

**EVALUATION OF SURVEILLANCE PERFORMANCE OF ACUTE FLASC PARALYSIS IN
THE DEMOCRATIC REPUBLIC OF CONGO.**

Case of the Tshopo Provincial Health Division from 2015 to 2019.

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ABSTRACT

Regular assessment of surveillance performance of acute Flaccid paralysis is one of the approaches to the global polio eradication initiative. This is in order to soak up bottlenecks and to act quickly to make amends. That's why we carried out this study in the Provincial Health Division of Tshopo in the Democratic Republic of Congo from 2015 to 2019. We conducted a descriptive cross-sectional study in which analyses examined 660 cases of Paralysis Flasque Aigue reported from January 2015 to December 2019.

The non-probabilistic method tailored to the quota sample (Lokutu and Kisanagni Antennes) was chosen to base our study. Data were collected at the level of Health Zones (23) which reported cases of Paralysis Flasque Aigue. The demographic weight between the two Antennes Lokutu and Kisangani is 23% and 72%. We have seen a marked increase in notification of Acute Flasque Paralysis from 2015 to 2018 and a decline in 2019 that has not affected the overall result of the Province. From 2015 to 2019: the average annualized rate of acute non-polio Flaccid Paralysis equal to 8.5 and 8.2 cases per 100,000 inhabitants under the age of 15 at the level of two Antennes (Lokutu and Kisangani), the proportion of acute Flaccid Paralysis samples pre-arranged between 24 and 48 hours was mostly greater than 80%, only in 2019 when the two Antennes (Lokutu and Kisangani) show a relaxation in the maintenance of adequate stool samples (80%). The delay between the second levy and its arrival at The Lokutu Antenne was more encroached on in 2015 (79%) and in 2018 (74%) Lokutu Antenna has not met the target (80%). The two Antennes (Lokutu and Kisanagni) performed poorly in terms of the proportion of PFA with known vaccine status from 2015 to 2019 - 95%, both Antennes (Lokutu and Kisanagni) obtained surveillance indices of Acute Flaccid Paralysis above 2.5.

The indicators chosen to assess epidemiological surveillance of cases of Acute Flaccid Paralysis attest that it is sensitive despite some adjustment on the vaccination status of reported Acute Flaccid Paralysis cases and the long delay between the 2nd sample and its arrival at the Antennes (Lokutu and Kisangani).

To remedy this situation, health structures must rely on the implementation of the effective community dynamics put in place. Therefore, a small dose of political and community support to change the image of road infrastructure is essential for outstanding indicators to turn into the right one in DR Congo.

1. INTRODUCTION

In the fight against polio eradication decreed since 1988 (BienzK; Binz H; Bourquin C; Boltshouser E; Vernezza P. .2000), the best way to ensure this is through the achievement of good practices, which consists in re-monitoring and evaluating indicators of surveillance of acute flaccid paralysis (AFP) by service providers wherever they are in health facilities and in communities in both rich and developing countries.

As Bill Gates, Co-Chair of the Bill and Melinda Gates Foundation, said in January 2009:

"Eradicating a disease is a difficult, slow and laborious task. But failure is absolutely not an option. We will not let children die on the pretext that it is tiring to save them" (WHO, 2009b).

In 2018, as part of the certification of polio eradication in the African region, the World Health Organization (WHO) certifies that "certification of a region is considered only when all its Member States have demonstrated the absence of transmission of wild poliovirus for at least three consecutive years, as evidenced by polio surveillance activities carried out in accordance with certification standards."

In 2014, eradication of the disease was certified in four of who's six regions, with the regions of Africa and the Eastern Mediterranean yet to be certified.

What is important to recognize is that the African Region has made remarkable progress towards polio eradication. By June 2018, 22 months had passed since the last case of wild poliovirus infection was confirmed in the African Region, with the last cases reported in Nigeria on 21 August 2016. The last polioviruses were isolated from the environment on 27 September 2016.

However, the work of the Global Polio Eradication Initiative will not end once it has been eradicated. Activities will be needed to minimize the risk of poliovirus reintroduction and the emergence of a vaccine-derived circulating poliovirus (WHO, 2019c). These activities include family-oriented monitoring and service evaluation of AFP surveillance, analyzing stool monitoring and polio risk through key indicators of polio eradication worldwide: 1. Statement of all cases of acute flaccid paralysis occurring in people under the age of fifteen. 2. Two virological examinations of stools within at least 24 to 48 hours, within a fortnight of the onset of acute flaccid paralysis. 3. No isolation of wild polio viruses for a period of three years (Bienz K; Binz H; Bourquin C; Boltshouser E; Vernezza P; 2000) as well as the case benefit of PFA

with adequate stools (up to 80%), proportion of stool samples tested in a WHO-accredited laboratory (80%) and the proportion of AFP cases with inadequate stools that received follow-up examinations on the 60th day (up to 80%) (Ministry of Public Health, 2018).

The Congo Democratic Republic (DRC) in general and the Provincial Health Division (DPS) Tshopo in particular are concerned about this polio initiative. This is how a study was conducted from 2015 to 2019. Having done so, this exercise allows DPS Tshopo to position itself against the fight since 1988 for polio eradication and, if necessary, capitalize efforts where it goes and adjust the shot where it does not work.

