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CONTAMINATED DRINKING WATER

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Editorial

By : ML. Mazaba
Zambia National Public Health Institute

Citation Style For This Article: Mazaba ML. Water Contamination – A Public Health Concern. Health Press Zambia Bull. 2020; 4(2); pp 1-2.

Safe water and adequate sanitation are a mainstay in safeguarding public health and national well-being. Poor water and sanitation propagate waterborne infectious diseases and other ailments that are caused by unsafe water. Waterborne diseases caused by bacteria, parasites and virus add substantially to worldwide morbidity and mortality. Various diseases including but not limited to diarrhoea, cholera, dysentery, typhoid, and polio have been attributed to consumption of feacal contaminated water. It is estimated that over 485,000 deaths each year are caused by diarrhoea associated with consumption of water or food contaminated with infectious agents, which often come from human and animal waste. Other diseases such as malaria, dengue, yellow fever, trachoma, and schistosomiasis are associated with contamination of water with vectors including mosquitoes and helminths also contribute to increased morbidity and mortality globally [1-3]. Other than microbial contamination, chemicals such as pesticides, hydrocarbons, persistent organic pollutants, or heavy metals contribute to morbidity and mortality. Noted are the increased number of persons affected with cancers, hormonal problems, damaged nervous systems, liver and kidney damage, slower growth and even death associated with consumption of chemically contaminated water [4].

In many parts of the world the quality and safety of drinking water continues to be an important public health issue despite an agenda to ensure equitable access to safe water and adequate sanitation; Target 7c of the Millennium Development Goals (MDG 7c) aimed to halve the population that had no sustainable access to water and basic sanitation before 2015 but this was not achieved and carried on to the Sustainable Development Goals – SDG Target 6.1 which calls for universal and equitable access to safe and affordable drinking water. Despite these strategies, it is anticipated that by 2025, half of the world's population will still be living in water-stressed areas [5,6].

Conclusion

Despite the fact that in 2010, the UN General Assembly explicitly recognized the human right to water and sanitation, emphasising that everyone has the right to sufficient, continuous, safe, acceptable, physically accessible, and affordable water for personal and domestic use, many individuals, families and communities do not have access to such a supply. And where there is an abundance of fresh water, these areas still face other challenges of pollution, activities such as industry and waste, inadequate or ineffective sanitation and other negative forces.

Inadequate or inappropriately managed water and sanitation services expose individuals to preventable health risks. Water Sanitation and Hygiene (WASH) remain important determinants of health, therefore, key intervention strategies for reducing preventable morbidity, mortality and health care costs must be considered. Adequate safe and readily available water remains essential for individual and public health, as well as being a social determinant of health. It is important therefore that countries ensure improved water supply and sanitation, and better management of water resources. An improved status will in turn boost countries' economic growth and can contribute greatly to poverty reduction.

We must all play a role in ensuring Universal access to WASH for all!

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WHAT THE HEP IS GOING ON?!! PROTECTING FUTURE GENERATIONS: ADDRESSING HEPATITIS B AMONG PREGNANT WOMEN AND NEWBORNS IN ZAMBIA

Perspective

By : NL Mulambya, A Moraes, M Washington
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Citation Style For This Article: Mulambya NL,Moraes A,Washington M . What the HEP is going on?!! Protecting future generations: Addressing hepatitis B among pregnant women and newborns in Zambia. Health Press Zambia Bull 2020; 04(2); pp 3-5.

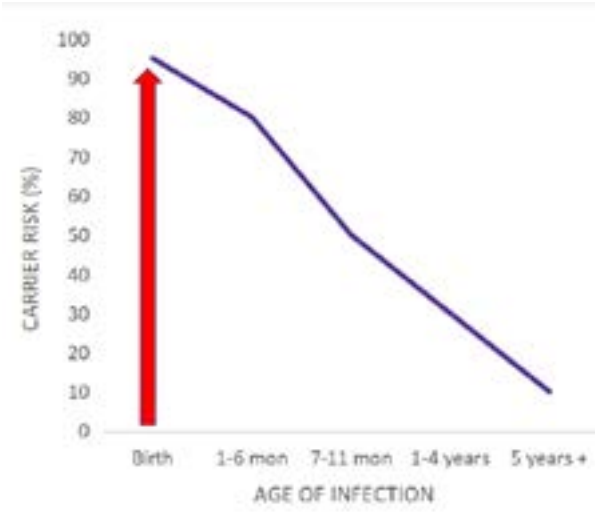
Key Messages

- *Hepatitis B virus (HBV) mother to child transmission (MTCT) accounts for one-third of the global hepatitis HBV burden*
- *Pregnant HBV infected woman have a 70-90% increased risk of transmitting HBV to their newborn*
- *90% of infected newborns develop chronic hepatitis B*
- *A birth HBV immunisation introduced in Zambia is estimated to reduce HBV MTCT infection by 80%*

Problem Statement

Hepatitis B is a viral disease caused by the hepatitis B virus (HBV). Common modes of transmission include: mother to child transmission (MTCT), contact with infected blood and body fluids, and sexual transmission. According to the 2016 Zambia Population HIV Impact Assessment, 3.5% of the population is infected with HBV[1]. An estimated 208,000 children aged 0-9 years are HBV infected. Approximately 56,000 pregnant women are living with HBV[2] (about 6.5% of pregnant women), although most do not know there HBV status due irregular screening. Perinatal transmission from mother to infant at birth is very high with 70-90% of infants becoming infected in the absence of post exposure prophylaxis]3]. Furthermore, infections acquired in infancy through perinatal or early childhood exposure are 90% more likely to become chronic than infections acquired later in life as seen in Figure 12.

Zambia also performs irregular HBV screening, thus Zambian women who are HBV infected and unaware of their status are at an increased of HBV MTCT[4]. However, studies have shown that treatment of HBV positive women with tenofovir, used in ART treatment, reduces MTCT to less than 2%6,[5]. As an unintended positive consequence, women who are coinfected with HIV/HBV and on ART are at a lesser risk of HBV MTCT8.



The country has been aware of the dangers associated with HBV infection for decades, hence the introduction of HBV vaccination as part of routine childhood immunisation program in 2005. Despite these efforts, the risk for HBV MTCT is still high as vaccine is given beginning at 6 weeks, leaving infants younger than 6 weeks at an increased risk for HBV seroconversion. Studies have shown that an HBV immunisation given within 24 hours of birth reduces HBV infection by 85%[2].

Policy Rational

1.In Zambia, one reason for the higher risk of chronic HBV is due to irregular testing and treatment of HBV infected pregnant women and the lack of the HBV birth dose immunisation[7].

Considering the research showing the reduction of HBV MTCT from pre-birth prophylaxis of tenofovir to the infected mother and HBV immunisation of newborns, we are proposing four policy options:

(2) introduce HBV screening and HBV treatment for HBV infected pregnant women; (3) introduce a birth HBV vaccination to newborns; and (4) the combination of HBV screening and HBV treatment for HBV infected mothers and birth HBV vaccination for newborns. This analysis is done assuming a healthcare facility that sees 36,000 births per year.

Policy Options

1. Currently, there is no vaccination at birth, no screening for HBV infected women, and no treatment for HBV infected pregnant women. Studies conducted in Malawi and South Africa showed a 10% infection rate among infants born from HIV/HBV co-infected mothers, which our model coming close to what we would expect in Zambia at 9.1%. This estimate is close to another Zambian estimate[8].
2. Introduce HBV screening and treatment for HBV positive pregnant women (Treat Only)
WHAT: HBV screening and treatment for HBV positive women
WHY: In addition to the current routine ANC screening for HIV and syphilis, add HBV screening and giving tenofovir to

HBV positive pregnant women from 28-32 weeks of pregnancy to reduce HBV viral load and reduce the risk of transmission by up to 40%. If implement in Zambia, this could reduce the percentage of children infected to 7.7% at a cost of $4,222 per HBV infected child adverted.

FEASIBILITY: Low to medium. This option builds on the Ministry of Health (MOH) strategic plan to eliminate MTCT of HIV and HBV infection in the population by 2030. Implementation will require training of staff and community sensitization on HBV screening during antenatal visits.

3.Introduce a birth HBV vaccination to newborns (Vaccinate only)

WHAT: HBV vaccination for the newborn regardless of the mothers HBV status

WHY: Currently, HBV vaccination starts at 6 weeks meaning that babies remain at high risk for HBV infection during the first 6 weeks of life. If an HBV vaccine is given at birth, we estimate that this would reduce the percentage of HBV positive children down to 1.8% at a cost of $236 per HBV infected child adverted.

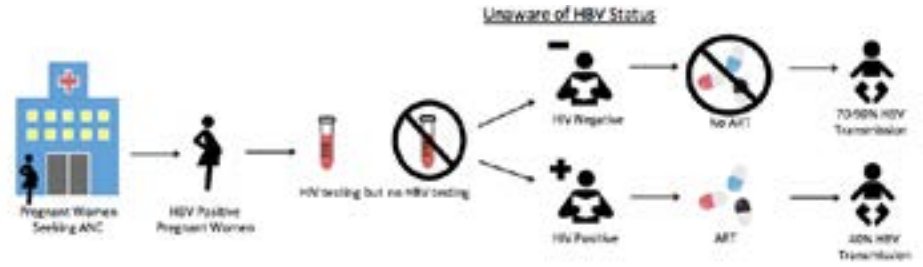
FEASIBILITY: Medium to high. This option also builds on the MOH strategic plan as stated above. Implementation will require training of staff and community sensitization in order to achieve maximum coverage as for other vaccines such as BCG and OPV. It will also require an additional budget of about $0.6 million for one health facility.

