ZNPHI
ZAMBIA NATIONAL
PUBLIC HEALTH INSTITUTE

The Health Press

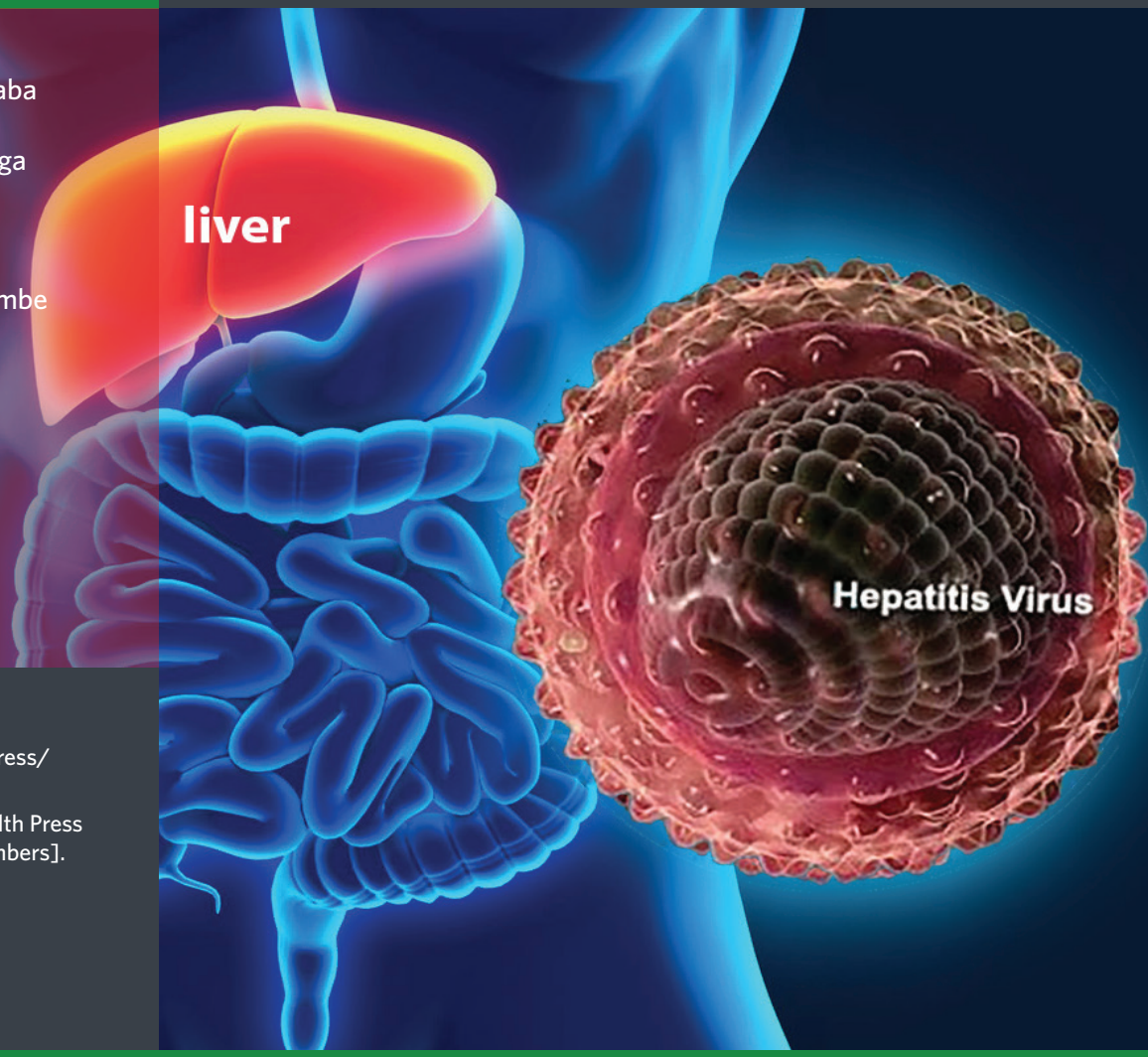
ISSN 2520-4378

VOL. 02
ISSUE 07
31 JULY 2018

ZAMBIA'S JOURNAL ON PUBLIC HEALTH, DISEASE SURVEILLANCE, PREVENTION AND CONTROL

The Health Press - Zambia is published by Zambia National Public Health Institute, Ministry of Health Zambia since Jan 31, 2017.

Address: Plot 13, Reedbuck Road, Kabulonga, Lusaka.



Email: editor.heathpress@znphi.co.zm
Website: http://znphi.co.zm/thehealthpress/
Suggested Citation:
[Author Surname, Initial].[Article title].Health Press Zambia Bull 2018;02(7):[inclusive page numbers].

TABLE OF CONTENTS

EDITORIAL

Hepatitis 1

ML Mazaba

LETTER TO THE EDITOR

Letter on invA gen and antibiotic susceptibility of Salmonella spp. isolated from commercially processed broiler carcasses in Lusaka District, Zambia 3

Blanco

PESPECTIVES

Full Immunisation Coverage Of Under Five Children And Its Correlates Among Women In Lubuto, Ndola, Zambia. 6

M Chofwe, M Kwangu

SURVEILLANCE REPORT

Influenza Bulletin 13

Republic Of Zambia (Ministry Of Health)

HEPATITIS

Editorial

By ML Mazaba

Zambia National Public Health Institute, Lusaka, Zambia.