OBJECTIVE

The main objective of the study is to judge the surveillance performance of acute flaccid paralysis in order to persuade service providers (all tendencies) to monitor acute flaccid paralysis on efforts in the fight for polio eradication at the Tshopo Provincial Health Division from 2015 to 2019.

METHODS

Study medium

The Tshopo is one of 26 provinces that compete RD Congo. It contains a Public Health Division on the Sanitaire level. To this end, the TSHOPO DPS is regrowing two branches of the Extended Vaccination Program. This is the KISANGANI antenna with 17 Health Zones and the LOKUTU Antenna, which has 6 Health Zones within it. In short, the DPS Tshopo has a total population (2019) estimated at 3,692,007 inhabitants; an area of 197,637 km² with a density: 19 inhabitants per km². The number of islands is about 200 scattered in 426 health areas. The number of encampments is estimated at about 150 and 120 mining quarries. The known refractories to the vaccination service are: BONGOLA MOTEMA, NZABOYA, KITAWALA AND IDOMITES. Two health zones are insecure: LOWA and OPIENGE.

Type of study and sampling

We conducted a descriptive cross-sectional study.

The analyses examined 660 cases of acute flaccid paralysis (AFP) reported from January 2015 to December 2019.

The non-probabilistic method taillée on the sample by quota (Antenne PEV and Antenne PEV Kisanagni) was chosen to base our study.

Data were collected at the health zones level that reported AFP cases

TSHOPO Province.

The criteria for selecting PFA stool samples for our study are those selected by WHO and are:

1. The sample between the death of paralysis and the date of collection of the first sample (standard: '14j');

2. the delay between the 1st and 2nd stool samples (standard: between 24 and 48 hours);
3. the stay of PFA stool samples at the Antennes level (standard: 3 days);
4. the proportion of AFP with known vaccine status (standard: 80%)
5. the annualized rate of non-polio AFP (standard: 3 days / 100,000 inhabitants among children aged 15);
6. the PFA Surveillance Index (Ministry of Public Health, 2018):.

- If significant weakness in the detection of AFP cases with or without weakness in the promptness of stool collection and quality;
- Active PFA surveillance is underperforming;
- – 2.4 = performance active PFA surveillance*;
- 2.5 - PFA monitoring performing fairly well

How to calculate. Monitoring index - incidence rate \times (% of pre-prepared stool samples - 14 days), Ministry of Public Health (2018).

Subject to careful review of each indicator and analysis of the data at the sub-national level. We have accepted as acceptable, a proportion greater than or equal to 80% (WHO standard).

Organization of the AFP surveillance system.

In the surveillance of PFA in DR Congo in Tshopo Province, once a case is notified either by the Community Relay (RECO) or by the claimant two samples must be pre-prepared within the time limit (24-48 hours), kept in the cold temperatures ranging from 2 to 8 degrees Celsius in a refrigerator posted at the Health Centre if not at the Central Office. To leave the community (the family of the child who is the victim of the PFA) and reach the refrigerator, PFA samples are kept in a box Isotherm containing two or four cold accumulators depending on whether it is Apex or Geostyl (fast cold chain). To transport samples from Health Centres to The EPI Antenne, we always use the fast cold chain. The time taken between the second sample to the National or Central laboratory level does not 72 hours or 3 days (OTOWANGE M. Y.S. LIFOFA O.L. AKUKU-K. E.H. OTOLITO T.F; TUMBA K.J.C; 2020)

PERFORMANCE indicators for AFP monitoring

Evaluation of performance indicators for AFP surveillance is done using standard indicators whose objectives have been set by the World Health Organization (WHO).

For convenience reasons, the following indicators were analyzed.

Indicator 1: The number of AFP notified

Indicator 2: The annualized PFA_NPrate for children under the age of 15. This is the number of cases of AFP recorded per 100,000 children under the age of 15. (WHO Goal 3);

Indicator 3: The time between the 1st and 2nd stool samples (standard: between 24 and 48 hours);

Indicator 4: The percentage of AFP cases for which 2 samples are collected within 14 days (WHO target-80%);

Indicator 5: the stay of PFA stool samples at the Antennes level (standard: 3 days);

Indicator 6: the proportion of AFP with known vaccine status (standard: 80%)

Indicator 7: SPFA Monitoring indices

Data analysis

The data was analyzed using Excel 2010 software. This analysis assessed the performance indicators of the surveillance system. The graphics were compiled using Excel 2010 before being housed in the Word 2010 version.

The following variables were selected for our study: number of reported AFPPs; number of PFA with pre-prepared stool samples between 24-48h, number of PFA with known vaccine status, annualized non-polio AFP levels, number of PFA with adequate stool samples, number of PFA with samples arrived at the Antenne within 3 days, S PFA surveillance index.

