Analysis of Sexually Transmitted Infections data in Chegutu district, Zimbabwe, 2015 to 2019: Secondary data analysis

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ABSTRACT

Introduction: Sexually Transmitted Infections (STIs) cause significant morbidity and mortality in newborns and adults and speed up transmission of the Human Immunodeficiency Virus (HIV). Chegutu District Health Information Software (DHIS2) data revealed that Chegutu District had a total new STIs incidence rate of 21 per 1000 in 2019 which was an increase from 16 per 1000 in 2015. We analysed the STIs/HIV data to determine the incidence of STIs, STIs/HIV coinfection, HIV testing uptake and STIs trends from 2015 to 2019 to understand the STIs burden and identify areas that need strengthening. **Methods**: We conducted secondary data analysis of STIs/HIV data presented in Chegutu District Health Information Software (DHIS2). Microsoft Excel was used to calculate STIs incidence rate, frequencies, proportions, trends, linear regression analysis and t-tests. **Results**: We analysed 25,586 STIs records from 2015 through 2019. The majority of STIs clients were females 13,916/25.586(44%). The most prevalent STIs from 2015 to 2019 were vaginal discharge syndrome 7,498 /25,586(29%). The 25-49-year age group had the highest STIs incidence from 13 per 1000 in 2015 to 17 per 1000 in 2019(R 2=0.87: p<0.01). The STIs incidence rate in females was 33 per 1000 in 2015 to 44 per 1000 in 2019 (R2 =0.96: p< 0.01). The proportion of HIV testing uptake in males was 44% in 2015 to 56% in 2019(R2=0.61 p=0.01). **Conclusion**: STIs remain a public health concern among all age groups in Chegutu District. Females were more affected by STIs than males. The age group 25 to 49 years was most affected by STIs.

KEYWORDS: Sexually Transmitted Infections, HIV, Secondary Data Analysis, Zimbabwe

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Introduction

Sexually transmitted infections (STIs) are infections that can be transferred from one person to another through sexual contact, vertically during pregnancy, or through blood or blood products [1,2]. Bacteria, viruses, and parasites are the most common pathogenic causes of STIs. STIs indirectly facilitate the transmission of the Human Immunodeficiency Virus (HIV), leading to abortions, infertility, foetal and neonatal deaths, and physical, psychological, economic and social consequences that compromise the quality of life of those infected [3,4]. Furthermore, STIs such as the human papillomavirus cause cervical cancer and could lead to cervical cancer-related deaths. Babies born with syphilis present with complications such as severe anaemia, meningitis, enlarged liver and spleen, jaundice, nerve damage, or skin rashes [5]. Condoms provide one of the most effective STIs prevention methods when used correctly and consistently. Hepatitis B and Human Papillomavirus are part of the routine immunization schedule for the prevention of viral STIs in Zimbabwe. Adult voluntary medical male circumcision, microbicidal use and partner treatment are other interventions used to prevent STIs [2].

Globally, STIs remain a major public health threat as an estimated one million new cases are reported per day [5]. In 2019, Hepatitis C and B accounted for three million new cases and 1.1 million deaths globally [6]. In 2020, an estimated 374 million new STIs cases of the four curable STIs which are chlamydia, gonorrhoea, syphilis, and trichomoniasis were reported globally [2]. The incidence of most other STIs is plateauing globally, except for slow declines in congenital syphilis which accounted for 473 cases per 100 000 live births in 2020. Each year, human papillomavirus (HPV) infection is linked to over 311,000 cervical cancer deaths globally [2]. In Africa, 95.9 million new cases of the four curable STIs were reported in 2020, representing 25.6 % of the global STIs incidence [2] .