4.Combination of HBV screening and HBV treatment for HBV infected mothers and birth HBV vaccination for newborns Introduce HBV screening, treatment for HBV infected pregnant women, and HBV birth vaccination for the newborn (Option 2 and 3 combined)

WHAT: In addition to routine ANC screening for HIV and syphilis, add HBV screening and giving tenofovir treatment to HBV positive pregnant women from 28-32 weeks of pregnancy to reduce HBV viral load, combined with HBV vaccination for the newborn.

WHY: Most pregnant women are unaware of their HBV status. Furthermore, only the HIV/HBV co-infected pregnant women benefit from tenofovir, which leaves women who are HIV negative but HBV positive at risk of spreading infection to the newborn and possibly to their partners. Screening will identify these women and treatment can be provided. Vaccination will add additional protecting to the newborn. We estimate that this policy option would reduce the percentage of HBV infected children to 1.5%, at a cost of $923 per infected child averted.

FEASIBILITY: Medium to high. This option builds on the MOH strategic plan to eliminate HBV infection in the population, but it is estimated to cost and additional $2.5 million for one health facility.



Summary of Policy Options (For a healthcare facility that sees 36,000 births per year)	Option 1 Status Quo	Option 2 Treat Only	Option 3 Vaccinate Only	Option 4 Option 2 and 3 Combined
Percentage of newborns infected	9.10	7.67	1.75	1.48
Cost per pregnant woman/newborn (USD)	-	$60.65	$17.37	$70.41
Total cases of infected newborn	3,277	2,759	631	531
Percent decrease in infections vs option 1		1.44	7.35	7.63
Number of cases prevented vs option 1		517	2,646	2,745
Program cost (USD)		$2,183,215	$625,304	$2,534,708
CE ratio vs option 1 (USD per infected newborn prevented)		$4,222	$236	$923

Recommendations and next steps

Option 3 offers the highest health benefit given the additional money spent to implement the strategy. Additionally, Option 4 can be considered for the benefit it offers to reduce transmission to the newborn and potentially to sexual partners, and possible curing the mother. These analyses do not take into consideration the long-term benefit: reducing expensive health cost and major health issues in the future year due to liver cancer, jaundice, and death. For example, treating someone today for liver cancer is $30,000. Costs are likely to be higher in the future.

Implementation of these options will entail an estimated first year spending the following at national level: Option 2: $38,607,364; option 3; $11,057,047; Option 4: $44,839,286. The following are also needed:

- Raised communication awareness about HBV
- Training of health workers on HBV screening and treatment guidelines.
- Introduction of mono-dose at birth vaccine into the current immunisation schedule
- Ensure logistics can accommodate the additional ART and vaccine requirement

Without the introduction of these options, we can expect to see up to as many as 9% of newborns infected with HBV and the government would have to pay for the negative health outcomes in the future.

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REDUCE SALT INTAKE, SAVE A HEART!
REDUCED MORBIDITY AND MORTALITY DUE TO HYPERTENSION

Perspective

By : BM Katemba, CMwango, JM. Nkaama, C Chunga, D Mwansa, D Mushinge, K M Banda
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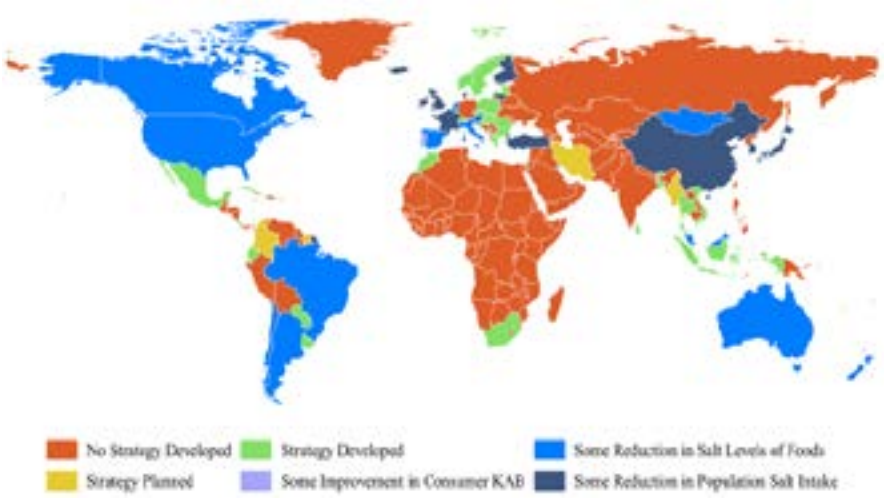
Key Messages

- *Circulatory diseases are the third leading cause of death in Zambia*
- *Hypertension is a silent killer; most people do not know they have it*
- *Hypertension is non-curable but can be controlled*
- *In Zambia, hypertension accounts for the highest proportion of deaths due to cardiovascular diseases*
- *On average, 670 people die every year due to hypertension in Zambia*
- *Reduced sodium intake can increase someone's life expectancy by 5-6 years*
- *The consumption of sodium among Zambians is twice as high (9.5 grams) as the World Health Organization (WHO) recommended (5 grams) per day*



Problem Statement

Hypertension, also known as high or raised blood pressure, is a global public health issue. The condition rarely causes symptoms in the early stages and a lot of people go undiagnosed. Those who are diagnosed may not have access to treatment and may not be able to successfully control their illness overtime["Global_brief_hypertension.Pdf."]. It is currently estimated that 34.8% of the adult population (18-69 years) in Zambia are living with hypertension["Zambia-NCD-STEPS-Survey-Report-2017 (1).Pdf."].

In 2016, hypertension accounted for 3.3% of all deaths in Zambia["2016 VITAL Statstics Report.Pdf."]. Risk factors include unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and stress[Franco OH, Peeters A, Bonneux L, de Laet C: Blood pressure in adulthood and life expectancy with cardiovascular disease in men and women. Hypertension 2005, 46:280.]. Diet has been identified as one of the major contributing factors to hypertension in Zambia["ZMB_B3_NCDs Strategic Plan.Pdf."]. Research has shown that excess consumption of sodium is associated with increased risk of hypertension and cardiovascular diseases. The 2017 Steps survey shows that Zambians consume an average of 9.5 grams of sodium/salt per day. This is nearly double the WHO recommended limit of 5 grams per day["Zambia-NCD-STEPS-Survey-Report-2017 (1).Pdf."].

Reducing sodium intake has been identified as one of the most cost-effective measures countries can take to reduce hypertension incidence and improve health outcomes in hypertensive patients["Policybrief34.Pdf."] yet Zambia is one of the countries that has no strategy on regulating sodium intake[Trieu, K., Neal, B., Hawkes, C., Dunford, E., Campbell, N. C., RodriguezFernandez, R., Legetic, B., McLaren, L., Barberio, A. & Webster, J. (2015). Salt Reduction Initiatives around the World – A Systematic Review of Progress towards the Global Target. PloS One, 10(7), e0130247. doi: 10.1371/journal.pone.0130247].

According to different studies done by WHO, the main source of consumed sodium is processed foods and ready-made meals["Global_brief_hypertension.Pdf."]. With a great availability of processed foods in Zambia, regulating the amount of sodium in processed foods can prevent 2,716 deaths annually.

1.Maintain status quo

The current status in Zambia is that there is no strategy to reduce sodium intake despite overwhelming evidence showing the benefit of sodium reduction on reducing hypertension. Sodium consumption in Zambia is currently double WHO's recommended daily intake. With the current status, 34.8% of the adult population in Zambia are living with hypertension["Zambia-NCD-STEPS-Survey-Report-2017 (1).Pdf."]. As of 2016, a total of 36,400 premature deaths["Zmb_en.Pdf."] were recorded as a result of NCD and 3.3% were as a result of hypertension["2016 VITAL Statstics Report.Pdf."].

2.Mandatory regulation of the amount of sodium in processed foods and labelling

What: Pass legislation on regulating the amount of sodium in processed foods. Manufacturers and importers are compelled by law to adhere to set standards. Sodium levels in food will be checked to make sure that companies are complying with the standards.

Why: The main source of food in most countries is 'processed food' and ready-made meals["Policybrief34.Pdf."]. 70% of the consumed foods in Zambia is purchased[Global Panel on Agriculture and Food Systems for Nutrition. (2016). Food systems and diets: Facing the challenges of the 21st Century. London: Global Panel] and studies have further shown that 70% of the consumed sodium/salt comes from processed foods[https://www.cdc.gov/salt/pdfs/sodium_role_processed.pdf]. Zambians consume 9.5 grams of sodium/salt per day["Zambia-NCD-STEPS-Survey-Report-2017 (1).Pdf."] and currently, 34.8% of the people in Zambia are living with hypertension[]. Sodium reduction at 2.0 to 2.3 grams per day significantly decreases the risk of cardiovascular diseases by 20%[Ha S. K. (2014). Dietary salt intake and hypertension. Electrolyte & blood pressure: E & BP, 12(1), 7–18. doi:10.5049/EBP.2014.12.1.7]. According to literature, 15% reduction in the sodium/salt intake translates to 3/1.4mm Hg drop in the average blood pressure in the adult population between a period of 8 years[Sadler K, Nicholson S, Steer T, Gill V, Bates B, Tipping S, et al. National Diet & Nutrition Survey— Assessment of dietary sodium in adults (aged 19 to 64 years) in England, 2011. Department of Health; 2011 [cited 2014 29 October]. Available: https://www.gov.uk/government/uploads/system/ uploads/attachment_data/file/213420/Sodium-Survey-England-2011_Text_to-DH_FINAL1.pdf.] [He FJ, Pombo-Rodrigues S, MacGregor GA. Salt reduction in England from 2003 to 2011: its relationship to blood pressure, stroke and ischaemic heart disease mortality. BMJ Open. 2014 April 1, 2014; 4(4).]. Mandatory reduction of sodium/salt addition in manufactured foods will reduce 70% of the daily consumed sodium/salt.

