International Journal of Gender and Women's Studies
December 2017, Vol. 5, No. 2, pp. 80-87
ISSN: 2333-6021 (Print), 2333-603X (Online)

Published by American Research Institute for Policy Development
DOI: 10.15640/ijgws.v5n2p8
URL: https://doi.org/10.15640/ijgws.v5n2p8

Gender Dimensions of Acute Flaccid Paralysis Surveillance in Nigeria

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Abstract

Background: After nearly two years without reporting any case of Wild Poliovirus (WPV), Nigeria has of recent (2016) witnessed a setback in its struggle to eradicate polio. Four cases of Acute Flaccid Paralysis (AFP) from three Local Government Areas (LGAs) of the security challenged state of Borno were confirmed as WPV cases with the latest case having a date of onset of paralysis on 21st August, 2016. A case of circulating Vaccine Derived Poliovirus type 2 (cVDPV2) from a healthy contact of one of the WPV cases was confirmed. In addition, cVDPV2 was confirmed in a sample from one of the seven environmental sample collection sites in Borno. Another case of cVDPV2 with date of onset of paralysis on 28thOctober 2016 was confirmed in Sokoto state. Gender inequities and inequalities are a major cause of inequity in health. Gender equality in health means that women and men have equal chances of realizing their full rights and potential to be healthy, and contribute to health development. It is therefore important to mainstream gender dimension in the engagement of women through improving their employability in the disease surveillance sector of public health.

Objectives: The objective of this study is to determine whether there is gender disparity among boys and girls in the incidence of reported AFP cases in Nigeria during the reporting period (2007-2016); and also to identify any gender bias among male and females in the number of AFP surveillance workforce.

Methods: We conducted a retrospective review of reported AFP cases in Nigeria between 2007 and 2016 from the AFP database at the World Health Organization Country Office. We conducted gender analysis of the datato identify any inequities and subjected any observed difference to a statistical test of significance. We also conducted literature search on gender dimensions of AFP surveillance.

Results: The AFP detection rate in Nigeria has consistently increased from 2007 to 2016, with the highest number of AFP cases reported being 17,867 in 2016. Of the total AFP cases reported, 81.5% and 18.5% were under and over five years of age respectively. The proportion of male and female AFP cases that were under five years was 81% and 82% respectively. There was a consistent decline in the proportion of OPV zero dose AFP cases with the least (0.3%) 2016. There was increase in the proportion of 3+ OPV doses with the highest (91%) also in 2016. In the year 2016, there were more male (29) state epidemiologists than females (8), more male (23) state DSNOs than females (14), more male (609) LGA DSNOs the females (218) and more male (543) LGA assistant DSNOs than females (274). The number of health facility surveillance focal persons however is almost equal in both sexes (2814 males Vs 2879 females).

Conclusion: There was no gender disparity among boys and girls in the incidence of reported AFP cases and in their status of OPV immunization. Gender disparity however exists at the disadvantage of females with regards to the number of key personnel involved in the conduct of surveillance activities. Mainstreaming gender sues in the health human resource policy and planning in states and LGAs to enable engagement of more women in the disease surveillance sector of public health is crucial.

Keywords: Gender, AFP surveillance, Health, Disease.

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Introduction

After nearly two years without reporting any case of Wild Poliovirus (WPV), Nigeria has of recent (2016) witnessed a setback in its struggle to eradicate polio. Four cases of Acute Flaccid Paralysis (AFP) from three Local Government Areas (LGAs) of the security challenged state of Borno were confirmed as WPV cases. A case of circulating Vaccine Derived Poliovirus type 2 (cVDPV2) from a healthy contact of one of the WPV cases was confirmed. In addition, cVDPV2 was confirmed from one of the seven environmental sample collection sites in Borno (1). Another case of cVDPV2 with date of onset of paralysis on 28th October 2016 was confirmed in Sokoto state. The date of onset of paralysis of the latest WPV case in the country was on 21st August 2016 (2).

Disease surveillance is the cornerstone of public health and is essential for disease prevention, management, control, eradication; and evaluation of interventions (3). AFP surveillance is an intensive case-based surveillance wherein a comprehensive set of data is collected for every case of child under 15 years of age with acute onset of paralysis or a person of any age in whom poliomyelitis is suspected by a physician (4).