RESULTS

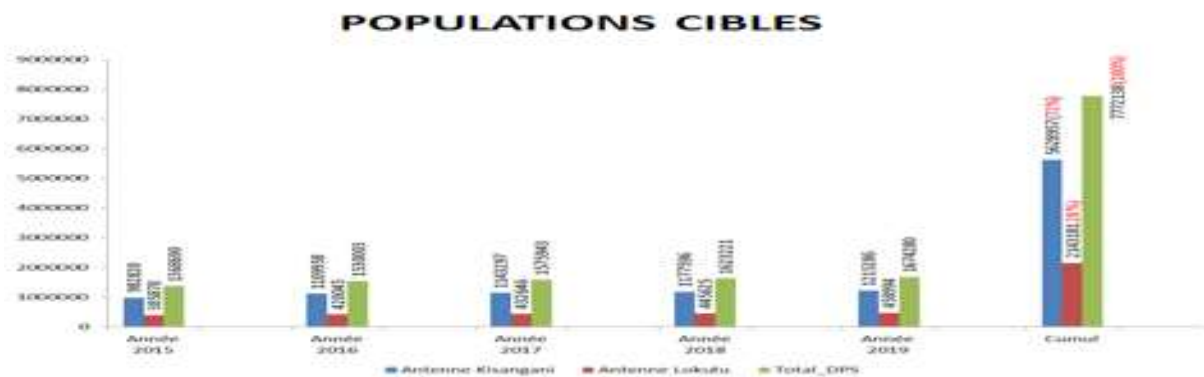


Figure 1. Populationis target for monitoring THE AFP of the Tshopo DPS from 2015 to 2019.

Figure 1 shows that the demographic weight between the two EPI antennas of the Tshopo DPS is divided as follows: 23% (Lokutu) and 77% (Kisangani).

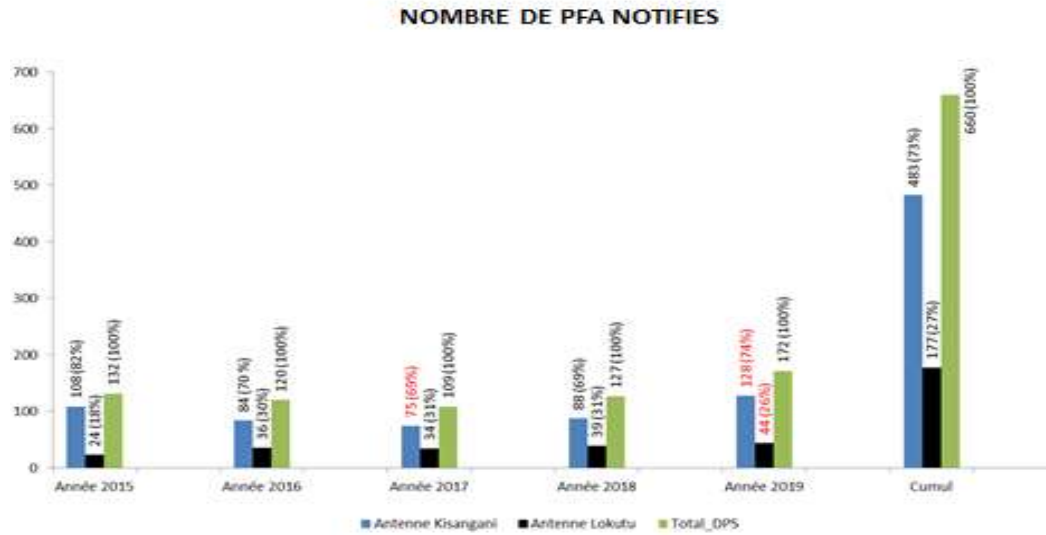


Figure 2. Number of PFA reported to DPS Tshopo from 2015 to 2019.

Among the 2 EPI Antennas (Lokutu and Kisangani), we note that there is a marked increase in AFP notification from 2015 to 2018 and a decline in 2019 that has not affected the overall result of the DPS (No. 660).