Correspondence: Mazyanga Lucy Mazaba (mazyanga.mazaba@znphi.co.zm)

Citation style for this article: Mazyanga ML. Hepatitis. Health Press Zambia Bull. 2018;2(4); pp 1-2.

The month of April on its 28th Day in 2018, saw the celebration of World Hepatitis Day. This health day celebrated annually, came about after a resolution at the 63rd World Health Assembly in May 2010 where a global endorsement that the awareness on hepatitis is raised at national and international levels was given.

Hepatitis, which is the inflammatory condition of the liver, is caused by various elements including viruses, drugs, toxins and alcohol among other, with viruses being the major cause. Hepatitis caused by viral infections is categorized as hepatitis A, B, C, D and E caused by different viruses. The most common and of greater public health concern are hepatitis B and C. According to the WHO, about 350 million people in the global village are living with chronic hepatitis B or C causing cancer and leading to 1.34 million deaths per annum [1].

World Hepatitis Day aims to create global awareness on causes and solutions to hepatitis infection. This year the following facts were shared by the WHO:

- ***Viral hepatitis B and C are major health challenges***
- ***Viral hepatitis B and C are root causes of liver cancer***
- ***Timely testing and treatment of viral hepatitis B and C can save lives***
- ***Viral hepatitis causes debilitating diseases and also places a huge economic burden on families***
- ***Viral hepatitis has become a major killer due to a lack of global attention***
- ***Over the past 15 years, more and more people have been dying of viral hepatitis***
- ***At the same time, people are becoming newly infected with hepatitis***
- ***Hepatitis attacks the most vulnerable***
- ***You can help eliminate hepatitis***

The WHO this year emphasised and encouraged all to get TESTED, TREATED and CURED (TTC) against hepatitis. With active TTC, the over 90% infections due to Mother to Child and early childhood infections could be prevented. It has been observed that more than 60% of liver cancers caused by hepatitis B and C could have been resolved if treated timely. Amon the most vulnerable in relation to hepatitis B and C are children born to infected women, drug abusers, sexually active persons engaged in unprotected sex, men having sex with men, , persons who get tattoos and health workers [1].

The CDC reports that risk for chronic infection is related to age at infection and that approximately 90% of infected infants become chronically infected, compared with 2%–6% of adults. This situation could be prevented with vaccination [2]. The CDC has implemented in the United States and encourages other countries to increase viral hepatitis surveillance, improve access to prevention interventions, clinical care, and treatments as a way of controlling and preventing hepatitis [3].

Africa carries the larger proportion of morbidity and mortality due to hepatitis B virus [4], and Zambia has not been spared in the scourge of hepatitis infections and the complications resulting, more so among HIV infected persons according to Kapambwe et. al (2011) [2].

Globally, there are efforts to eliminate hepatitis as emphasised in the Global Hepatitis Health Sector Strategy that is aiming for “elimination of viral hepatitis as a public health threat” by 2030 [5]. Along this 2030 global goal, enhanced elimination efforts for hepatitis are being promoted under the broader remit of global Sustainable Development Goals (SDGs) [6].

The Health Press Zambia (THP-Z) reiterates and echoes the call by WHO that to prevent further spread and complications of hepatitis, we must all get Tested, and if infected, Treated and Cured. THP-Z also encourages the public to get vaccinated to control and prevent hepatitis infections. Get TTC is our call too!

LIST OF REFERENCES

1. World Health Organisation. World Hepatitis Day. URL: http://www.who.int/who-campaigns/world-hepatitis-day/2018

2. Centers for Disease Control and Prevention. Hepatitis. URL: https://www.cdc.gov/hepatitis/HBV/index.htm

3. Centers for Disease Control and Prevention. World Hepatitis Day. URL: https://www.cdc.gov/hepatitis/worldhepday.htm

4. Kapembwa KC, Goldman JD, Lakhi S, et al. HIV, Hepatitis B, and Hepatitis C in Zambia. Journal of Global Infectious Diseases. 2011;3(3):269-274. doi:10.4103/0974-777X.83534.

5. WHO (2016) Draft global health sector strategy on viral hepatitis, 2016–2021.

6. Griggs D, Stafford-Smith M, Gaffney O, Rockstrom J, Ohman MC, et al. (2013) Policy: Sustainable development goals for people and planet. Nature 495: 305–307. pmid:23518546

LETTER ON INVA GEN AND ANTIBIOTIC SUSCEPTIBILITY OF SALMONELLA SPP. ISOLATED FROM COMMERCIALLY PROCESSED BROILER CARCASSES IN LUSAKA DISTRICT, ZAMBIA

LETTER TO THE EDITOR

Blanco

1.Tropical Gastroenterology and Nutrition Group, University of Zambia, School of Medicine, Department of Internal Medicine Lusaka, Zambia

Dear editor,

I have read the article TM Shamaila, K Ndashe, C Kasase, M Mubanga, L Moonga, J Mwansa, BM Hang'ombe (2018) invA gen and antibiotic susceptibility of Salmonella spp. isolated from commercially processed broiler carcasses in Lusaka District, Zambia. Health Press Zambia Bull. 2018;2(6); pp 6-12. I would like to comment on the choices of approach and methods implemented in the project. In my view, these have rendered results that may lead to misinterpretations and unnecessary alarm in the media and among consumers.

