



## Evaluation of HIV Surveillance System in Rivers State, Nigeria

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### ABSTRACT

**Background:** Rivers State has been reported to have the highest HIV prevalence of all the thirty-six states in Nigeria. HIV surveillance system generates information for timely and appropriate public health action. Evaluation of the surveillance system is vital in ensuring that the purpose of the surveillance system is being met. This study aimed to evaluate the HIV surveillance system in Rivers State from 2012-2014.

**Methodology:** This is a surveillance evaluation involving qualitative method and review of 2012-2014 HIV surveillance data. The evaluation process was carried out in line with the Centers for Disease Control and Prevention (CDC) guidelines on public health surveillance evaluation. Key informant interview (KII) sessions were held with stakeholders at all levels to assess the operation, functionality and key attributes of the surveillance system.

**Results:** The evaluation revealed that the HIV surveillance system is functional and operates a passive type of surveillance using the bottom to top approach in data transmission. The findings indicated that the system is simple, flexible and acceptable. However, it lacks data stability and representativeness is limited by non-inclusion of private health facilities. The surveillance data collected for the period of 2012 to 2014 revealed HIV prevalence rates of 13.6% (2012), 7.3% (2013) and 9.4% (2014).

**Conclusion:** The HIV surveillance system in Rivers State is a useful tool for planning public health activities. The institution of measures to prevent strike actions among health workers in the State will enhance the stability of data. Private health facilities should be included in the HIV surveillance system to ensure better representativeness.

**Key words:** HIV, surveillance, Rivers State

### INTRODUCTION

Human Immunodeficiency Virus (HIV) is a chronic viral infection that attacks the immune system of the infected individual and rapidly progresses to development of Acquired Immune Deficiency Syndrome (AIDS) and death without appropriate medical intervention.<sup>1</sup> Since its emergence in 1981, about 78 million people worldwide have been infected with the virus and about 39 million people have died.<sup>1</sup> The HIV/AIDS epidemic continues to have grave consequences on the



individuals, households and nations, reducing by more than half the Gross Domestic Product (GDP) of severely infected countries.<sup>2</sup> In countries most heavily affected, HIV has reduced life expectancy by more than 20 years, slowed economic growth, and deepened household poverty.<sup>2</sup>

Nigeria, the most populous African nation, is the country with the second highest HIV burden in the world after South Africa.<sup>3</sup> There are 3.5 million people living with the virus and 300,000 new infections annually.<sup>3</sup> The generalized prevalence among 15-49 year olds is approximately 3.6% but there are significantly higher rates among most-at-risk-populations (MARPs).<sup>4</sup> These MARPs include commercial sex workers, illicit intra-venous drug users and men who have sex with men. Directly, MARPs alone contribute about 23% of new HIV infections and with their partners' contribute 40% of new infections.<sup>4</sup>

In response to the fight against HIV/AIDS, the Nigerian government established agencies to control and prevent HIV, formulated policies on HIV prevention and importantly, instituted a HIV surveillance system.<sup>5</sup> Surveillance is the ongoing, systematic collection, analysis, interpretation and dissemination of data for appropriate public health action.<sup>6</sup> The presence of a surveillance system ensures the institution of timely interventions to control and prevent the disease under surveillance.<sup>5</sup> The HIV surveillance system is established to provide information on the burden of HIV, which will then guide preventive and treatment programs. Additionally, it identifies and monitors trends of HIV over time and serves as a basis for epidemiological research.<sup>5</sup>

The United States Centers for Disease Control and Prevention (CDC) emphasize the need for routine evaluation of disease surveillance system within a district, region or a nation.<sup>6</sup> The functionality of a surveillance system is determined through surveillance system evaluation. Hence, evaluation of a surveillance system is vital in the identification of gaps in the system as well as ensuring improvement in the quality, efficiency, and usefulness of the system.