In Nigeria, the AFP surveillance performance as gauged by the non-polio AFP and stool adequacy rates has been impressive during the period from 2007 to 2016 (5).In 2016 for instance, the country recorded a non-polio AFP rate of 19.5 cases per 100,000 children <15 years old (the target is 3.0/100,000). The stool adequacy rate during the same period was 98% (the target is 80%). Despite this performance, however, surveillance gaps, especially at sub-national levels, exist such as classification of polio-compatible cases, isolation of orphan viruses, underperforming LGAs, reporting of not true AFP cases and missing of true cases. In addition, some areas cannot be reached with surveillance and immunization activities due to security reasons (6).

The words 'sex' and 'gender' are not interchangeable terms (7). While 'sex' refers to the biological and physiological characteristics that define women and men, 'gender' on the other hand is the socially defined roles, responsibilities and inter-relationships that a given society considers appropriate for men, women and boys and girls (8). Gender-disaggregated data or analysis on the other hand refers to the systematic gathering and examination of information on gender differences and social relations in order to identify, understand and redress inequities based on gender (9).Although male predominance has been observed in the incidence of symptomatic infectious diseases,it is difficult and complex to attribute differences in disease processes uniquely to either sex or gender, because sex and gender are not independent of one another (10).

Traditionally in most settings of the developing world, women are regarded as feeble, subservient and therefore assume domestic roles of nurturing and other issues related to the home and family; while the men, regarded as more aggressive, active and dominant have found a convenient niche in the public domain and glitter of power, politics, governance and economics (11).

Indeed, in many societies some occupations have for many generations been 'reserved' for females only due to certain socio-cultural perceptions and such occupations have become a 'taboo' for men (12).Such 'reserved' occupations are more likely to be informal, of lower status, part-time or temporary; and at the lower end of salary scale (13). This kind of male-skewed stero-type limits women's choice and ability to access knowledge, skills and technology relevant to other forms of occupations (14).Gender inequality, one of the most prevalent forms of social inequality however operates globally though in different forms, effects and magnitude. Most root causes of inequality can be traced to such factors as culture, level of development, education, geographical location; and religion (15).

Although women outnumber men in the field of health worldwide, however, employment in the formal health systems tend to be gender differentiated in terms of divisions of labour and associated hierarchies, with women frequently concentrated in specific segments of the health care labour force such as nursing and are generally concentrated at the lower end of the hierarchy and salary grades. Women are less likely than men to be in senior professional, managerial and policy making roles (16). In the sphere of disease surveillance specifically, women are grossly under-represented in Nigeria. This is despite the acknowledgement that women are not a homogeneous group and not all women work in traditionally 'female' jobs. The same applies to men. The 2006 World Health Report (WHR 2006) defines health workers as "… all people primarily engaged in actions with the primary intent of enhancing health".

Methods

Study area and population

Nigeria is located in West Africa. The country has a total population of close to 200 millionand there are 100 females for every 102 males. The country is sub-divided into 36 states and the Federal Capital Territory, where the capital, Abuja is located. It is bordered by Republic of Benin to the west, Chad and Cameroon to the east and Niger Republic to the north. Its coast in the south lies on the Gulf of Guinea in the Atlantic Ocean.

Description of the AFP surveillance system in Nigeria

The AFP surveillance system in Nigeria is both health facility and community-based. There is a network of prioritized reporting sites (both public and private health facilities) and community informants comprising patent medicine vendors, traditional and spiritual healers, traditional bone setters and traditional birth attendants spread across all the political wards, states and LGAs in the country.

The health facility focal persons in reporting sites, as well as other health workers or clinicians, detect and report AFP cases to the LGA DSNO.The DSNO, in turn, has the responsibility of investigating the reported cases including stool specimen collection and transportation to the national polio laboratory under reverse cold chain conditions. The LGA DSNO is supported by an assistant and WHO LGA facilitator. Community informants refer AFP cases to the nearest reporting sites or report cases directly to the LGA DSNO. Active surveillance at LGA level is conducted by LGA DSNO, the assistant, WHO LGA facilitators, and field volunteers.

At the state level, the state epidemiologist and the state DSNO coordinate surveillance activities including organizing monthly LGA DSNO meetings, outbreak investigation, supervision, training and sensitization activities. The WHO Cluster Coordinators support the state and LGA surveillance focal points, conduct active surveillance, verify reported AFP cases and conduct 60-dayfollow-upof inadequate AFP cases, confirmed poliovirus cases, and cases with Sabin (i.e., vaccine virus).

