total of 169 cases and 34 deaths were reported with a CFR of 20.1%. Male shows a high prevalence of 100 (59.1%) than female 69(40.9%) see Figure 1. Most of the cases were less than 3 years old. The majority (85%) of the cases were < 5years old. It was also noted that (68%) of the cases were 0-36months old. Nevertheless, the age groups most affected were 13-24 months (26%) see figure 2. The occurrence of the cases peaked at week 10 with smaller peaks at weeks 6, 14, 16 and 19 see figure 5.

Blood samples from 5valunteer suspected cases were analyzed using Enzymes Linked Immunosorbent Assay (ELISA). Serological tests of the above samples were conducted at the WHO accredited laboratory in Kaduna State reveal 3 positive IgM out 5 with a prevalence of 3(60%)

Vaccination with one dose of measles vaccine was lower among the positive cases 38(39%) than the Negative cases 68(68%). Although the odd of this association was less than 1, it was statistically significant ($P < 0.05$) see table 1.

A high percentage (71%) of the measles cases had previous exposure to suspected cases. The odd of exposure to suspected measles case among those that fell ill was 4 times than those not ill. Exposure to a measles case was a significant risk factor for becoming ill $P< 0.05$

A higher percentage of those with measles 55(57%) had more than 3 people/room compared with Negative 22(23) %. The odd of a higher population/room was 1.3 – 1.4 times among the measles cases. Nevertheless, this association was not statistically significant $P > 0.05$ see Table 2.

Figure : 1 shows Male shows high prevalence of 100 (59.1%) then female 69(40.9%).

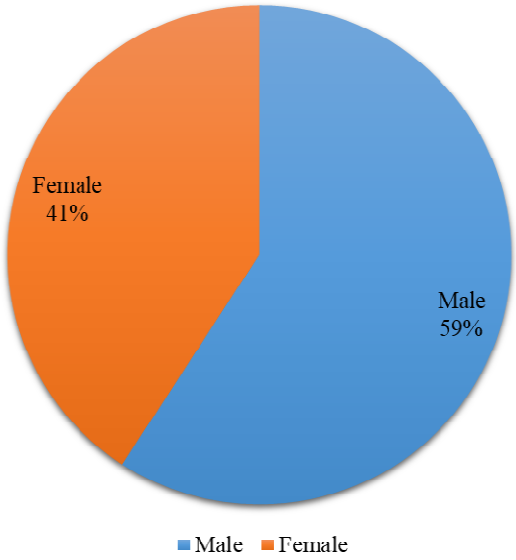
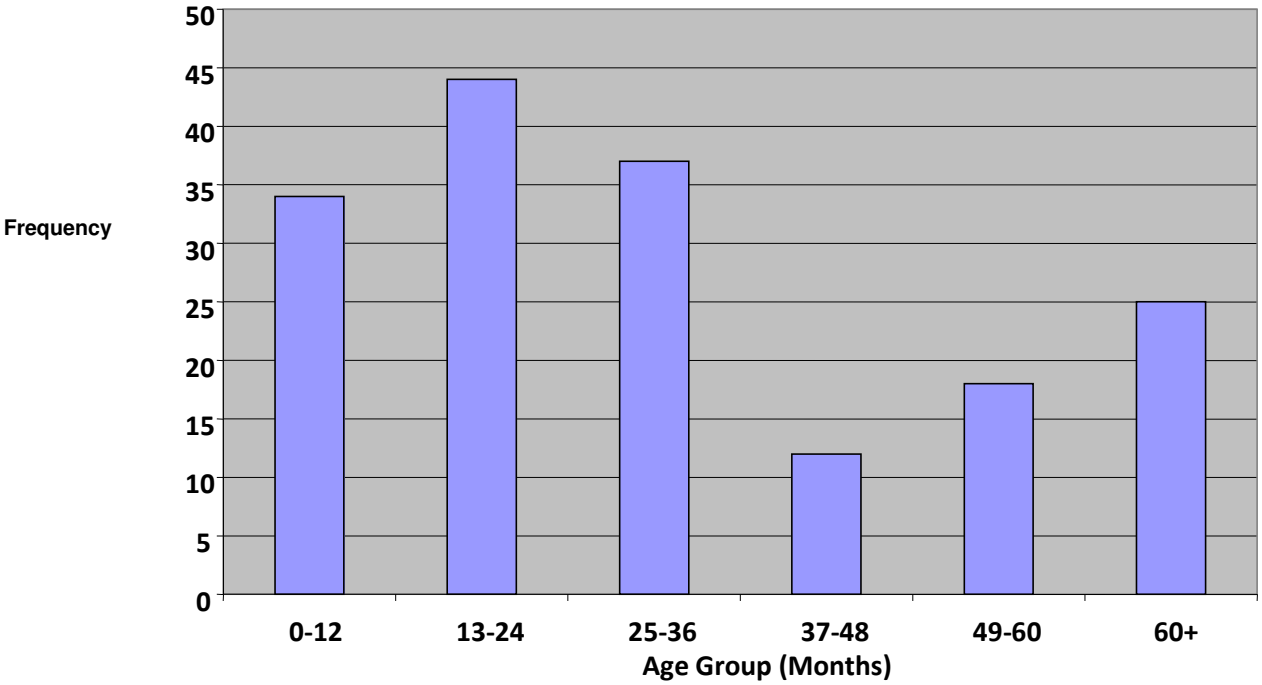