Feasibility: High. This policy option builds on government efforts to fight NCDs in the country. It will require a legal framework, sensitization of food manufacturers and enforcement officers to ensure that manufacturers adhere to the set standards.

3.Voluntary collaboration with food manufactures to regulate the amount of sodium in processed foods

What: Engage food associations and food manufacturers to reduce the sodium content in their product portfolio. Manufactures will voluntarily participate in the programme and will sign an agreement with the responsible ministry to commit to gradual and progressive reduction of sodium content in manufactured foods. In the event of noncompliance, the responsible line ministry will issue a written notice in order to demand regularization. There will be no penalties for not conforming to the agreement.

Why: As established, 70% of the consumed sodium comes from processed and commercially prepared food. With this approach, it is expected that 62% of the manufacturers will comply[https://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2016.303397] to set sodium reduction standards and 2,039 deaths will be averted annually.

Feasibility: High. To increase the feasibility of this policy option, there is need to engage food manufacturers from the initial stage of developing sodium reduction guidelines.

4.Health promotion and increased awareness of sodium intake via mass media and health care providers

What: Conduct Mass media awareness campaigns to raise consumer awareness and education on the dangers of unregulated sodium/salt intake.

Why: On average, 39% of households in Zambia have access to information through television or radio[2018 National Survey on Access and Usage of Information and Communication Technologies by Households and Individuals]. Through this strategy, 53%[https://www.indexmundi.com/zambia/demographics_profile.html] (3,564,894) of people living in Zambia will be reached with campaign messages and it is expected that 59%[https://www.lusakatimes.com/2016/05/11/local-manufacturers-told-improve-quality-products/] (2,103,288) will adhere to sodium/salt reduction messages although only 2 g/day reduction in sodium/salt is expected to be achieved by compliant volunteers[Hyseni, L., Elliot Green, A., Lloyd-Williams, F., O'Flaherty, M., Kypridemos, C., McGill, R., Capewell, S. (2016). P48 Systematic review of dietary salt reduction policies: evidence for an "effectiveness hierarchy"? Journal of Epidemiology and Community Health, 70(Suppl 1), A74.2–A75.doi:10.1136/jech-2016-208064.147].

Feasibility: High. This policy option builds on the already existing health promotion strategy that the ministry has adopted in tackling non-communicable diseases. This action will require behavior change and adherence of sodium/salt reduction messages by end users.

Policy Recommendations

Based on these findings, we can conclude that the mandatory regulation of sodium/salt uptake in processed foods is the most cost-effective method of curtailing hypertension in Zambia. The findings indicate that this intervention would yield the highest number of lives saved (2,716) over a 10-year period. Furthermore, the intervention yields the lowest cost to save an additional life and has the lowest annual implementation cost per death averted relative to the status quo. The relatively greater health benefit from mandatory reduction of sodium/salt in manufactured foods compared to voluntary interventions is consistent with previous works[Cobiac LJ, Vos T, Veerman JL (2010) Cost-effectiveness of interventions to reduce dietary salt intake. Heart 96: 1920–1925. doi: 10.1136/hrt.2010.199240 PMID: 21041840] [Collins M, Mason H, O'Flaherty M, Guzman-Castillo M, Critchley J, Capewell S. (2014) An economic evaluation of salt reduction policies to reduce coronary heart disease in England: a policy modeling study. Value Health 17: 517–524. doi: 10.1016/j.jval.2014.03.1722 PMID: 25128044] [Collins, M., Mason, H., O'Flaherty, M., Guzman-Castillo, M., Critchley, J., & Capewell, S. (2014). An Economic Evaluation of Salt Reduction Policies to Reduce Coronary Heart Disease in England: A Policy Modeling Study. Value in Health, 17(5), 517–524. doi:10.1016/j.jval.2014.03.1722]and is not surprising given the strong scientific basis for the effectiveness of public health laws in general[Moulton AD, Mercer SL, Popovic T, Briss PA, Goodman RA, Thombley ML, et al. (2009) The scientific basis for law as a public health tool. Am J Public Health 99: 17–24. doi: 10.2105/AJPH.2007.130278 PMID: 19008510] [Goodman RA, Moulton A, Matthews G, Shaw F, Kocher P, Mensah G, et al. (2006) Law and public health at CDC. MMWR Morb Mortal Wkly Rep 55 Suppl 2: 29–33. PMID: 17183242].

Table 1 Policy options economic evaluation

Estimated cost by Option	Option 1: Status Quo	Option 2: Mandatory regulation	Option 3: Voluntary collaboration	Option 4: Health promotion
Implementation/lifetime cost	5,716,560.7	55,728,852.2	53,910,108	532,928,138
Deaths averted/ Lives Saved	629	2,716	2,039	677
Cost per Death Averted	9,088	20,518	26,440	787,190
Additional Cost per Death Averted		2,179	3,107	998,507
Annual Cost per Death Averted	826	1,865	2,403	71,562
Total Annual Cost	519,6 87	5,066,259.00	4,900,919	48,448,012
Political Feasibility	Medium	High	High	High
Operational Feasibility	High	Medium	Medium	Medium

* Currency (ZMK) | Status quo implementation cost – budget allocation on all NCDs

What needs to be done?

- Firstly: Identification of all key stakeholders to ensure that the developed guidelines incorporate all stakeholders concerns
- Secondly: MoH to work with (National Food and Drugs, ZABS, Manufacturer Association of Zambia) and other stakeholders to develop the first draft of the regulations
- Thirdly: Engage Zambia Law Development Commission to develop the final draft of the regulations which will be submitted to Ministry of Justice for adoption
- Fourthly: Launch and enforcement of the regulations

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AN OUTBREAK OF DIARRHOEAL DISEASE ATTRIBUTED TO CONTAMINATED DRINKING WATER, NALOLO DISTRICT, ZAMBIA – 2019.

Research Article

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Abstract

On 10th January 2019, the Ministry of Health, through the Zambia National Public Health Institute, received notification from the Provincial Health Office in Western Province of 25 cases, presenting with symptoms of acute diarrhoea; two died. We investigated to describe the epidemiology and identify risk factors.

We reviewed medical records of patients who presented at the health facilities from December 2018 through January 2019. A suspected case was acute onset of watery diarrhoea with or without vomiting, fever, abdominal weakness, and body weakness in resident of Sumi or Situka villages, Nalolo district, from 1st December 2018 to January 2019. We collected stool and water samples for laboratory examination.

Of 30 patients reviewed, eight were confirmed and 13 probable cases. Most (53%) of cases were male, and 83% were aged < 15 years. The median age was 25 years. Fifty-three percent of cases were reported in Situka; 47% in Sumi. Escherichia coli was isolated in eight samples. Two water samples analysed indicated high levels of faecal contamination.

This was most likely a waterborne disease outbreak caused by feacal contamination of drinking water source, an ox-bow lake. Implementation of environmental and sanitary control measures brought the outbreak to an end.

Introduction

Diarrhoeal diseases remain a public health concern, and are the leading cause of child morbidity and mortality in the world1. Despite being preventable, through safe drinking-water and adequate sanitation and hygiene, 780 million individuals lack access to improved drinking-water, and 2.5 billion lack improved sanitation worldwide1. Diarrhoea disease-related outbreaks due to infection, are widespread throughout developing countries where sanitary conditions are relatively poor [1,2.]

In Zambia, sporadic diarrheal disease outbreaks such as cholera, typhoid fever, and dysentery have been reported annually3. Most of the reported diarrheal disease outbreaks are attributed to inadequate access to safe water, unsatisfactory functionality of sanitation systems as well as comprised food safety [4,5.]

Outbreak

On the 10th January 2019, the Ministry of Health (MOH), through the Zambia National Public Health Institute (ZNPHI), received an outbreak notification of non-bloody diarrhoea and vomiting with two deaths in Sumi and Situka villages of Nalolo district in Western Province. By 12th January 2019, the cases increased to 25, which prompted the district health office (DHO) to set up a screening and treatment centre (STC) at Situka village to heighten access to health services among the affected residents. The cases that reported at the STC were commenced on antibiotics. One severe case was referred to Lewanika General Hospital. Further, the DHO, with support from Provincial Health Office (PHO), distributed liquid chlorine for treatment of drinking water and provided health promotions and other environmental activities.

The Ministry of Health, through ZNPHI's Public Health Emergence Operation Centre, in collaboration with the World Health Organisation (WHO) Country Office constituted a national investigation team to support the province and district response to the outbreak. The composition of the national investigation team included a Field Epidemiologist, a Public Health Officer, and a National Surveillance Officer. The team travelled to the province on 16th January 2019 and proceeded to Nalolo district on the 17th January 2019.

