facilities, we have had meetings with these institutions but for them to send data here they are finding it a problem. But for a few like Lusaka Trust Hospital whenever they have a case that is notifiable, they call, they have my number and we go there and collect information and then we disseminate to the relevant authorities." (Key Informant – DHMT).

IDSR system stability

Stability here refers to the duration and consistency of operation of the system [24]. This study also tried to gauge the stability of certain aspects of the IDSR system by asking the key informants to give an estimate on the frequency of internet outage that they experience in a specified period of time – in this case, six months (this is relevant as a bulk of communication between the different IDSR implementation levels is done via the internet). Most of the key informants had indicated that they experience internet outage when; power supply to their offices has been cut mostly due to load-shedding; subscription fees to the service providers have not been paid by the respective health offices; and at times even when there is internet connectivity, it often is so slow that officers cannot download or upload files either through their emails addresses or through the DHIS II in a timely manner. In order to ensure that reports are sent on time, most officers at the periphery as well as at the core of the IDSR system resort to the use of their personal internet access mostly through their mobile phones at their own cost:

"In most cases, there is internet only when they is power, however, we are heavily load-shaded here at the office. Hence, in most of the cases, we have to rely on our own internet mostly through mobile phones … for districts the situation is quite bad. Since most of them depend on their grants to pay for such services as internet connectivity … at the moment, grants are a bit erratic, there isn't much funding from the central government. Worse even at the centre level, for they just use their own initiative to send these reports". (Key Informant – LPHO)

Discussion

The study has shown that the Ministry of Health has made significant strides in the adaptation and implementation of the IDSR strategy to the Zambian context. The strength of the system is that it has been rolled out to all health facilities throughout the country. The technical guidelines for IDSR in Zambia make it explicit that all health facilities public or private have to report all suspected, and confirmed mortality cases associated with any of the priority notifiable infectious diseases stipulated within the guidelines and the Public Health Act of 1995. The guidelines even go further by requiring all health facilities to submit weekly and monthly reports on selected priority notifiable infectious diseases regardless of whether or not they have had a case. The Ministry has also established an IDSR implementation structure with clearly defined roles and responsibilities for each position from national to facility level. There is also a dedicated budget plan for IDSR implementation Mandyata et al. BMC Public Health (2017) 17:746 Page 10 of 12 which is revised on a regular basis. However, despite these strengths, they are still gaps that are hampering the optimal implementation of the strategy. On the core functions side of the strategy, the ministry is still facing challenges in the effective detection, registration and reporting of cases to the higher levels. While these challenges emanate from a multi-facet of sources, health workers' attitude, inadequate and ill-trained human resources (in IDSR), high patient demand, several reporting requirements, inadequate availability of necessary materials and tools, and poor information and communication technology infrastructure are directly contributing to the dismal performance of the system [7, 25, 26]. Health worker motivation, especially at district and facility levels, was particularly negatively impacted by the inadequacy and inconsistency feedback that is provided to the lower levels. Health workers are not adequately informed on their performance concerning the tallying and submission of weekly and monthly disease surveillance counts and how their efforts are contributing to the fight against priority notifiable infectious diseases in the community where they work. The study has also shown that it is not only the lack of feedback that is affecting the optimal performance of the system in detecting, preventing and controlling notifiable infectious diseases but also the health workers lack lustre attitude towards recording, tallying and reporting of all cases that they see at their respective health facilities. While the poor enforcement of the Public Health Act, technical guidelines on IDSR and other regulations are some of the contributors to this negative attitude, the heavy leaning of the general health system in Zambia towards curative medicine at the expense of preventive medicine through public health and the high patient to medical personnel ratio are other contributing factors. Weaknesses in providing appropriate technical support especially transportation and communication facilities are also significantly contributing to the inability of the health workers particularly at district and facility levels to adequately carry out their assigned IDSR implementation duties. These facts were found to be re-enforcing the sub-optimal performance of the other areas of the core functions that is, case registration, reporting, analysis and response, and control. Consistent feedback coupled with other incentives (that is improved technical support) and disincentives for defaulters was found to significantly contribute to improvements in the quality, timeliness and completeness of reporting of monthly and weekly disease surveillance reporting in Peru and Tanzania [25, 27]. Sub-optimal performance of the core function side of the strategy was also re-enforced by poor implementation of the support side of the strategy [28, 29]. Training of key front line staff on IDSR was still inadequately being done. At the same time, the technical guidelines on IDSR implementation in Zambia [17] are also not readily made available particularly at health facility level. Health workers mostly rely on their experiences and academic backgrounds in order to execute their duties with regard to IDSR - which may not be adequate as disease surveillance is not specifically offered as a course in medical colleges and universities in the country. This

is further having an impact on the quality and quantity of the disease surveillance data that is being generated, transmitted and utilised for decision making in the Zambian health system. The higher the number of key frontline staff trained in IDSR, the higher the reported improvements in the quality of reporting, feedback, supervision, monitoring and evaluation including timeliness and completeness of reporting in the health systems of Cape Verde, Eritrea, Ethiopia, Guinea Bissau, Tanzania, South Sudan, Gambia, Uganda and Malawi [25, 30, 31]. Competent disease surveillance staff at all levels of health service delivery are a necessity especially in a resource limited country like Zambia for rational planning, implementation and infectious disease prevention and control [32]. These weaknesses coupled with other broader health system gaps that is the inadequate enforcement of the Public Health Act of 1995 [16] and other local and international regulations on health service delivery in Zambia, health financing, inadequate human resources, logistical and technical support and so on., are all reflected in the sub-optimal performance of the IDSR particularly on the quality attributes of timeliness and completeness of reporting as well as in the management of disease surveillance data at national level.

Conclusion

The Ministry of Health has over the years made significant strides in the quest to have a system that would specifically be used to detect, prevent and control priority notifiable infectious diseases in the country in the most effective and efficient manner. So far, the Ministry has put in place an IDSR implementation structure with clearly defined goals and measurable indicators. The ministry has also created dedicated disease surveillance positions, epidemic preparedness committees, and rapid response teams from national to district levels. However, a number of gaps still remain. These include inadequately trained human resources, lack of provision of optimal technical support to the DHMTs and health facilities, poor infrastructure and coordination challenges. For as long as these challenges remain unattended to, the number of preventable morbidity and mortality cases associated with priority notifiable infectious diseases in Zambia will continue to be high. It is, therefore, of utmost importance that the Ministry of Health comprehensively Mandyata et al. BMC Public Health (2017) 17:746 Page 11 of 12 addresses the challenges that have been raised in this study in order to improve decision making within the health system and to inform policy and ultimately, to effectively and efficiently detect, prevent and control priority notifiable infectious diseases in Zambia.

Abbreviations

AFP: Acute Flaccid Paralysis; CDHMT: Chongwe District Health Management Team; DHIO: District Health Information Officer; DHIS II: District Health Information System Version II; DHMT: District Health Management Team; EHO: Environment Health Officer; EVD: Ebola Virus Disease; HIV: Human Immunodeficiency Virus; HMIS: Health Management Information System; IDSR: Integrated Disease Surveillance and Response; IHR: International Health Regulations; LDHM T: Lusaka District Health Management Team; LPHO: Lusaka Provincial Health Office; M&E: Monitoring and Evaluation; MOH: Ministry of Health; PHO: Provincial Health Office; TB: Tuberculosis; UNZABREC: University of Zambia Biomedical Research Ethics Committee; WHO – AFRO: World Health Organisation Regional Office for Africa; WHO: World Health Organisation

Acknowledgements

Not applicable.

Funding

This study was not funded by any funding body

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding authors on reasonable request.

Authors' contributions

CM conceptualized the study area, collected, analysed and interpreted the data and wrote the draft manuscript from beginning to end. LKO provided supervision, participated in the analysis and interpretation of the data as well as in the refining of the whole manuscript. WM provided guidance and supervision in the conceptualization, analysis and interpretation of the data as well as in refining the whole manuscript from beginning to end. All authors read and approved the final manuscript.

Ethics approval and consent to participate

This study was ethically approved by the University of Zambia Biomedical Research Ethics Committee assurance no: FWA00000338 IRB00001131 of IORG0000774.

Consent for publication

Not Applicable.

Competing interests

The authors declare that they have no competing interests.

Publisher's Note

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SURVEILLANCE REPORT

The Integrated Disease Surveillance and Response (IDSR)

Surveillance and Disease Intelligence Unit

Zambia National Public Health institute (Ministry of Health)

Reporting Period: 25/11/2018 to 1/12//2018. ***Epidemiology Bulletin: Week 49*** Issue: 49

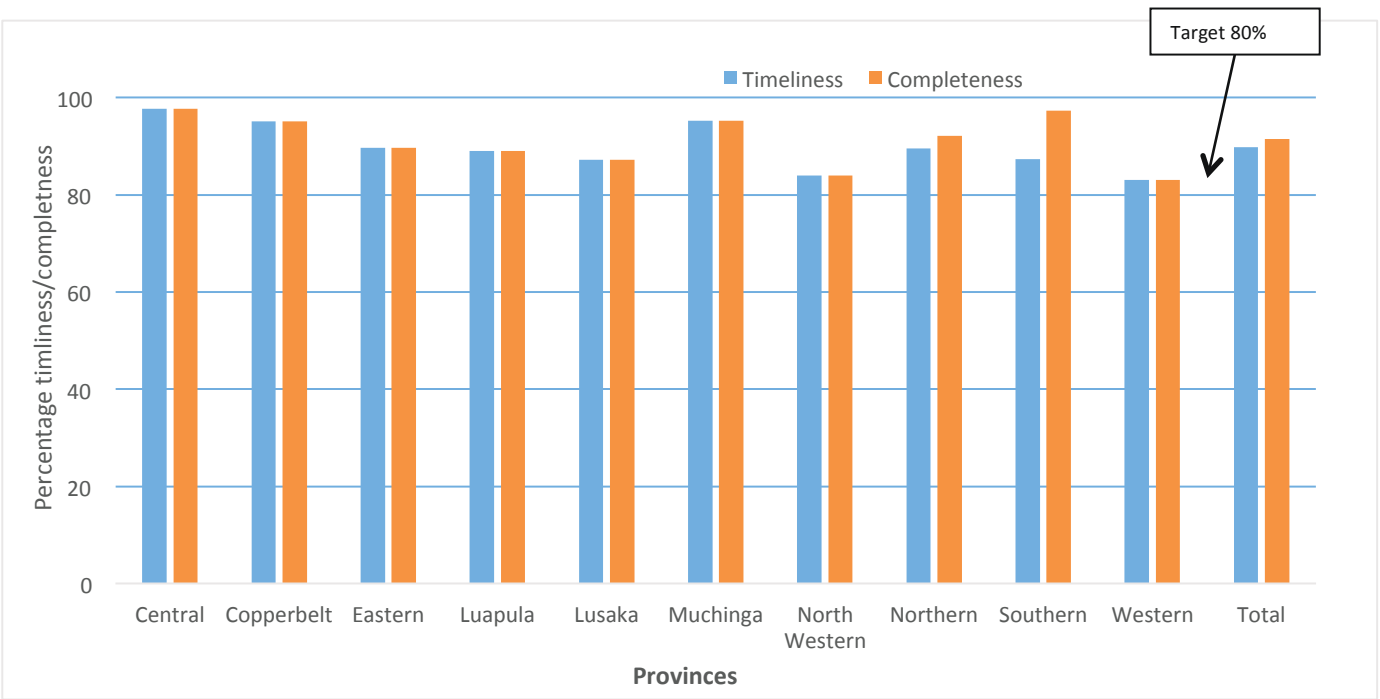
Highlights of the week

- **Health Facility Completeness: 91% (2,004/2,191)**
- **Health Facility Timeliness: 90% (1,969/2,191)**
- **Meningitis**: There were no suspected reported.
- **Cholera**: No suspected cases of cholera.
- **Acute Flaccid Paralysis (AFP):** 3 AFP cases were notified from Southern (1), Lusaka (1) and Copperbelt (1) Province.
- **Measles: 8** cases of suspected measles were reported from Luapula (4), Southern (2) Copperbelt (1) and Central (1) provinces. 4 cases are undergoing investigations.
- **Dysentery**: A total of 1,040 suspected cases were notified from all provinces.
- **Typhoid**: There were 0 suspected cases of typhoid reported.
- **Malaria:** 134,613 cases of suspected malaria were reported. Out of these cases (99.9 %) were laboratory tested, with a positivity rate of 45.3%**.**
- **HIV**: Of the 49,368 persons tested this week, 4,485 were confirmed with a positivity rate of 9.1%
- **Maternal Deaths:** 8 maternal deaths were registered from Eastern (1), Southern (2), Western (1), Lusaka (1), and North-western (3) Provinces.
- **Dog Bites:** A total of 299 cases of dog bites were reported nationwide.
- **Rabies:** 0 cases of suspected rabies were notified. Cumulative cases reported are 23.