At the national level, surveillance is coordinated by the national epidemiologist who receives and analyses laboratory results from the two national polio laboratories and shares feedback with stakeholders, conducts supervision and monitors surveillance performance, organizes surveillance assessments, outbreak investigation, peer reviews, training and supports the polio laboratories and the national polio committees. WHO supports the surveillance system at all levels including the provision of logistics support to the DSNOs, national polio laboratories, and the national polio committees.After 60-day follow-up examination, inadequate AFP cases in whom residual paralysis occurs or who die or are lost to follow-up, are referred to the National Polio Expert Committee (NPEC). The NPEC classifies such cases as compatible or otherwise based on clinical, epidemiological, and laboratory evidence.

The NPEC is a multi-disciplinary five-member committee with expertise in epidemiology, neurology, paediatrics and internal medicine that was formed in 2001 to provide a final classification for relevant AFP cases with detailed case investigation reports including neurological review by neurologists. All cases brought to the NPEC are finally classified as either polio-compatible or discarded. Discarded cases are further classified into other differentials such as Guillain-Barré syndrome, transverse myelitis or traumatic neuritis as the case may be. The committee meets quarterly and shares classification results to all stakeholders including the national certification committee, the federal ministry of health, national primary health care development agency and partners.

Data collection and analysis

We conducted a retrospective review of reported AFP cases in Nigeria between 2007 and 2016 from the AFP database at the World Health Organization Country Office. We disaggregated the data by gender and conducted gender analysis to identify any inequities and subjected any observed difference to a statistical test of significance. The application used for the statistical analysis is the analysis Tool Pack of the Microsoft Excel Add-In to perform a t-test of significance of the difference of the means at 95% confidence interval (alpha).

We also conducted literature search on gender dimensions of AFP surveillance with key search words built around the themes of gender and health, immunization, vaccines, surveillance and health workforce. Only papers published in English were considered in the review. The review was conducted between June and September 2017.

Results

The AFP detection rate in Nigeria has consistently increased from 2007 to 2016, with the highest number of AFP cases reported being 17,867 in 2016. During the reporting period, the total number of AFP cases reported was 85,666 out of which 48,702 (57%) and 36,964 (43%) were boys and girls respectively. Consistently more male AFP cases were being reported than females in all the years during the reporting period. Of the total AFP cases reported, 81.5% and 18.5% were under and over five years of age respectively. The proportion of male and female AFP cases that were under five years was 81% and 82% respectively. Consistently more under five years AFP cases were being reported than those over five years in all the years during the reporting period.

During the reporting period, there was a consistent decline in the proportion of OPV zero dose AFP cases with the least (0.3%) in 20016 and consistent increase in the proportion of 3+ OPV doses with the highest (91%) also in 2016. This performance cuts across gender. In the year 2016, there were more male (29) state epidemiologists than females (8), more males (23) state DSNOs than females (14), more males (609) LGA DSNOs the females (218) and more males (543)LGA assistant DSNOs than females (274). The number of health facility surveillance focal persons however is almost equal in both sexes (2814 males Vs 2879 females). Generally, there are more male key surveillance personnel than females in the northern zones (3331 males Vs 1081 females); and the reverse was the case in the southern zones (687 males Vs 2377 females).

Discussion

We found that the AFP case detection in the country has consistently improved from 2007 to 2016 with the highest level of detection in 2016 which was above the minimum requirement set by WHO in each of those years (17).The number of male AFP cases during the reporting period was higher than that of females, but the difference is not statistically significant based on the t-test (t-stat 1.2, t-critical 1.7) at 95% confidence interval. This finding is similar to others in Ghana, Iran and Italy in which higher frequency of AFP was observed among boys than girls (18).Male predominance has been observed in the incidence of symptomatic infectious diseases in children probably due to reduced immunity, influence of sex hormones, genetic influence and exposure-related factors. This observation is however not consistent and it has been postulated that the observation is not real but may be an artifact of statistics showing variability in the proportion of symptomatic infectious diseases of a reflection of the heterogeneous group of causes of AFP (19).

Even though AFP is a heterogeneous group, most of the cases (>80%) reported were under five years of age among both boys and girls. It is this age group that is also most affected by polio even though polio can strike at any age depending on the immunity status of individuals (20). Older children and adults in settings with high population density and poor sanitation have however been shown to play a significant role in sustaining poliovirus transmission (21).Indeed, outbreak of polio among older children and adults have been well documented (22,23).