As a first observation, swabbing of carcasses is not the usual choice method for detection and identification of Salmonella in meat samples. In processing plants, swabbing is used for estimating success of disinfection procedures on surfaces (e.g. cutting tables, workers' hands). Swabs are tested for S. aureus, Total Coliforms and E. coli, but not Salmonella [1]. The results are quantitative and expressed in CFU/surface area. Salmonella detection in food products is a qualitative method, in which the two possible results are "detected" or "unable to detect Salmonella" in a given mass of sample. Samples are normally taken from skin (neck, for example) and meat cuts, before and after going through the chiller [2], for more representative quantification of contamination throughout the process. The samples undergo an enrichment process, followed by successive inoculations in selective media, ending with confirmation of suspicious isolates and serotyping. The work on which the authors based their choice of swabbing the cloaca and visceral surfaces (sic) [3], reports washing of whole carcasses in buffered peptone water as a sampling method, not swabbing. Carcass washing was done because Northcutt et al. [3] evaluated the level of contamination on the carcass surface, but it is not usually implemented.

Secondly, the advantage of being able to use molecular procedures is to perform a test of high specificity at an earlier stage (e.g. from an enrichment broth), and faster than obtaining isolates in selective media and ulterior serotyping. Running PCR and microbiological studies simultaneously is not a sensible practice, unless in specific cases, such as the validation of the PCR method. If that was the objective of the work, then it was not clearly stated.

Finally, and most importantly, although the authors reported having serotyped the isolates identified as Salmonella spp., they did not mention the serovars to which the isolates belonged. Instead, they used the presence of the invA gen as a marker for Salmonella spp. The problem with this approach is that the invA gen is common to all members of the genus Salmonella [4], however some serovars of Salmonella found in chicken carcasses are very specific for chickens and do not represent a risk for human population (for example, Salmonella enterica subsp. Enterica serovar gallinarum).

In other words, this approach may have overestimated the actual risk to humans on those samples. If it is compulsory to follow the molecular diagnostic path, then a gen more specific to serovars of human interest should be targeted, as for example the fliC gen for Salmonella enterica subsp. enterica serovar typhimurium [4]. Figure 1 (modified from [5]) resumes this idea - whilst the PCR for gen invA helps to discriminate at the top of the hierarchy between Salmonella and other non-Salmonella genera, procedures to indicate risks to human health should be targeting genes at the serovar level (bottom of the diagram).

