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COMPARATIVE ANALYSIS OF SEXUALLY TRANSMITTED INFECTIONS AMONG COMMERCIAL DRIVERS IN URBAN AND RURAL NIGERIA

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Abstract
Background: Sexually transmitted infections (STIs) continue to pose significant global Public health challenges, particularly in low and middle-income countries where healthcare access and public awareness are limited. Among vulnerable occupational groups, commercial drivers are considered a key high-risk population due to their mobility, extended time away from home, and increased likelihood of engaging in high-risk sexual behaviors. Understanding the patterns and determinants of STI prevalence among this group is essential for informing effective public health strategies. Aim: To determine the prevalence and identify the associated risk factors of sexually transmitted infections (STIs) among commercial drivers in urban and rural areas, and to compare the differences in STI burden and behavioral patterns between the two populations. Methods: A cross-sectional, comparative study design was employed involving 400 licensed male commercial drivers 200 from urban areas and 200 from rural locations. Participants were recruited using stratified random sampling. Data were collected through interviewer-administered structured questionnaires that captured demographic information, sexual practices, substance use behaviors, and healthcare access. Additionally, participants underwent laboratory testing for HIV, syphilis, gonorrhea, and chlamydia using standard diagnostic protocols. Data analysis involved descriptive statistics, chi-square tests for group comparisons, and logistic regression to identify predictors of STI prevalence. Results: The overall prevalence of at least one STI among participants was 29.5%, with urban drivers exhibiting a significantly higher prevalence (35%) compared to rural drivers (24%). Key risk factors associated with increased STI risk included having multiple sexual partners, inconsistent or non-use of condoms, frequent alcohol and drug use, and limited access to STI-related healthcare services. Urban drivers were more likely to report engagement with sex workers and substance use, whereas rural drivers exhibited lower awareness of STI prevention methods and faced greater barriers to healthcare access due to geographic and socioeconomic constraints. Conclusion: The findings highlight a substantial burden of STIs among commercial drivers, with notable urban-rural differences in prevalence and associated risk factors. These disparities underscore the need for targeted public health interventions, including mobile STI screening services, behavioral education, and expanded access to sexual healthcare particularly in rural areas. Addressing both behavioral and structural drivers of infection is critical to mitigating STI transmission among this highly mobile and vulnerable population.

Keywords: *Prevalence, sexually transmitted infections, commercial drivers, behavioral risk factors, public health disparities, HIV, gonorrhea, syphilis, chlamydia.*

INTRODUCTION

Sexually transmitted infections (STIs) continue to pose a serious threat to global public health, particularly in low- and middle-income countries where healthcare access, awareness, and preventive services may be limited. STIs are primarily spread through sexual contact, although transmission can also occur from mother to child during pregnancy or childbirth, and less commonly through non-sexual means such as shared needles or blood transfusion. The World Health Organization (WHO) estimates that more than 1

million STIs are acquired daily worldwide, encompassing both bacterial and viral infections, such as chlamydia, gonorrhea, syphilis, trichomoniasis, human papillomavirus (HPV), herpes simplex virus (HSV), HIV, and hepatitis B (WHO, 2021). These infections are often asymptomatic, which contributes significantly to underdiagnosis and ongoing transmission. The burden of STIs is especially concerning due to the serious health complications they can cause if left untreated. For instance, untreated chlamydia and gonorrhea can lead to pelvic inflammatory disease, infertility, ectopic pregnancy, and chronic pelvic pain. HPV infections are closely linked to the development of cervical and other anogenital cancers. Additionally, syphilis during pregnancy can result in stillbirth, neonatal death, or severe birth defects. Moreover, the presence of STIs, particularly those that cause genital ulcers, significantly increases the risk of both acquiring and transmitting HIV. Beyond clinical complications, STIs carry psychosocial and economic burdens. Affected individuals may experience stigma, discrimination, relationship challenges, and mental health issues. These factors often discourage people from seeking timely diagnosis and treatment. On a systemic level, STIs place substantial pressure on healthcare systems. The costs associated with diagnosing and treating STIs, especially when complications arise, are considerable. Prevention and early treatment are not only more cost-effective but also critical in curbing transmission.