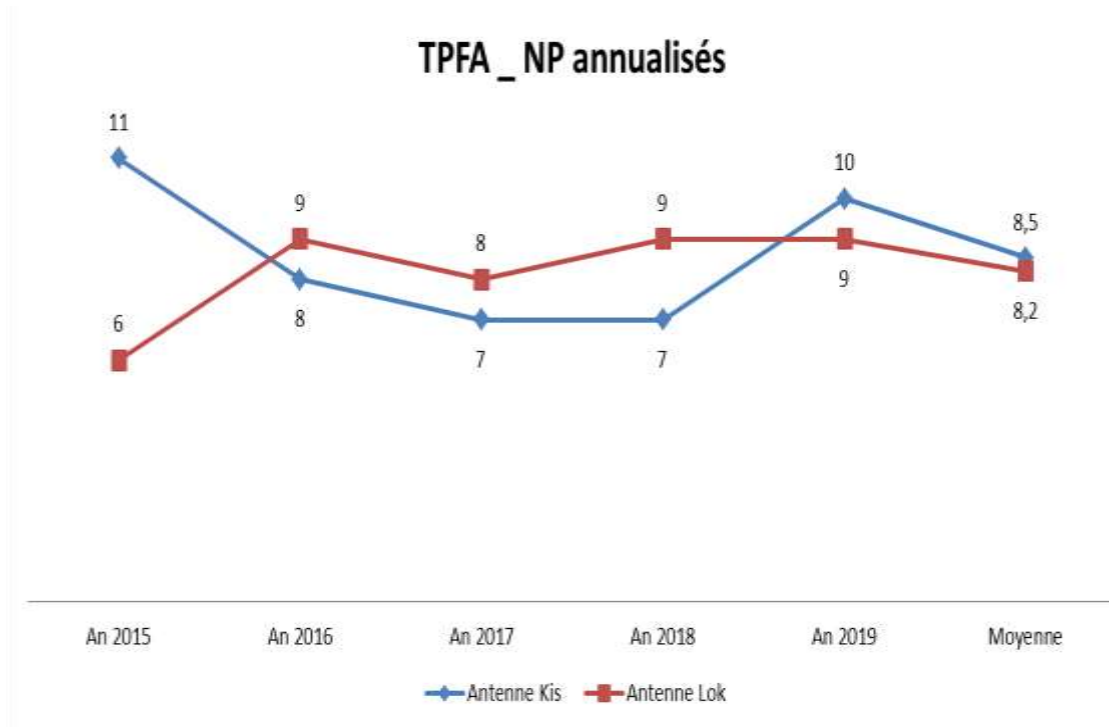


Figure 3. Non-polio AFP annualized at DPS Tshopo from 2015 to 2019.

Figure 3 shows average non-plio rates equal to 8.5 and 8.2 cases per 100,000 population under 15 years of age (Standard) from 2015 to 2019 at the level of two EPI Antennes (Lokutu and Kisangani).

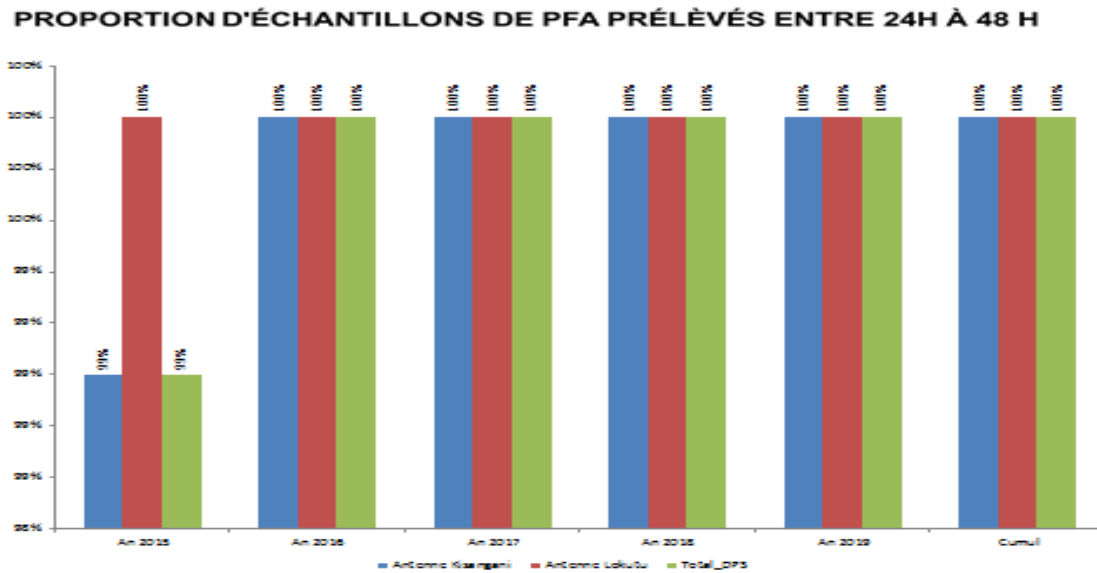


Figure 4. Proportion of PFA samples pre-prepared at Tshopo DPS between (24 to 48) hours from 2015 to 2019.

From 2015 to 2019, the proportion of AFP samples pre-served between 24 and 48 hours was mostly above 80%.