STIs programming in Chegutu District is one of the comprehensive HIV prevention strategies which include Social Behaviour Change Communication (SBCC), Voluntary Medical Male Circumcision (VMMC) services, Prevention of Mother-Child Transmission of HIV (PMTCT) services, condom promotion, Antiretroviral therapy (ART), Pre-exposure prophylaxis (PrEP), Post Exposure Prophylaxis (PEP), and targeting young people and key populations for prevention [7]. In Zimbabwe, the Ministry of Health and Child Care (MOHCC) recommends the integration of STIs/HIV services as STIs and HIV are interrelated [7]. In Chegutu District, healthcare services for the management of STIs are provided in the public and private sectors. In the public sector, services are available in all secondary and primary healthcare facilities' outpatient departments [3]. HIV testing services are offered as an option to all clients treated for sexually transmitted infections and clients can choose to opt in or out. Chegutu District employs syndromic sexually transmitted infection management, which is guided by the identification of consistent signs and symptoms rather than laboratory tests. Zimbabwe adopted the World Health Organization (WHO) flowcharts and HIV testing services algorithms to help health workers manage STIs [4]. STIs in children are diagnosed using syndromes such as urethral discharge syndrome or vaginal discharge syndrome. These are mostly related to sexual assault. STIs data is obtained from patients seen in the outpatient departments.

The 35 health facilities in Chegutu district report STIs data to the district. The nurse captures data on clients treated for sexually transmitted infections in the health facility's sexually transmitted infections register. At the end of the month, STIs data disaggregated by age group, sex, other forms of STIs and STIs syndromes which are urethra or vaginal discharge, genital ulcer disease, pelvic inflammatory disease, ophthalmia neonatorum are summarised into a paper-based Tally 5 (T5) form in duplicate. One copy of the Tally 5 form is kept in a file at the health facility and the second copy of the paper-based Tally 5 form is sent to the district. At the district, the District Health Information Office enters all the data into the electronic DHIS2 which allows the integration of all reporting systems. STIs/HIV integration data is captured in the health facility's HIV testing services register. Every month-end data is summarised onto a paper-based monthly return form which is sent to the District Health Information office which will enter the data into the electronic DHIS2. STIs/HIV data is collected as part of the larger health system data aggregation in the health system. STI data variables captured in DHIS2 include age groups 0-9 years, 10-24, 25-49 and 50 years and above, sex, types of STIs syndromes and other unspecified forms of STIS. The age groups are according to the Ministry of Health Child Care

classifications. STIs/HIV integration data variables that are captured include the total number of STI clients who had HIV tests and the total number of STIs clients who tested HIV positive. Every month, the consolidated STIs electronic data is transmitted by the District Health Information Office to the provincial and national levels.

Chegutu District Health Information Software (DHIS2) data revealed that Chegutu District had a total new STIs incidence rate of 21 per 1000 in 2019 which was an increase from 16 per 1000 which was recorded in 2015. The rising number of new clients being treated for STIs raised serious concerns that should be investigated and addressed. Moreover, STIs/HIV data has been collected routinely in Chegutu District without being analysed. Understanding the incidence of STIs, the STI/ HIV coinfection, HIV testing uptake and STIs trends in the district will assist in recognition of the STIs/HIV burden and the prevention and control effort that is required. We analysed STIs/HIV data in the Chegutu District to determine the incidence of STIs, the STIs/HIV coinfection, HIV testing uptake and STIs trends to identify areas that need improvement and strengthening.

Methods

Study design

We conducted secondary data analysis of STIs/HIV data presented from Chegutu District Health Information Software 2 (DHIS 2).

Study setting

The study was conducted in Chegutu district, Mashonaland West province in Zimbabwe. Chegutu is one of the seven administrative districts in Mashonaland West province. It has 25 urban wards which are surrounded by commercial farms, mining compounds and 29 rural wards. The district contains significant gold and platinum deposits. There are no tertiary colleges in Chegutu District. Commercial mining, indigenous companies, commercial farming, subsistence farming and artisanal mining are the sources of livelihood in the district. Artisanal mining is characterised by the frequent movement of people. A major trade route passes through the Chegutu District´s urban areas. A study reported that urban areas around trade routes are STIs hotspots due to the increased number of sex workers found on routes that are used by long-distance truck drivers. Moreso, truck drivers are a high STIs risk group due to multiple partners [2]. Commercial farming in the district is mainly driven by casual workers who are characterised by low levels of education. The district has one secondary-level hospital and 34 primary healthcare facilities which offer treatment services for STIs and HIV testing services in the outpatient departments. According to the Zimbabwe 2022 census results, Chegutu district serves a total population of 332,202 [8].