Regional Outbreaks

- **Ebola Virus Disease, DRC:** 494 cases reported, 446 confirmed cases and 283 deaths and a CFR 58.0%.
- **Monkeypox, DRC:** 3,949 cases, 86
- deaths and a CFR of 2.2%.
- **Measles, DRC:** 44,864 cases, 842 confirmed cases, deaths, 566 CFR 1.3%.
- **Cholera, Zimbabwe:** 10,550 cases, 59 deaths, CFR 0.6%**.**

NATIONAL IDSR HEALTH FACILITY REPORTING RATES, WEEK 49, 2018

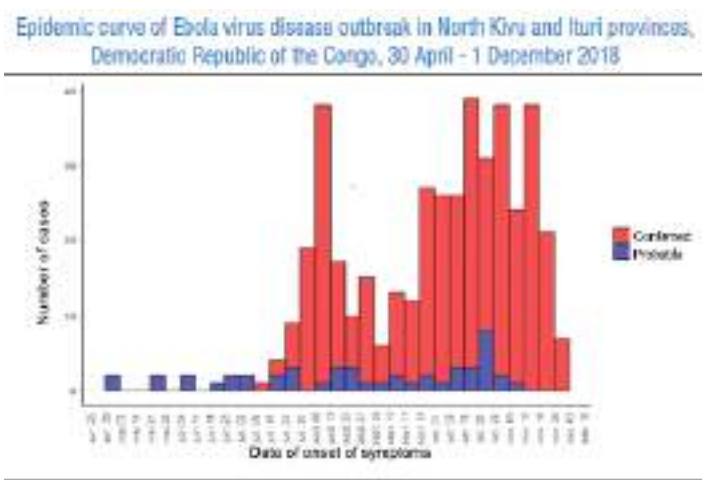


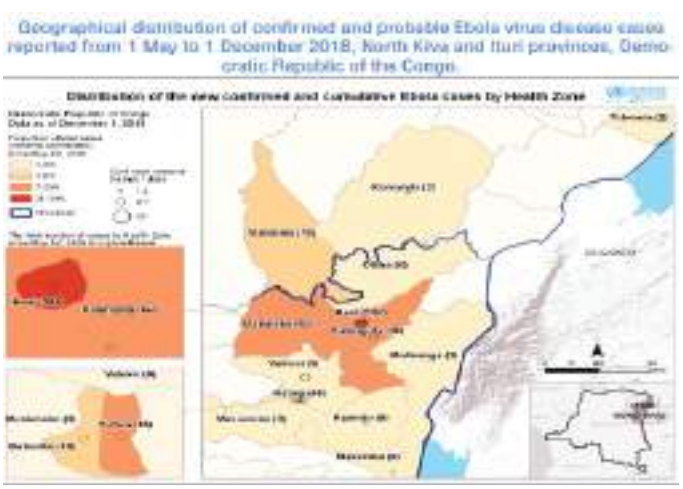
SUMMARY REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS F0R WEEKS 1-49, 2018								
	Week 49				Cumulative week 1 - 49			
Disease Conditions	Cases Suspected	Cases Tested	Cases Confirmed	Number of Deaths	Cases Suspected	Cases Tested	Cases Confirmed	Number of Deaths
AFP	3	3	0	0	202	202	0	0
Cholera	4	0	0	0	5,945	2,087	944	113
Meningitis *(Neisseria)*	1	0	0	0	188	0	0	0
Measles	8	4	0	0	543	291	19	5
Neonatal tetanus	0	0	0	0	4	0	0	0
Plague	0	0	0		0	0	0	0
Rabies	0	0	0	0	23	0	0	24
Dog bites	299	0	0	0	15,423	0	0	0
Dysentery	932	6	11	0	44,556	3,352	298	0
Typhoid fever	0	0	1	0	672	363	56	0
Yellow fever	0	0	0	0	7	0	0	0
VHF	0	0	0	0	0	0	0	0
Anthrax	0	0	0	0	10	0	0	0
Influenza	0	0	0	0	0	0	0	0
Non bloody diarrhoea	9963	0	0	0	262,912	924	101	0
Schistosomiasis (Bilharzia)	263	37	13	0	16,682	2,563	836	0
*Malaria	134,613	133,266	60,901	0	6,750,662	6,110,676	2,550,125	
*HIV		49,368	4,485	0		1,936,065	82,398	
Maternal Death	8			8	681			681
Total	146,462	182,684	65,411	8	9,034,575	8,056,579	2,634,777	823

*Mortality for these conditions is currently not well captured on a weekly basis in IDSR

EARLY WARNING DISEASES

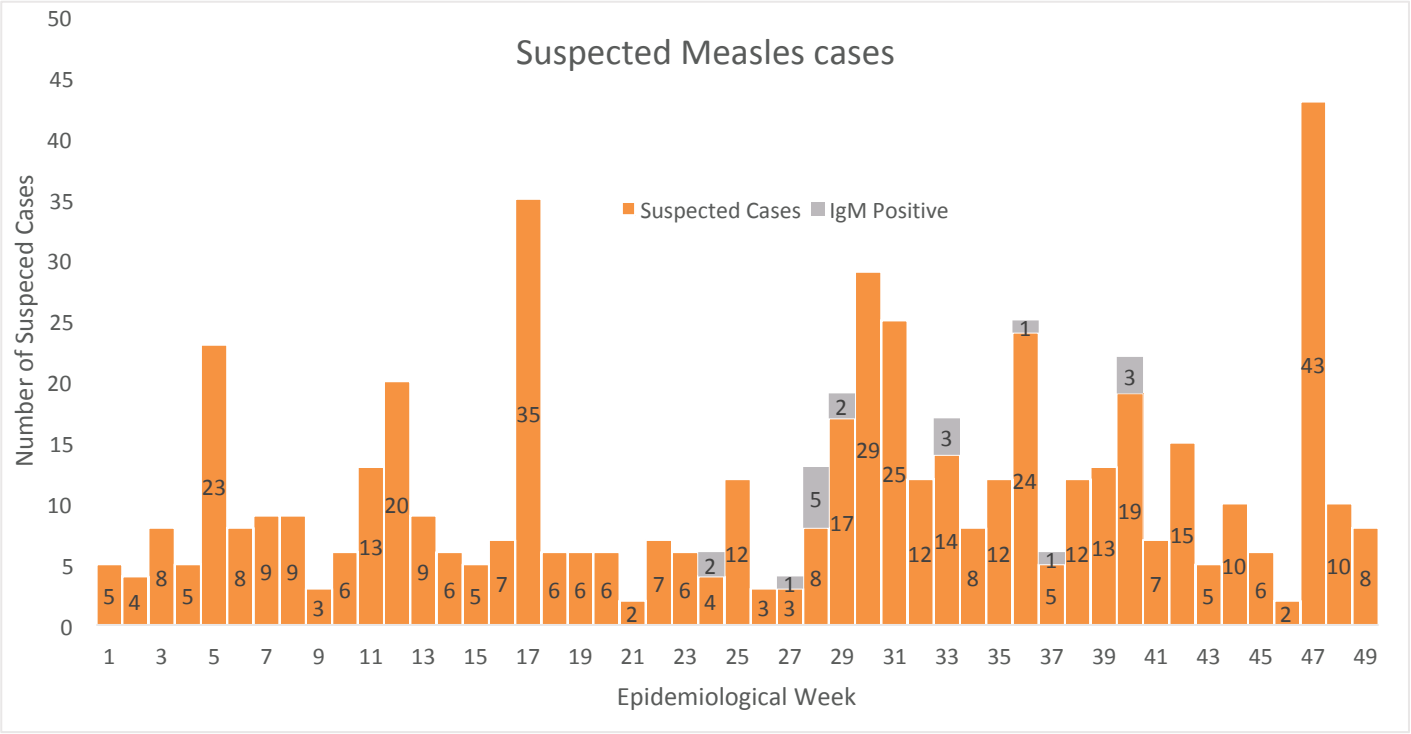
Ebola Virus, DRC, 2018





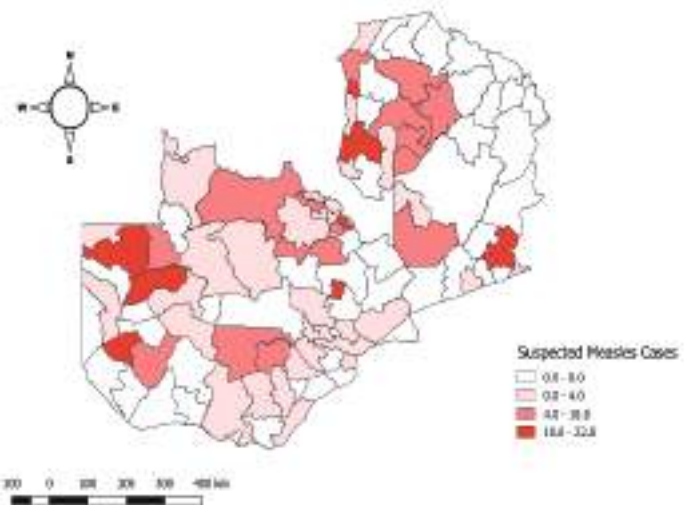
- The Ebola outbreak in North Kivu and the Ituri provinces of DRC is ongoing with 54 new cases and 28 new deaths reported in this week. There are 494 cumulative suspected cases, with 446 confirmed giving a positivity rate of 89% and 283 deaths (CFR is 58%) since the beginning of the outbreak.
- There are currently 15 health zones which is an increase of 1 health zone from the previous week. 12 of the 15 health zones have reported new cases. The most affected areas are Beni (203) and Mabalako (82) accounting for 57% of all cases since the beginning of the outbreak, from the15 health zones.
- 49 health care workers have been infected resulting in 15 deaths.

VACCINE PREVENTABLE DISEASES



Measles

Reported Suspected Measles Cases, Weeks 1-49



A total of 8 cases of suspected measles were reported in week 49. Four were sent for laboratory investigations for measles IgM.

Cumulatively, 543 suspected cases of measles have been reported. 63.9% (347) have been tested for measles IgM, 257 were negative, 19 cases were positive for measles IgM and 73 had a history of vaccination. There have been 5 deaths, with a CFR of 1.0%. None of the positive cases had a previous history of vaccination.

Four districts have surpased the epidemic threshold for confirmed cases, Lusaka, Mansa, Mwinilunga and Mpongwe districts. Response measures have included ring vaccintions. in all affected areas.

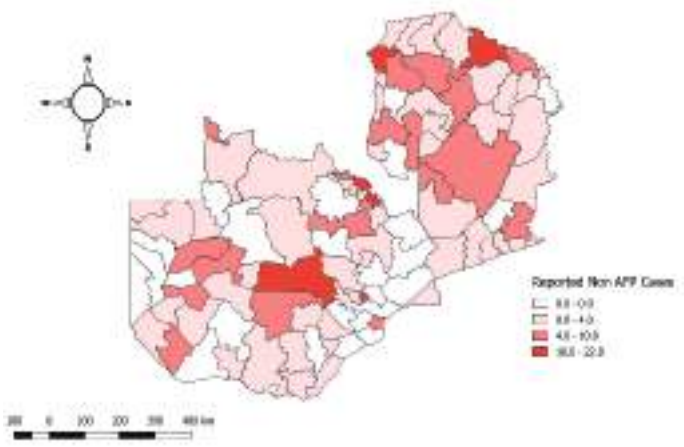
Silent districts (39) not reporting measles should intensify measles case-based surveillance to attain the recommended non febrile rash rate of 2 cases per 100,000 population.