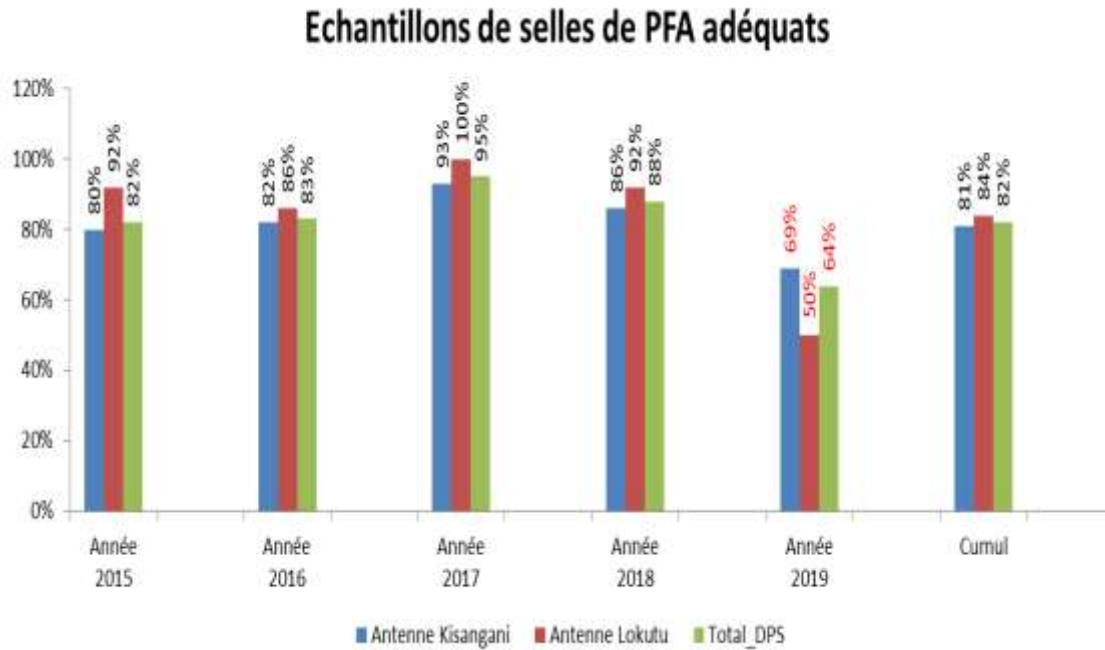


Figure 5. Proportion of PFA stool samples suitable for Tshopo DPS from 2015 to 2019.

In the entire Tshopo DPS during the five years of our study, only in 2019 when the two EPI Antennas (Lokutu and Kisangani) show a slackening in the maintenance of adequate stool samples (80%).

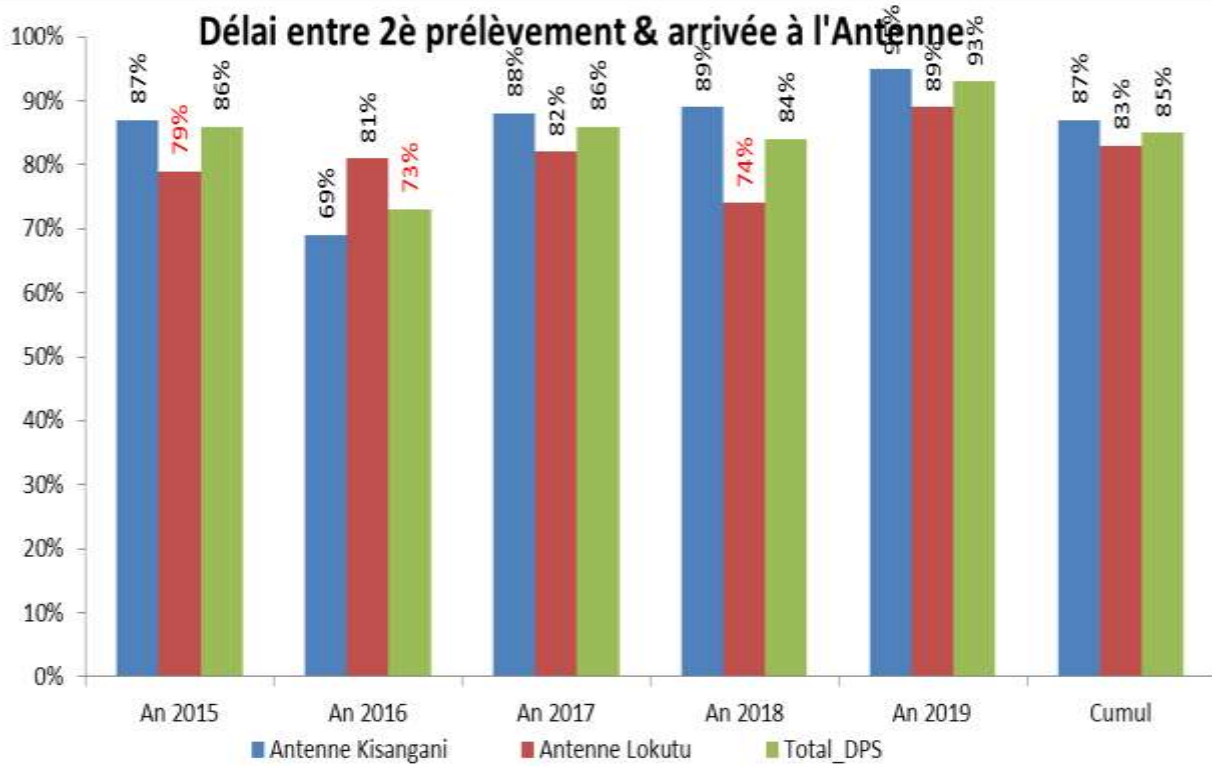


Figure 6. Time between the 2nd levy and its arrival at the EPI Antenne, DPS Tshopo, 2015 to 2019.