This study sought to answer the following research questions: What are the operations, functionality and attributes of the HIV surveillance system in Rivers State? What is the burden of HIV in Rivers State based on the surveillance data for the period of 2012 to 2014? Hence, this study aimed to evaluate the HIV surveillance system for the period of 2012 to 2014 in Rivers State, as the State currently has the highest HIV prevalence rate of 15.2% in Nigeria.<sup>7</sup> The objectives of this evaluation were to assess the operations, functionality and attributes of the HIV surveillance system in Rivers State for the period of 2012 to 2014. The burden of HIV in the State for the time period was also determined from the surveillance data.

## METHODOLOGY

Rivers State is situated in the south-south region of Nigeria. It has 23 local government areas and a total population of 5,198,716.<sup>8</sup> The evaluation of HIV surveillance system in Rivers State, Nigeria was conducted in line with the CDC updated guidelines for evaluating public health surveillance system<sup>6</sup> from January to March 2015. Information on the operations, functionality and attributes of the HIV surveillance system was collected qualitatively using key informant interview sessions. The surveillance data for the time period under evaluation (2012 to 2014) was analyzed to determine the burden of the disease in the State as this is required in every surveillance evaluation.<sup>6</sup>



The key informant interview (KII) sessions involved 20 key stakeholders from the three-tier level of government and international partners. These key informants occupied designated positions regarding HIV/AIDS surveillance. The interview sessions were done to assess the operation, functions and attributes of the surveillance system in accordance with the CDC updated guidelines for evaluating public health surveillance system.<sup>6</sup> The one-on-one interview sessions were undertaken by the lead author, who has been trained in the application of the CDC updated guideline for evaluation of public health surveillance systems by Nigeria Field Epidemiology and Laboratory Training Programme (NFELTP). Informed consent was obtained from the key informants prior to the interviews.

The attributes of surveillance system assessed were data quality (assessed by the presence of data supervision, data quality assurance reviews and the completeness of the data); stability of the surveillance system (assessed by ascertaining the presence of a dedicated staff for data activities and the level of interruption of the system due to inadequate human resources and finances); simplicity (ascertained by the ease by which data collectors filled the form); acceptability (determined by the willingness of the surveillance data collectors and users to continue to participate in the system and rely on data from it); representativeness (assessed using the distribution of data in person and place); flexibility (assessed by retrospectively examining the ease by which the system accommodated other health events in the past three years and variation in funding and sources); sensitivity of the surveillance system (assessed based on the screening tool used for defining a case of HIV).

Information obtained from the interviews was presented appropriately to highlight the operations, functions and attributes of the HIV surveillance system in the State. Review of HIV data collected via the surveillance system from 2012 to 2014 (three-year period) was done to estimate the burden (prevalence rates) of the disease in the State. The 2012-2014 raw data on HIV from the surveillance system spreadsheet containing information on age, sex, HIV counseling and testing (HCT) and HIV test results were analyzed using Microsoft Excel 2013. The analysis was done to determine the general, sex-specific and age-specific prevalence rates for the period of 2012 to 2014. In calculating the prevalence rates, the total number of positive cases constituted the numerator while the denominator was the total number of people counseled and tested. The cumulative HIV surveillance data for the periods (2012-2014) were disaggregated by sex and age categories and the differences in the proportions observed were compared using Chi square tests. A p value of less than 0.05 was considered significant.