Sincerely

Dr Oscar Adrian Blanco (BVSc, PhD)
Poultry Veterinarian

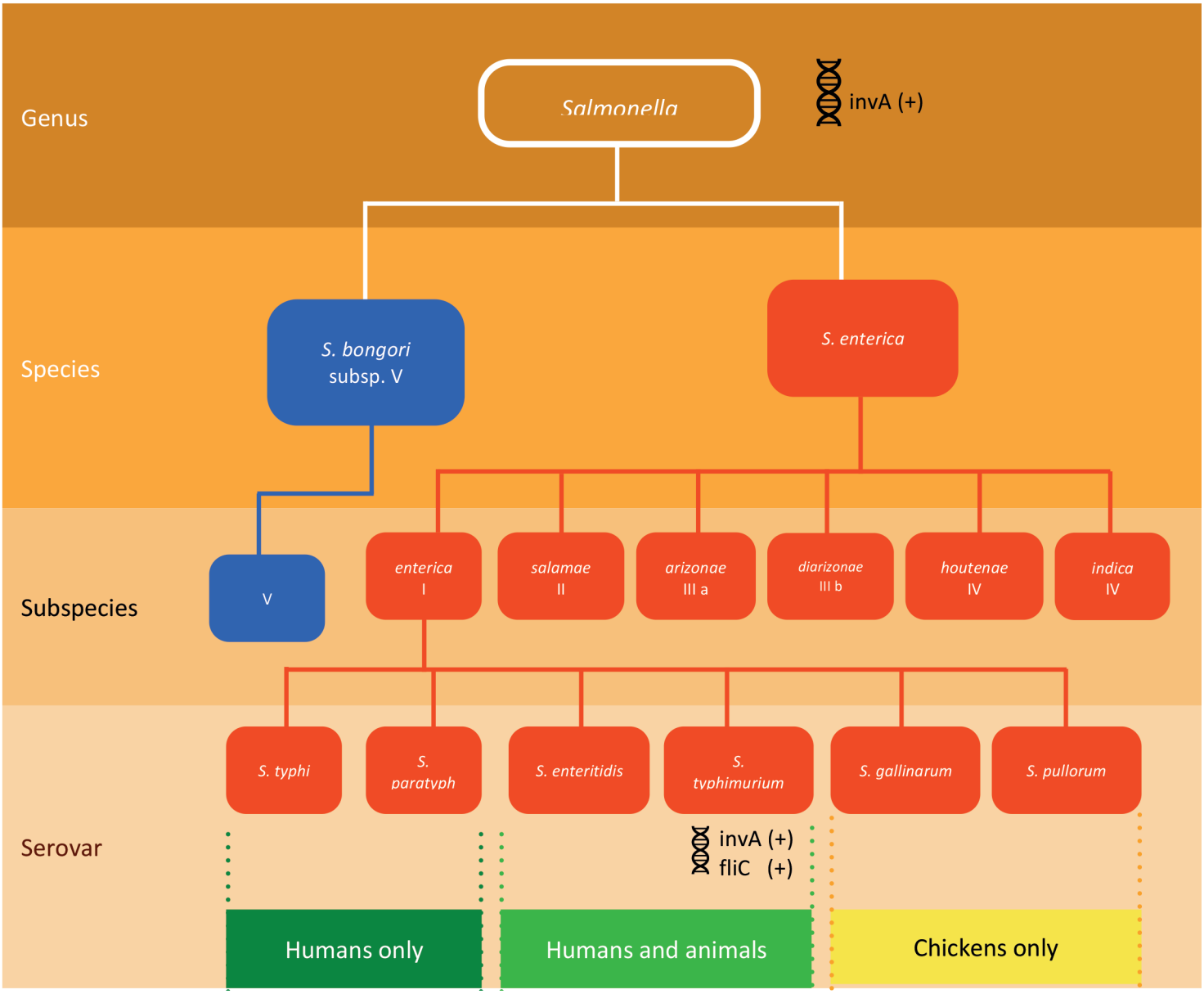


Figure 1. Classification of members of the genus Salmonella (after[5]). The gen invA is common to all members of the genus, even the serovars adapted to chickens. Detection of serovars pathogenic to humans by PCR may require more specific genes, such as fliC for Salmonella enterica subsp. enterica serovar typhimurium [4].

LIST OF REFERENCES

1. Vetdiagnostix (2010a) Poultry Processing Plant - Hygiene Analysis. Laboratory Manual, Poultry Health and Food Safety Management, Chapter 8. Horner RF and Last RD (contributors). Vetdiagnostix, Pietermaritzburg, South Africa.

2. Vetdiagnostix (2010b) Poultry Processing Plant -Product Analysis. In: Laboratory Manual, Poultry Health and Food Safety Management, Chapter 9. Horner RF, Last RD (contributors). Vetdiagnostix, Pietermaritzburg, South Africa.

3. Northcutt JK, Berrang ME, Dickens JA, Fletcher DL and Cox NA (2003) Effect of Broiler Age, Feed Withdrawal, and Transportation on Levels of Coliforms, Campylobacter, Escherichia coli and Salmonella on Carcasses Before and After Immersion Chilling. Poult. Sc. 82:169–173.

4. Jamshid A, Reza M, Samira B and Nik A (2009) Identification of Salmonella spp. and Salmonella typhimurium by a multiplex PCR-based assay from poultry carcasses in Mashhad- Iran. Int. J. Vet. Res., 3: 43-48.

5. Hurley D, McCusker MP, Fanning S and Martins M (2014) Salmonella–Host Interactions – Modulation of the Host Innate Immune System. Front. Immunol., 5: 1-11

FULL IMMUNISATION COVERAGE OF UNDER FIVE CHILDREN AND ITS CORRELATES AMONG WOMEN IN LUBUTO, NDOLA, ZAMBIA.

PERSPECTIVE

M Chofwe[1], M Kwangu[2]

1. MBchB Student at Michael ChilufyaSata School of Medicine, Copperbelt University, Ndola, Zambia
2. Department of Basic Sciences, Michael Chilufya Sata School of Medicine, Copperbelt University, Ndola, Zambia

Citation style for this article: Chofwe M, Kwangu M. Full Immunisation Coverage Of Under Five Children And Its Correlates Among Women In Lubuto, Ndola, Zambia. Health Press Zambia Bull. 2018 2(7); pp 5-16.

Child morbidity and mortality in most developing countries is mainly due to vaccine-preventable diseases and Zambia is not an exception according to WHO. Although numerous interventions have been made to increase immunisation coverage, full immunisation coverage in Zambia remains relatively low at 68%. This study examines the predictors of full childhood immunisation. A cross-sectional study of a representative sample of 364 women with children under the age of five years from households of diverse socio-economic levels in a peri-urban locality in Ndola, Zambia, was performed.

Only 44.8% of subjects were found to be fully immunised. Children aged 1-12 months were less likely to be fully immunised than younger or older children: 30.7% compared with 56.5% for children aged <1month, 50.0% for those aged 13-24 months, and 55.6% for children aged 25-60 months. Contrary to other studies, distance from health centre, and maternal education were not found to predict the outcome of the immunisation status of a child.

Immunisation coverage in Lubuto, Ndola, was much lower than found in other surveys done in the region. The differences found in immunisation coverage by marital status and age of the child should be considered by programme and policy makers if better rates of immunisation are to be achieved. In addition to this, younger mothers should be targeted.

Key words: Full immunisation, Correlates, Under-five Children, Lubuto, Ndola.

INTRODUCTION

Immunisation can control or eliminate life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year [1]. Not only is immunisation a cost effective method of preventing child morbidity and mortality, it also has a positive effect on economic development by reducing the cost of health care [2]. Morbidity and mortality caused by diseases that are preventable by vaccine are still very high in many developing countries around the world [3] and Zambia is not an exception [4]. Although no data are available on deaths caused by vaccine-preventable diseases, the figures pertaining to the average under-five mortality rate in Zambia have shown an impressive decline by 61 percent from 191 deaths per 1,000 live births to 75 deaths per 1,000 live births over the past two decades (1992 – 2014), but these rates are still very high [5].

In sub Saharan Africa, the proportion of unimmunised children ranged from as low as 4.6% in Malawi to 84.2% in Uganda in 2010[4]. Zambia adopted the UNICEF and WHO guidelines for childhood immunisation. These guidelines require that for a child to be considered fully immunized, he/she must receive BCG vaccination (against tuberculosis), three doses of DPT (diphtheria, pertussis, and tetanus) vaccine, three doses of polio vaccine, and measles vaccine by the age of 12 months or the child must be up to date with the vaccines he/she is supposed to have received for his/her age [6]. Overall, 68% of children in Zambia are considered fully immunised but these still remain relatively low as most children are still not fully immunised [1,5,7].