The delay between the second levy and its arrival at the EPI Antenne was more encroached on in 2015 (79%) 2018 (74%) Lokutu PEV Antenna has not reached 80% (WHO Standard)

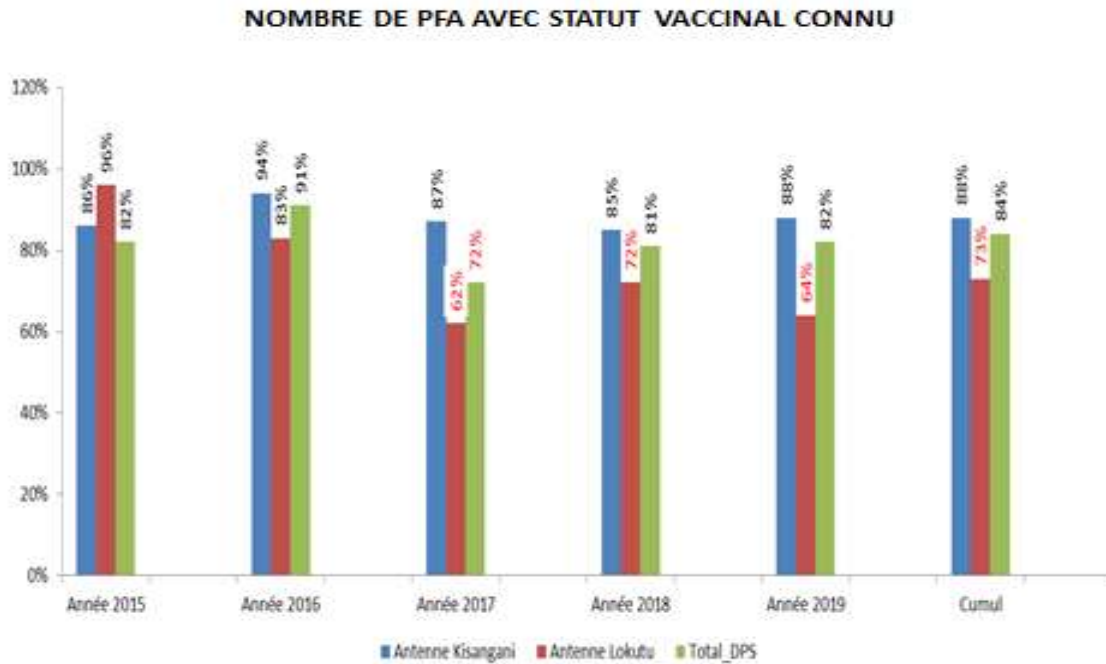


Figure 7. Proportion of AFP samples with vaccine status known at DPS Tshopo from 2015 to 2019.

Starting from Figure 7, the two EPI Antennes (Lokutu and Kisanagni) showed poor performance in terms of the proportion of PFA avec known vaccine status from 2015 to 2019 95%.

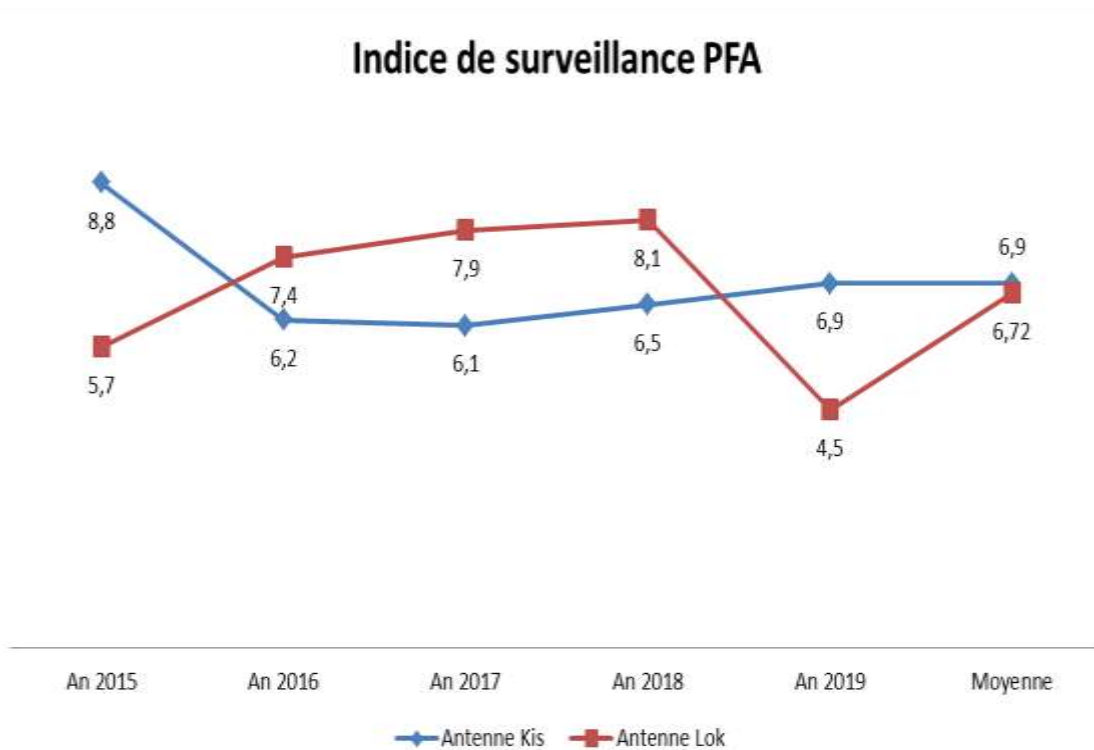


Figure 8. PFA monitoring index at DPS Tshopo from 2015 to 2019.