Study population

The study population were clients aged 0-9 years, 10-24, 25-49 and 50 years and above who were diagnosed with sexually transmitted infections from 2015 to 2019 in Chegutu District.

Data source

The STIs/HIV data was obtained from the District Health Information System (DHIS2), an electronic database in the Chegutu District. The 25,586 STIs data set was complete and was representative of all 35 health facilities in the district (private and public).

Variables

The variables that were analysed included data quality (completeness and representativeness), age groups (0-9 years, 10-24 years, 25-49 years, 50 years and above), sex (male or female), STIs syndromes (urethral discharge syndrome: males only, vaginal discharge syndrome: females only, genital ulcer diseases syndrome; males and females, pelvic inflammatory disease syndrome: females only, ophthalmia neonatorum: 0-9 years only both males and females and other STIs which are not specified in DHIS 2. For STIs/HIV integration, we analysed the number of STIs clients who were tested for HIV (by age groups (0-9 years, 10-24 years, 25-49 years, 50 years and above and sex: male or female) and the number of STIs clients who tested HIV positive (by age groups (0-9 years, 10-24 years, 25-49 years, 50 years and above and sex: male or female).

Data collection

A data abstraction tool designed by the researchers in Microsoft Excel was used to collect data. The STIs/HIV data was downloaded from District Health Information Software (DHIS2) as Microsoft Excel worksheets for the five years from 2015 to 2019.

Data analysis

Sexually transmitted infections classification was based on the syndromic classification of urethral discharge syndrome, vaginal discharge syndrome, genital ulcer disease syndrome, and lower abdominal pain syndromes [7]. Microsoft Excel was used to generate frequencies and proportions, means of demographic data which included age groups and sex for the 25,586 STIs records. Microsoft Excel was used to calculate the incidence rate of STIs in Chegutu. Chegutu District annual population estimates from 2015-2019 were obtained from DHIS2. The population estimates included age groups and sex. These age groups were under 1 year, 01-04 years, 05-09 years, 10-14 years, 15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, 55-59 years, 60-64 years, 65-69 years, 70-74 years, 75 years and above. The incidence rate was calculated as new STIs in the age group 0-9 years divided by the total population of people aged 0-9 years multiplied by 1000. The formula was applied for all age groups. Microsoft Excel was used to generate bar and linear graphs to demonstrate the trends in STIs and HIV testing uptake in the Chegutu District. Using Microsoft Excel, linear regression analysis was done to determine the significance of trends at a 95% confidence interval and 0.05 significance level. We assumed there was a linear relationship between the STI incidence rate or HIV testing uptake or HIV positivity rate (independent variables) and the years (2015 to 2019 (dependent variable). A t-test was used to test if there was a linear correlation between STI incidence rate HIV testing uptake or HIV positivity rate and the years (2015 to 2019). The t-test helped to determine if the linear relationship was statistically significant.

Permission and ethical considerations

Permission to conduct the analysis was granted by Chegutu District Medical Officer and Health Studies Office. Ethical approval for the study was obtained from Mashonaland West Provincial Medical Directorate Ethical Review Board. Since secondary data was used, no consent was sought as no personal identifying data was used in the analysis. Data was only shared with the responsible authorities.

Results

Demographic characteristics of STIs clients

A total of 25,586 records of STIs clients who were treated during the period from 2015 to 2019 were reviewed. The median age of the patients was 34 years, Interquartile range (IQR 20-43 years). The majority of STIs clients, 17,094/25,586 (67%) clients, were aged between 25 to 49 years. STIs clients aged between 10 and 24 years constituted 6,275/25,586 (24%). STIs clients aged 50 years and above were 1,747/25,586 (7%). Only 470 /25,586 (2%) of the STIs clients were aged below 0 to 9 years. The majority of STIs clients, 13,916/25,586 (54%), were females and 11,670/25,586 (46%) were males. Only 470/25,586 (2%) of the STIs clients were aged below 0 to 9 years (Table 1).

Sexually Transmitted Infections Prevalence

The most prevalent STIs in the district from 2015 to 2019 were vaginal discharge syndrome 7,498/25,586 (29%) followed by urethral discharge syndrome 6,968/25,586 27%). The least prevalent STIs was ophthalmia neonatorum with 374/25,586 (2%) (Figure 1).