We investigated the outbreak to determine the extent of the outbreak; characterise the outbreak by place, person and time; confirm the aetiology of the outbreak, generate hypothesis for the risk factors, and develop and implement a plan to prevent additional infections and future outbreaks.

Methods

Setting

Nalolo is a rural district located in Western Province of Zambia with total catchment population of 55,569. The district has an economy mainly supported by agriculture. The outbreak occurred in two villages located along the Zambezi river bank under the catchment area of the Situnga health facility with the population of 164 people. The two villages are approximately 300 meters apart.

Case definition

A suspected case was defined as acute onset of watery diarrhoea with or without vomiting, fever, abdominal weakness and body weakness in a resident of Sumi or Situka villages in Nalolo district from 1st December 2018 to January 2019. A probable case was defined as a suspected case epidemiologically linked to another clinically compatible case but without labora-

tory confirmation. A confirmed case was a case of diarrhea in person with positive laboratory test indicative of diarrhoea infection caused by bacterial, viral or parasitic organisms - Salmonellae serotype Typhi, Escherichia coli, Shigella, or Vibrio cholerae species.

Data Collection

This was a retrospective descriptive study based on data abstracted from medical records of patients presented at the health centres including STC and those admitted to the Lewanika General Hospital between 30th December 2018 and 16th January 2019. Data on disease surveillance and epidemic preparedness and response were also collected through interviews using a structured questionnaire and checklist administered to staff at the DHO and PHO.

Specimen Collection

Eight stool samples were collected from cases seen at the STC for laboratory examination and sent to Lewanika General Hospital on the 10th January, 2019. Two food (nshima and sour milk from four affected households) and two water samples from an ox-bow lake (the only source for drinking water) were collected for bacteriological analysis. Stool specimens were also shipped to University Teaching Hospital laboratory for quality control on 17th January 2019.

Data Analysis

The data obtained from medical reviews, questionnaires, checklists, and laboratory results were descriptively analysed by using proportions and presented in tables and graphs.

Ethical considerations

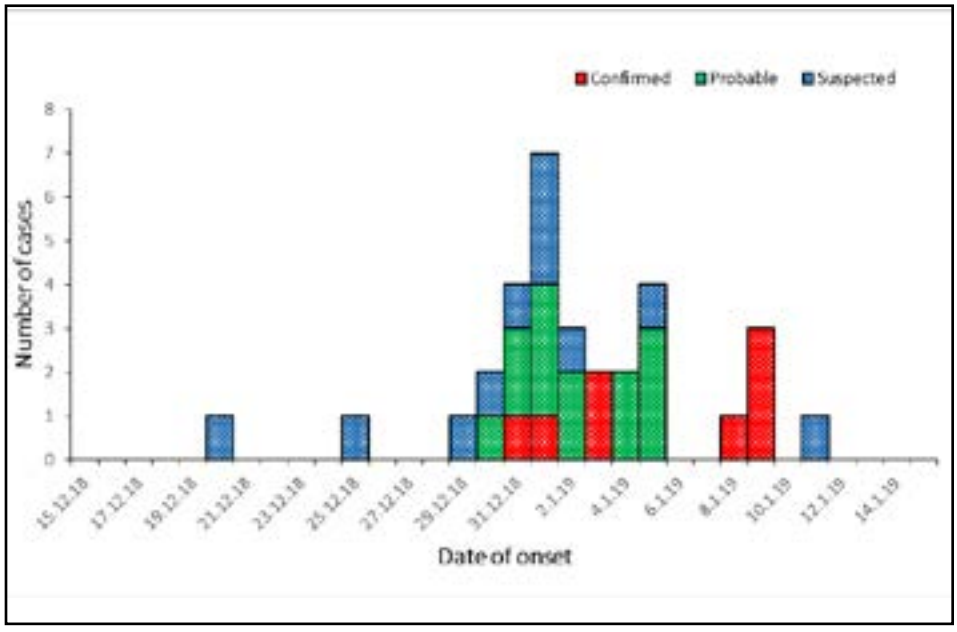
The study was conducted under the public health response authority from Ministry of Health. Therefore, the investigation was coordinated by Epidemic Preparedness and Response cluster at ZNPHI while permission to conduct data collection within the Ministry, was obtained from the Permanent Secretary, Technical Services. . However, verbal permission was sought from the district and hospital management to review medical records.

Results

From 11th December 2018 to 13th January 2019 a total of 30 cases were reported in Nalolo district. We identified eight confirmed cases, and 13 probable cases. Most (53%) of cases reviewed were among male, and 83% were among persons aged <15 years (Table). The median age was 25 years. Most (70%, n=21) of the cases were recorded between the 30th December 2018 and 5th January 2019 (Figure. Fifty-three percent of cases were among residents of Situka village and 47% (n=14) among residents of Sumi both under the catchment of Sunungu Rural Health Centre (Table). The index case was in a female aged 26 years reported on the 11th December 2018 at Itufa health centre of Senanga district.

The outbreak was initially detected by the Senanga DHO on 7th January 2019, which later notified Nalolo DHO that one of its rural health centers, Itufa, had been receiving cases of non-bloody diarrhea, suspected to have been typhoid fever. Although the two affected villages are in Sinungu Health Centre catchment area on the west bank of Zambezi river, the communities prefer accessing health services from Itufa Health Centre located on the east-bank of the Zambezi because it takes less time to reach Itufa Health Centre than Sinungu despite the need to cross river

Figure 1: Cases of Diarrheal Disease by date onset, Nalolo, December 2018 – January 2019 (N=30).



The clinical characteristics for the cases included diarrhoea, vomiting, intermittent fever, abdominal pains, and body weakness. Nine cases were treated as in-patients while 21 were treated as out-patients (Table). Of the eight stool samples collected from patients microscopy, culture and sensitivity, none was positive for S.Typhi or Shigella, however, E. coli was isolated in eight samples and Enterobacter agglomeran was isolated in one sample. We did not perform further tests to determine the toxigenicity of the E. coli and Enterobacter agglomerans isolates. The only blood specimen tested for serology, was sero-negative. None of the food analysed had microorganisms isolated. All the water samples analysed indicated high levels of faecal contamination (i.e. >5000 colonies/100ml).

Data from checklist revealed that all the health workers in Nalolo district had not been trained in Integrated Disease Surveillance and Response (IDSR); only one person was reported to have been trained at Lewanika General Hospital. In addition, Emergency Preparedness and Response Committee meetings were rarely held either at the district offices or the hospital.

Table: Demographic and clinical characteristic of diarrheal disease, Nalolo, 2019 (N=30)

Characteristics	Number (%)
Gender (Male)	16(53)
Age group (years)	
≤5	1 (3)
6-10	1 (3)
11-14	3 (10)
15+	25 (83)
Residence	
Situka	16 (53)
Sumi	14 (47)
Signs and Symptoms	
Diarrhoeal	30 (100)
Vomiting	25 (83)
Fever (>38 °C)	30 (100)
Abdominal pains	30 (100)
Body weakness	30 (100)
Constipation	11(36)
Laboratory (Positive – *E.Coli*)	
Stool	8 (100)
Water	2 (100)
Food	0 (0)
Hospitalization	
In-patient	9 (30)
Outcome	
Alive	28 (93)
Dead	2 (7)

Discussion

Our investigation revealed that there was an outbreak of diarrheal disease associated with exposure to contaminated drinking water, caused by E.coli infection, which mostly affected residents above 15 years. All the cases reported from the two villages in which the outbreak occurred relied on untreated water from a nearby ox-bow lake. Prevention of diarrhoeal diseases is an important public health strategy for reducing morbidity and mortality not only in children but also in older age groups. In enteric disease outbreaks, sources of infection have been traced to a variety of origins such as surface water, household water containers, foods and drinks, and poor sanitary conditions1,6. The local municipal council and cooperating partners, responsible for management of water and sanitation can effectively prevent such outbreaks by providing safe water to the community. Provision of safe water is vital to protecting public health in Zambia; most of the reported waterborne disease outbreaks during the period 2017–2018 were associated with drinking contaminated water, accounting for at least 5,097 cases of illness, 1006 hospitalizations, and 99 deaths[3].

Almost all the patients presented with abdominal pains, diarrhea, vomiting, fever and malaise suggestive of exposure to E. coli high toxigenic strains. Although we could not perform further tests to determine the toxigenicity of the E. coli and Enterobacter agglomerans isolates, our results reveal very high faecal contamination of water from the ox-bow lake. Studies have documented the potential human health risk associated with the exposure to water contamination from shallow wells, due to the very high level of human faecal indicator bacteria isolated strains such as E. coli and Enterococcus from water and surface sediment [7].

The diagnoses of diarrheal diseases caused by specific pathogens may be challenging because they are usually clinically diagnosed as common salmonella gastroenteritis or enteric fevers (including typhoid fever), or often misclassified as malaria. Studies have documented that people in endemic areas are at a risk of contracting both (typhoid fever and malaria) infections concurrently 8–10. There is a considerable overlap of signs and symptoms of malaria and typhoid fever; the similarity of clinical features of both diseases leads to misdiagnosis and mistreatment of the febrile patients thus the initial suspicion of typhoid fever by clinicians in affected villages. Most of the cases suspected to have typhoid fever were treated with oral rehydration therapy and antibiotics which included ciprofloxacin and metronidazole, despite both the stool and blood serological tests being negative. Therefore, a reliable diagnostic method is important for effective management of cases to avoid misuse and wastage of drugs1,8,11. Further, strengthening surveillance at all levels may play an important role in early detection of notifiable diseases.