It should be noted that Figure 8 shows that the two EPI Antennas (Tshopo and Lokutu) of the Tshopo DPS obtained PFA monitoring indices greater than 2.5.

DISCUSSION.

In our study, among the 2 EPI Antennas (Lokutu and Kisangani), we find that there is a marked increase in AFP notification from 2015 to 2018 and a regression in 2019 that at all did not affect the overall result of the DPS (no. 660).

Notification in polio eradication is one of the major steps that contributes to a good AFP surveillance system.

This is where we come up with the idea of Kaddache C. and Boukari R (2010) which states that:"if a country does not meet the criteria: to identify all AFP (3 cases /100,000 children under the age of 15 in this case), declare them (by the Ministry of Santé Publique), investigate them(feces samples and examination at 60 days after the onset of paralysis) its sanity system is therefore unable to capture its PFA and is therefore also unable to capture cases of wild poliovirus or poliovirus derived from the vaccine

strain." This means that the monitoring system is able to capture cases of PFA plus it has the chance to get hold of the (the) cases of PVS or cVDPV. Fortunately, during the five years considered in our study, no cases were positive (neither a PVS case and even less, cVDPV), or according to Dr. Nancy Messonnier of the CDC interviewed by the Times, "If a virus is the cause, it is possible that the test is not good enough or that the germ left the cerebrospinal fluid at the time the tests were performed.

However, in the EUDOSIE SERIES of SIMO FOHOM (2006), 980 cases of AFP were reported for a period from 1999 to 2005 or for 7 years. The discrepancy between our study and this study is justified in terms of our number of years of study. The notification of a large number of cases at the level of two EPI Antenne (Kisangani and Lokutu) is the product of AFA Surveillance of years both entities of the Provincial Division of Santé.

At the level of two EPI antennes (Lokutu and Kisangani), annualized non-polio AFP rates are expected to exceed 3 cases per 100,000 inhabitants under the age of 15 from 2015 to 2019. This feat corroborates with the 2006 data collected by WHO (2007) after a country-by-country analysis of the quality of the AFP's on-the-ground wake-up survey shows improvements in the vast majority of cases. The percentage of countries with a notification level of 2 per 100,000 children under the age of 15 in the two endemic regions with the highest burden of disease increased from 62% to 75% for AFR countries (WHO Regional Office for Africa, 2018) and 54% to 63% for SEAR's Asian countries (WHO Regional Office for Southeast Asia, 2018).

The improvement of AFP Monitoring in the two entities of the Provincial Health Division demonstrated the notification of a large number of cases at the level of two EPI Antenne (Kisangani and Lokutu) mentioned in situ and the best results of annualized TPFA_NP in children under five during the 5 years of our study justify this feat.

Of course, a plan to strengthen the monitoring of AFP following an external WHO evaluation of the national AFP surveillance system in DR Congo then increased the level of PFA non-poliomyelic from 2 cases to 3 cases (period d lull) to 4 cases per 100,000 children under the age of 15 in the region where the outbreak of cVDPV (poliovirus derived from the circulating vaccine strain) or PVS (poliovirus) is rife; what is considered to correspond to a suffocating sensitivity to determine if polioviruses are circulating in the area (CynthiaJ Snider. 2016).

Our study series shows that from 2015 to 2019, the proportion of pre-prepared FAP stool samples between (24 and 48) hours was mostly over 80%. Proportions of stool samples in the range of (24 to 48) hours give

the sampler more chance to get their hands on wild poliovirus (1, 2 or 3) or vaccine-derived polioviruses (circulating, ambiguous or immunosuppressed) in individuals with AFP.

In the overall Tshopo DPS during the five years of our study, only in 2019 when the two EPI Antennas (Lokutu and Kisangani) show a slackening in the maintenance of adequate stool samples (80%).

In our study, this situation can be explained mainly by the non-compliance with the rules for sampling barriers in terms of quantity (8 to 10 grams) and time interval (24 to 48 hours) that flows between the 1st and 2nd PFA stool samples by AFP epidemiological surveillance service providers at the levels of two EPI Antennas (Lokutu and Kisanagni). Or by the fact that community dynamics did not go into its thematic section "Community-based Surveillance (SBC)" where RECOs were to surprise in real time (14 days) the cases of AFP that occurred in their households of accountability during the realization of home visits of households. If not then, the reason for inadequacy is elsewhere: long delay in transporting PFA stool samples between the 2nd sample and its arrival at the National Reference Laboratory (72 hours), incorrect filling of an investigation form of PFA cases, poor PFA stool retention process.

Results similar to our study (proportion of stool samples from PFA -lt; 80%) were found during the update of the "Polio Eradication Activities (IEP) in DR Congo in Kinshasa Province on 28 February 2014 where the proportion of adequate coprological samples collected was equal to 79% of AFP cases.