Rubella

There has been a cumulative number of 8 cases reporting positive for rubella IgM. None had a history of vaccination.

AFP Surveillance weeks 1-49

Reported Non- Polio AFP Cases, Weeks 1-49



In the current reporting week,1 cases of AFP was reported from Northern province.

From week 1 to 49, a total of 202 AFP cases have been reported and laboratory investigated for polioviruses from 78 reporting districts. 54.8% (112) have been vaccinated.

No wild type or vaccine-derived polioviruses have been isolated from nationwide case-based surveillance or environmental surveillance (Lusaka, Ndola and Kitwe Districts).

One sabin type 2 Poliovirus was confimed from an environmental surveillnce Kitwe district in week 43.

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The annualized non polio AFP rate in week 49 is 2.6/100,000. Sub-national attainment of the non –polio AFP indicator of 2/100,000 was not met in 3 provinces. Silent districts, not reporting AFP, should intensify AFP case-based surveillance to detect at least 1 case per 100,000 population.

Performance of AFP Surveillance

Performance of AFP Surveillance, 2018, Zambia

(Data submitted from provinces (week 49, 2018)

Provinces	2018 estimates <15 pop (million)	Annual Expected AFP Cases	All Reported Cases in database	Only AFP cases	Annualized Non-polio AFP rate	AFP cases with 2 stools within 14 days (0-14d)	AFP cases with 2 stools within 14 days %	Confirmed VDPV	Confirmed Wild	Compatible (virologic Classification system)	AFP Detection rate	AFP cases with results	AFP cases with pending Lab results #	AFP cases with pending Lab results %	Non-polio enterovirus cases #	Non-polio enterovirus cases %	Surveillance index
Central	0.7	16	21	21	2.6	17	81%	0	0	0	3.0	21	0	0%	4	19%	2.1
Copperbelt	1.2	23	40	40	3.3	36	90%	0	0	0	3.7	40	0	0%	3	8%	2.9
Eastern	0.9	18	14	14	1.5	11	79%	0	0	0	1.7	14	0	0%	0	0%	1.2
Luapula	0.6	11	28	28	4.8	23	82%	0	0	0	5.4	28	0	0%	3	11%	3.9
Lusaka	1.4	28	15	15	1.0	10	67%	0	0	0	1.1	15	0	0%	0	0%	0.7
Muchinga	0.5	9	13	13	2.7	13	100%	0	0	0	3.0	13	0	0%	0	0%	2.7
North Western	0.4	8	12	9	2.1	11	92%	0	0	0	2.3	9	0	0%	2	22%	1.9
Northern	0.7	13	26	26	3.8	22	85%	0	0	0	4.2	26	0	0%	3	12%	3.2
Southern	0.9	17	10	10	1.0	9	90%	0	0	0	1.2	10	0	0%	1	10%	0.9
Western	0.5	10	23	23	4.6	17	74%	0	0	0	5.2	23	0	0%	0	0%	3.4
Zambia	**7.7**	**152**	**202**	**202**	**2.6**	**169**	**84%**	**0**	**0**	**0**	**4.1**	**202**	**0**	**0%**	**16**	**8%**	**2.2**

Surveillance gap

Yellow for NPAFP rate - certification level BUT surveillance gap for stool adequacy

Green indicates provinces with operational + certification-level surveillance

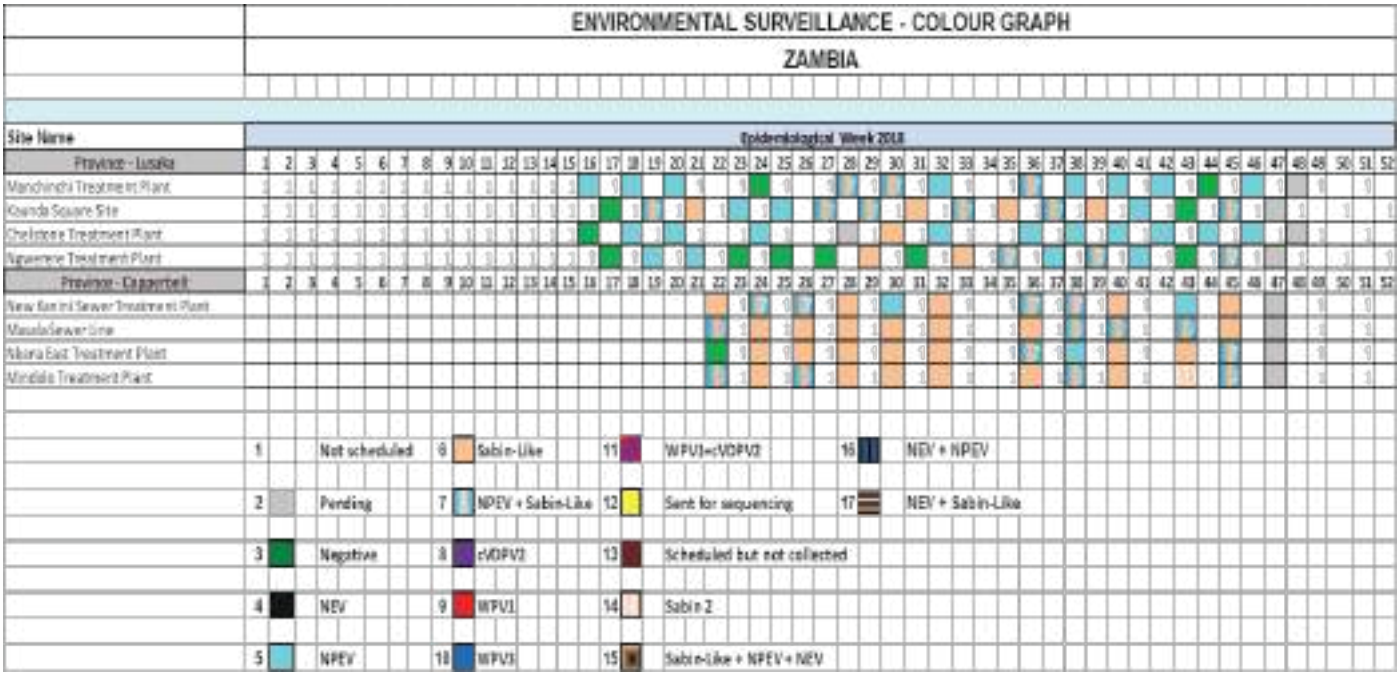
Key: 1). Non - polio AFP rate - target ≥ **2 per 100,000** under 15 years children

2). AFP cases with stool samples within 14 days (stool adequacy) - target ≥ **80%**

3). Surveillance index - target ≥ **1.5**

4). Non-polio enterovirus rate - target ≥ **10%**

AFP Environmental Surveillance

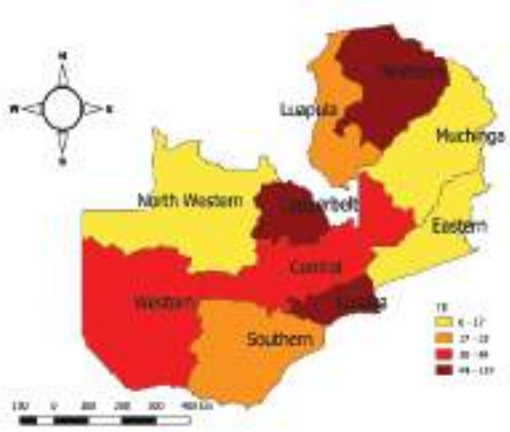


The event concerning the confirmation of the Sabin Type 2 Poliovirus (PV2 SL) from environmental surveillance site in Kitwe district continues to be monitored. Due to the risks of PV2 SL to revert to the virulent paralytic form through prolonged person to person transmission, AFP surveillance should be intensified. A field investigation through the Ministry of Health, Zambia National Public Health Institute and partners did not find evidence of the use of the monovalent OPV2 or the withdrawn trivalent vaccine in Kitwe district. Similarly there was no evidence of person to person transmission.

HIGH BURDEN DISEASES

TB

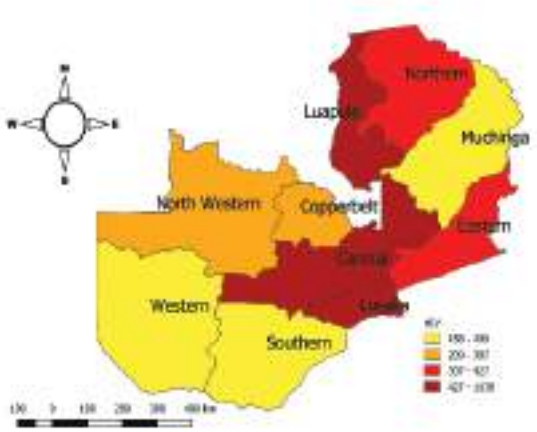
Cumulative Incidence of confirmed TB weeks 1-49



Of the 1,692 cases suspected for TB, 233 have been confirmed positive. Cumulatively, Lusaka and Copperbelt Provinces have the highest mean confirmed incidence of 3.3/100,000 and 2.7/100,000, respectively, from weeks 1 to 49. Lusaka and Copperbelt Provinces have reported the highest burden of disease in week 49 with the incidence of 3.4/100,000 and 2.1/100,000, respectively.

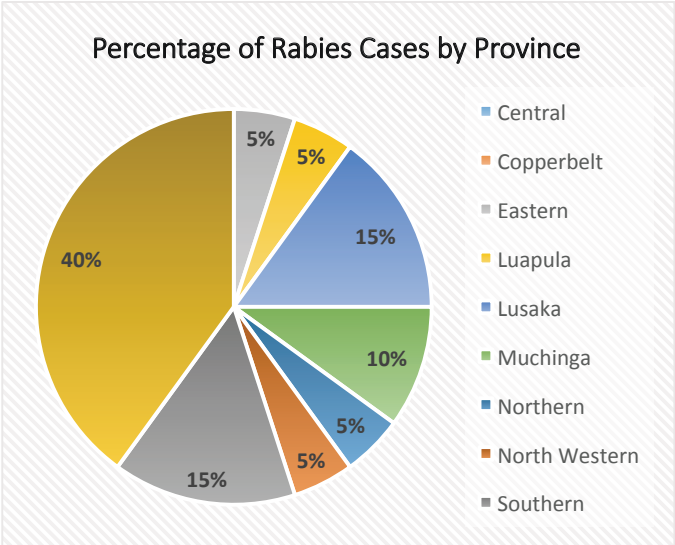
HIV

Cumulative Incidence of confirmed HIV weeks 1-49



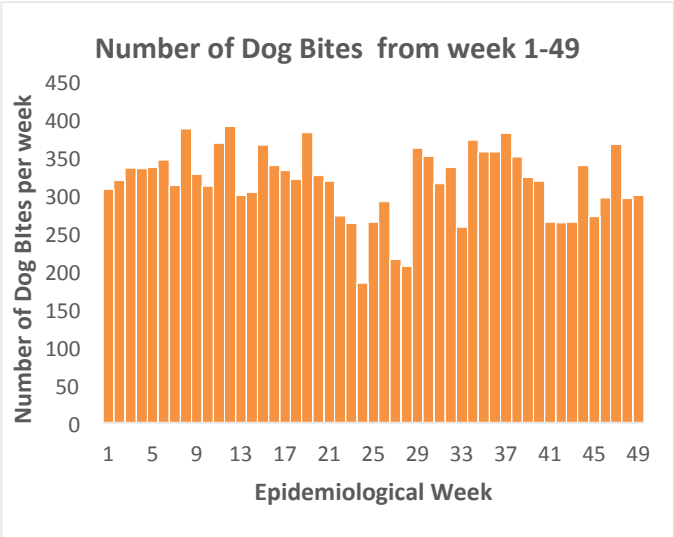
Countrywide, 49,368 people were tested for HIV. Central province reported the highest burden of new positive cases in the week with an incidence of 22.5/ 100,000 followed by Lusaka province with 20.6/100,000. Cumulatively, Central and Lusaka Province have reported the highest mean confirmed incidence of 24.0/100,000 and 22.8/100,000 from weeks 1 to 49.