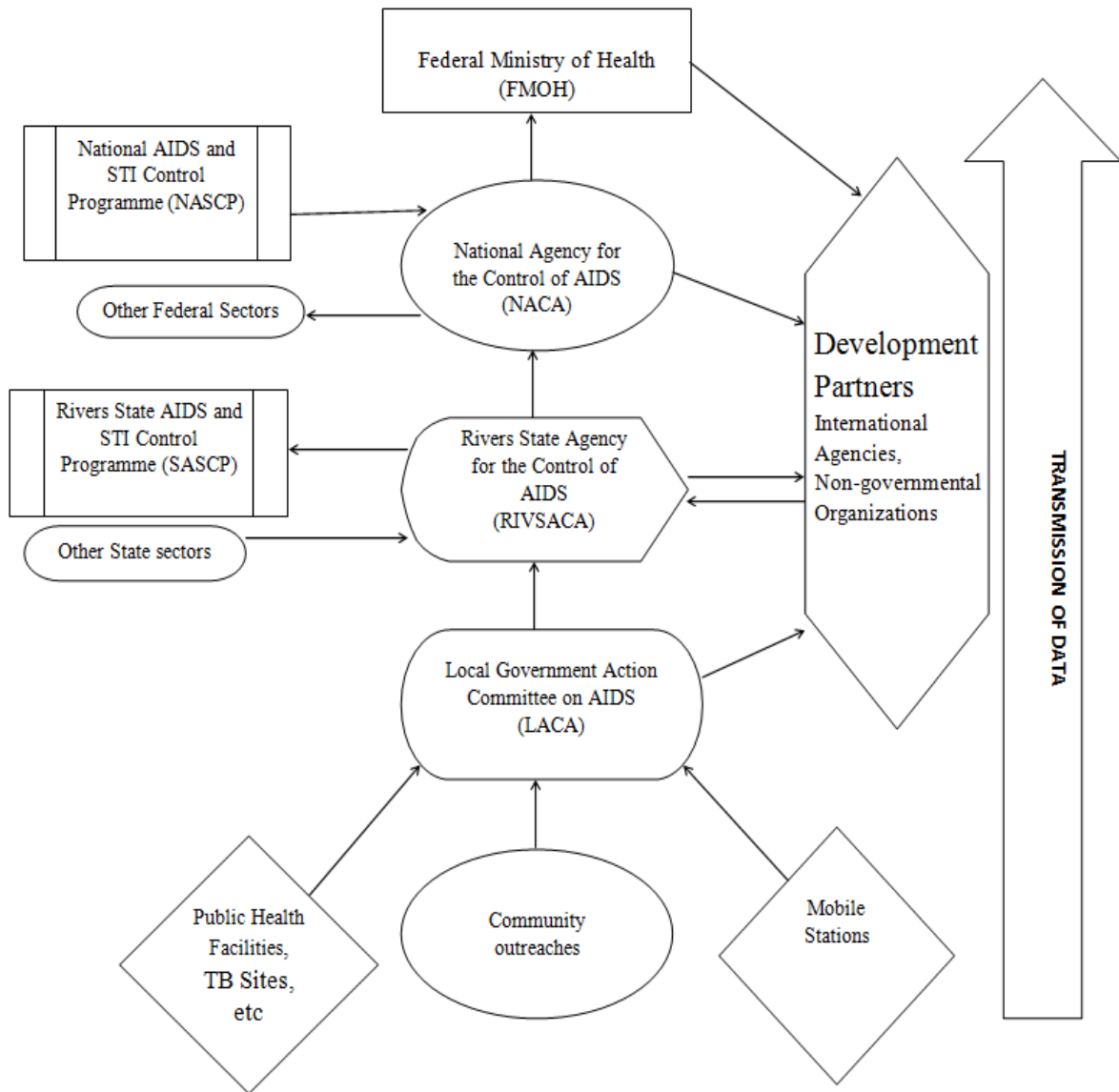


Figure 1. HIV surveillance data flow in Rivers State obtained from the evaluation process

## RESULTS

### *Operation and function of the HIV surveillance system in Rivers State*

A total of 20 key stakeholders were interviewed (Table 1). The findings from the interview sessions revealed that the HIV surveillance system in Rivers State operates as a passive surveillance using the bottom to top approach i.e. from the health facility to the local government, then to the state and national levels. The data is also shared with development partners.

Table 1. Distribution of the level of key informants interviewed

Level of key informant	n	%
National government level	2	10.0
State government level	4	20.0
Local government level	12	60.0
International partner level	2	10.0
Total	20	100.0

### *Findings on the attributes of the HIV surveillance system*

**Simplicity:** The KII sessions with the key informants at the local government level, who serve as the primary data collectors revealed that most of them (87.5%) affirmed the simplicity of data collection tools.