Generally, there was no observed difference in the status of OPV immunization among reported AFP cases irrespective of whether they were boys or girls. This finding is in keeping with pooled results from most countries in a WHO project that investigated the epidemiology of the unvaccinated child and subsequent follow up study that focused specifically on sex disparities in immunization coverage and gender related barriers to coverage. The results showed that generally males and females had the same likelihood of not being vaccinated as well as the same likelihood of having received at least one dose of vaccine, as fully vaccinated children. It is however important to note that A few moderate exceptions exist showing sex discrepancies favouring boys at a sub national level and in a few countries with known gender inequity and son preference (24). Other studies also corroborated this gender neutral observation as regards immunization in addition to neutrality by birth order and religion. However, there was a difference in compliance to vaccination in different ethnic groups (25).Unfortunately, however, sex disaggregated data on immunization even though collected by most countries, are not often collated and analyzed or used beyond its collection. In addition, perceived utility of such data among health workers and even some immunization programme officers is mixed (26).The distribution of key surveillance personnel in the country in 2016 was highly skewed in favour of males and this is statistically significant with regards to state epidemiologists, LGA DSNOs and LGA assistant DSNOs. The number of health facility surveillance focal persons however is almost equal in both sexes. Generally, there are more male key surveillance personnel than females in the northern zones, probably due impact of culture and lower level of female literacy compared to the southern zones where the reverse was the case.

Serious female public health workforce shortages exist in the country in disciplines that perform surveillance functions, and these shortages impact on the quality of surveillance itself as in some settings only women have access to female caregivers from whom reliable information on AFP and other diseases are obtained.

There are perceptions and concerns from some quarters that promotion of gender equality would "interfere with local culture", and that it would not be 'ethical' to promote gender equality in such settings. In other cases, the cultural values of a particular area are described as a major constraint on efforts for gender equality, and therefore action is considered to be difficult for practical reasons. But culture is dynamic and is subject to change either deliberately or in response to such factors as socio-economic situations due to globalization, new technologies etc. The challenge insuch settings is to gain a better understanding of the context and in particular to identify opportunities for supporting and promoting gender equality and sharing experiences to set a cycle of positive change.

We conclude that AFP case detection in the country has improved significantly during the reporting period. There was no gender disparity in the incidence of reported AFP cases and in their status of OPV immunization. There was regional disparity and gender bias in favour of males in the number of key surveillance personnel.

Promoting gender equality has been acknowledged worldwide as among the important catalysts to sustainable development (27). The goal of achieving equality between women and men is based on principles of human rights and social justice as enshrined in the Universal Declaration of Human Rights (28).To tackle gender inequalities, we recommend integrating or mainstreaming gender into all facets of our socio-economic life. This requires a gender equality policy in which women and men have the same opportunities, rights and responsibilities in all areas of life. Building the human capital of women to allow comparable opportunity in the modern labour market by encouraging equal access to education and skill acquisition for women to increase their participation in all spheres of life should be a priority. We advocate breaking the stereotype, barriers, all discriminatory practices and illusions that women cannot 'fit in' when it comes to disease surveillance practice.