Despite many strategies to improve immunisation coverage, including the Expanded Programme on Immunisation, Universal Child Immunisation introduced to reinforce the Expanded Programme on Immunisation [8], Integrated Management of Child Illness programme and Reach Every Child/District adopted in 2003[9,10], and the Global Alliance for Vaccines and Immunisation (GAVI), a public-private global health partnership[11], immunisation coverage in Zambia has remained the same since 2007. Although there was an increase in immunisation coverage and community participation over the past decade because of these strategies, coverage could not reach optimal levels because of a number of problems [9,10]. A review of previous studies showed that many factors have been said to contribute to low immunisation rates in Zambia and many other countries. Among these, service factors [12,13], parental attitudes, and knowledge about immunisation [14] emerged as the most important categories. Mothers' responsibility for children's full immunisation is affected, among other things, by their level of education [5,6,15,16], access to media, use of maternal health care services, and economic status [2]. Place of residence [3,5,6,17] and distance from the nearest health centre [3,12,16,18] are among some of the other factors that are said to influence immunisation coverage in countries around the world. Mothers with high parity were less likely to fully immunise their children in Bangladesh[18], Jamaica, Trinidad and Tobago[19], and South Africa[20].

Every immunization programme should strive to provide quality services that are accessible, affordable, reliable, convenient, acceptable, and friendly and should try to obtain feedback from families and

community leaders as well as monitor missed and under-immunised children. This can assist in assessing and addressing the causes of missed opportunities and under immunization [21]. Therefore, the present study examined children's' full immunisation coverage and the demographic and socio-economic correlates of immunisation status among mothers in Lubuto, Ndola, Zambia.

METHODS

The current study utilized a cross-sectional design using a representative sample of women with chil¬dren under the age of five years from households with varying socio-econom¬ic levels in peri-urban locality in Ndola, Zambia.

Ndola is the third largest city in Zambia with population of 455, 194 as of the 2010 Census. It is situated in Copperbelt Province. Lubuto is one of the biggest peri-urban areas of Ndola city with its local clinic, Lubuto Health Centre, having a catchment area of about 48, 550 of which 6, 865 are children under five years as of 2014.

A systematic random sampling method was used to select eligible households from which women with children under five were sampled.

A sample size of 364 children aged under five years from the target popula¬tion was used for the study. This was determined using the statistical programme Epi Info version 7.1.3.3

Data was collected using a questionnaire developed to gather information on socio-demographic characteristics of participants, immunisation knowledge, and immunisation status of the child. The mothers where interviewed and data recorded accordingly. To assess the knowledge levels of mothers on immunisation various questions were asked, scored and recorded as poor, moderate or good. The immunisation status of the children was considered as the outcome (dependent) variable and was recorded as fully immunised when a child was up to date with the vaccines he/she was supposed to have received. In addition to the age of the mother, number of children, age of the last child, education level, religion, distance from health centre and knowledge on immunisation were other variables. Data collected was then entered into SPSS version 20 and later analysed. Cross tabulation was done and logistic regression was further done to establish the determinants of immunisation status.

Ethical Consideration

The research proposal was reviewed and approved by Tropical Disease Research Center (TDRC) Ethics Committee at Ndola Teaching Hospital. Then authorization document was obtained from the District Medical offices in Ndola.

RESULTS

A total of 364 women took part in the survey of which 84% were aged between 15 and 35. Only 343 participants were enrolled giving a response rate of 94.2%. 44.3% of children were fully immunised. Of the 54.5% of children who were not fully immunised, 52.2% were partially immunised and 2.3% had not received any vaccination. 1.2% of the children's information was not given.

Immunisation coverage varies with background characteristics. In Table 1, full immunisation was higher in children with mothers aged >36 (60.0%) as compared with mothers aged 15–25 years (37.6%) 26-35 years (46.2%). Children with mothers who were less likely to be fully immunised (33.8%) achieved full immunisation at 33.8% compared to mothers who were married, divorced, separated, or widowed (47.9%)

As shown in Table 1, although most children were aged between 1 month and 12 months, full immunisation was higher among those aged 25–60 months (55.9%). The percentage of full immunisation increased consistently with the increase in the number of children a woman had, from 34.6% for 1 child to 57.5% for 5 or more children.

Full immunisation coverage was lowest in children with mothers who had attended college/university (36.9%) and highest among those with mothers that never attended school 50.0%.

Almost all (96.7%) participants were Christians so no analysis by religion was performed. Of children who lived near the health centre, 46.7% were fully immunised compared with 41.0% of children who lived far from the health centre. Most of the mothers had poor knowledge about immunisation but 42.8% of children with such mothers were fully immunised compared with 51.5% of children with mothers with more knowledge (Table 1).

Table 1 shows frequencies and percentages of full immunisation for Specific Age according to Background Characteristics. After Chi square testing it was found that age of the mother, marital status, age of the last child and number of children a mother had some association with the immunisation status of a child.

evidence of improving population coverage of agreed standards and assessments. By 2025 80% of Member States will show evidence improving population coverage of agreed standards and assessments.