**Flexibility:** Information on tuberculosis have been introduced successfully with the HIV data collection tool without significant change in personnel and allocated funds thus suggesting the flexibility of the surveillance system.

**Acceptability:** The KII sessions with stakeholders during the evaluation process revealed that all stakeholders (100%) were willing to continue to participate in the surveillance system. They believe they are involved in playing major roles in the fight against HIV/AIDS.

**Representativeness:** The HIV surveillance system in Rivers State involves all the local government areas and people of all ages. The system also captures pregnant women with HIV as well as neonates exposed to HIV exposed mothers. Thus, all individuals irrespective of age, sex and locality are not excluded in the surveillance system. However, the non-inclusion of private health facilities in the system limits the representativeness of the system.

**Data Quality:** Data quality validation is done quarterly by the Rivers State Ministry of Health and Rivers State Agency for the Control of AIDS (RIVSACA) when funds are available. The evaluation



process also showed that 75% of the primary data collectors at the local government level were trained in the preceding six months on data management.

**Sensitivity:** The HIV surveillance system defines a case based on a rapid diagnostic test (RDT) kits for HIV. The choice of RDTs being used is based on the recommendation by the National Guidelines on HIV Counselling and Testing.<sup>9</sup> The RDTs recommended (Determine, Uni-gold and STAT-PAK) all have sensitivities of 100%. Thus, the sensitivity of the surveillance system is good.

**Stability:** The HIV surveillance system in the state has poor stability. This is because there has been no consistency in the collection of data due to the frequent strike actions of the health workers in the state. During, such strike actions, the health facilities are not functional, thus deterring data collection from such health facilities.

#### *Burden of HIV*

The HIV surveillance data of 2012 identified 8072 HIV positive cases among 59400 persons counseled and tested for HIV in the state, giving a prevalence rate of 13.6%. In 2013, out of the 62925 persons counseled and tested for HIV, 4566 were identified as HIV positive, giving a prevalence rate of 7.3%. Six thousand three hundred and eighty seven (6387) persons were found to be positive for HIV among the 67596 persons counseled and tested for HIV, resulting to a prevalence rate of 9.4% in 2014. Figure 2 shows the general and sex-specific HIV prevalence rates across the time periods. In all the three time periods, females had higher prevalence rates than males. The age-specific prevalence showed that age group 20-24 years had the highest prevalence in 2012 while ages above 50 years had highest prevalence rates in 2013 and 2014. Figure 3 shows the age-specific prevalence rates across the time periods. Cumulative HIV surveillance data for 2012 to 2014 showing HIV prevalence rates disaggregated by sex and age categories is presented in Table 2. There were significant differences ( $p > 0.0001$ ) in the cumulative prevalence rates across sex and age category.