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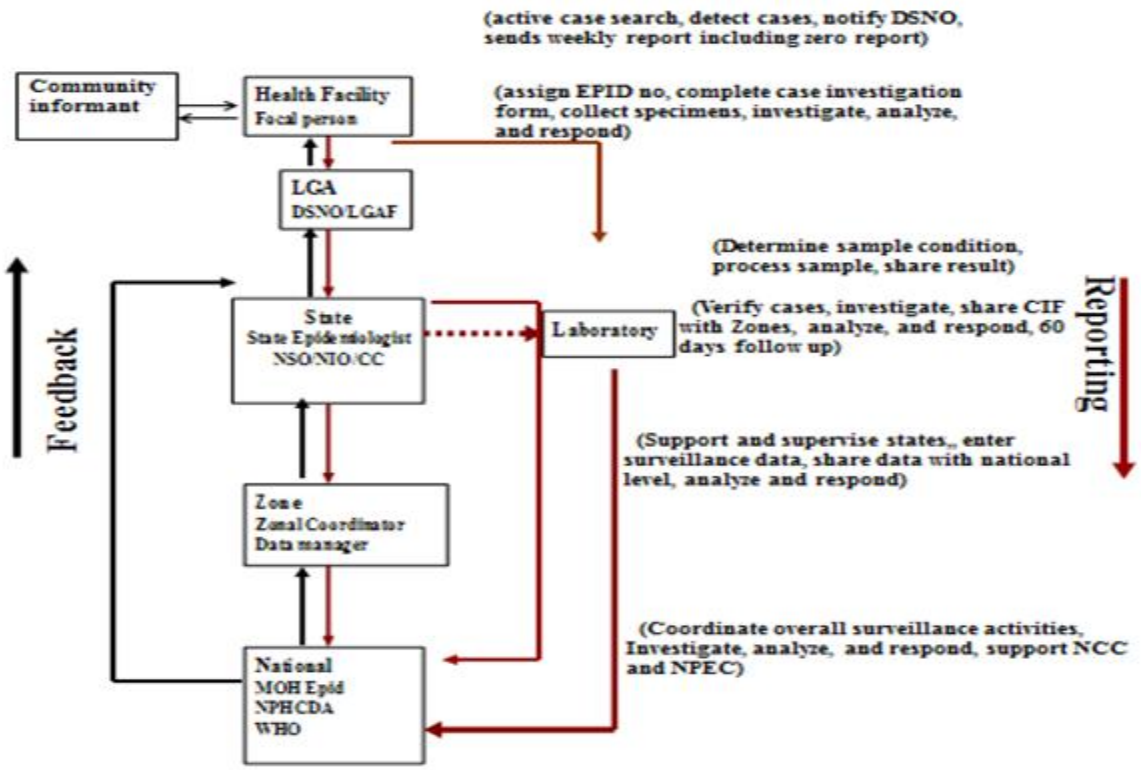
Figure 1 Polio Surveillance System in Nigeria, 2016



Abbreviation: CC, Cluster Consultant. CIF, Case Investigation Form. DSNO, Disease Surveillance and Notification Officer. LGAF, Local Government Area Facilitator. MOH, Ministry of Health. NCC, National Certification Committee. NPEC, National Polio Expert Committee. NPHCDA, National Primary Health Care Development Agency. NSO, National Surveillance Officer. WHO, World Health Organization.

Figure 2: Trend of Reported Cases of Acute Flaccid Paralysis by Sex in Nigeria (2007-2016)

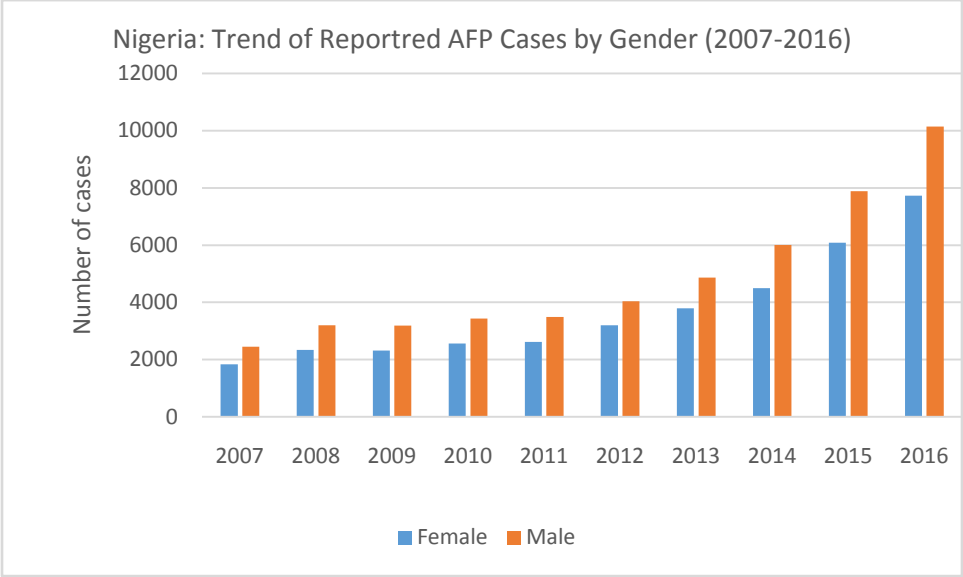


Table 1: Distribution of Reported Cases of Acute Flaccid Paralysis by Age Group and Sex in Nigeria (2007-2016)