CONCLUSION

The theme of the World Health Day 2018 has put a spotlight on the need for renewed commitment to accelerate the efforts for moving towards Universal Health Coverage and the attainment of the Sustainable Development Goals. Although countries have made progress in improving coverage for life saving interventions, significant gaps still exist and many people still suffer financial cost. The call made to countries at the Tokyo Declaration in 2017 to accelerate progress towards UHC by making specific plans with indicators was timely. Using the existing implementation frameworks for UHC and the Global UHC monitoring framework by WHO and the World Bank, many countries can make a difference in improving health and equity. Moving towards UHC will involve ensuring adequate health care budgets, financial protection mechanisms, human resources, information systems, health infrastructure and health technologies and adequate stocks of essential drugs. WHO therefore remains committed to continue working with other partners in supporting efforts aimed at bringing quality healthcare services to the population in an equitable manner and to support monitoring of UHC. Universal Health Coverage is both technically and financially feasible and is the best investment for a safer, fairer and healthier world for everyone.

Table 1: Frequencies and percentages of full immunisation for specific age by background Characteristics

FULL IMMUNISATIONFOR AGE				
BACKGROUND CHARACTERISTICS	YES	NO	TOTAL (n)	P Value
AGE: 15 – 25	53 (37.6%)	88 (62.4%)	141 (100%)	0.030
26 – 35	67 (46.2%)	78 (53.8%)	145 (100%)	
36 – 45	30 (60.0%)	20 (40.0%)	50 (100%)	
46 - highest	1 (100%)	0 (0.0%)	1 (100%)	
Marital status				
Single	25 (33.8%)	49 (66.2%)	74 (100%)	0.037
Married	104 (46.8%)	118 (53.2%)	222 (100%)	
Divorced	10 (71.4%)	4 (28.6%)	14 (100%)	
Separated	10 (55.6%)	8 (44.4%)	18(100%)	
widow	3(27.3%)	8 (72.7%)	11 (100%)	
Age of last child:				
Less than 1 month	13 (56.5%)	10 (43.5%)	23 (100%)	0.001
1 month – 12 months	39 (30.7%)	88 (69.7%)	127 (100%)	
13 months – 24 months	45 (50%)	45 (50.0%)	90 (100%)	
25 months – 60 months	55 (55.6%)	44 (44.4%)	99 (100%)	
Number of children:				
1	37 (34.6%)	70 (65.4%)	107 (100%)	0.018
2	38 (42.2%)	52 (57.8%)	90 (100%)	
3-4	54 (52.9%)	48 (47.1%)	102 (100%)	
5-highest	23 (57.5%)	17 (42.5%)	40 (100%)	
Maternal Education:				
Primary school	29 (43.9%)	33 (56.1%)	66 (100%)	
Secondary school	60 (44.8%)	74 (55.2%)	134 (100%)	0.461
College/university	24 (36.9%)	41 (63.1%)	65 (100%)	
Never attended school	39 (50.0%)	39 (50.0%)	78 (100%)	
Distance from health center:	48 (41.0%)	69 (59.0%)	117 (100%)	
Far	78 (46.7%)	89 (53.3%)	167 (100%)	0.590
Near	26 (32.1%)	55 (67.9%)	81(100%)	
Not very far				
Knowledge:				
Poor	110 (42.8%)	147 (57.8%)	257 (100%)	
Moderate	39 (50.0%)	39 (50.0%)	78 (100%)	0.155
Good	2 (100%)	0 (0.0%)	2 (100%)	

N = 343, where N is for Total number of participants

Determinants of immunisation status

Multiple logistic regression analysis was used to identify the most relevant determinants of the immunisation of children under the age of five. Table 1 presents the results of the binary logistic regression analysis, with full immunisation for age as the dependent variable, after the categorical variables were identified.

The Table 2 shows that marital status and age of the last child were significant predictors of correct vaccination for the child's age. The odds ratio (OR) indicated that women on separation were 8.58 more likely to get their children fully immunised compared to those who were single.

The age of the child was strongly related to his or her immunisation status. Children aged 13 – 24 months were 0.36 times less likely to have been fully immunised than those aged less than one month.

Furthermore, maternal education and knowledge about immunisation had not shown significant influence on the odds of the child being correctly immunised. Similarly, age of the mother, number of children, religion and distance from health centre played no role in the odds of the child being fully immunised.

Table 2: Results for Logistic Regression Analysis of the determinants of child immunisation

BACKGROUND CHARACTERISTICS	ODDS RATIO (Confidence Interval 95%)
Marital status;	
Single	1*
Married	1.745 (0.41 – 7.49)
Divorced	2.962 (0.74 – 11.81)
Separated	8.580 (1.41 – 52.13)**
Widow	3.638 (0.70 – 18.84)
Age of Child;	
Less than 1 month	1*
1 month – 12 months	1.204 (0.46 – 3.14)
13 months – 24 months	0.363 (0.21 – 0.64) **
25 months – 60 months	0.792 (0.44 – 1.43)

** = Reference Category*

***= P value < 0.05 (significant)*

DISCUSSION

The full immunisation coverage in the present study was found to be 44.8%, which is lower than the provincial coverage of 81%, the national coverage of 68%, and much lower than the worldwide coverage of 84% [6, 22]. This shows that despite high coverage in urban areas, gaps are marked as the health services and supplies may not be adequate for immunising the large population in peri–urban areas. Thus, coverage in the poorest slums and peri urban areas within cities may be as bad as or even worse than in rural areas [17].

Most children had received some of the vaccines but were not completely immunised for their age. The issue of not completing recommended doses of vaccines is of much concern. A child is protected optimally from specific infections if the child received all of the doses. Skipping, delaying or missing a dose or doses makes the child vulnerable to the specific infection [23].

The major factors affecting full immunisation coverage among women, in the present study, were found to be; marital status, and the age of the child.