Sexually Transmitted Infections incidence rate by age group

The age group 25 to 49 years had the highest STIs incidence rate which significantly increased from 13 per 1000 in 2015 and 2016, 14 per 1000 in 2017, 16 per 1000 in 2018 to 17 per 1000 in 2019 (R^2 =0.87: p< 0.01). The incidence rate in the age group 10 to 24-year was significantly increased from 5 per 1000 in 2015, 2016 and 2017, to 6 in 2018 and 7 per 1000 in 2019 (R^2 =0.89: p= 0.04) (Figure 2).

Sexually Transmitted Infections incidence rate by sex

Females had a higher incidence rate per 1000 than males over the five years. The incidence rate of STIs among females increased from 33 per 1000 in 2015, to 34 per 1000 in 2016, to 38 per 1000 in 2017, to 41 per 1000 in 2018 and 43 per 1000 in 2019 (R^2 =0.96: p< 0.01) and was statistically significant. STIs incidence among males increased from 22 per 1000 in 2015, to 23 per 1000 in 2016 and 2017, to 29 per 1000 in 2018 and decreased to 22 per 1000 in 2019 and was statistically significant (R^2=0.09: p< 0.01) (Figure 3).

HIV testing uptake by age in STIs clients

HIV testing was highest in the 10 to 24-year age group. HIV testing increased from 56% in 2015 to 63% in 2019 and the increase in HIV testing uptake was statistically significant (R^2 = 0.48: p< 0.01). In the 25 to 49 years age group, there was a gradual significant increase in HIV testing uptake from 38% in 2015 to 47% in 2018. However, HIV testing uptake decreased to 43% in 2019 (R^2=0.47: p-<0.001). In the 50 years and above age group, HIV testing increased from 26% in 2015 to 40% in 2019 and was statistically significant (R^2=0.47: p<0.01).

HIV testing uptake by sex in STIs clients

The HIV testing uptake in females was 38% in 2015 and the trend showed more than a doubled increase in the proportion of STIs clients tested for HIV in females between 40% in 2016, and 85% in 2017. A sharp decrease to 48% was noted in 2018 and 2019 and was statistically significant (R^2= 0.05 p< 0.01). HIV testing in males increased from 44% in 2015, decreased to 43% in 2016, rose to 59% in 2017, dropped to 55% in 2018 and slightly increased to 56% in 2019. The increase in trends of HIV testing uptake by males was statistically significant (R^2= 0.608 p<0.01) (Figure 4).

HIV positivity by age group in STIs clients

HIV positivity in the age group 25 to 49 years declined from 19% in 2015, 16% in 2016, 5% in 2017, 13% in 2018, to 8% in 2019 and was statistically significant (R =0.79: p=0.01). HIV positivity in the 10 to 24-year age group declined from 13% in 2015, and 2016, 5% in 2017, and 9% in 2018 to 6% in 2019 and was statistically significant (R^2= 0.92: p=0.01).

HIV positivity by sex in STIs clients

HIV positivity rates in males were constant at 17% in 2015 and 2016. Declined to 9% in 2017, increased to 11% in 2018 and dropped to 6% in 2019. The decline in HIV positivity rates was statistically significant (R^2 =0.82: p= 0.01). HIV positivity rates in females declined from 18% in 2015 to 14 in 2016, 9% in 2017, 11% in 2018 and 7% in 2019 to 7% in 2019 (R =0.86: p=0.01) and were statistically significant (R^2 =0.86: p=0.01).

Discussion

The objective of the study was to determine the incidence of STIs, STIs/HIV coinfection, HIV testing uptake and the STIs trends in the Chegutu District. The STIs disease burden has been on a significant increase in Chegutu District over the five years 2015 to 2019. The high STIs incidence in the 10 to 24 year age group and 25 to 49 year age group could be attributed to being in the teenage and reproductive ages which engage in risky sexual relationships [9]. Our study findings are in contrast with findings by Torrone et al. (2018) who reported in a meta-analysis study that STIs prevalence was higher among 15 to 24 year olds than 25 to 49 to year-old women due to non-condom use [10]. The high incidence rate of STIs among the 10- to 24-year-old age group could be explained by inter-generational relationships where the young people cannot negotiate for safer sex thus exposing them to STIs. Similar findings, t in South Africa reported that young people who did not want to be seen purchasing condoms had limited access to condoms due to fear of being judged therefore exposing them to STIs [11].