Year	N0(%) AFP (<5 years)		No(%) AFP (>5 years)		No(%) Total	
	M	F	M	F	M	F
2007	2025(83)	1541(84)	421(17)	298(16)	2446(100)	1839(100)
2008	2737(86)	2015(86)	461(14)	323(14)	3198(100)	2338(100)
2009	2631 (82)	1923(83)	559(18)	388(17)	3190(100)	2311(100)
2010	2780(81)	2097(82)	655(19)	468(18)	3435(100)	2565(100)
2011	2875(82)	2173(83)	617(18)	443(17)	3492(100)	2616(100)
2012	3246(80)	2593(81)	794(20)	606(19)	4040(100)	3199(100)
2013	3938(81)	3075(81)	923(19)	712(19)	4861(100)	3787(100)
2014	4814(80)	3667(82)	1196(20)	830(18)	6010(100)	4497(100)
2015	6395(81)	4992(82)	1493(19)	1095(18)	7888(100)	6087(100)
2016	8168(81)	6320(82)	1974(19)	1405(18)	10142(100)	7725(100)

Table 2: Status of Oral Polio Vaccine Immunization of Reported AFP Cases by Sex (2007-2016)

YrOnset	No(%) AFP Zero Dose		No(%) AFP 1-2 Doses		No(%) AFP 3 Doses		No(%) AFP 3+ Doses		No(%)AFP Unknown Dose		No(%)AFP Total	
	M	F	M	F	M	F	M	F	M	F	M	F
2007	218(9)	204(11)	581(24)	417(23)	500(20)	351(19)	1112(45)	838(45)	35(2)	29(2)	2446(100)	1839(100)
2008	337 (11)	278(12)	719(22)	500(21)	562(18)	411(18)	1524(48)	1107(47)	56(1)	42(2)	3198(100)	2338(100)
2009	192(6)	127(6)	542(17)	390(17)	595(19)	421(18)	1831(57)	1344(58)	30(1)	29(1)	3190(100)	2311(100)
2010	116(3)	98(4)	369(11)	290(11)	605(18)	437(17)	2297(67)	1710(67)	48(1)	30(1)	3435(100)	2565(100)
2011	113(3)	78(3)	313(9)	238(9)	416(12)	351(13)	2618(75)	1924(74)	32(1)	25(1)	3492(100)	2616(100)
2012	103(3)	73(2)	362(9)	277(9)	428(11)	359(11)	3129(77)	2483(77)	18(0)	7(0)	4040(100)	3199(100)
2013	73(2)	43(1)	367(8)	313(8)	444(9)	311(8)	3969(82)	3110(82)	8(0)	10(0)	4861(100)	3787(100)
2014	36(1)	36(1)	321(5)	286(6)	373(6)	287(6)	5265(87)	3877(86)	15(0)	11(0)	6010(100)	4497(100)
2015	32(0)	29(1)	440(6)	395(6)	471(6)	386(6)	6931(87)	5268(87)	14(0)	9(0)	7888(100)	6087(100)
2016	26(0)	21(0)	441(4)	323(4)	414(4)	324(4)	9241(91)	7050(91)	20(0)	7(0)	10142(100)	7725(100)

Table 3: Distribution of key surveillance personnel in political zones by sex, 2016

Political Zones	No(%) State Epidemiologist		No (%) State DSNO		No(%) LGA DSNO		No(%) LGA ADSNO		No(%) Health Facility Focal Person	
	M	F	M	F	M	F	M	F	M	F
NCZ	5(71)	2(29)	4(57)	3(43)	125(90)	14(10)	69(78)	20(22)	662(60)	440(40)
NEZ	6(100)	0(0)	5(71)	2(29)	121(98)	3(2)	112(97)	4(3)	541(70)	235(30)
NWZ	6(86)	1(14)	7(100)	0(0)	193(94)	13(6)	223(98)	5(2)	1252(82)	276(18)
SEZ	5(100)	0(0)	3(60)	2(40)	45(47)	50(53)	37(40)	56(60)	48(9)	515(91)
SSZ	3(50)	3(50)	2(33)	4(67)	80(65)	43(35)	57(47)	65(53)	161(21)	606(79)
SWZ	4(67)	2(33)	2(40)	3(60)	45(32)	95(68)	45(27)	124(73)	150(16)	807(84)
Total	29(78)	8(22)	23(62)	14(38)	609(74)	218(26)	543(66)	274(34)	2814(49)	2879(51)

Abbreviation: NCZ, Northcentral Zone. NEZ, Northeast Zone. NWZ, Northwest Zone. SEZ, Southeast Zone. SSZ, Southsouth Zone. SWZ, Southwest Zone. DSNO, Disease Surveillance and Notification Officer. ADSNO, Assistant Disease Surveillance and Notification Officer.