Figure : 2 Age group distribution of Measles Cases in Dan Manau, Jan - June 2008



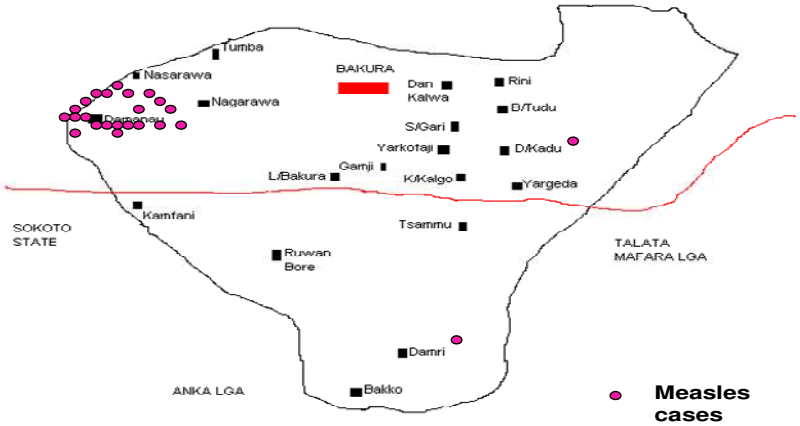
The majority (85%) of the cases were < 5years old. It was also noted that 68% of the cases were 0-36months old. Nevertheless, the age groups most affected were 13-24 months (26%).

A MAP OF ZAMFARA STATE, 2008

Figure 3: Map of Zamfara state LGAs showing the location of Dan Manau Village within Bakura LGA.

Figure 4: Distribution of measles cases by settlement, Jan – June 2008

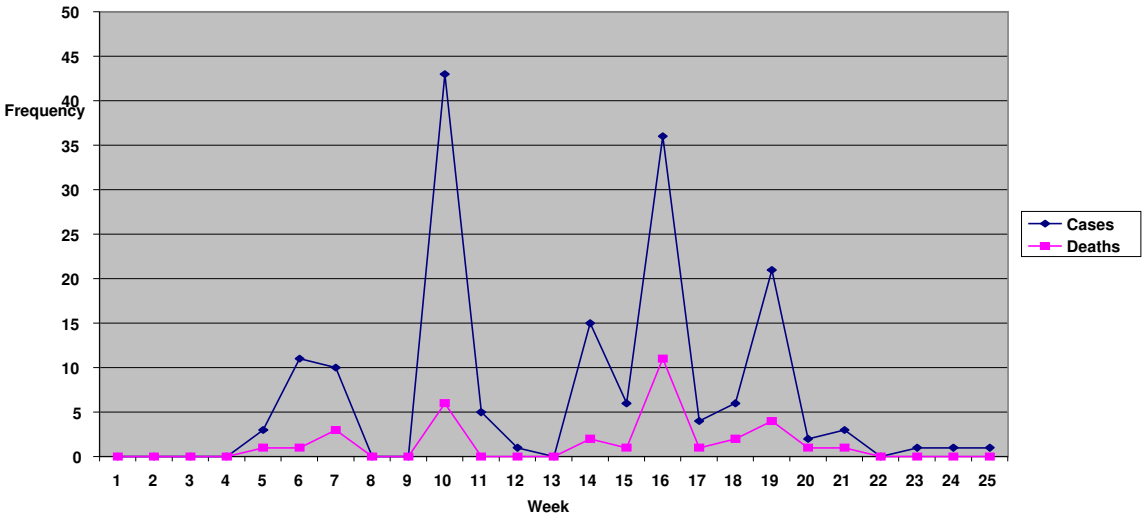
Reported Measles Cases Distribution in Bakura LGA, Jan – June 2008



Note : Dots not drawn to scale

A higher number of measles cases was reported from Dan Manau ward.