Most children in the current study were born to mothers who were married and had a better chance of being fully immunised. For single mothers, the immunisation rate was 33.8%, significantly less that for all other statuses combined (47.9%). The impact of marital status on the child's vaccination status has been reported elsewhere [24]. In addition Mapatano et al [25] stated that although marital status was not a predictor of immunisation in their study, a husband's involvement showed significant impact and thus involving the father will benefit immunisation programmes.

Age of the child also played a part in the outcome of the immunization status of a child. Most mothers are afraid of the side effects of the vaccines especially in the early days of life [3]. This may have explained the low levels of immunisation in the early years of life. This seems to reflect a gap in knowledge about vaccines [3]. Although not significant in this study, vaccination-related knowledge is a significant determinant of immunisation status, as observed by Kim et al [26]. Studies have shown that increasing maternal knowledge regarding vaccines improves immunisation status [27].

Maternal age and number of children had some association to the immunisation status

of the child but did not significantly contribute to the outcome of the immunisation status of a child in the current study.

Contrary to what was found in other studies, distance from health centre [12, 16, 18] and Maternal Education [24] were found not to be significantly associated with the outcome of the immunisation status of the child in this study. This could have been due to having multiple vaccination centers spread throughout Lubuto. This means shorter distance to the vaccination center and the clinic is less congested. In addition, Lubuto has Community Health Volunteers who constantly remind mothers to have their children vaccinated and assist health workers with educating women about various health-related topics including immunisation.

The most important limitation of the present study is that the gender of the child was not recorded while collecting the data. This shortcoming creates an unclear picture with regard to the role of gender as a factor that might have an effect on immunisation coverage among children under the age of five years and a study to explore the role of gender in immunisation coverage is recommended.

CONCLUSION

These findings show that with 44.8% full immunisation coverage, the main limiting factors for full immunisation in Lubuto, Ndola are marital status and age of the child. Programmes and policy makers should take these factors into account when designing strategies for enhancing the utilization of immunisation services.

ACKNOWLEDGEMENTS

The authors would like to acknowledge all the families who volunteered to provide data for this survey. We also thank the efforts of the field staff (field interviewers) for their consistent and tireless efforts in completing the study on time. Furthermore, our gratitude goes to the Copperbelt University Staff for their support.

LIST OF REFERENCES

1. WHO (2017): http://www.who.int/topics/immunisation/en/
2. Gurmu E, Etana D: Factors influencing Children's full immunization in Ethiopia. African Population Studies (2016) Vol. 30, No I: 2306 - 2317
3. Ibnouf AH, Van debBonrne H, Maare JAM: Factors influencing immunization coverage among children under five years of age in Khartoum State, Sudan: SA FamPract(2007): vol 49(8): 14
4. Wiysonge CS, Uthman OA, Ndumbe PM, Hussey GD: Individual and contextual factors assocated with low immunization coverage in sub-Saharan Africa A multilevel analysis. PLoS ONE (2012)7(5):37905
5. ZDHS (2007): Demographic and health survey 2007
6. ZDHS (2013-2014): Demographic and Health Survey 2013-2014, Preliminary report
7. UNICEF (2017): http://www.unicef.org/immunization/
8. Babaniyi O, Siziya S, Mukonka V, Kalesha P, Mutambo K, Matapo B and Musanje H: Child nutrition and health campaign in 2012 in Zambia: Coverage rates for measles, Oral polio vaccines, vitamin A and de-worming, The 0pen vaccine journal (2013) volume 6:1-8
9. MOH (2005): Zambia Immunization Programme Comprehensive Multi-year Plan, 2006-2010
10. MOH (2011): National Human Resources for Health Strategic Plan 2011-2015
11. GAVI (2009): Developing countries increasingly finance purchase of life saving vaccines. http://www.gavi.org/library/news/press-release/2009/developing-countries-increasingly-help-finance-purchase-of-life-saving-vaccines/
12. Halwindi H, Siziya S, Magnussen P, Olsen A: Factors perceived by caretakers as Barriers to health care for under-five children in Mazabuka District, Zambia: ISRN Tropical medicine (2013): volume 2013, Article ID 905836, 10 pages
13. Amin R Telma, Oliveira, Cunha M, Brown TW, Favin M, Cappelier K: Factors Limiting immunization coverage in urban Dilli, Timor-Leste, Global health: Science and practice(2013) 1(3):417-427
14. Odusanya O, Alufohai EF, Meurice FP, Ahonkhai VI: determinants of vaccination coverage in rural Nigeria: BMC Public Health(2008): vol 8:381
15. Waters HR, Dougherty L, Tegang S, Tran N, Wisonge CS, Long K, Wolfe ND, Burke DS." Coverage and Costs of Childhood Immunization in Cameroon: Bulletin of the World Health Organization (2004) 82, 668 – 675.
16. WadoYohannesDibaba, Afework MF, Hindin J M: Childhood vaccination in rural southwestern Ethiopia: the nexus with demographic factors and women's autonomy. Pan Afr Med J (2014)17 (supp 1): 9.
17. Atkinson SJ, Cheyne J, , Immunization in urban areas: Issues and strategies: Bulletin of the World Health Organization, (1994) 72 (2): 183-194
18. Rahman M, Obaida-Nasrin S: Factors affecting acceptance of complete immunization coverage of children under five years in rural Bangladesh: SaludPublicaMex (2010)52: 134-140
19. Bronte –Tinkew J, Dejong GF (: "Do household Structure and Household Economic resources Predict Childhood Immunization? Evidence from Jamaica and Trinidad and Tobago": Population Research and Policy Review(2005) 24 (I): 27-57
20. Fadnes LT, Jackson D, Engebretsen IM, Zembe W, Sanders D, Sommerfelt H, Tylleskar T. "Vaccination coverage and Timeliness in Three South African areas: A Propective Study" BMC Public Health II(2011), 404
21. Favin M, Steinglass R, Fields R, Banerjeed K, Sawhneye M: Why children are not vaccinated: a review of grey literature: International Health, (2012) vol 4: (4):229-238