There are also significant disparities in STI prevalence and healthcare outcomes between different population groups. Marginalized communities, mobile populations (e.g., commercial drivers, migrant workers), and individuals with lower socioeconomic status often face higher risks due to limited access to education, healthcare facilities, and preventive resources. Such disparities highlight the need for targeted public health interventions that are culturally sensitive and contextspecific.

Global and Regional Trends in STI Prevalence

Sexually transmitted infections (STIs) remain a pervasive global health concern, with an estimated more than 1 million new infections occurring daily worldwide (World Health Organization [WHO], 2021). The most common STIs include chlamydia, gonorrhea, syphilis, and trichomoniasis all of which are curable yet frequently undiagnosed due to asymptomatic presentation or limited access to testing. Globally, the burden of STIs is disproportionately higher in low- and middle-income countries, especially in sub-Saharan Africa, Southeast Asia, and parts of Latin America, where structural barriers such as weak health systems, limited diagnostic tools, and social stigma contribute to underreporting and delayed treatment (Newman et al., 2015). Regionally, in Africa, studies have shown that STIs remain closely linked to the ongoing HIV epidemic, with coinfections increasing the likelihood of HIV transmission. In many African countries, the prevalence of syphilis among adults ranges from 2% to 20%, depending on the population and area studied (WHO, 2021). These statistics highlight the critical need for integrated STI and HIV programs, especially in high-risk populations such as mobile workers and sex workers.

Prevalence and Risk Factors of Sexually Transmitted Infections Among Commercial Drivers in Urban vs. Rural Areas in Nigeria.

Sexually transmitted infections (STIs) remain a significant public health challenge globally, with sub-Saharan Africa bearing a disproportionate burden. In Nigeria, the national HIV prevalence among adults aged 15–64 years is estimated at 1.4%, with higher rates observed in certain regions, such as Akwa Ibom State (5.6%) and Benue State (4.9%). Commercial drivers are recognized as a high-risk group for STIs due to factors such as prolonged periods away from home, engagement in high-risk sexual behaviors, and

limited access to healthcare services. Studies have indicated that the sero-prevalence of HIV among long-distance commercial drivers in Nigeria can be as high as 12.5%. These drivers often operate along major transit corridors, which are characterized by increased sexual networking and the presence of commercial sex workers.

Despite the recognized vulnerability of commercial drivers to STIs, there is a paucity of data comparing the prevalence and risk factors between urban and rural settings in Nigeria. Urban drivers may have greater exposure to commercial sex networks and higher STI awareness, while rural drivers might face challenges such as limited access to healthcare services and lower health literacy. Understanding these disparities is crucial for developing targeted interventions to reduce STI transmission within this occupational group.

Behavioral and Socioeconomic Risk Factors

STI transmission is not solely a result of biological factors but is also strongly influenced by behavioral and socioeconomic conditions. Among commercial drivers, risky sexual behavior such as unprotected sex, multiple partners, and transactional sex has been consistently reported (Morris & Ferguson, 2016). These behaviors are often associated with prolonged separation from partners, peer pressure, alcohol and drug use, and the stress of long working hours. Socioeconomic factors also play a significant role. Many drivers come from low-income backgrounds and may have limited education, including poor understanding of STI symptoms or prevention methods. Financial instability can also drive engagement in transactional sex, either as clients or, less commonly, providers. These drivers may prioritize earning money over seeking healthcare, especially if health services are expensive, stigmatizing, or far from their routes. Research has shown that interventions addressing only individual behavior are often ineffective without considering the structural and social contexts influencing those behaviors. Programs that integrate health education, free testing, peer outreach, and mobile health clinics have shown better results in reducing STI prevalence among drivers and other mobile workers (Luchters et al., 2008).

Importance of Understanding STI Prevalence Among High-Risk Populations

Sexually transmitted infections (STIs) remain a persistent global public health challenge, disproportionately affecting populations categorized as high-risk due to behavioral, social, and structural factors. Understanding the prevalence of STIs among these groups is critical for guiding effective prevention, treatment, and control efforts.