Females had a significantly higher incidence of STIs compared to males over the five years. This could be explained by the fact that men and women have different susceptibility to STIs due to biological vulnerability as women have a longer contact period with pathogens after sexual exposure than men. Women have better health-seeking behaviours than men and therefore use reproduction health services more frequently hence, they have more chances to be screened for STIs [2]. . The findings were consistent

with findings in Ethiopia which reported that younger people in the age group of 20 to 34 years were the most affected by STIs with a larger proportion being females [12].

The most prevalent STIs in the Chegutu district from 2015 to 2019 were vaginal discharge syndrome followed by urethral discharge syndrome. Our findings are similar to findings reported in n Zimbabwe where the second aetiological cause of vaginal discharge was gonorrhoea. Gonorrhoea is more symptomatic hence women are more likely to present at a health facility [13]. The prevalence of vaginal discharge syndrome among women could contribute to ophthalmia neonatorum in babies. Our results are also consistent with findings in Ethiopia which reported that the most frequent STI syndromes were vaginal discharge in women and urethral discharge in men [12].

HIV testing uptake among all age groups and in both males and females was generally below This is despite the Ministry of Health and Child Care (MOHCC) increasing HIV testing strategies to identify people who are unaware of their status. Provider Initiated Testing and Counselling (PITC) is offered at all entry points into a health facility such as outpatients and maternal and reproductive services. MOHCC widened HIV testing choices through the introduction of the self-testing approach in 2016 [7]. Low HIV testing uptake delays access to HIV care and the country´s objective of reaching the first 95% will not be achieved. These findings on low HIV testing uptake are consistent with findings in Nigeria which found that HIV testing was low among adolescents and young adults aged 15 to 24 years [14].

HIV positivity was on a significant decline for the five-year duration in all age groups and both males and females. From 2017, HIV positivity among all age groups was below 13%. The decline in HIV positivity could be attributed to a combination of HIV prevention strategies which includes condom programming, Voluntary Medical Male Circumcision (VMMC), social behaviour change communication, elimination of mother to child transmission of HIV and antiretroviral therapy treatment as a preventive measure which were implemented in the country [7]. The low HIV positivity could also be explained by the decline in the national HIV prevalence among adults of 12.9% and provincial prevalence of 12.8% [15]. Our findings are contrary to earlier findings in Zimbabwe which reported an increase in HIV positivity among STIs clients from 2012 to 2015 [16].

Limitations

The factors contributing to a high incidence of STIs could not be ascertained as we used secondary data for our study. We could not verify the STIs/HIV data reported in DHIS2 due to the unavailability of resources to visit the 35 health facilities in the district.

Conclusion

STIs remain a public health concern among all groups age in Chegutu District. Females were more affected by STIs than males. The age group 25 to 49 years was most affected by STIs. The most prevalent sexually transmitted infections in Chegutu District were vaginal discharge syndrome and urethral discharge syndrome. HIV testing uptake and HIV positivity were decreasing in the district. We recommended that the district should strengthen the routine community campaigns on STI and HIV to empower the community with the knowledge that will lead to behaviour change and reduce STI and HIV incidence. We also recommend further studies to determine factors associated with contracting STIs among all age groups to come up with preventive strategies and reduce the increasing STIs incidence in the district.

What is known about this topic

- Understanding STI trends in the district will assist the district in HIV programming towards ending the HIV epidemic by 2030

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- The sexually transmitted infections syndromes, signs and symptoms, mode of spread and the prevention and control measures

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What this study adds

- The study highlighted the most prevalent STIs that have been demonstrated in other setting but has not been demonstrated in Chegutu District, Zimbabwe
- Understanding STIs incidence, STs/HIV coinfection, HIV testing uptake and STIs trends will assist districts in STIs/HIV programming towards reducing the double burden.
- From 2015 to 2019 there was an upward trend in STI infections in the district which is a cause for concern

Competing Interests

The authors declare no competing interests

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Availability of data and materials

The STIs/HIV data sets that were analysed are available from the corresponding author upon reasonable request.