There was inadequate coordination and feedback among the key public health players (health centre, districts and referral hospital) during reporting, detection and confirmation. Although the health centre notified the hospital on the 7th January 2019, Senanga district DHO informed Nalolo DHO days later, contrary to standard reporting guidelines for immediately reportable diseases12. Additionally, the two DHO did not provide follow-up or feedback regarding the outbreak. Ideally, suspected outbreaks of epidemic-prone diseases are required to be reported to the next level within 48 hours of surpassing the epidemic threshold 13. However, this was not case as the national level was notified 10 days later. The DHO's public health departments have a primary responsibility of detecting and investigating outbreaks.

Our investigation evaluation indicated deficiencies to timely notify, detect and respond to the outbreak. The heightened challenges could arise from the fact that none of staff in the district were trained in IDSR 13–15. Since the district has some hard-to-reach areas within its catchment attributed to distance and impassable terrains, training of staff in community based surveillance could improve notification, detection and response to outbreaks 16. Regular supportive supervision could also have enhanced surveillance data validation. Delayed response to the outbreak was compounded by the fact that the district did not have the capacity to confirm any outbreaks because it had no laborato-

ry and all the samples were sent to a level II referral hospital located over 40 kilometers away. Although Nalolo district is a new district, there is need to have a laboratory which can at least perform basic analyses such as bacteriological testing to improve timely confirmation of diarrhea diseases.

Our investigation suggests poor health-seeking behavior among residents in the two affected villages. The positive change in health seeking behaviour could be enhanced by regular health education programs especially on good handwashing and other hygiene practices 17,18. Residents of Sumi and Situka villages had no access to a safe drinking water and basic sanitary facilities[7]. The community was accessing water for both human consumption and domestic use from an oxbow lake with stagnant water without any form of water treatment. Equally, the lack of secure pit latrines in the area could have propagated the infection as the communities prefer open defecation to toilet use. There could be increased contamination of water source due to rain water and human/animal waste interaction4. The lack of access to safe drinking water was partly attributable to the fact that the villages are inhabited by the nomadic Mubyane families of the Lozi tribe, who migrate seasonally from flooded plain to highlands along the Zambezi river. Therefore, sinking of some permanent protected boreholes on the safe highlands could improve access to safe drinking water and reduce contamination of the water used in the community.

To contain the outbreak, the DHO with support from PHO erected a tent for an onsite treatment centre at Situka village; distributed sodium hypochlorite solution for treatment of drinking water; and provided health education on personal hygiene including use of appropriate sanitary facilities such as pit latrines. Further, follow-up visits were conducted to further assess and collect information on the outbreak, and the national team provided technical support to DHO. The stool samples were subjected to further examination, while screening and active surveillance was continued.

Limitations

Our study was based on the descriptive secondary data analysis; we could not establish other risk factors accountable for increased diarrheal disease susceptibility in the study population. We could not perform further tests to determine the toxigenicity of the E. coli and Enterobacter agglomerans isolates.

Conclusion

Our investigation shows a waterborne disease outbreak caused by feacal contamination of drinking water source. Delayed confirmation and response by the local health could have contributed to spread of the outbreak among residents. Continued implementation of health education on water treatment (chlorination and boiling), use of toilets and good handwashing practices are highly recommended. Prompt confirmatory test should also be prioritised by clinicians as diarrheal patients may be misdiagnosed, e.g., presumed to have malaria. There is a need to provide training and capacity building for health personnel in disease surveillance to improve detection, response and coordination at all levels.

Acknowledgements

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Competing interests

The authors declare no competing interests.

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (IDSR) WEEK 09 (24 FEBRUARY-1 MARCH 2020)

Surveillance Report

Surveillance and Disease Intelligence Unit
Zambia National Public Health Institute

Citation Style For This Article: Surveillance and Disease Intelligence Unit. Intergrated Disease Surveillance and Response. Health Press Zambia Bull 2020; 04(2); pp 16-20.

Weekly Summary

Current outbreaks and public health threats

- **cVDPV Outbreak:** No new confirmed cases were recorded this week.
- **Measles Outbreak:** Cumulatively, 5 suspected cases and One confirmed Measles positive IgM were reported from Lunte district but no new cases were reported from Kasama district in the week under review. Both of these districts are in Northern province.
- **Poliovirus:** Two AFP specimens tested positive for PV2 and have been sent for sequencing.
- **Coronavirus (COVID-19):** surveillance ongoing, especially at points of entry. For the week under review **#** of high risk arrivals screened are as follows: **288 #** of contacts: **288**, **#** high risk persons/contacts monitored: **191**, **#** suspected COVID-19: **4, #** Probable COVID-19: 0**0, #** Confirmed COVID-19: **00**

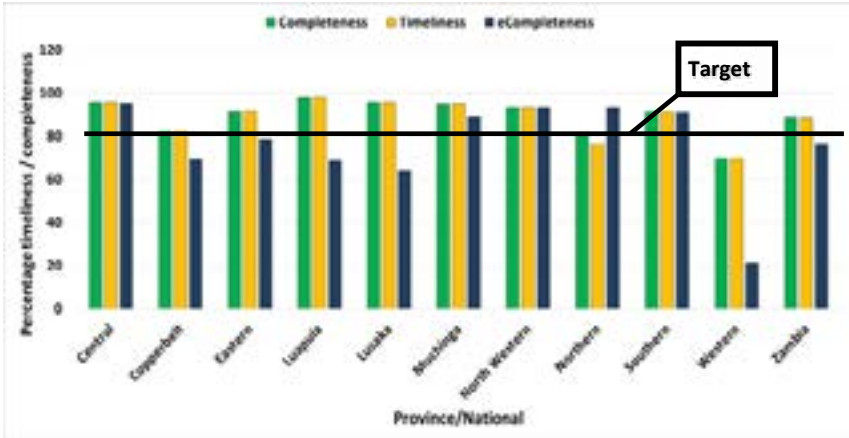
Immediately notifiable diseases

- **Acute Flaccid Paralysis (AFP**): Seven cases were reported from Northern (5), Central (1) and North western (1) provinces.
- **Maternal Deaths:** Sixteen maternal deaths were recorded in Central (4), Lusaka (3), Southern (3) Copperbelt (2), Western (2) , North western (1) and Eastern (1) provinces.
- **Measles:** Seven suspected measles cases were reported in Northern (4), Eastern (2) and Lusaka (1) provinces.

Other diseases/events

- **Typhoid:** Seven suspected cases were reported from North western (6) and Eastern (1) provinces.
- **Rabies:** One suspected rabies death was recorded from Mporokoso district in Northern province .

Paper and Electronic Timeliness and Completeness, Health Facility Level



Paper Timeliness: 80% Paper Completeness: 80% Electronic Completeness: 78%

Provincial Report Timeliness

Province	WEEK5	WEEK6	WEEK7	WEEK8	WEEK9
Central	T	T	L	L	L
Copperbelt	L	L	L	L	T
Eastern	T	L	T	L	T
Luapula	T	T	T	T	T
Lusaka	L	L	T	L	T
Muchinga	T	T	NR	L	T
North Western	L	NR	T	L	T
Northern	T	T	T	T	T
Southern	T	T	T	T	T
Western	T	NR	NR	NR	L

T=Timely L=Late NR=No Report

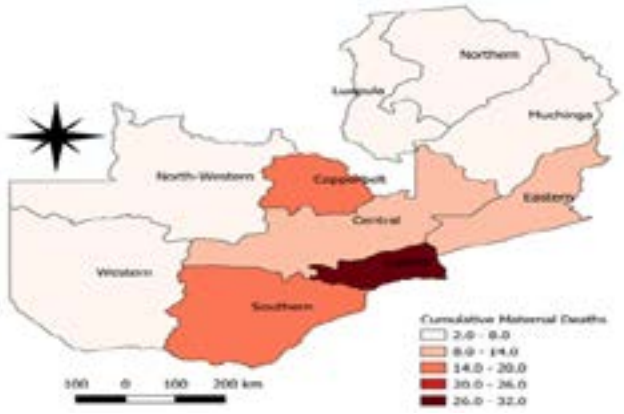
Summary Report Priority Diseases, Conditions and Events (Week 9)

	Week 9			Week 1-9Cumulative		
Disease/ Event / Condition	**Suspected cases**	**Tested**	**Confirmed**	**Suspected cases**	**Tested**	**Confirmed**
AFP	7	7	0	34	12	0
Cholera	0	0	0	3	3	0
Meningitis (Neisseria)	1	0	0	8	1	0
Measles	7	0	0	58	18	0
Neonatal Tetanus	1	0	0	2	1	0
Plague	0	0	0	0	0	0
Rabies	1	0	0	5	0	0
Dog bites	311			2,863		
Dysentery	695	2	0	6,810	108	59
Typhoid fever	7	0	0	81	16	2
Yellow fever	0	0	0	0	0	0
VHF	0	0	0	0	0	0
Anthrax	0	0	0	10	0	0
Influenza	0	0	0	0	0	0
Non Bloody Diarrhoea	15,036	0	0	127,773	0	0
Schistosomiasis (Bilharzia)	3480	28	22	3,466	506	156
Malaria	209,630	241,569	138,896	1,919,186	1,690,251	929,965
HIV	27,693	29,997	1,724	283,479	257,094	15,012
Tuberculosis	3152	2,926	285	25,917	22,955	2,158
Maternal Death	16			118		
Total	**257,036**	**274,529**	**140,927**	**2,369,813**	**1,970,965**	**947,352**