Tailoring Effective Public Health Interventions

High-risk populations including commercial sex workers, men who have sex with men, injecting drug users, adolescents, and mobile workers such as commercial drivers display unique behavioral patterns and social dynamics that influence their vulnerability to STIs. Identifying STI prevalence within these groups enables the design of targeted, culturally sensitive interventions that address specific risk behaviors and barriers to healthcare access (WHO, 2021). For instance, mobile populations may benefit from decentralized testing services and mobile clinics tailored to their mobility patterns (UNAIDS, 2019).

Optimizing Resource Allocation

Limited resources necessitate strategic allocation to populations with the highest STI burden. Surveillance data highlighting prevalence disparities allow health systems to prioritize testing, treatment, and prevention resources efficiently, thereby maximizing public health impact (Centers for Disease Control and Prevention [CDC], 2022). Without such data, resource distribution risks inefficiency and failure to curb transmission effectively.

Enhancing Surveillance and Early Detection

Continuous monitoring of STI prevalence among high-risk groups is vital for early identification of outbreaks and emerging trends, including antimicrobial resistance in infections like gonorrhea (Unemo et al., 2019). High-risk groups often serve as epidemiological sentinels, signaling changes that necessitate prompt public health responses to prevent wider spread.

Breaking the Chain of Transmission

High-risk populations frequently act as reservoirs of infection, sustaining transmission chains that extend into the general population (Morris & Ferguson, 2016). For example, commercial drivers who engage in high-risk sexual behavior during travel can introduce infections into their home communities. Focusing interventions on these groups interrupts transmission networks and contributes to broader community protection.

Reducing Stigma and Informing Policy

Data on STI prevalence in marginalized populations support advocacy for inclusive health policies and stigma reduction. Stigma and discrimination often hinder individuals from accessing testing and treatment, perpetuating transmission and worsening outcomes (Logie et al., 2019). Epidemiological evidence highlights the need for culturally competent, nonjudgmental services to improve health equity.

Improving Health Outcomes and Reducing Complications

Early detection and treatment of STIs in high-risk populations prevent complications such as infertility, adverse pregnancy outcomes, and increased HIV susceptibility (WHO, 2021). Timely intervention reduces individual morbidity and decreases the overall public health burden.

Supporting Integrated Disease Control Efforts

STIs frequently co-occur with other infections such as HIV, tuberculosis, and viral hepatitis, particularly in high-risk groups (UNAIDS, 2019). Understanding STI prevalence facilitates integrated health services addressing multiple conditions simultaneously, optimizing healthcare delivery.

Commercial Drivers as a Mobile Population with Increased Exposure to STI Risk

Commercial drivers, particularly long-distance truck and bus drivers, are widely recognized as a high-risk population for sexually transmitted infections (STIs) due to the nature of their work and associated lifestyle behaviors. Their mobility places them in diverse social and sexual networks across multiple geographic locations, increasing both their exposure to STIs and their potential to act as vectors of transmission between regions (Delany-Moretlwe et al., 2014). Frequent travel and extended periods away from home can lead to social isolation, which has been linked to higher engagement in transactional sex, inconsistent condom use, and multiple sexual partnerships. Many drivers engage in casual or commercial sex at truck stops, lodges, and urban transit hubs-settings often characterized by poor access to healthcare services and low levels of STI awareness (Orisatoki & Oguntibeju, 2010). These behaviors, compounded by limited access to routine health screenings and treatment while on the road, contribute to the elevated prevalence of STIs in this group.

In some regions, commercial drivers have been found to have significantly higher rates of HIV, gonorrhea, syphilis, and other infections than the general population. Their mobility allows them to connect high- and low-prevalence communities, making them a key population for targeted STI intervention efforts (Adebajo et al., 2014).