Figure 5: Weekly distribution of measles cases in Dan Manau, 2008



The outbreak started from week 6 and reached several peak point at weeks 10, 14, 16 and 19 with effective intervention the cases reduced at week 22.

Table 1: Assessment of risk factors in relation to vaccination for measles infection.

vaccine doses	Number Positive	prevalence (%)	Number Negative	prevalence (%)	Odds	95% CL	Association
0	36	37	28	28	0.6	0.1	No
1	38	39	68	68	0.5	0.03	Yes
2	20	21	3	3	**8.1**	0.0002	Yes
Unknown	3	3	1	1	**3.3**	0.28	No
Total	97		100				

P value <0.05

Table 2: shows the number of people per room.

Number of people per room	Number Positive	Prevalence (%)	Number Negative	Prevalence (%)	Odds	95% CL	Association
2 – 3	22	23	36	36	0.5	0.04	Yes
4 – 5	55	57	48	48	1.4	0.25	No
6—7	20	21	16	16	1.3	0.45	No
Total	97		100				

P value <0.05

DISCUSSION

The study's shows measles it is a public health problem particularly in children with low immunity, also the prevalence of measles varied from the location due to national measles vaccination campaign, herd immunity developed age and sex furthermore the laboratory study shows high. A total of 169 cases and 34 deaths were reported with a CFR of 20.1%. Male shows a high prevalence of (59.1%) than female (40.9%) see Figure 1. This doesn't show a relationship with (Sheyin *et al.,* 2016) (26.5%) for female and male (27.6%). Most of the cases were less than 3 years old. The majority (85%) of the cases were < 5years old. It was also noted that (68%) of the cases were 0-36months old. Nevertheless, the age groups most affected were 13-24 months (26%) see figure 2. this contradicts the findings of (Gerald, *et al.,* 2012). Who shows the high prevalence is between 2 months to 32 years, furthermore this in line with (Adeoye *et al.,* 2017). Whose find that All the cases were children less than 5 years and this agreed with my findings.

The occurrence of the cases peaked at week 10 with smaller peaks at weeks 6, 14, 16 and 19 see figure 5. This was found to be the same with (Gerald *et al.,* 2012) both the research agreed with week 10 have the highest peak of the disease.

Blood samples from 5 volunteers suspected cases were analyzed using Enzymes Linked Immunosorbent Assay (ELISA). Serological tests of the above samples were conducted at the WHO accredited laboratory in Kaduna State reveal 3 positive IgM out 5 with prevalence of (60%) this shows that the method for detection of IgM is highly sensitive and specific and it agreed with findings of (Gerald *et al.,* 2012; Celestine *et al.,* 2012).

Vaccination with one dose of measles vaccine was lower among the positive cases (39%) than the Negative cases (68%). see table 1.

And this closely related with (Adeoye *et al.,* 2017). Who has (47.5%) a Higher percentage of those with measles (57%) positive had more than 3 people/room compared with Negative (23%) of the measles cases. see Table 2. This disagrees with (Aliyu *et al.,* 2017).

LESSONS LEARNED

Measles case fatality can be reduced with early diagnosis and prompt response to reported outbreaks. Data collection from the field is better facilitated with the involvement of local manpower. The involvement of community leaders, LGA team members, local health care providers, and community influencers makes the outbreak investigation process easier. Outbreak investigation and response is better done in a group than individually.

RECOMMENDATIONS

1. Reactivation of the epidemic rapid response team (RRT).
2. Close monitoring of the alert and epidemic threshold of all the epidemic-prone disease (EPD) by Epidemiology Division of the state.
3. Improve the access and utilization of routine immunization services in all wards. All health facilities to provide at least two outreach services per month.

CONCLUSIONS

The measles outbreak is still a common occurrence during the hot session in most communities with poor utilization of routine immunization services. The impact on the community morbidity and mortality rates is high due to multifactorial factors such as delay in reporting, inadequate local response capacity, weak surveillance system, inadequate laboratory Services. The risk factors associated with the occurrence of measles were the absence of the first dose of measles vaccination and close contact with a suspected measles case.

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