22. WHO/UNICEF (2014): Global Immunization Data

23. Mutua MK, Kimani-Murage E, NgoiN,Ravn H, Mwaniki P, Echoka E. Fully immunized child coverage, timing and sequencing of routine immunization in an urban poor settlement in Nairobi, Kenya: Tropical Medicine and Health (2016) 44:13

24. Mukherjee S, MadhivananP,Li T, Albatineh A, Srinivas V, Jaykrishna P, Arun A, Krupp K. Correlates of completing routinevaccination among children in Mysore,India: Journal of Infection and Public Health (2015) 8, 62—71.

25. Mapatano MA, Kayembe K, Piripiri L, Nyandwe K (2008): Immunistion related knowledge attitudes and practices of mothers in Kinshasa, Democratic Republic of Congo: SA FamPract: vol 50 (2): 61a-e

26. Kim SS, Frimpong AJ, Rivers AP, Kronenfeld JJ. Effects of maternal and provider characteristics on up-to-date immunization status of children aged 19 to 35 months. Am J Public Health, 2007, 97:259–66.

27. Suarez L, Simpson DM, Smith DR. The impact of public assistance factors on the immunization levels of children younger than 2 years. Am J Pub Health 1997,87:845–8.

28. Devasenapathy N, Ghosh Jerath S, Sharma S, et al. Determinants of childhood immunization coverage in urban poor settlements of Delhi, India: a cross-sectional study. BMJ Open 2016; 6:e013015 :1-12

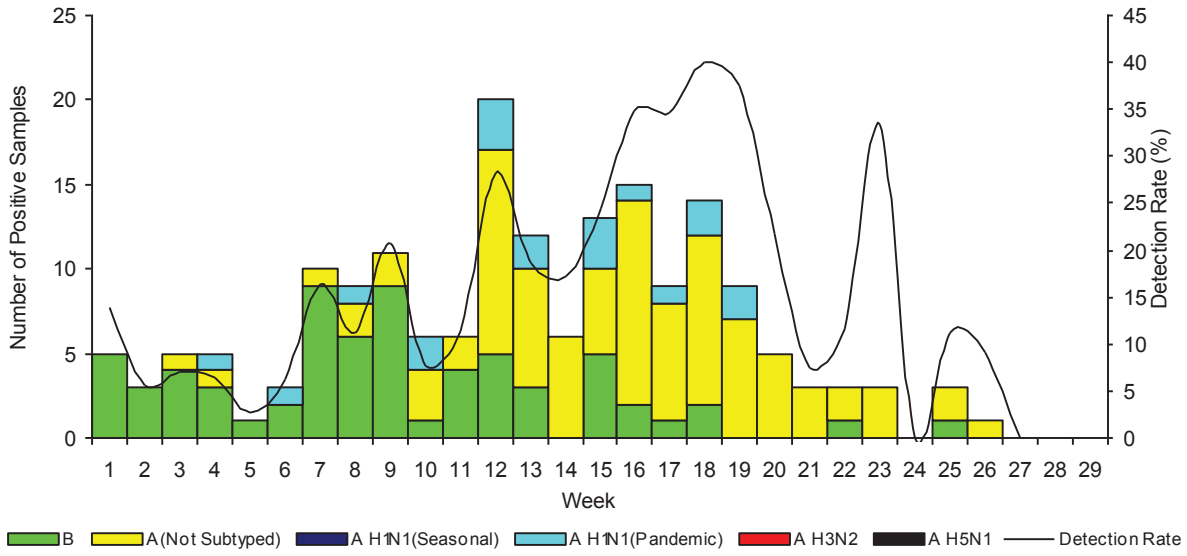
INFLUENZA SENTINEL SURVEILLANCE

Surveillance Report

Republic Of Zambia (Ministry Of Health)

Reporting Period: 01/01/2018 to 16/07/2018. ***Results until End of Epidemiologic Week:*** (2018) 29w

Number of Positive Samples by Influenza Types and Subtypes and Detection Rate by Week



Cumulative Number of Identified Influenza Types and Subtypes andTotal 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	32	50	0	15	0	0	**490**
SARI	21	30	0	4	0	0	**481**
Unknown	14	14	0	0	0	0	**169**
Total:	*67*	*94*	*0*	*19*	*0*	*0*	***1140***

Hospital/Clinic	B	A (Not Subtyped)	A H1N1 (Seasonal)	A H1N1 (Pandemic)	A H3N2	A H5N1	Total Samples Tested
Arthur Davison	8	11	0	1	0	0	99
Chipata Clinic	10	43	0	15	0	0	248
Ndola Central	10	1	0	1	0	0	180
New Masala	22	10	0	0	0	0	254
UTH Filter	2	6	0	0	0	0	119
UTH Pediatric	15	23	0	2	0	0	240
Total:	*67*	*94*	*0*	*19*	*0*	*0*	***1140***