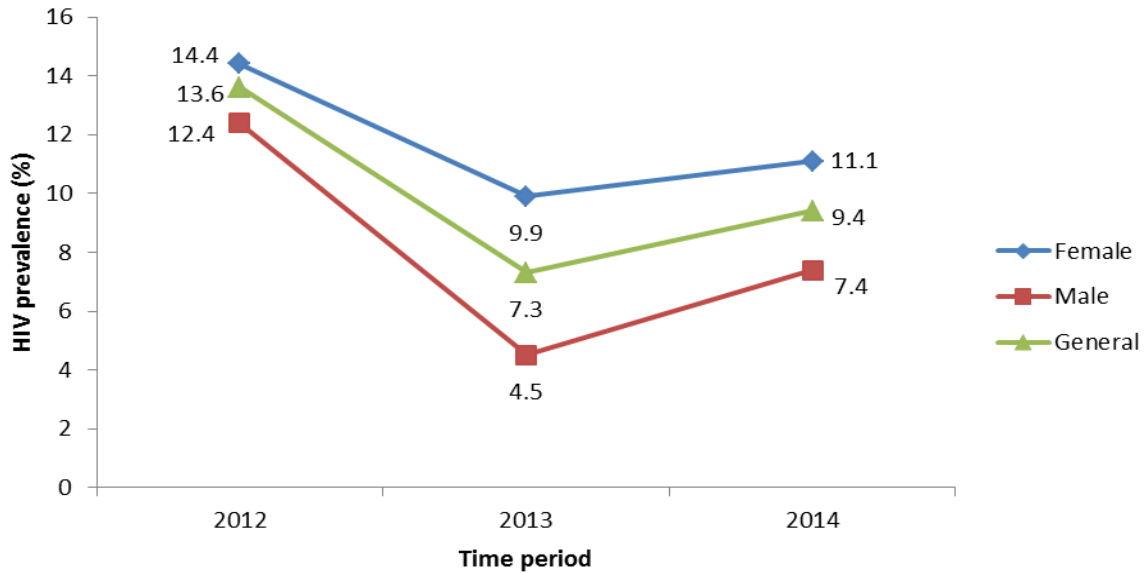


Figure 2. General and sex-specific HIV prevalence rate from 2012 to 2014 surveillance data

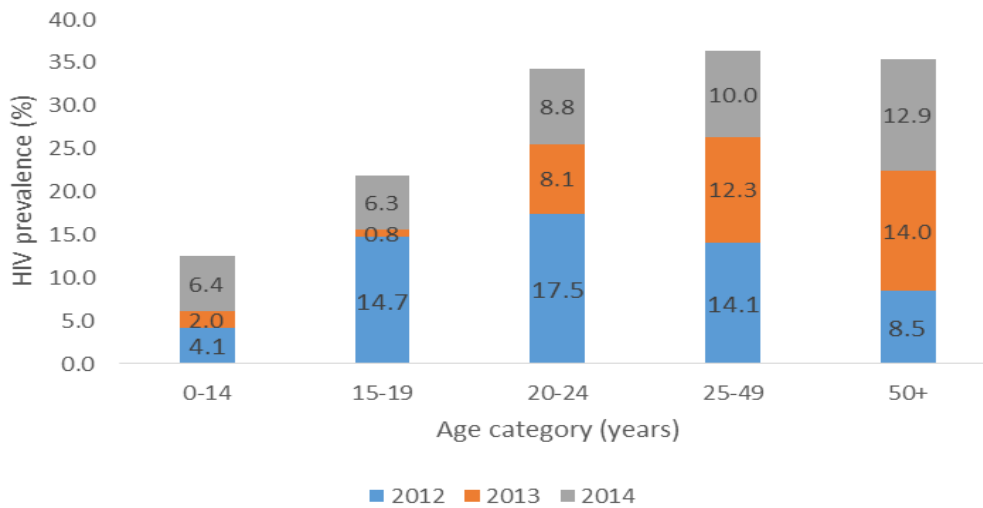


Figure 3. Age group-specific HIV prevalence rates from 2012 to 2014 surveillance data

Table 2. Cumulative 2012-2014 HIV surveillance data disaggregated by age and sex

Variables	Cumulative 2012-2014 HIV surveillance data		
	HIV positive n (%)	HIV negative n (%)	Total counseled and tested n (%)
<b>Sex</b>			
Male	6523 (7.7)	77699 (92.3)	84222 (100.0)
Female	12502 (11.8)	93197 (88.2)	105699 (100.0)
	$\chi^2=866.9; d.f.=1; p<0.0001^*$		
<b>Age categories (years)</b>			
0 – 14	1002 (3.4)	28585 (96.6)	29587 (100.0)
15 – 19	1222 (6.5)	17483 (93.5)	18705 (100.0)
20 – 24	3518 (11.7)	26436 (88.3)	29954 (100.0)
25 – 49	11555 (11.9)	85798 (88.1)	97353 (100.0)
≥ 50	1728 (12.1)	12594 (87.9)	14322 (100.0)
	$\chi^2=2231; d.f.=4; p<0.0001^*$		