Authors' contributions

Memory Chimsimbe: conception, design, acquisition of data, data analysis, interpretation of data, wrote the first draft of the manuscript. Pride Mucheto: conception, design, acquisition of data, data analysis, interpretation of data, wrote the first draft of the manuscript. Mujinga Karakadzai: conception, design, acquisition of data, data analysis, interpretation of data, wrote the first draft of the manuscript. Emmanuel Govha: reviewed several drafts of the manuscript for intellectual content. Tsitsi Patience Juru: reviewed several drafts of the manuscript for intellectual content. Notion Tafara Gombe: reviewed several drafts of the manuscript for intellectual content. Mufuta Tshimanga: reviewed several drafts of the manuscript for intellectual content. The manuscript was read and approved by all authors.

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Figures

Figure 1: Sexually Transmitted Infections Prevalence in Chegutu District, 2015 -2019

Figure 2: Trends of Sexually Transmitted Infections incidence rate by age groups in Chegutu District, 2015 to 2019

Figure 3: Trends of Sexually Transmitted Infections incidence rate by sex in Chegutu District, 2015 to 2019

Figure 4: Trends in HIV testing uptake by sex in Chegutu District, 2015 to 2019

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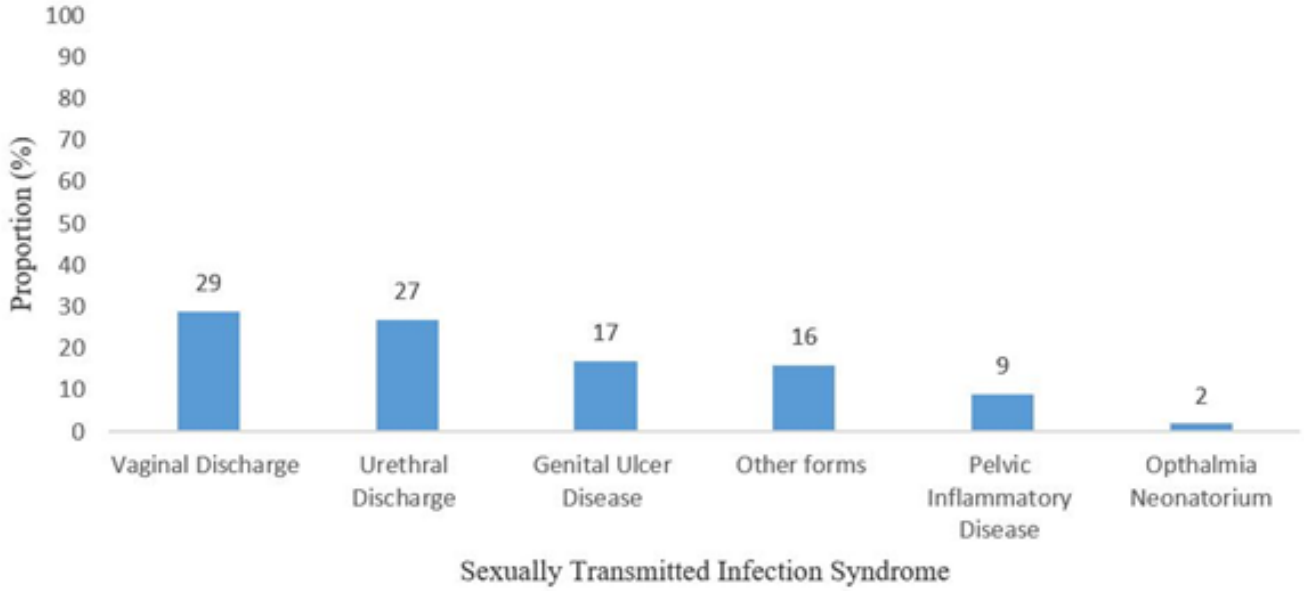

Figure 1: The Prevalence of Sexually Transmitted Infections Chegutu District, 2015 -2019, as reported in the DHIS 2