Rabies



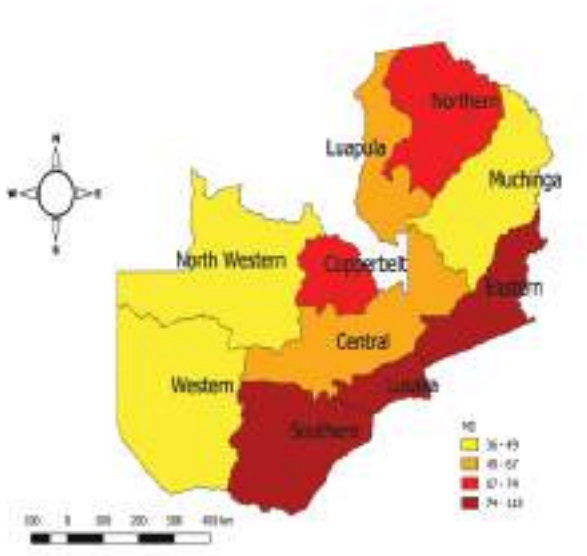
There have been no new rabies case this week, resulting in a death. Cumulatively, there have been 23 rabies cases with Western having the highest burden, reporting 40 % (8/23) of the cases.

Dog Bites



The total number of dog bites reported from all provinces was 299. Copperbelt province had the highest number, 49 dog bites. Since the beginning of the year, there have been 15,114 dog bites reported nationwide, through IDSR, and 23 rabies deaths. The average dog bite per week, to date, is 308.

Maternal Deaths

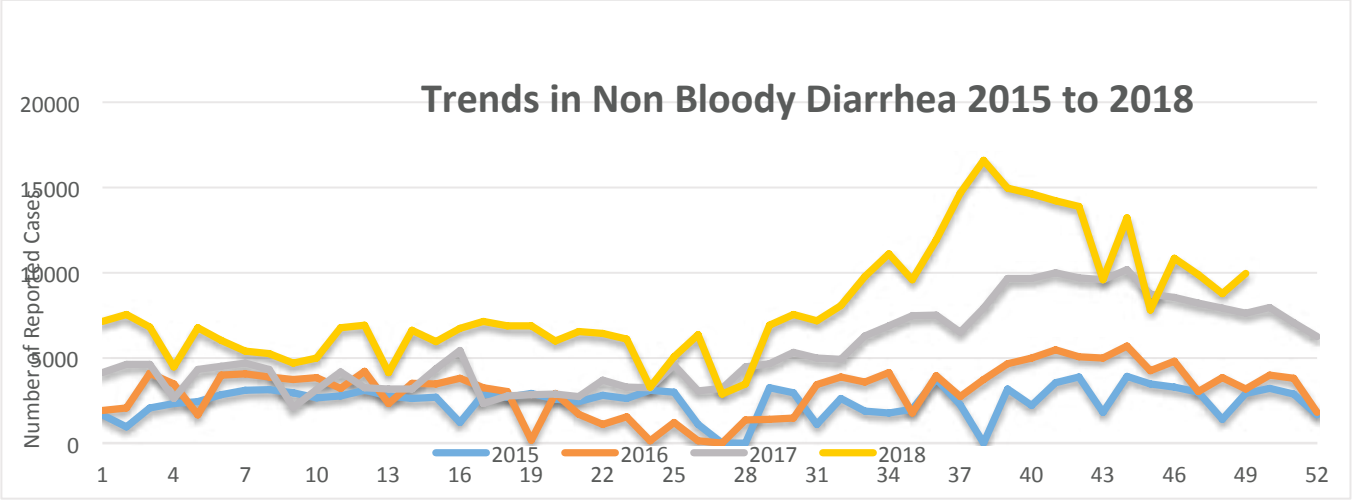


Maternal deaths by province, week 49

Province	Week 49	Cumulative
Eastern	1	83
Lusaka	1	119
Muchinga	0	45
Southern	2	76
Northern	0	69
NWP	3	47
Copperbelt	0	73
Central	0	64
Luapula	0	58
Western	1	47
Total	8	681

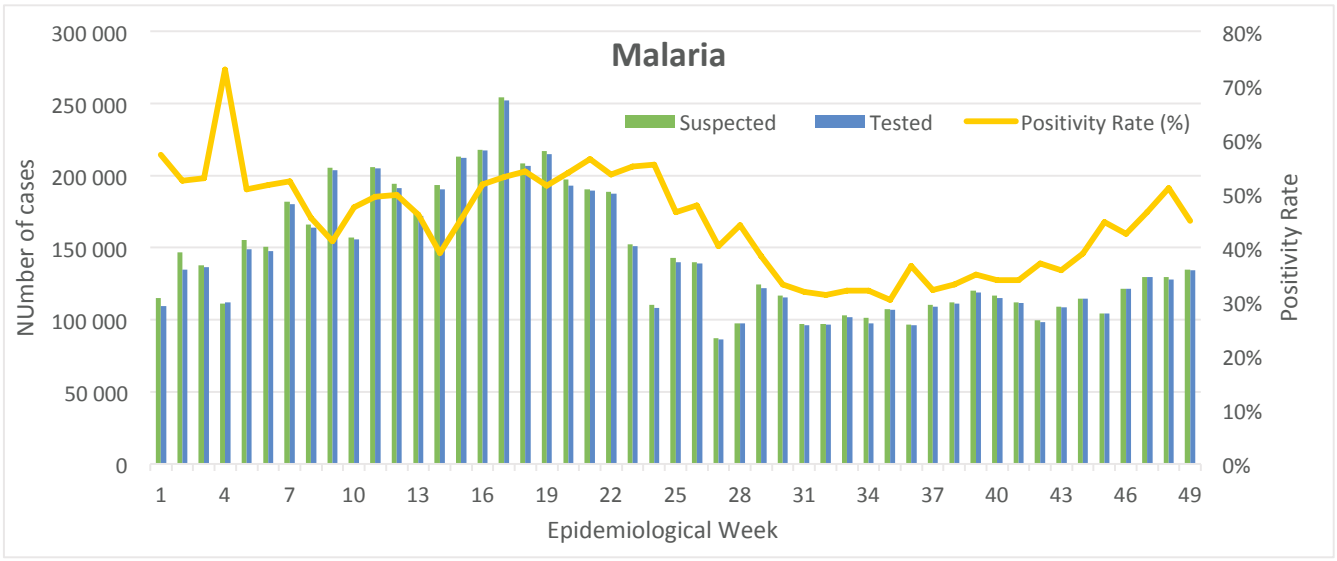
Eight maternal deaths were reported in week 49. Maternal death causes are not indicated. Cumulatively, 681 maternal deaths have been recorded up to the current week with Lusaka having the highest burden of 119 cumulative deaths from week 1 followed by Eastern province at 83 reported deaths.

Non-bloody diarrhoeas cases from week 1-49



The cumulative number of cases of non-bloody diarrheas in week 49 is 394,424. In week 49 only 8 of 10 provinces reported non- bloody diarrhoeas. Cumulatively Southern province has reported the highest number of non-bloody diarrheas from week 1, with 102,453 suspected cases. District surveillance officers are urged to strengthen surveillance and ensure adequate epidemic preparedness measures are in place for possible outbreaks.

National Trend of Malaria Cases, Week 1-49



Suspected malaria cases notified in week 49 were 134,312 and confirmed cases was 60,901 (incidence = 3.6/1000) while the positivity rate was 45.3%. The province with the highest burden of confirmed malaria in the current week was North-Western Province with an incidence rate of 10.2/1000. Cumulatively, North-Western has been reporting the highest mean incidence of malaria of 8.2/1000 per week, from week 1 to week 49. North Western province is encouraged to intensify vector control and case management in these high transmission provinces.

PUBLIC HEALTH ACTIONS

National Level

- National level to disseminate IDSR case definition tools to provincial surveillance officers (POS)
- PSO's to ensure priority disease notifications are supported by recommended laboratory investigations
- ZNPHI to distribute all EVD surveillance tools to all provinces.
- Ministry of Health and all key line Ministries to continue supporting the region with cholera prevention activities
- Provide support to PSO's for active surveillance activities
- Timely submission of weekly bulletins

Regional level

Heighted EBV Disease Surveillance

- All provinces to continue supporting districts implement Ebola preparedness measures at health facilities and points of entry (ground crossings, airports and ports)
- Suspected EVD cases meeting the case definition must be immediately reported to the next level and Zambia National Public Health Institute
- All districts, health facilities and ports of entry to ensure they use appropriate surveillance tools for Ebola Virus disease investigation
- Blood specimens from EVD suspected cases should be appropriately packaged and sent for laboratory investigations to UNZA Veterinary Laboratory Lusaka

Heightened Surveillance of Acute Watery Diarrhea

- Provinces to continue enforcing cholera preparedness measures and ensuring suspected cases are immediately reported to next level with appropriate laboratory confirmation.
- All regions are urged to have preparedness and response measures in place for cholera prevention and control

- Cholera epidemic prone regions should conduct public education on preventative measures and work with relevant stakeholders to prevent cholera outbreaks

Vaccine-Preventable Disease Surveillance in Silent Districts

- All silent districts with no reports of measles cases are urged to strengthen measles case-based surveillance especially in districts bordering DRC due to the increase in cross border transmissions, all suspected cases to have at least one sample laboratory-tested for measles by the national reference laboratory
- AFP silent districts to ensure active surveillance of AFP cases is intensified in all districts
- Provincial Surveillance Officers to fully investigate rubella positive cases in women of the child bearing age
- Increase public awareness of Congenital Rubella syndrome prevention
- All suspected cases of Neisseria meningitis to be sent to National Reference Laboratory for confirmation

REPORTED DISEASES, CONDITIONS AND EVENTS BY PROVINCE WEEK 49, 2018

Notifiable Diseases	Eastern	Lusaka	Muchinga	Southern	Northern	North-Western	Copperbelt	Central	Luapula	Western	Total
AFP	0	1	0	1	0	0	1	0	0	0	3
Cholera	0	2	0	2	0	0	0	0	0	0	4
Meningitis (*Neisseria*)	0	0	0	1	0	0	0	0	0	0	1
Measles	0	0	0	2	0	0	1	1	4	0	8
Neonatal tetanus	0	0	0	0	0	0	0	0	0	0	0
Plague	0	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0	0
Dog bites	18	25	7	53	20	27	43	50	17	39	299
Dysentery	83	84	31	230	41	39	127	202	39	56	932
Typhoid fever	0	0	0	0	0	0	0	0	0	0	0
Yellow fever	0	0	0	0	0	0	0	0	0	0	0
VHF	0	0	0	0	0	0	0	0	0	0	0
Anthrax	0	0	0	0	0	0	0	0	0	0	0
Influenza	0	0	0	0	0	0		0	0	0	0
Non bloody Diarrhoea	0	1,858	0	2,332	588	1,312	1,689	1,365	318	501	9,963
Bilharzia	37	35	13	78	0	22	9	38	23	8	263
Malaria	14,149	6,270	10,261	8,163	19,381	20,680	17,311	13,282	21,355	3,761	134,613
HIV											
Maternal deaths	1	1	0	2	0	3	0	0	0	1	8
Total	14,288	8,276	10,312	10,864	20,030	22,083	19,181	14,938	21,756	4,366	146,462

IDSR data on priority diseases is collected from health facility data collection tools and registers by district surveillance officers on a weekly basis

Reported by: Surveillance and Disease Intelligence Unit **Date: 11th December, 2018**

Edited by: Chanda Groeneveld, Kaluba Emma Musakanya, Muzala Kapin'a, Mazyanga L Mazaba and Victor Mukonka
Zambia National Public Health Institute (ZNPHI)

