TYPHOID IN ZAMBIA: AN ANALYSIS OF CASES REPORTED BETWEEN 2016 AND 2018

Research Article
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Citation Style For This Article: Katemba BM, Gianetti B, Groeneveld C, Musakanya KE. Typhoid in Zambia: An analysis of cases reported between 2016 and 2018. Health Press Zambia Bull. 2019; 3(4); pp 6-11.

Introduction
Typhoid fever is an acute, life-threatening, febrile illness [1]. In humans, Salmonella is categorized in two types: Salmonella enterica (S. enterica) low virulence serotypes that result in food poisoning and the high virulence serotypes known as Salmonella typhi (S. typhi) that cause typhoid. S. enterica also includes a group of serovars called S. paratyphi A, B and C that cause paratyphoid [2]. Typhoid has a case fatality rate of 1-4% in patients with appropriate therapy and can rise to 10-30% in untreated cases [3].

Globally, it is difficult to estimate the exact number of typhoid cases. According to the World Health Organization (WHO), the global typhoid fever burden ranges from 11 and 21 million cases and 128 000 to 161 000 typhoid-related deaths annually, and the burden of the diseases is skewed towards the middle and low income countries [4].

In developing countries typhoid is estimated to affect about 400,000 people annually with an incidence of 50 per 100,000 persons per year [5]. A number of typhoid outbreaks have been recorded in different African countries such as the Democratic Republic of Congo, Uganda, Malawi, Zambia, South Africa, Mozambique and the Ivory Coast [6]. Between January 2010 to September 2012, Zambia recorded a total of 2,040 typhoid cases with a case fatality rate of 0.5%. The disease mostly affected children less than 15 years with an even distribution of males and females. During this outbreak, most (83%) of the S. typhi isolates exhibited resistance to five core antimicrobials: ampicillin, chloramphenicol, streptomycin, sulfamethoxazole, and trimethoprim [7].

In 2017, a typhoid outbreak was reported in Mโปika district of Zambia with a total of 127 cases and one recorded death, translating to a case fatality rate of 0.8% (by May 2017) [8]. On 10 March 2017, the country recorded 28 cases with two typhoid related deaths in Luamala area of Solwezi district [9].

Previous reports have shown differing results in the number of typhoid cases reported from different parts of the country between 2016 and 2018. As such, this paper provides a consolidated trend analysis of typhoid cases between 2016 and 2018 in Zambia.

Methodology
Typhoid data was collected from the Integrated Disease Surveillance and Response (IDSR) system. Weekly IDSR data from 2016 to 2019 was entered and analyzed using Microsoft Excel and STATA 13. Trends of typhoid cases by province and year were presented using graphs generated in Microsoft Excel. The study used Tableau to show the spatial distribution of typhoid cases from 2016 to 2018. The study further utilized case reports generated during the outbreaks to supplement IDSR data and make recommendations.

Results
According to the IDSR, a suspected case definition of typhoid is; any person with gradual onset of steadily increasing and persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes abdominal pain and constipation. Based on the IDSR definition, Zambia recorded 414 suspected typhoid cases in 2016 with a total of 127 cases and one recorded death, translating to a case fatality rate of 0.8% (by May 2017) [8]. On 10 March 2017, the country recorded 28 cases with two typhoid related deaths in Luamala area of Solwezi district [9].

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Lusaka province had the highest number of typhoid suspected cases in 2017 and 2018 (Figure 3). In 2016, Northern Province had more suspected cases than Lusaka province. Central province reported zero suspected cases of typhoid in 2016 and 2018. Overall, Central province had the lowest suspected cases in the time series of 2016 to 2018 (Figure 3 & 4).
Figure 1 Suspected typhoid cases by year

Figure 2 Trend of suspected typhoid cases by epidemiological week
Trend analysis of typhoid cases by province (2016-2018)
Figure 3 Typhoid suspected cases by province

Figure 4 Map of suspected typhoid cases by province between 2016 and 2018 in Zambia
Discussion
This paper retrospectively investigated typhoid fever trends in Zambia using IDSR data. According to the findings, Zambia recorded more suspected cases of typhoid in 2017 compared to 2016 and 2018. There is no clear pattern of typhoid in Zambia suggesting the disease to be endemic. A sudden peak of suspected cases occurred between week 34 and week 35 each reported year. A study done in Delhi suggest that although the disease is endemic, the peak occurs in the hot days of summer [10]. Unlike Zambia’s observed situation, a seasonal pattern of the disease has become apparent in Malawi, A study done in 2015 showed that typhoid fever cases usually peak during the wet and dry season [11].

Despite all provinces recording suspected cases of typhoid fever, the study showed that Lusaka province, with 1,190 suspected cases, had the highest number of suspected cases. There is limited information on the actual risk factors for typhoid in Zambia; however, different studies have shown that typhoid fever is elevated in areas of low socio-economic status and high density populations. A study done in Malawi found that consuming water from a river and not washing hands after using the toilet were the main risk factors for typhoid. In Zimbabwe, water from shallow wells, boreholes and dams were contaminated with E.coli, indicating the possibility of further contamination with S. typhi [12].

Data providing a clear and representative picture of the samples sent for laboratory confirmation is yet to be obtained and validated. However, a typhoid outbreak investigation in Solwezi (Northern Zambia) in 2017 established that there was a critical need for laboratory investigation as patients presenting with malaria-like symptoms could also have typhoid fever [13]. Another study in Delhi established that correct diagnosis for typhoid fever is likely to be missed as patients often present with multiple clinical problems, requiring laboratory confirmation [14]. Therefore, typhoid fever suspected case reporting is prone to conflation by both over-counting and undercounting due to typhoid patients being falsely diagnosed with malaria and malaria patients being falsely diagnosed with typhoid.

Conclusion
According to data collected from the IDSR, typhoid fever is endemic in Zambia. Suspected cases did not follow any clear pattern in the last three years. There is need to further investigate the exact number of suspected cases that are laboratory confirmed and determine why certain suspected cases are not sent for laboratory investigation. It was clear in this study that Lusaka province suffered the highest number of typhoid suspected cases of all the provinces in Zambia. Finally, of the three years reviewed, the most suspected cases were reported in 2017 and lowest in 2016.
1. WER9313.Pdf. Typhoid vaccines: WHO position paper – March 2018
2. Kanungo, Dutta, and Sur, Epidemiology of Typhoid and Paratyphoid Fever in India.
5. Kariuki, Typhoid Fever in Sub-Saharan Africa.
7. Hendriksen et al., Genomic Signature of Multidrug-Resistant Salmonella Enterica Serovar Typhi Isolates Related to a Massive Outbreak in Zambia between 2010 and 2012.
8. OEW22-270262017.Pdf. Weekly bulletin on outbreaks and other emergencies
10. Gulati et al., Changing Pattern of Typhoid Fever.
11. Feasey et al., Rapid Emergence of Multidrug Resistant, H58-Lineage Salmonella Typhi in Blantyre, Malawi.