Figure 1: Sexually Transmitted Infections Prevalence in Chegutu District, 2015 -2019

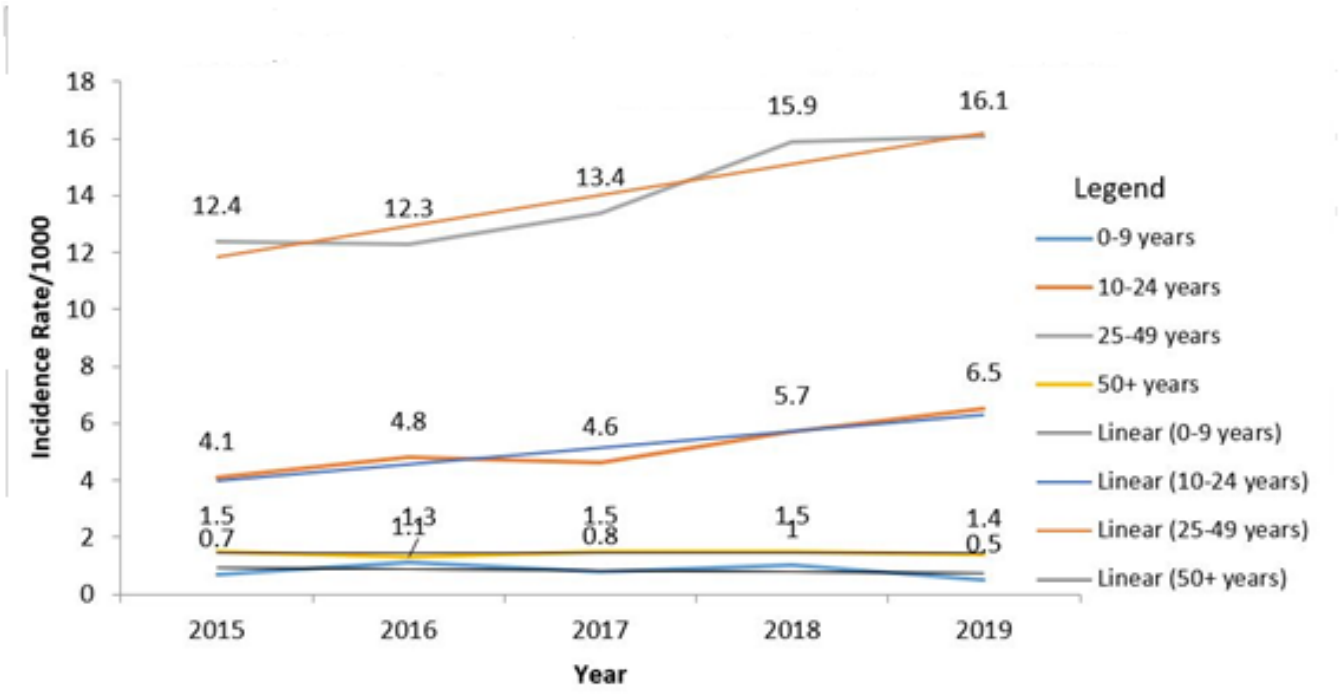

Figure 2: Trends in Sexually Transmitted Infections incidence rate by age groups, Chegutu District, 2015 to 2019