SURVEILLANCE REPORT

The Integrated Disease Surveillance and Response (IDSR)

Surveillance and Disease Intelligence Unit

Zambia National Public Health institute (Ministry of Health)

Reporting Period: 2/12/2018 to 8/12//2018. ***Epidemiology Bulletin: Week 50*** Issue: 50

Highlights of the week

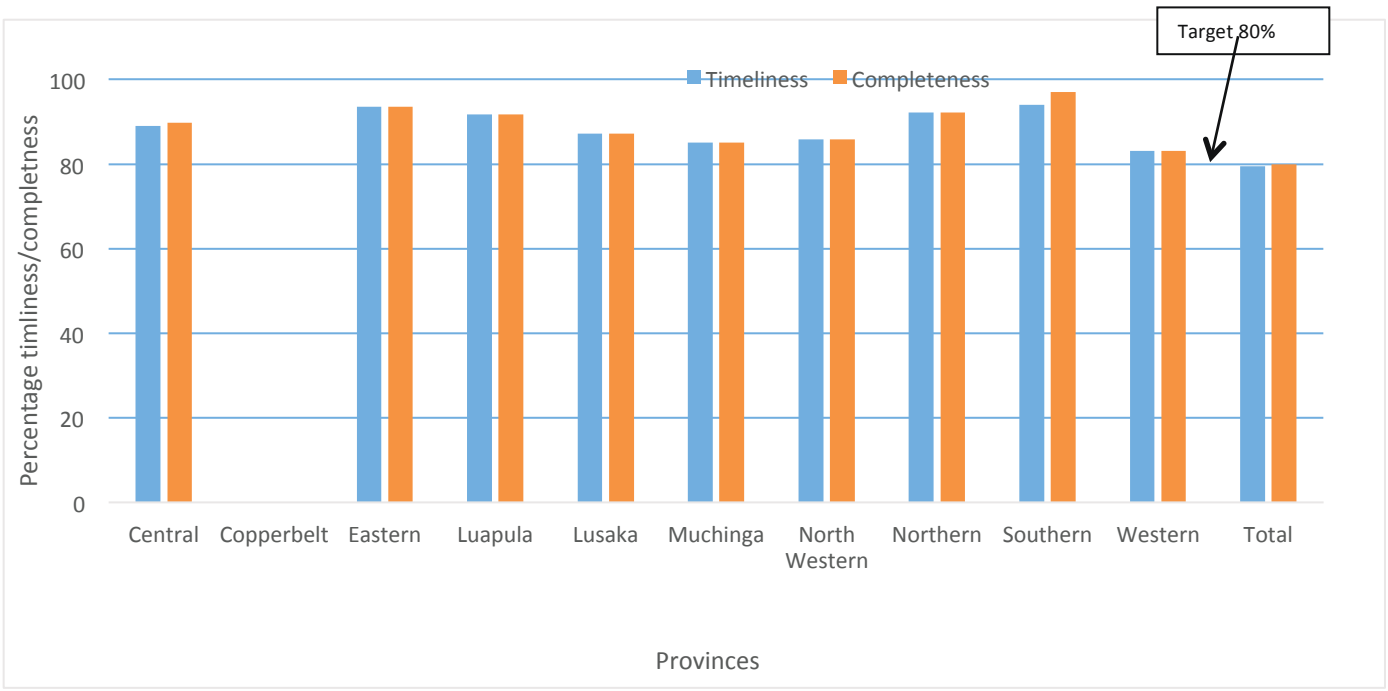
Weekly report is not reflective of Copperbelt province due to late reporting.

- **Health Facility Completeness: 80% (1,751/2,191)**
- **Health Facility Timeliness: 79% (1,740/2,191)**
- **Meningitis**: There were no suspected reported.
- **Cholera**: No suspected cases of cholera.
- **Acute Flaccid Paralysis (AFP):** 1 AFP case was notified from Southern (1) Province.
- **Measles: 7** cases of suspected measles were reported from Luapula province. All cases are undergoing investigations.
- **Dysentery**: A total of 721 suspected cases were notified from all provinces.
- **Typhoid**: There were 0 suspected cases of typhoid reported.
- **Malaria:** 107,692 cases of suspected malaria were reported. Out of these cases (99.9 %) were laboratory tested, with a positivity rate of 44.7%**.**
- **HIV**: Of the 40,391 persons tested this week, 1,568 were confirmed with a positivity rate of 3.9%
- **Maternal Deaths:** 7 maternal deaths were registered from Eastern (2), Northern (1), Central (3), and Western (1) Provinces.
- **Dog Bites:** A total of 227 cases of dog bites were reported nationwide.
- **Rabies:** 1 case of suspected rabies was notified from Eastern province. Cumulative cases reported are 24.

Regional Outbreaks

- **Ebola Virus Disease, DRC:** 531 cases reported, 484 confirmed cases and 313 deaths and a CFR 57.0%.
- **Monkeypox, DRC:** 3,949 cases, 86 deaths and a CFR of 2.2%.
- **Measles, DRC:** 44,864 cases, 842 confirmed cases, deaths, 566 CFR 1.3%.
- **Cholera, Zimbabwe:** 10,598 cases, 59 deaths, CFR 0.6%**.**

NATIONAL IDSR HEALTH FACILITY REPORTING RATES, WEEK 50, 2018

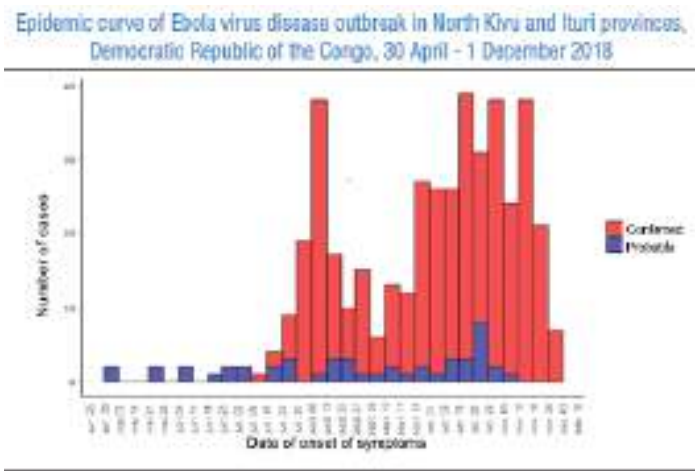


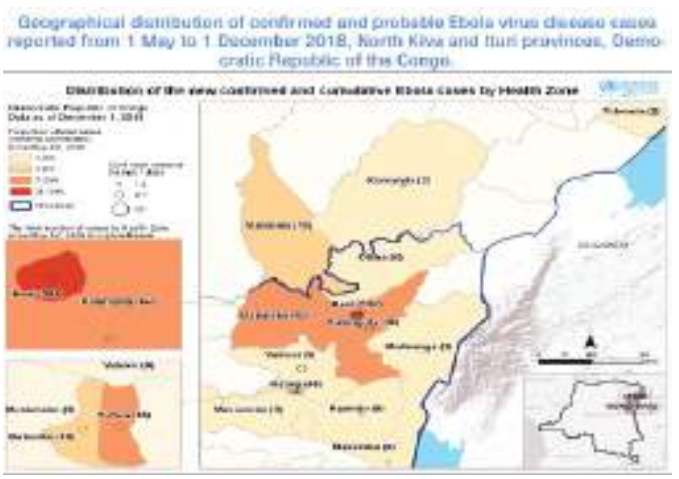
SUMMARY REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS F0R WEEKS 1-50, 2018								
	Week 50				Cumulative week 1 - 50			
Disease Conditions	Cases Suspected	Cases Tested	Cases Confirmed	Number of Deaths	Cases Suspected	Cases Tested	Cases Confirmed	Number of Deaths
AFP	1	1	0	0	203	203	0	0
Cholera	0	0	0	0	5945	2087	944	113
Meningitis *(Neisseria)*	0	0	0	0	188	0	0	0
Measles	7	7	0	0	550	298	19	5
Neonatal tetanus	0	0	0	0	4	0	0	0
Plague	0	0	0		0	0	0	0
Rabies	1	0	0	1	24	0	0	25
Dog bites	227	0	0	0	15650	0	0	0
Dysentery	721	27	11	0	45277	3379	309	0
Typhoid fever	0	0	1	0	672	363	57	0
Yellow fever	0	0	0	0	7	0	0	0
VHF	0	0	0	0	0	0	0	0
Anthrax	0	0	0	0	10	0	0	0
Influenza	0	0	0	0	0	0	0	0
Non bloody diarrhoea	9803	0	0	0	262912	924	101	0
Schistosomiasis (Bilharzia)	221	17	6	0	16903	2580	842	0
*Malaria	107692	106615	48170	0	6858354	6217291	2598295	0
*HIV		40,391	1568		0	1976456	83966	0
Maternal Death	7			7	688			688
Total	159,071	147,058	49,756	8	9,183,843	8,203,581	2,684,533	831

*Mortality for these conditions is currently not well captured on a weekly basis in IDSR