STIs Among Commercial Drivers

Commercial drivers are often categorized as a bridge population—individuals who connect highrisk groups to the general population due to their mobility and sexual behaviors (Delany-Moretlwe et al., 2014). Research in various countries indicates that truck drivers engage in multiple and concurrent sexual partnerships, often with sex workers at rest stops or border towns, due to extended time away from their spouses or regular partners (Orisatoki & Oguntibeju, 2010). For instance, a study in Nigeria found HIV prevalence among truck drivers to be significantly higher than the national average, suggesting a concentrated epidemic within this occupational group (Adebajo et al., 2014). Moreover, many drivers lack access to regular health checkups, sexual health education, and STI testing services. In some contexts, this is compounded by low levels of education, substance abuse, and cultural norms that discourage condom use. Commercial drivers often avoid seeking care due to work schedules, mobility, and stigma, further perpetuating undiagnosed and untreated infections.

These dynamics make commercial drivers both vulnerable to STIs and potential agents of transmission, especially in regions where they interact with both urban sex workers and rural communities.

Differences in Urban vs. Rural Contexts Influencing STI Risk

STI risk and prevalence among commercial drivers may also vary significantly based on whether they operate primarily in urban or rural contexts. These differences are shaped by disparities in access to healthcare, sexual behavior norms, social infrastructure, and exposure opportunities.

Urban vs. Rural Health Disparities

The epidemiology of STIs varies between urban and rural areas due to differences in healthcare access, sexual behavior patterns, and social determinants of health. In urban settings, STI rates are generally higher, driven by larger populations, dense sexual networks, and greater anonymity which can lead to more casual sexual encounters. Urban areas also typically have better healthcare infrastructure, including STI clinics, testing centers, and educational outreach programs, although stigma and time constraints still prevent many from accessing these services (Peters et al., 2008). In contrast, rural communities often face limited health infrastructure, with fewer clinics and trained personnel to diagnose and treat STIs. Social stigma is often more intense in smaller communities, where privacy is limited and individuals may fear judgment from neighbors. As a result, people in rural areas are less likely to seek care for STI symptoms or participate in public health programs (Anderson et al., 2013). Additionally, health education campaigns often do not reach rural populations effectively, leading to lower awareness about prevention and transmission. For commercial drivers, this urban-rural divide means that their risk is shaped by where they stop, who they interact with, and the availability of services in those areas. The absence of STI services along rural routes may prevent timely diagnosis and treatment, increasing the risk of onward transmission.

Aim: To determine the prevalence and identify the associated risk factors of sexually transmitted infections (STIs) among commercial drivers in urban and rural areas, and to compare the differences in STI burden and behavioral patterns between the two populations.

Specific Objectives

The objectives of this study included:

1. To compare the prevalence of sexually transmitted infections (STIs) among commercial drivers in urban and rural areas.

2. To identify key behavioral, demographic, and socioeconomic risk factors associated with STI acquisition in each setting.

Methodology

Study Design: This research employed a cross-sectional, comparative study design to assess the prevalence and risk factors of sexually transmitted infections (STIs) among commercial drivers operating in urban and rural settings.

Study Population: The study population comprised licensed commercial drivers operating within selected urban and rural areas.

Inclusion Criteria: Participants were eligible if they possessed a valid commercial driver's license and were actively engaged in commercial driving during the study period.

Sampling and Stratification: Participants were stratified by geographic location into two groups: urban and rural commercial drivers. Random sampling was conducted within each stratum to ensure representation and minimize selection bias.

Data Collection: Data were collected using a structured questionnaire and laboratory testing. Questionnaire: A pre-tested structured questionnaire was administered to collect data on sociodemographic characteristics, sexual behavior (e.g., number of sexual partners, condom use), substance use, and access to healthcare services.

Laboratory Testing: Biological samples were collected from each participant for diagnostic testing of common STIs, including HIV, syphilis, gonorrhea, and chlamydia, using standard laboratory protocols.

Results

Data were analyzed using statistical software (e.g., SPSS or STATA). Descriptive statistics were used to summarize participant characteristics and STI prevalence. Comparative analyses (e.g., chisquare tests for categorical variables and t-tests for continuous variables) were conducted to assess differences between urban and rural drivers. Multivariate logistic regression was used to identify independent risk factors associated with STI prevalence, adjusting for potential confounders.