Speaking of the delay between the second levy and its arrival at the EPI Antenne, it was more encroached in 2015 and 2018 when the Lokutu PEV Antenne reached only 79% and 74% respectively -lt; 80% (WHO standard). Ideally, the delay between the 2nd PFA stool sample and its arrival at the National Reference Laboratory would have been 3 days or 72 hours.

The reduced time for the arrival of AFP case stool samples at the National Reference Laboratory is crucial because it provides the surveillance system with more chance to get its hands on the virus (if there are any and if the required conditions are observed).

In the case of the Lokutu PEV Antenna, pour that PFA stool samples do; there is a related to it taking an average of 7 to 8 days. One more reason that forced us not to take into account the delay between the second sample and its arrival at the National Research Laboratory (INRB) in our study.

This is due to the geographical context of DR Congo: poor road infrastructure, long distance between health facilities, lack of adequate means of transport to quickly evacuate PFA stool samples, irregular flights to the country's capital, etc.

In the same vein, the proportion of samples of 319 cases of AFP reported and arrived at the National Reference Laboratory within 3 days of the 2nd sample was taken remained below target, i.e. varying between 40% and 70% in a study conducted by Tatou D. J.G, Khalef I, Brahim D.L and Boubker N entitled: "Epidemiology of AFP and the performance of the surveillance system in Mauritania from 2008 to 2012". Même for a study conducted by Kavunga M. H et al (2015) in DR Congo entitled: "Acute flaccid paralysis surveillance indicators in the Democratic Republic of Congo during 2008-2014" which during the seven years (2008-2014), the average proportion of samples of 13. 749 cases of AFP reported and arrived at the National Laboratory never reached 10%.

However, in our reflection on this study, the two 'Antenne PEVs (Lokutu and Kisanagni) show low performance in terms of the proportion of PFA with known vaccine status from 2015 to 2019 -It; 95%. Knowledge of vaccine status of AFP cases in our study focuses on the collective immunization of children with AFP. Low OPV coverage leaves us concerned that our province will not ever eradicate polio.

This control of the number of doses received by the patient for polio vaccine makes it possible to suspect:

- A "hot" case
- Or a vaccine-associated paralytic polio.

All unvaccinated people are susceptible to poliovirus. Newborns of immune mothers are naturally protected against paralytic disease for a few weeks. A 3-dose primary series of OPV vaccine produces humoral immunity against three-in chlio viruses for at least 95% of recipients. The 3-dose primary series of IPV produces humorous immunity for at least 99% of beneficiaries (Ministry of Public Health, Republic of Lebanon (2015).

The situation of the Lokutu EPI Antenne is contextual and is explained by the fact that the six Health Zones (100%) it composes are difficult to access geographically (presence of inhabited encampments in the immense Equatorial Forest, inhabited islands in the majesty Congo River). The existence of hunters, pygmies, fishermen added to this the habits and customs of the population, the presence of sects resistant to modern medicine "vaccination above all" that we quote: Catholic Bongola Motema that is to say "Calotins convert", Zaboya, Kitawala,etc. Not to be overlooked is also the lack of Technical and Financial Partners (TFP) in the overall routine immunization activities outside the one-time support of WHO (Epidemiological Surveillance) and Unicef (purchasing routine vaccines) in the six Health Zones.

Not with standing, Kavunga M. H et al (2015) in their study cited in supra observed low vaccination performance among reported AFP cases (3-dose OPV vaccine coverage: 62.4% from 2008 to 2014). The same weaknesses were reported in the FOHOM S.E (2006) study series, where the vaccine status of AFPcases from 1999 to 2005 that received 3 or more doses was only 49.6% and 80%.

For the set of two EPI Antennas (Lokutu and Kisangani), the PFA monitoring index obtained is above 2.5. This is to translate or testify that the surveillance of PFA was largely sensitive to the levels of two EPI Antennas (Lokutu and Kisangani) of the Provincial Division of Health of the Tshopo in DR Congo during the period of our study.

Pareil indice de surveillance de PFA > 2,5 a été trouvé par Kavunga M. H et al (2015) dans son étude sur « Acute flaccid paralysis surveillance indicators in the Democratic Republic of Congo during 2008-2014 » et Bassey E.B et al (2011) dans son étude intitulée : « Surveillance of acute flaccid paralysis in Akwa Ibom State, Nigeria 2004-2009 ».

CONCLUSION.

In general, the pace of the indicators chosen to assess epidemiological surveillance of AFP cases at the levels of two EPI Antennas (Lokutu and Kisangani) of the Provincial Division of Health in DR Congo from 20015 to 2019 attests that it is sensitive in the absence of some adjustments on the vaccination status of reported AFP cases and the long delay between the 2nd sample and its arrival atx Antennes PEV (Lokutu and Kisangani).

We believe that to remedy this situation, health facilities must rely on the implementation of effective community dynamics in their entity that may surprise in time cases of AFP and identify children not or incompletely vaccinated during routine vaccination within households of accountability under supervision by community relays. Therefore, a small dose of political and community support to change the image of road infrastructure is essential for outstanding indicators to turn into the right one in DR Congo.

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