EARLY WARNING DISEASES

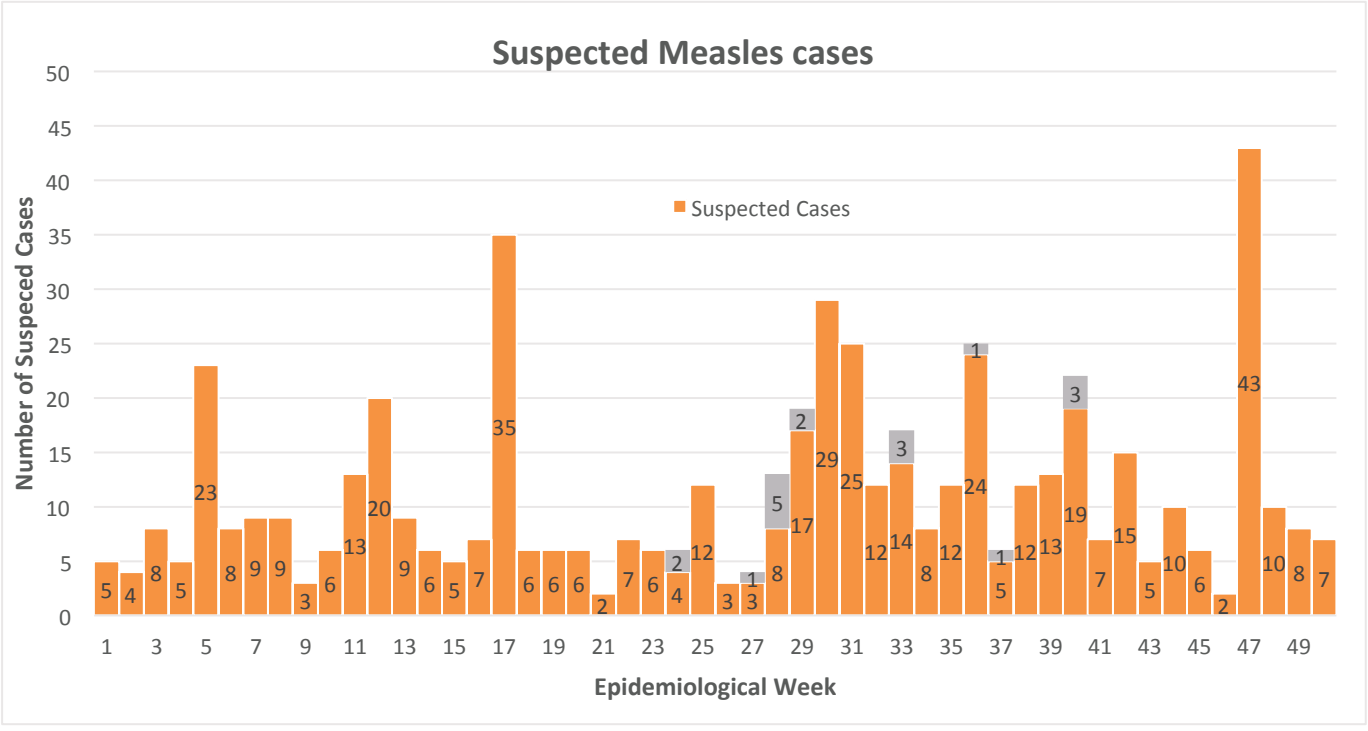
Ebola Virus, DRC, 2018



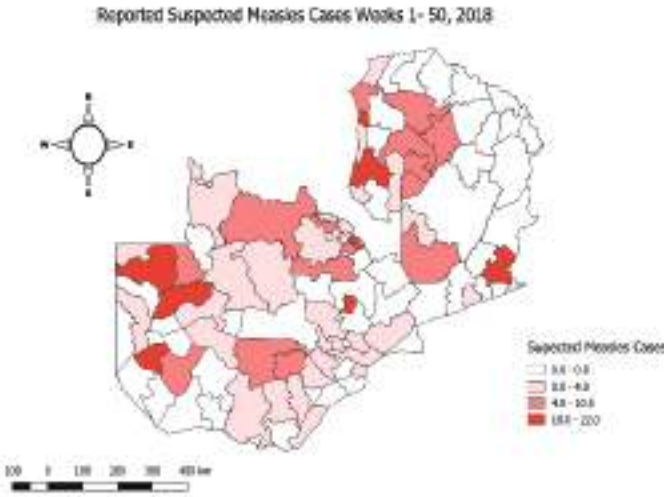


- The Ebola outbreak in North Kivu and the Ituri provinces of DRC is ongoing with 37 new confirmed cases and 30 new deaths reported in this week. There are 531 cumulative suspected cases, with 483 confirmed giving a positivity rate of 89% and 313 deaths (CFR is 58%) since the beginning of the outbreak.
- There are currently 15 health zones which is an increase of 1 health zone from the previous week. 12 of the 15 health zones have reported new cases. The most affected areas are Beni (207) and Mabalako (79) accounting for 57% of all cases since the beginning of the outbreak, from 15 health zones. 52 health care workers have been infected resulting in 17 deaths.

VACCINE PREVENTABLE DISEASES



Measles



A total of 7 cases of suspected measles were reported in week 50. All of the cases were sent for laboratory investigations for measles IgM.

Cumulatively, 550 cases reported. 63.9% (347) have been tested for measles IgM, 257 were negative, 19 cases were positive for measles IgM and 73 had a history of vaccination. There have been 5 deaths, with a CFR of 1.0%. None of the positive cases had a previous history of vaccination.

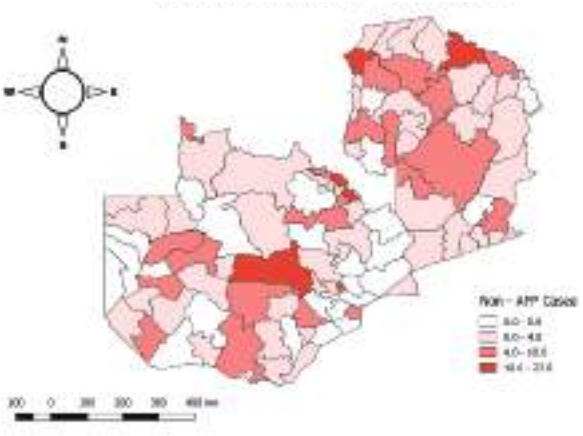
4 districts have surpased the epidemic threshold for confirmed cases, Lusaka, Mansa, Mwinilunga and Mpongwe districts. Response measures have included ring vaccintions. in all affected areas.

Silent districts (39) not reporting measles should intensify measles case-based surveillance to attain the recommended non febrile rash rate of 2 cases per 100,000 population.

Rubella

There has been a cumulative number of 8 cases reporting positive for rubella IgM. None had a history of vaccination.

AFP Surveillance weeks 1-50



In the current reporting week,1 suspected case of AFP was reported from Southern province. Case has been sent to lab for investigation but is results are pending.

From week 1 to 50, a total of 203 AFP cases have been reported and laboratory investigated for polioviruses. 54.8% (112) have been vaccinated from 78 districts.

No wild type or vaccine-derived polioviruses have been isolated from nationwide case-based surveillance or environmental surveillance (Lusaka, Ndola and Kitwe Districts).

A Polio Virus type 2 Sabin polivirus isolated in week 43.

The annualized non polio AFP rate in week 50 is 2.6/100,000. Sub-national attainment of the non –polio AFP indicator of 2/100,000 was not met in 3 provinces. Silent districts, not reporting AFP, should intensify AFP case-based surveillance to detect at least 1 case per 100,000 population.

Performance of AFP Surveillance

Performance of AFP Surveillance, 2018, Zambia

(Data submitted from provinces (week 50, 2018)

Provinces	2018 estimates <15 pop (million)	Annual Expected AFP Cases	All Reported Cases in database	Only AFP cases	Annualized Non-polio AFP rate	AFP cases with 2 stools within 14 days (0-14d)	AFP cases with 2 stools within 14 days %	Confirmed VDPV	Confirmed Wild	Compatible (virologic Classification system)	AFP Detection rate	AFP cases with results	AFP cases with pending Lab results #	AFP cases with pending Lab results %	Non-polio enterovirus cases #	Non-polio enterovirus cases %	Surveillance index
Central	0.7	16	21	21	2.7	17	81%	0	0	0	2.9	21	0	0%	4	19%	2.2
Copperbelt	1.2	23	40	40	3.3	36	90%	0	0	0	3.6	40	0	0%	3	8%	3.0
Eastern	0.9	18	14	14	1.5	11	79%	0	0	0	1.6	14	0	0%	0	0%	1.2
Luapula	0.6	11	28	28	4.9	23	82%	0	0	0	5.3	28	0	0%	3	11%	4.0
Lusaka	1.4	28	15	15	1.0	10	67%	0	0	0	1.1	15	0	0%	0	0%	0.7
Muchinga	0.5	9	13	13	2.7	13	100%	0	0	0	2.9	13	0	0%	0	0%	2.7
North Western	0.4	8	12	9	2.1	11	92%	0	0	0	2.3	9	0	0%	2	22%	1.9
Northern	0.7	13	26	26	3.8	22	85%	0	0	0	4.2	26	0	0%	3	12%	3.2
Southern	0.9	17	10	10	1.0	9	90%	0	0	0	1.1	10	0	0%	1	10%	0.9
Western	0.5	10	23	23	4.7	17	74%	0	0	0	5.0	23	0	0%	0	0%	3.4
Zambia	**7.7**	**152**	**202**	**202**	**2.6**	**169**	**84%**	**0**	**0**	**0**	**4.1**	**202**	**0**	**0%**	**16**	**8%**	**2.2**

Surveillance gap

Yellow for NPAFP rate - certification level BUT surveillance gap for stool adequacy

Green indicates provinces with operational + certification-level surveillance

Key: 1). Non - polio AFP rate - target ≥ **2 per 100,000** under 15 years children

2). AFP cases with stool samples within 14 days (stool adequacy) - target ≥ **80%**

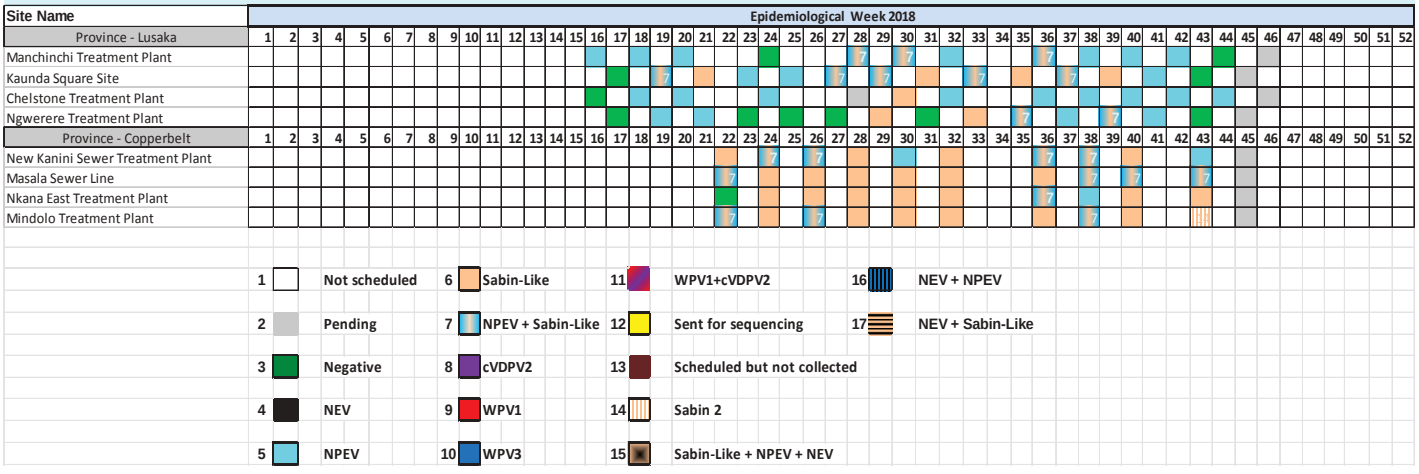
3). Surveillance index - target ≥ **1.5**

4). Non-polio enterovirus rate - target ≥ **10%**

AFP Environmental Surveillance

ENVIRONMENTAL SURVEILLANCE - COLOUR GRAPH

ZAMBIA

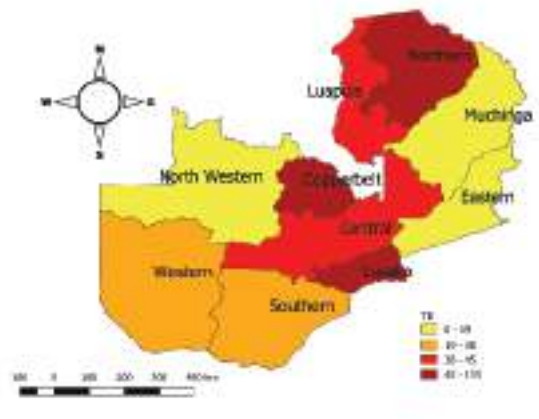


The event concerning the confirmation of the Sabin Type 2 Poliovirus (PV2 SL) from environmental surveillance site in Kitwe district continues to be monitored. Due to the risks of PV2 SL to revert to the virulent paralytic form through prolonged person to person transmission, AFP surveillance should be intensified. A field investigation through the Ministry of Health, Zambia National Public Health Institute and partners did not find evidence of the use of the monovalent OPV2 or the withdrawn trivalent vaccine in Kitwe district. Similarly there was no evidence of person to person transmission.

HIGH BURDEN DISEASES

TB

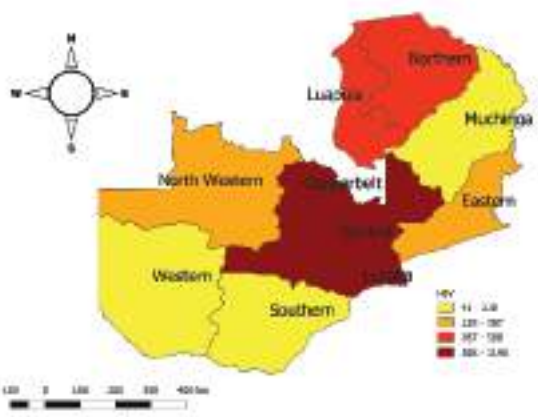
Cumulative Incidence of confirmed TB weeks 1-50



Of the 1,274 cases suspected for TB, 251 have been confirmed positive. Cumulatively, Lusaka and Copperbelt Provinces have the highest mean confirmed incidence of 3.3/100,000 and 2.6/100,000, respectively, from weeks 1 to 50. Lusaka and Copperbelt Provinces have reported the highest burden of disease in week 50 with the incidence of 4.7/100,000 and 2.1/100,000, respectively.