Maternal Deaths

Week 9

Cumulative Number of Maternal Deaths by Province



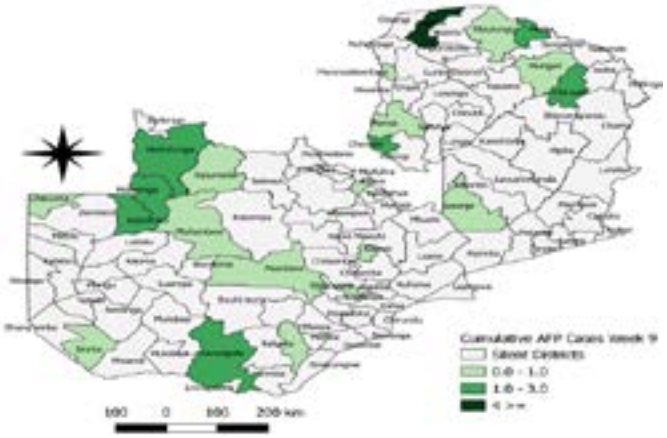
- 16 maternal deaths were registered this week.
- Indirect causes and obstetric hemorrhages continue to be the leading cause of maternal deaths.
- Lusaka province (32) has cumulatively recorded the highest number of deaths since week 1.
- In total 118 maternal deaths have been recorded from week 1 to 9.

Vaccine Preventable Diseases

Week 9

AFP Surveillance

Districts with reported AFP Cases Week 1-9 2020



- Seven cases of AFP were reported from Kaputa (5) in Northern, Kabwe (1) in Central and Mufumbwe (1) North western Provinces. All samples were collected for laboratory investigation.
- Cumulatively, 34 AFP cases have been recorded from 22 districts.
- As a result of the outbreak, non-AFP target rates has been increased to **4/100, 000** population below 15.

- Two AFP specimens tested positive for poliovirus type 2 from Kaputa district in Northern Province and Manyinga district in North western Province.
- The samples have been forwarded to the regional reference laboratory for sequencing and results will be shared as soon as they are available.
- **The risk of cVDPV2 transmission in Zambia is high in districts that are: 1) Silent, 2) Not attaining Non-Polio AFP Rates of 4/100,000 or 80% stool adequacy, 3) Neighboring to countries with active outbreaks and 4) Having low IPV vaccination coverages.**

Poliovirus Environmental Surveillance (ES)

- The scheduled collections from the sites in Lusaka and Copperbelt provinces were conducted

*

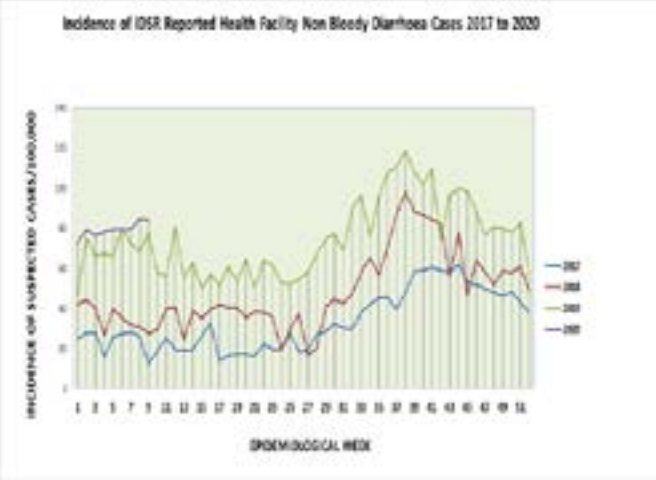
Measles Outbreak

- Measles outbreak iin Northern Province is ongoing, affecting Kasama and Lunte districts.
- Cumulatively, 41 cases, 7 confirmed measles Igm and no deaths.
- 36 suspected cases and 6 measles Igm confirmed cases in Kasama
- 5 suspected cases and 1 measles Igm confirmed cases in Lunte district.
- No new cases have been reported from Kasama district in the week under review.
- 3 new suspected cases were recorded from Lunte district.

Measles & Rubella surveillance

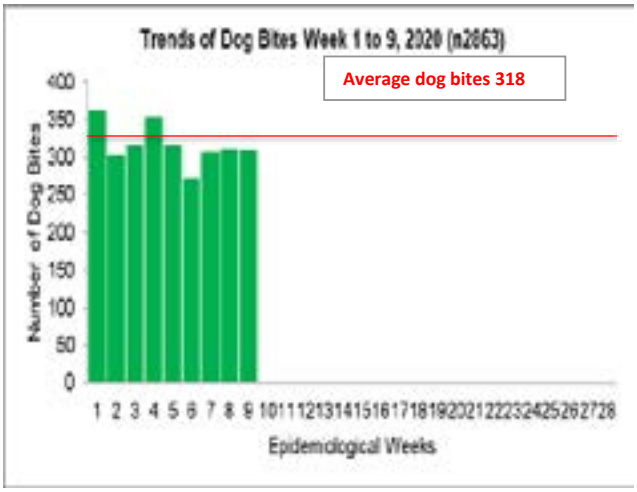
- 7 suspected measles cases were reported this week.
- samples were collected and sent for laboratory investigations
- Cumulative, 58 suspected measles cases and 8 measles Igm confirmed cases have been reported.
- 4 confirmed Measles rubella have been reported.

Non-Bloody Diarrhoea



- Cumulatively, 127,773 cases of non-bloody diarrhea were reported from week 1 to week 9 2020.
- The highest number of cases reported are from Lusaka province representing 16.4% (20,951).
- The highest cumulative incidence reported is from Central province at 1,154 per 100,000.

Dog Bites



- Cumulatively, 2,863 dog bites have been reported from Week 1 to Week 9.
- Dog bites surveillance serves as a proxy for rabies surveillance both in human and animal health systems.
- Central province has recorded the highest number of dog bites representing 20% (505).

Global/Regional/Public Health Events (Cases/Case Fatality Rate)

Ebola	Measles	Cholera	Poliovirus (c VDPD)	CoronaVirus (COVID-
DRC : 3,444 CFR 66.0%	**DRC:** 20,475 CFR 1.20% 1.90%	**DRC:** 3,575 CFR 1.50% **Malawi:** 3 CFR 0.0%	**Angola:** 117 CFR 0.0% **DRC:** 105 CFR 0.0%	**Global:** **88,300 CFR 3.6%** **Africa:** **5** **CFR 0.0%**

Early Warning Diseases

Ebola Virus, DRC 2018-2020

- No new confirmed EVD case and no deaths were recorded from DRC outbreak in the week under review.
- Cumulatively, 3,444 suspected cases, 3,310 confirmed cases, 134 probable cases and 2,264 deaths (CFR is 66%) have occurred since the outbreak.
- A total of 139 contacts are currently under follow-up

Though number of new cases seem to be reducing, the regional risk of spread remains high.

COVID-19

- Three countries in the WHO African region, Algeria, Nigeria and Senegal, have confirmed cases of coronavirus disease 2019 (COVID-19).
- A total of five confirmed cases have been reported 3 from Algeria, 1 Nigeria and 1 from Senegal.
- No deaths have been reported.
- A total of 86 contacts to the Algerian (34) and Nigerian (51) cases have been identified and are being followed up.

*****For more information look up the WHO Weekly Bulletin on Outbreaks and Other Emergencies and for Global updates on the coronavirus COVID 19 look up John Hopkinsdashboard on https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html?*****

Public Health Actions

Circulating Vaccine Derived Poliovirus Outbreak

- All provinces are further encouraged to strengthen AFP surveillance using available technological tools and geo code all cases detected.
- The national annualized Non Polio AFP detection rate has increased to 4 cases /100,000 of children detected under 15 years for provinces.
- Note all AFP cases are immediately notifiable and require immediate investigation with new case investigation forms.
- All districts are expected to conduct health facilities integrated supervisory active searches at priority sites as per recommended schedule.
- Provinces to ensure silent districts not reporting AFP/measles cases are supported for active surveillance of AFP cases.

Ebola Virus Disease Preparedness

- All provinces to strengthen EVD surveillance among all health care providers and raise community awareness of EVD prevention.
- Provide weekly reports in IDSR reports of active searches including zero reporting in at risk districts, including ports of entry.
- Ensure epidemic preparedness measures for detecting cases, sample testing/transportation and managing cases are effected.
- All border districts to strengthen point of entry EVD screening including facilitation of cross boarder monitoring and reporting of suspected EVD cases.

Heightened Surveillance in Cholera Hotspots

- With the increased rainfall patterns and imminent flooding that raises risks for diarrheal diseases, cholera hotspots are encouraged to continue and intensify surveillance and review of epidemiological trends to quickly detect and respond to changes.
- All provinces and districts are further advised to have sufficient stock piles of chlorine (granular & soluble).
- Continue to provide health education to sensitize communities and health workers on cholera preventative measures.
- WASH continue water monitoring and distribution of chlorine in identified at risk populations.
- Provincial epidemic preparedness committees to engage all relevant government stakeholders and multisector partners required to prevent cholera outbreaks.