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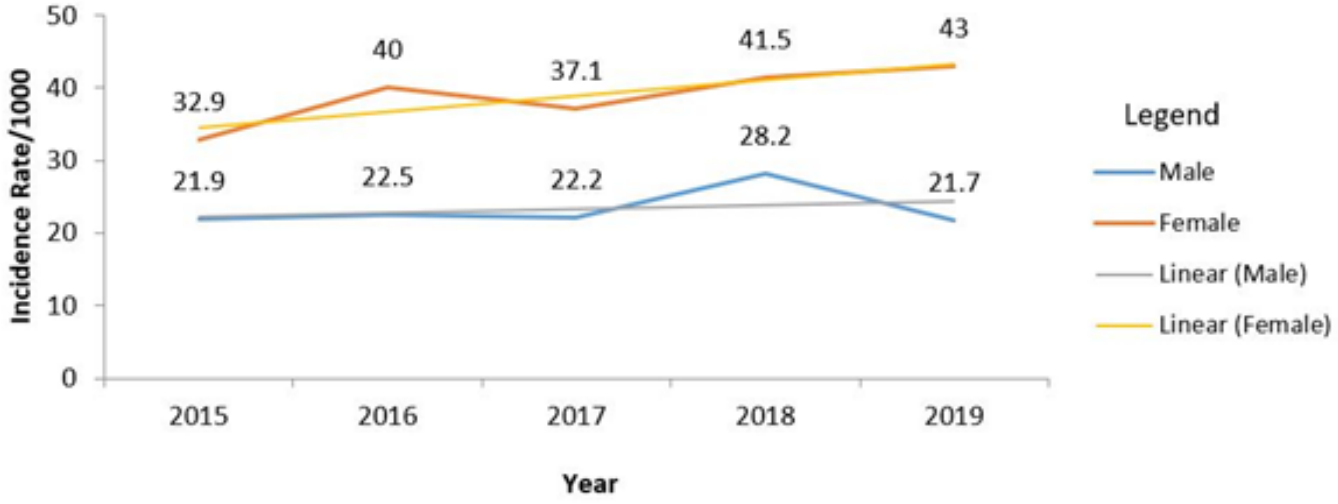

Figure 3: The trend of STI incidence rate by sex in the Chegutu district over 5 years, from 2015 to 2019

Figure 3: Trends of Sexually Transmitted Infections incidence rate by sex in Chegutu District, 2015 to 2019

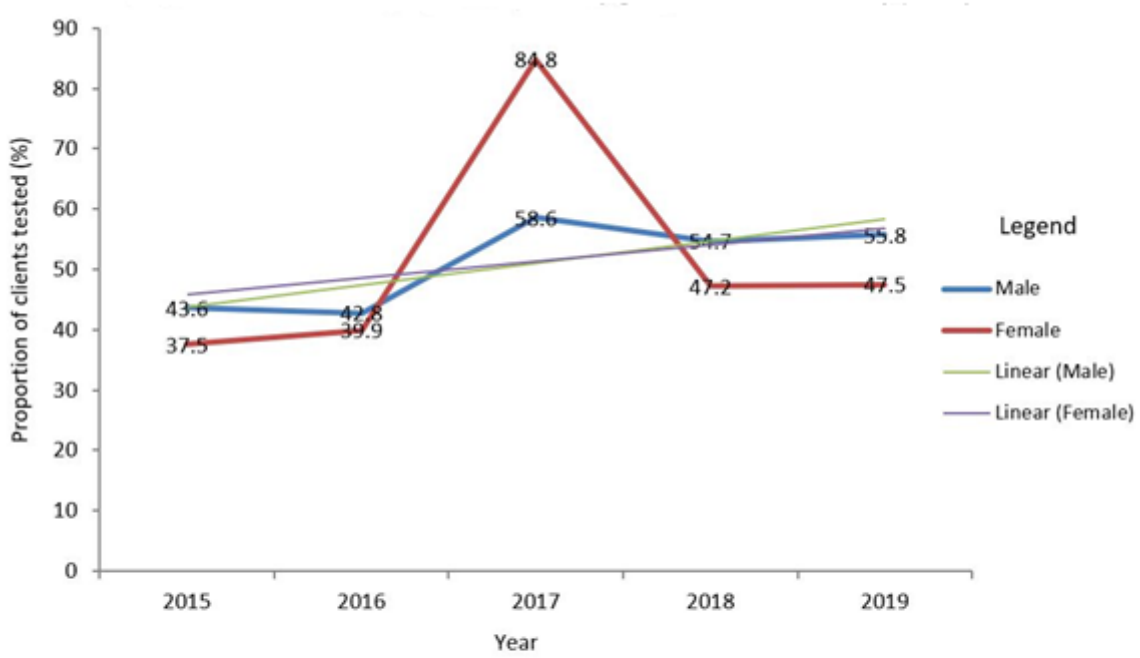

Figure 4: Trends in HIV testing uptake by sex in Chegutu District, 2015 to 2019

Figure 4: Trends in HIV testing uptake by sex in Chegutu District, 2015 to 2019