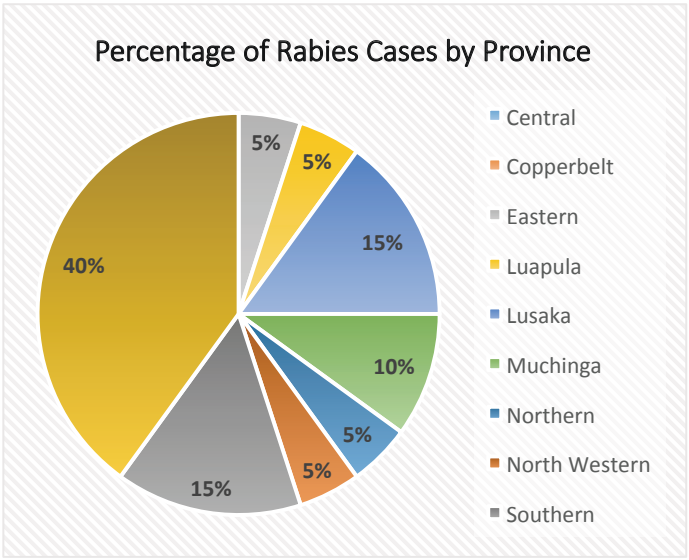
HIV

Cumulative Incidence of confirmed HIV weeks 1-50



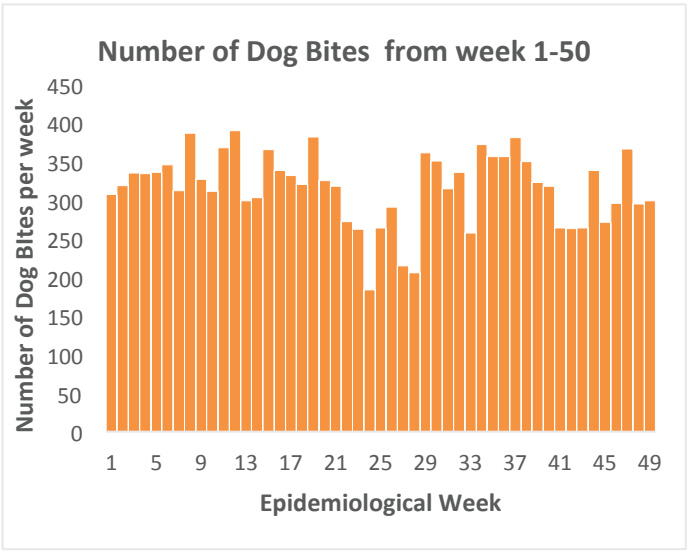
Countrywide, 49,368 people were tested for HIV. Lusaka province reported the highest burden of new positive cases in the week with an incidence of 19.5/ 100,000 followed by Central province with 16.3/100,000. Cumulatively, Central and Lusaka Province have reported the highest mean confirmed incidence of 23.8/100,000 and 22.8/100,000 from weeks 1 to 50.

Rabies



There has been 1 new rabies case this week, resulting in a death. Cumulatively, there have been 24 rabies cases with Western having the highest burden, reporting 40 % (8/24) of the cases.

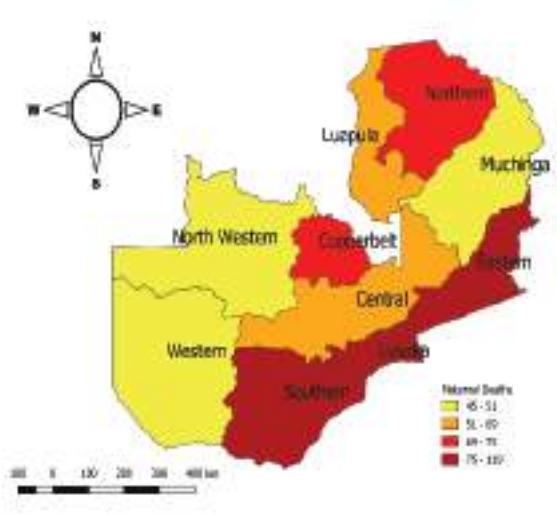
Dog Bites



The total number of dog bites reported from all provinces was 227. Copperbelt province had the highest number, 50 dog bites. Since the beginning of the year, there have been 15,480 dog bites reported nationwide, through IDSR, and 23 rabies deaths. The average dog bite per week, to date, is 314.

Maternal Deaths

Cumulative number of Maternal Deaths weeks 1-50

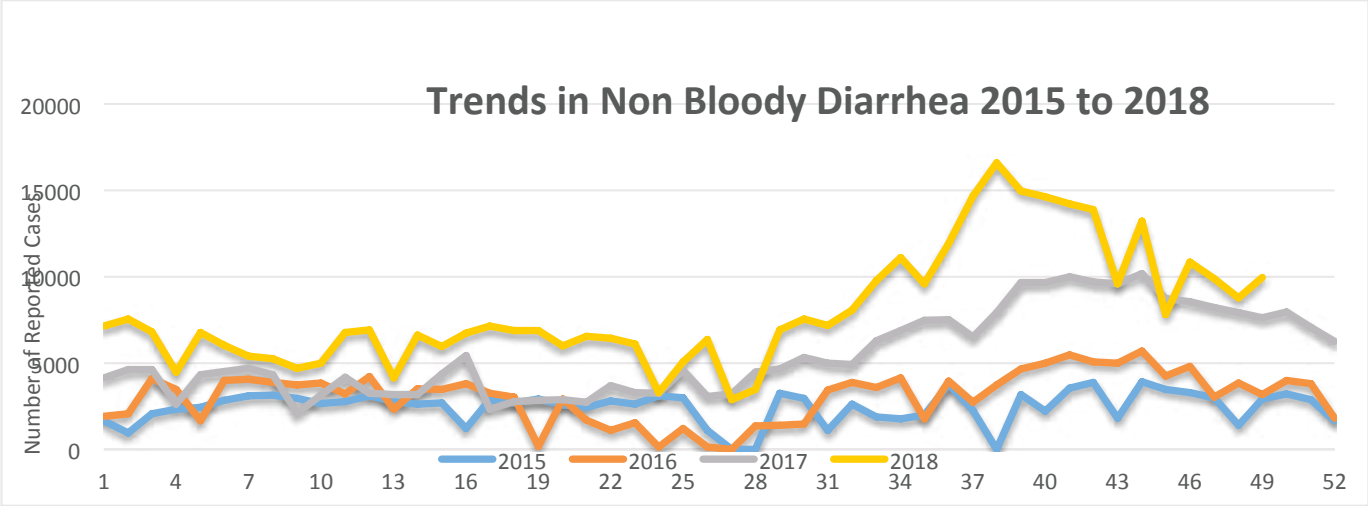


Maternal deaths by province, week 50

Province	Week 50	Cumulative
Eastern	2	85
Lusaka	0	119
Muchinga	0	45
Southern	0	76
Northern	1	70
NWP	0	47
Copperbelt	0	73
Central	3	67
Luapula	0	58
Western	1	48
Total	7	688

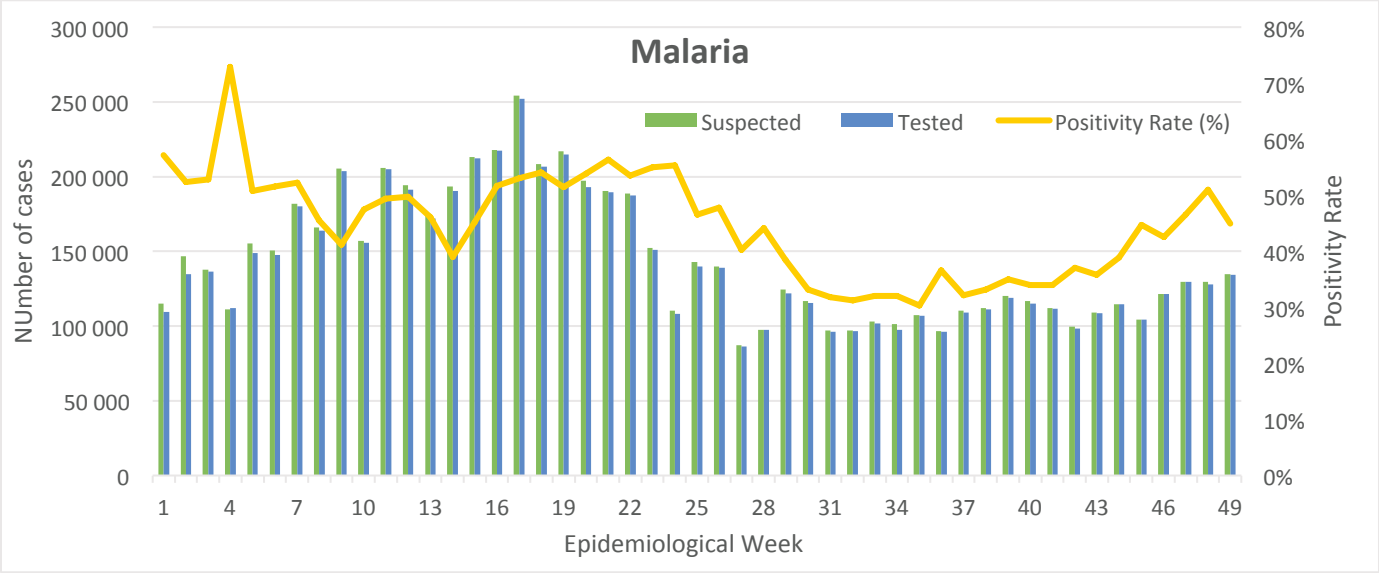
Seven maternal deaths were reported in week 50. Maternal death causes are not indicated. Cumulatively, 688 maternal deaths have been recorded up to the current week with Lusaka having the highest burden of 119 cumulative deaths from week 1 followed by Eastern province at 85 reported deaths.

Non-bloody diarrhoea cases from week 1-50



The cumulative number of cases of non-bloody diarrheas in week 50 is 404,227. In the current week, 9 of 10 provinces reported non- bloody diarrhoeas. Cumulatively Southern province has reported the highest number of non-bloody diarrheas from week 1, with 104,736 suspected cases. District surveillance officers are urged to strengthen surveillance and ensure adequate epidemic preparedness measures are in place for possible outbreaks.

National Trend of Malaria Cases, Week 1-50



Suspected malaria cases notified in week 50 were 107,692 and confirmed cases was 40,391 (incidence = 2.9/1000) while the positivity rate was 44.7%. The province with the highest burden of confirmed malaria in the current week was North-Western Province with an incidence rate of 12.9/1000. Cumulatively, North-Western has been reporting the highest mean incidence of malaria of 11.9/1000 per week, from week 1 to week 50. North Western province is encouraged to intensify vector control and case management in these high transmission provinces.