Global Alert of the Coronavirus & Preparedness

- Orientation of staff at points of entry on COVID-19 in all provinces is being conducted in cascade
- Screening at all points of entry to be strengthened especially at international points of entry.
- Circulation of awareness materials to the public and health personnel is being done.
- Report all suspected patients to higher authority immediately.
- Strengthen surveillance for all Influenza Like Illness (ILI) and Severe Acute Respiratory Illness (SARI)
- Case definitions to be made available and other IEC materials in health facilities and public places.
- A call centre has been established at ZNPHI and all queries should be channeled to the following numbers: **+260 96 4638726/+260 974493553/+260 95 3898941.**

Reported by Surveillance and Disease Intelligence Unit: Muzala Kapin'a, Nkomba Kayeyi, Moses Banda, Mazyanga M Liwewe, Victor Mukonka and Zambia National Public Health Institute (ZNPHI)

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (IDSR) WEEK 13 (23 TO 29 MARCH 2020)

Surveillance Report

Surveillance and Disease Intelligence Unit
Zambia National Public Health Institute

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Weekly Summary

Current outbreaks and public health threats

- **COVID-19 (Coronavirus):** 27 confirmed cases, 0 deaths and 368 case were investigated and reported in the week under review. As of the 29th of March, a total of 29 confirmed cases and 0 deaths have been recorded.
- **cVDPV Outbreak:** No new confirmed cases were recorded this week.
- **Poliomyelitis:** One sample of PV1 has been isolated and sent for sequencing.
- **Measles Outbreak:** No new suspected cases were reported in the week under review from Lunte district of Northern province.
- **Cholera Outbreak:** No confirmed cases were reported from Itezhi-Itezhi districts of Central Province

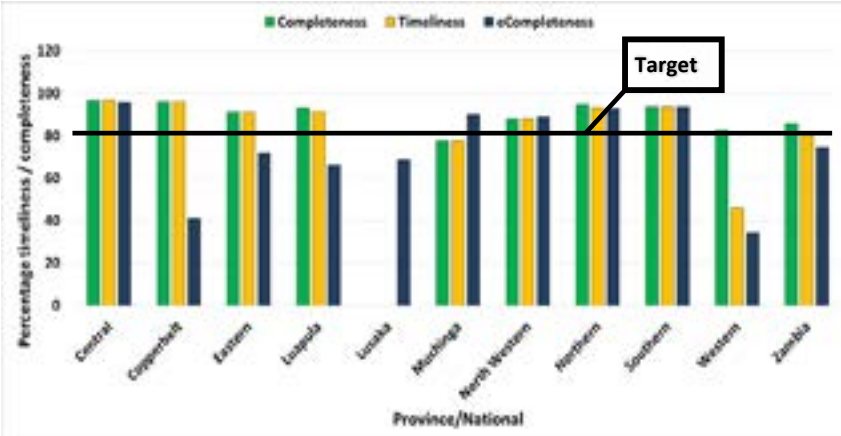
Immediately notifiable diseases

- **Acute Flaccid Paralysis (AFP**): Three cases were reported from North western (2) and Eastern (1) province.
- **Maternal Deaths:** Fourteen maternal deaths were recorded in Lusaka (5), Eastern (3), Muchinga (2) Northern (1), Central (1), Southern (1) and Luapula (1) provinces.
- **Measles:** Two suspected measles cases were reported in Western (1) and Southern (1) provinces.
- **Cholera:** Five suspected cases were reported from Kasama district of Northern province. Samples for all the cases were collected for laboratory investigation.

Other diseases/events

- **Mumps:** 273 suspected cases were reported from Southern (84), Central (73), Eastern (51), Copperbelt (34), North western (21), Western (6) and Luapula (4) provinces.

Paper and Electronic Timeliness and Completeness, Health Facility Level



Paper Timeliness: 81% Paper Completeness: 85% Electronic Completeness: 74%

Provincial Report Timeliness

Province	WEEK 9	WEEK 10	WEEK 11	WEEK 12	WEEK 13
Central	L	T	T	L	L
Copperbelt	T	T	L	L	T
Eastern	T	T	L	L	L
Luapula	T	T	T	T	T
Lusaka	T	L	NR	L	NR
Muchinga	T	T	T	L	T
North Western	T	L	L	L	T
Northern	T	T	T	T	T
Southern	T	T	T	L	L
Western	L	L	NR	L	L

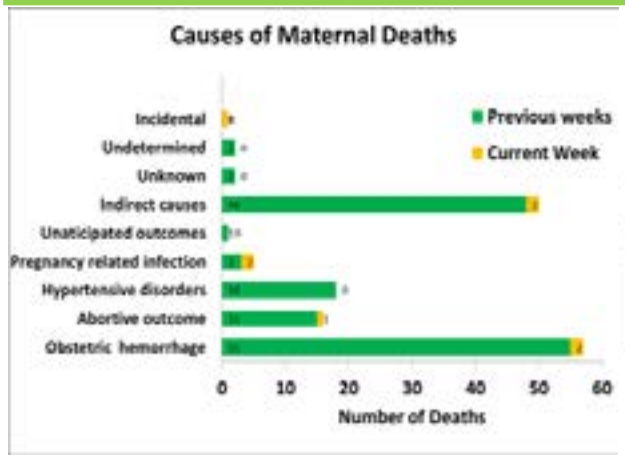
T=Timely L=Late NR=No Report

Summary Report Priority Diseases, Conditions and Events (Week 13)

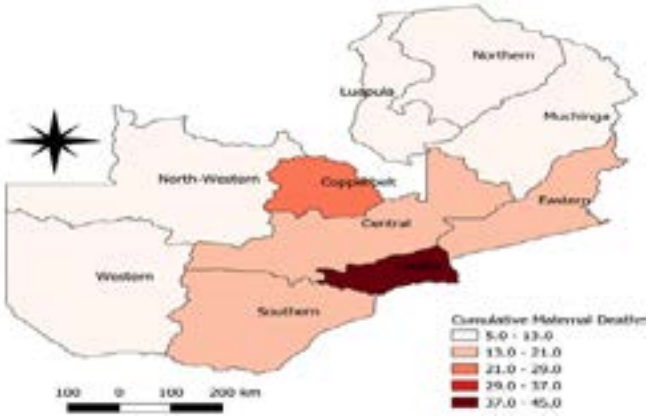
	Week 13			Week 1-13 Cumulative		
Disease/ Event / Condition	**Suspected**	**Tested**	**Confirmed**	**Suspected**	**Tested**	**Confirmed**
COVID– 19	368	368	27	406	406	29
AFP	3	3	0	48	21	0
Cholera	5	5	0	10	10	2
Meningitis (Neisseria)	2	0	0	14	1	0
Measles	2	1	0	89	31	0
Neonatal Tetanus	0	0	0	4	1	0
Plague	0	0	0	0	0	0
Rabies	0	0	0	6	0	0
Dog bites	248			3,851		
Dysentery	565	3	3	9,235	152	66
Typhoid fever	0	0	0	96	16	2
Yellow fever	0	0	0	0	0	0
VHF	0	0	0	0	0	0
Anthrax	0	0	0	13	0	0
Trypanosomiasis	0	0	0	6	1	0
Influenza	0	0	0	0	0	0
Non Bloody Diarrhoea	12.814	39	0	181,621	46	0
Schistosomiasis (Bilharzia)	327	88	32	4,992	735	237
Malaria	266,766	263,501	155,583	2,927,136	2,677,369	1,505,358
HIV	21,402	20,866	1,125	376,613	347,310	19,846
Tuberculosis	2,847	2,737	152	38,681	33,557	2,833
Maternal Death	14			166		
Total	**305,035**	**287,217**	**156,879**	**3,542,656**	**3,059,295**	**1,528,344**

Maternal Deaths

Week 13



Cumulative Number of Maternal Deaths by Province



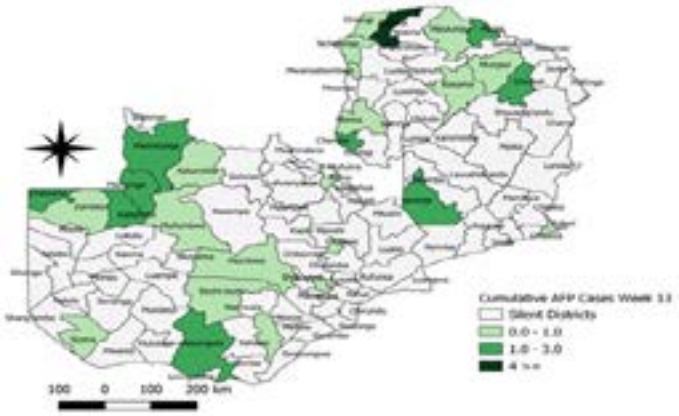
- 14 maternal deaths were registered this week.
- Obstetric hemorrhages and Indirect causes continue to be the leading cause of maternal deaths.
- Lusaka province (45) has cumulatively recorded the highest number of deaths thus far.
- In total 166 maternal deaths have been recorded since week 1.