\*Statistically significant

d.f - degree of freedom

## DISCUSSION

The population-based passive type of surveillance for HIV in Rivers State noted from this evaluation is similar to the HIV surveillance system in other regions within<sup>10</sup> and outside Nigeria.<sup>11,12,13</sup> This passive type of surveillance is commonly applied in routine surveillance of diseases of public health because it is cheaper, requiring fewer resources, and hence more likely to be sustainable than the active type of surveillance.<sup>14</sup> Nonetheless, it requires training, supervision and motivation of the data collectors to operate very effectively.<sup>14</sup> The introduction of reward-system could be included for the motivation of data collectors. The bottom to top approach used in the operation of HIV surveillance implies that data generated from the population is transmitted to the local government level, then to the state government and finally to the federal government. The bottom to top approach also requires that the federal level gives feedback to the state and from the state to the local government level. This approach in HIV surveillance ensures that the data derived from the system can be used for decision making at these different levels.

The finding that the surveillance system is simple, acceptable, flexible, and sensitive in this evaluation study is commendable and implies that the system is useful. This finding is consistent with the HIV surveillance evaluation study in New York, United States.<sup>13</sup> Concerning the attribute of





representativeness of the surveillance system, all ages, sex are being captured but the restriction of data collection to public health facilities limits the representativeness of the system. The key stakeholders need to collaborate with private health facilities to ensure the inclusion of private health facilities in the data being collected in the state. This is needed for the surveillance system to assess the true burden of the disease in the state. Another pertinent issue is the stability of the surveillance system. The stability attribute of the HIV surveillance system is being affected by frequent health care workers strike. This highlights the need for institution of policies to ensure optimal welfare of health care workers in a bid to prevent such incessant strike actions, which fetters the HIV surveillance system in the state. The evaluation also found that the HIV surveillance system in Rivers State is achieving the key objective of any surveillance system, which is the collection of data for appropriate public health action. However, the data generated from the HIV surveillance system does not identify new cases of HIV; hence HIV incidence rates cannot be computed from the data. Nonetheless, this surveillance data is useful in assessing the prevalence of HIV, which is a measure of the burden of the disease. The finding of HIV prevalence rates from the surveillance data of 2012-2014 being consistently higher than the national prevalence rate of 3%<sup>7</sup> implies the need to intensify efforts at reducing the burden of this disease in the state. Also, the finding of females consistently having higher HIV prevalence rates than males is in consonance with the national figures, which reveal higher prevalence in females than males. Hence, there is a need for HIV preventive activities targeted at the female population.<sup>7</sup> Efforts should also be made by the state government in collaboration with non-governmental organizations to scale up HIV sensitization and prevention programs.

Although, this evaluation noted that the system is effective i.e. meeting the goals of a surveillance system. The information on the financial resources involved in the HIV surveillance system was not disclosed to assess the efficiency of the system, which refers to the extent to which the objectives of the system are being achieved with minimum resources.<sup>6</sup> Hence, this serves as a limitation in this study. Also, the estimation of HIV prevalence rates using the passive surveillance data obtained may reveal an over or under-estimation of the number of cases.

Noteworthy, HIV surveillance evaluation has been reported in the south-east region of Nigeria,<sup>10</sup> none has been reported for south-south, Nigeria in peer-reviewed literature. This study thus adds to the body of knowledge and also highlights the need for HIV surveillance evaluation in the south-south region of Nigeria.

## CONCLUSION

This HIV surveillance evaluation in Rivers State reveals that the system is achieving the purpose of a public health surveillance system in identifying and monitoring the trends of disease. Also, the surveillance system is simple, flexible, acceptable, sensitive, and operates a bottom to top approach. However, collaboration with private health facilities is needed to achieve better representativeness of HIV surveillance data. Also, the institution of measures to prevent strikes among health care workers will ensure the stability of the system.



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