PUBLIC HEALTH ACTIONS

National Level

- National level to disseminate IDSR case definition tools to provincial surveillance officers (POS)
- PSO's to ensure priority disease notifications are supported by recommended laboratory investigations
- ZNPHI to distribute all EVD surveillance tools to all provinces.
- Ministry of Health and all key line Ministries to continue supporting the region with cholera prevention activities
- Provide support to PSO's for active surveillance activities
- Timely submission of weekly bulletins

Regional level

Heighted EBV Disease Surveillance

- All provinces to continue supporting districts implement Ebola preparedness measures at health facilities and points of entry (ground crossings, airports and ports)
- Suspected EVD cases meeting the case definition must be immediately reported to the next level and Zambia National Public Health Institute
- All districts, health facilities and ports of entry to ensure they use appropriate surveillance tools for Ebola Virus disease investigation
- Blood specimens from EVD suspected cases should be appropriately packaged and sent for laboratory investigations to UNZA Veterinary Laboratory Lusaka

Heightened Surveillance of Acute Watery Diarrhea

- Provinces to continue enforcing cholera preparedness measures and ensuring suspected cases are immediately reported to next level with appropriate laboratory confirmation.
- All regions are urged to have preparedness and response measures in place for cholera prevention and control

- Cholera epidemic prone regions should conduct public education on preventative measures and work with relevant stakeholders to prevent cholera outbreaks

Vaccine-Preventable Disease Surveillance in Silent Districts

- All silent districts with no reports of measles cases are urged to strengthen measles case-based surveillance especially in districts bordering DRC due to the increase in cross border transmissions, all suspected cases to have at least one sample laboratory-tested for measles by the national reference laboratory
- AFP silent districts to ensure active surveillance of AFP cases is intensified in all districts
- Provincial Surveillance Officers to fully investigate rubella positive cases in women of the child bearing age
- Increase public awareness of Congenital Rubella syndrome prevention
- All suspected cases of Neisseria meningitis to be sent to National Reference Laboratory for confirmation

REPORTED DISEASES, CONDITIONS AND EVENTS BY PROVINCE WEEK 50, 2018

Notifiable Diseases	Eastern	Lusaka	Muchinga	Southern	Northern	North-Western	Copperbelt	Central	Luapula	Western	Total
AFP	0	0	0	1	0	0	0	0	0	0	1
Cholera	0	0	0	0	0	0	0	0	0	0	0
Meningitis (*Neisseria*)	0	0	0	0	0	0	0	0	0	0	0
Measles	0	0	0	0	0	0	0	0	7	0	7
Neonatal tetanus	0	0	0	0	0	0	0	0	0	0	0
Plague	0	0	0	0	0	0	0	0	0	0	0
Rabies	1	0	0	0	0	0	0	0	0	0	1
Dog bites	15	37	10	40	18	26	0	49	16	16	227
Dysentery	48	91	25	233	23	41	0	188	21	51	721
Typhoid fever	0	0	0	0	0	0	0	0	0	0	0
Yellow fever	0	0	0	0	0	0	0	0	0	0	0
VHF	0	0	0	0	0	0	0	0	0	0	0
Anthrax	0	0	0	0	0	0	0	0	0	0	0
Influenza	0	0	0	0	0	0	0	0	0	0	0
Non bloody Diarrhoea	820	2164	55	2283	706	1616	0	1054	704	401	9803
Bilharzia	50	24	3	48	0	20	0	35	25	16	221
Malaria	13817	5354	11359	2624	15779	21788	0	11585	20223	5163	107692
HIV											
Maternal deaths	2	0	0	0	1	0	0	3	0	1	7
Total	14753	7670	11452	5229	16527	23491	0	12914	20996	5648	159,071

IDSR data on priority diseases is collected from health facility data collection tools and registers by district surveillance officers on a weekly basis

Reported by: Surveillance and Disease Intelligence Unit **Date: 11th December,**

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Zambia National Public Health Institute (ZNPHI)

IDSR BULLETIN 2018

ZNPHI
ZAMBIA NATIONAL PUBLIC HEALTH INSTITUTE

World Health Organization

Ministry of Health

INFLUENZA SURVEILLANCE MONTHLY BULLETIN

Surveillance Report

Virology Laboratory – Zambia

University Teaching Hospital (Ministry of Health)

Updated: 31 December 2018.

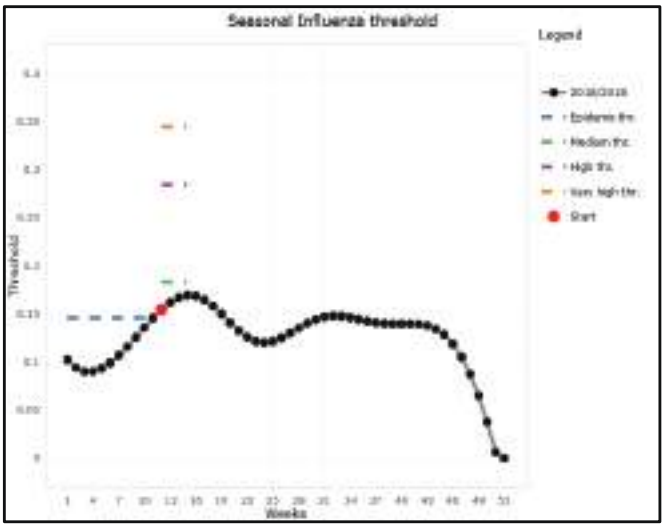

Fig 1: Rate of Influenza (Week 51 Surveillance in 2018)

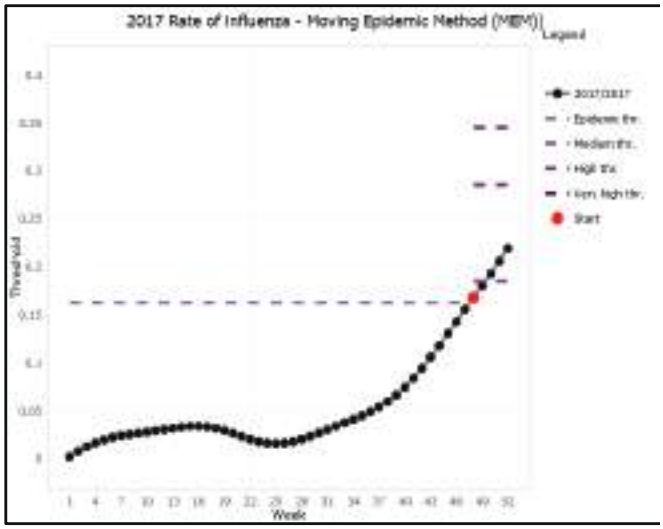

Fig 2: Rate of Influenza (Surveillance in 2017)

The graphs are extracts of a web based Moving Epidemic Method application for determining the Influenza threshold in weeks. The 2018; as at week surveillance shows that, the start of the influenza Epidemic was in **week 7**, through to **week 19**. The epidemic start (**week 7**) recorded **11** posit influenza cases from a total of **64,** PCR processed samples while attaining a **Medium Epidemic threshold** in **week 12**, with an epidemic peak be identified in **week 16 (medium threshold)**; which recorded a total of **22** positives from 77 PCR processed samples and a low flu occurrences in week . In contrast, the 2017 (as @ Week 51) surveillance showed an epidemic start, in week 48, which recorded a total of 12 positive influenza cases fro total of **51,** PCR processed samples. While the epidemic peak was identified in **week 52**; with a total of **15** positives out of **63**, PCR processed samples.

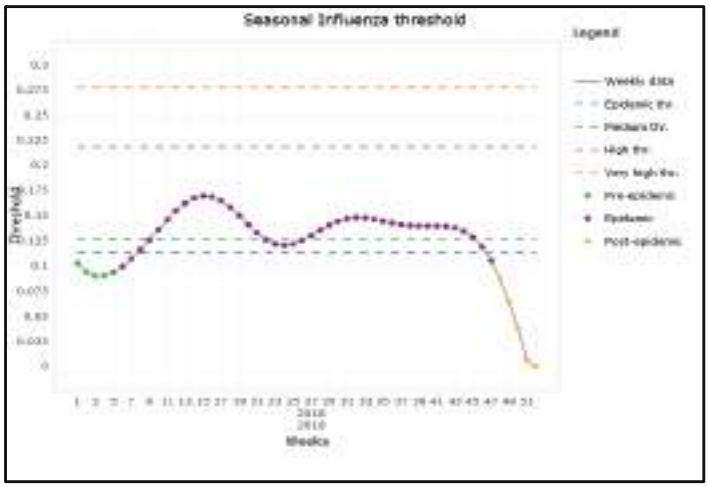

Fig 3: A seasonal Influenza rates as @ week 51 in 2018, shows a steady influenza epidemic which started in week 7 and reached a Medium threshold in week 21 with its peak being in week 16. The flu epidemic period lasted for 10 weeks and the period showed two (2) cycles; a first in week 9 while a second cycle of the flu epidemic started in Week 25.

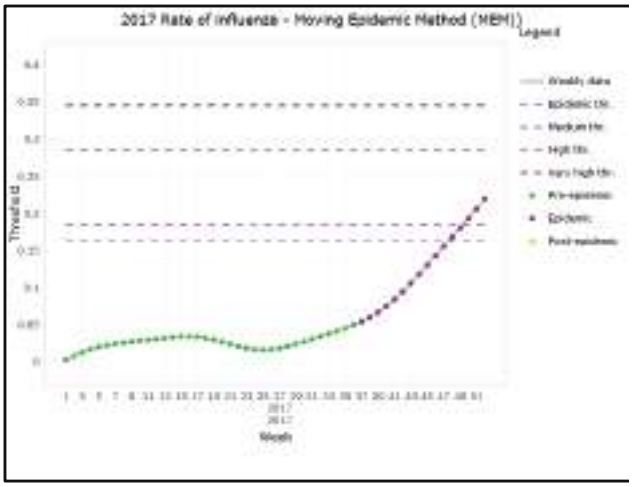

Fig 4: The 2017 seasonal Influenza rate as @ week 52 showed a steady flu epidemic which started in week 37 and reached a Medium threshold in week 49 with its peak being week 52. The flu epidemic period lasted for 9 weeks. This flu period showed only single flu cycle.

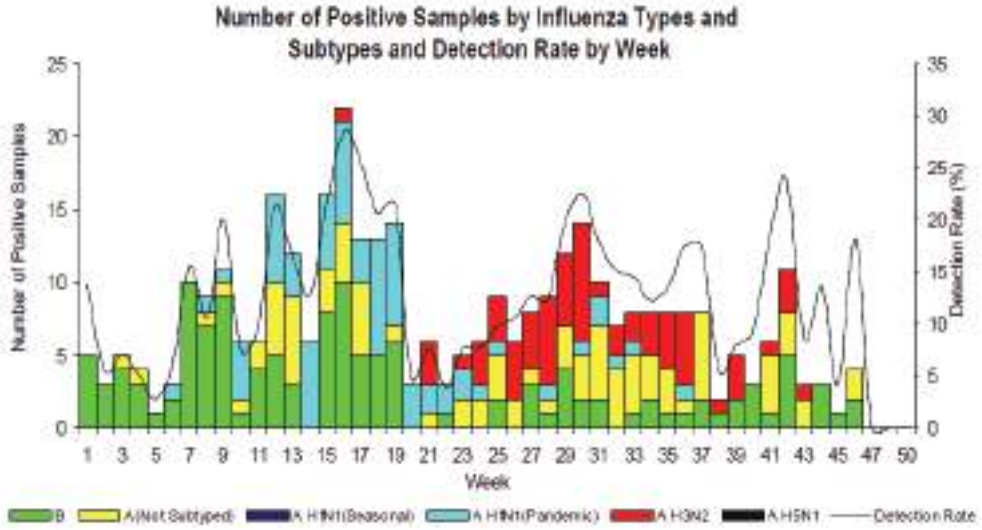

Fig 5: Positive influenza samples by subtypes (November 2018). There was continues random spread of influenza subtypes seen throughout weeks, 1 – 43. A high number of subtypes B and H1N1 were detected at the beginning of the year [week 1 -19] while, the current prevalence shows a steady increase of positive flu subtype H3N2 [Week 21- 41] with a few flu B subtypes at the end of 2018.

Cumulative Number of Identified Influenza Types and Subtypes and Total Number of Samples Collected by Case and Hospital/Clinic

Case	B	A (Not Subtyped)	A H1N1 (Seasonal)	A H1N1 (Pandemic)	A H3N2	A H5N1	Total Samples Tested
ILI	77	51	0	42	23	0	1071
SARI	54	23	0	19	39	0	1204
Unknown	20	12	0	9	12	0	381
Total:	*131*	*86*	*0*	*70*	*64*	*0*	*2656*

Hospital/Clinic	B	A (Not Subtyped)	A H1N1 (Seasonal)	A H1N1 (Pandemic)	A H3N2	A H5N1	Total Samples Tested
Arthur Davison	8	10	0	8	5	0	220
Chipata Clinic	39	54	0	54	9	0	481
Ndola Central	15	7	0	2	17	0	450
New Masala	47	16	0	8	14	0	632
UTH Filter	0	10	0	1	7	0	437
UTH Pediatric	22	9	0	15	12	0	447
Total:	*131*	*86*	*0*	*70*	*64*	*0*	*2656*

Fig 6: Total samples Processed as of 31st December 2018, is 2656. 351 (13%), are positives and 2305 (87%) negative samples. Flu Case Identification included a total of 1071 (40%) ILI and 1204 (45%) SARI Cases classified.