Vaccine Preventable Diseases

Week 13

AFP Surveillance

Districts with reported AFP Cases Week 1-13 2020



- Three cases of AFP were reported from Chavuma (1) and Kabompo (1) districts of North Western province and Vubwi (1)distrct of Eastern province. All three samples were collected for laboratory investigation.
- Cumulatively, 48 AFP cases have been recorded from 26 districts.
- As a result of the cVDPV outbreak, non-AFP target rate has been increased to **4/100, 000** population below 15.

- **One case of PV1 has been isolated and sent for sequencing from Nchelenge district in Luapula province.**
- All results received so far from specimens submitted to the regional lab came out negative for cVDPV
- **The risk of cVDPV2 transmission in Zambia is high in districts that are: 1) Silent, 2) Not attaining Non-Polio AFP Rates of 4/100,000 or 80% stool adequacy, 3) Neighboring to countries with active outbreaks and 4) Having low IPV vaccination coverages.**

Poliovirus Environmental Surveillance (ES)

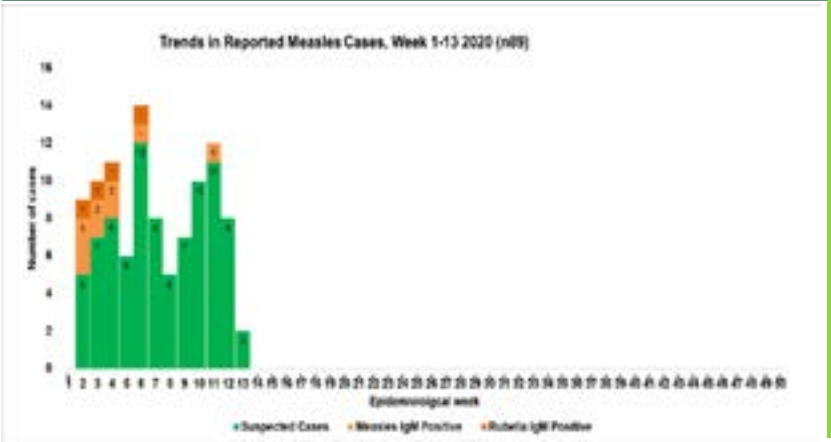
Site Name	Epidemiological Week 2020					
Province - Lusaka	1	2	3	4	5	6
Manchinchi						
Kaunda Square Site						
Chelstone Treatment						
Ngwerere Treatment						
Province - Copperbelt	1	2	3	4	5	6
New Kanini Sewer						
Masala Sewer Line						
Nkana East						
Mindolo Treatment						
Kawama Sewer						
Mushili Sewer						
KEY	sabin-link		NPEV	Sabin like + NPE		Pending

The scheduled collections from the sites in Lusaka provinces have been derailed because of conflicting activities.

Measles Outbreak

- No new cases were recorded from the ongoing Measles outbreak in Northern Province affecting Lunte district.
- Cumulatively, 25 suspected cases have been reported since the outbreak was declared.
- 1 Igm positive case was reported in the affected district.
- The affected health facilities in the district are Mulenga Mapesa and Mukupa Kaoma.

Measles & Rubella surveillance

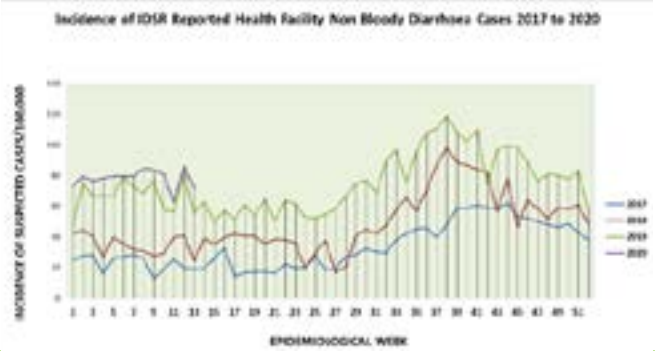


- 2 suspected measles cases were reported in the week under review.
- 1 sample was collected and sent for laboratory investigations.
- Cumulatively, 89 suspected measles cases , 9 measles Igm confirmed cases and 4 confirmed measles rubella cases have been recorded.

COVID-19

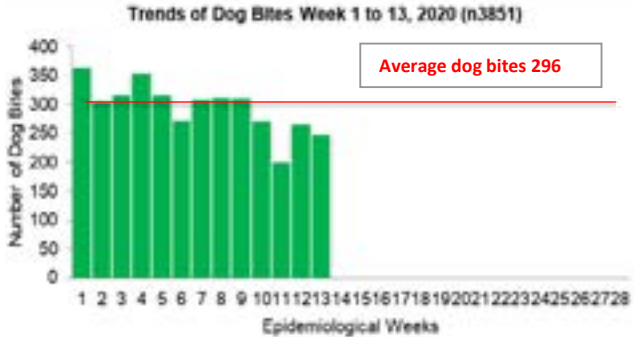
- 27 confirmed cases of COVID–19 were reported in the week under review from Lusaka (25)province and on the Copperbelt (2) province.
- There have been no deaths recorded from the COVID–19 cases.
- The confirmed cases are in quarantine at Levy Mwanawasa Hospital and Masaiti district hospital respectively and are receiving medical care.
- A total of 3,142 high risk persons are under observation, this includes travelers from high risk countries as well as persons that may have come in contact with the confirmed cases.
- The University Teaching Hospital Virology Lab (UTHVL) is conducting tests for suspected cases and has to date received 475 samples, 400 have been processed with 29 confirmed positive for COVID-19.

Non-Bloody Diarrhoea



- Cumulatively, 181,621 cases of non-bloody diarrhea were reported from week 1 to week 13.
- The highest number of cases reported are from Central province representing 15.8% (28,664).
- The highest cumulative incidence reported is from Central province at 1,653 per 100,000 population.

Dog Bites



- Cumulatively, 3,851 dog bites have been reported from Week 1 to Week 13.
- Dog bites surveillance serves as a proxy for rabies surveillance both in human and animal health systems.
- Central province has recorded the highest number of dog bites representing 20% (790).

Global/Regional/Public Health Events (Cases/Case Fatality Rate)

Ebola	Measles	Cholera	Poliovirus (c VDPD)	CoronaVirus (COVID-
DRC : 3,453 CFR 66.0%	**DRC:** 29,981 CFR 1.30%	**DRC:** 4,998 CFR 1.30%	**Angola:** 131 CFR 0.0%	**Global: 724,042 CFR 4.7%**
		Moz: 313 CFR 4.2%	**DRC:** 108 CFR 0.0%	**Africa: 3,217 CFR 2.1%**

COVID-19 WHO African Region

- During the week under review 2 more countries (Guinea Bisau and Mali) have confirmed COVID-19 cases in the WHO African region bringing the total number of African country's with COVID-19 to 39.
- 2477 new confirmed cases of COVID-19 were reported across all affected countries in week 13, the highest number of new cases so far during a single week.
- Cumulatively, a total of 3,217 confirmed cases and 69 deaths have been reported in the WHO African region.
- In addition to sporadic importation of cases, the majority of the countries in the region are now experiencing local transmission of COVID-19,

Ebola Virus, DRC 2018-2020

- No new confirmed EVD case and no deaths were recorded from DRC outbreak in the week under review.
- Cumulatively, 3,453 suspected cases, 3,310 confirmed cases, 134 probable cases and 2,273 deaths (CFR is 66%) have occurred since the outbreak started earlier in 2018.
- The last day of the week under review marked the 40th consecutive day without recording a confirmed EVD case. This outbreak of EVD would appear to be coming under control.

***For more information look up the WHO Weekly Bulletin on Outbreaks and Other Emergencies and for Global updates on the coronavirus

Public Health Actions

Circulating Vaccine Derived Poliovirus Outbreak

- All provinces are further encouraged to strengthen AFP surveillance using available technological tools and geo code all cases detected.
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- Provide weekly reports in IDSR reports of active searches including zero reporting in at risk districts, including ports of entry.
- Ensure epidemic preparedness measures for detecting cases, sample testing/transportation and managing cases are effected.
- All border districts to strengthen point of entry EVD screening including facilitation of cross boarder monitoring and reporting of suspected EVD cases.

Heightened Surveillance in COVID– 19 High Risk Districts

- Surveillance (including Event Based Surveillance) is being actively conducted at POEs, health facilities, and sentinel sites.
- Screening facilities have been set up at POEs; additionally, screening is being done at the dry port in Makeni for all buses coming in from outside the country.
- Additional thermal scanners to be procured and placed at the POEs to avoid over-crowding and enhance social distancing; set up/identification of designated quarantine facilities to enforce guidelines on quarantine.
- Isolation facilities have also been set up in all high risk districts across the ten provinces;
- Provincial epidemic preparedness committees to engage all relevant government stakeholders and multisector partners required to prevent, control and stop transmission of COVID– 19.

Global Alert of the Coronavirus & Preparedness

- Orientation of staff at points of entry on COVID-19 in all provinces is being conducted in cascade
- Screening at all points of entry to be strengthened especially at international points of entry.
- Circulation of awareness materials to the public and health personnel is being done.
- Report all suspected patients to higher authority immediately.
- Daily monitoring & 14 day quarantine of all travelers from high risk countries is mandatory.
- Strengthen surveillance for all Influenza Like Illness (ILI) and Severe Acute Respiratory Illness (SARI)
- Case definitions to be made available and other IEC materials in health facilities and public places.
- A call centre has been established at ZNPHI and all queries should be channeled to the following numbers: **909/+260 96 4638726/+260 974493553/+260 95 3898941.**

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