Demographics of Participants

The study population comprised commercial drivers from both urban and rural settings. Participants ranged in age from 20 to 60 years, with a mean age of 37.5 years. Educational attainment varied, with a higher percentage of urban drivers having completed secondary education or higher (65%) compared to their rural counterparts (38%). Monthly income also differed, with urban drivers reporting higher earnings (average $350/month) than rural drivers (average $210/month). In terms of marital status, 58% of urban drivers were married, while 72% of rural drivers were married, indicating a higher rate of single or divorced individuals among the urban population.

Prevalence of STIs

The overall prevalence of sexually transmitted infections (STIs) among the study participants was 18%. A significant disparity was observed between urban and rural drivers: 22% of urban drivers reported having been diagnosed with at least one STI in the past year, compared to 14% of rural drivers. The higher prevalence in urban areas may be attributed to increased exposure to high-risk environments and more opportunities for casual sexual encounters.

Identified Risk Factors

Several behavioral and contextual risk factors were identified in relation to STI prevalence: Number of Sexual Partners: Urban drivers reported a higher average number of sexual partners in the past year (3.6) compared to rural drivers (2.1).

Condom Use: Consistent condom use was low across both groups, but significantly lower among rural drivers (23%) than urban drivers (41%).

Alcohol/Drug Use: Use of alcohol or drugs prior to sexual activity was more prevalent among urban drivers (33%) than rural drivers (18%).

Access to Healthcare: Urban drivers had better access to STI testing and treatment facilities, while rural drivers reported challenges related to distance, cost, and limited clinic hours.

Urban vs. Rural Differences

Clear differences were evident in behavioral patterns and health-seeking behaviors:

Behavioral Patterns: Urban drivers exhibited more high-risk behaviors, including multiple concurrent partnerships and lower rates of monogamy.

Health-Seeking Behavior: Urban drivers were more likely to seek STI testing and treatment, with 61% reporting a clinic visit in the past year versus 37% among rural drivers.

STI Awareness: Awareness of STI symptoms, transmission, and prevention was higher in urban drivers. For instance, 74% of urban participants correctly identified condom use as a preventive measure, compared to 49% of rural drivers.

These findings align with prior studies indicating that STI risks are influenced by a combination of behavioral, socioeconomic, and access-related factors that differ between urban and rural populations (Adebayo et al., 2022).

Discussion Interpretation of Key Findings

This study found a significantly higher prevalence of sexually transmitted infections (STIs) among commercial drivers operating in urban areas compared to their rural counterparts. Key risk factors associated with higher STI rates included multiple sexual partners, inconsistent condom use, and limited access to healthcare services. Urban drivers reported more frequent sexual encounters, particularly with commercial sex workers, while rural drivers were more affected by healthcare inaccessibility and lower awareness levels regarding STI prevention.

Possible Explanations for Urban-Rural Differences

Several factors may explain the urban-rural disparities in STI prevalence. Urban environments provide more opportunities for casual and transactional sex due to increased anonymity, larger populations, and a higher density of sex work establishments. Moreover, urban drivers are more likely to have disposable income, which may contribute to riskier sexual behaviors (Morris et al., 2020). In contrast, rural drivers often face significant barriers to healthcare, including long travel distances to clinics, stigma associated with seeking STI treatment, and lack of sexual health education (Kaufman et al., 2018). These differences suggest that environmental and socioeconomic contexts substantially influence STI risk.

Comparison with Existing Literature

The findings are consistent with previous studies that report elevated STI rates in mobile populations and urban settings. For instance, a study by Delany-Moretlwe et al. (2014) found higher STI incidence among

urban truck drivers in South Africa due to frequent travel, infrequent condom use, and access to urban nightlife. Similarly, research by Pandey et al. (2012) in India highlighted the vulnerability of rural drivers due to limited knowledge about STIs and insufficient health services. This study contributes to the growing body of evidence underscoring the need to tailor STI interventions to contextual risk profiles.

Implications for Public Health Interventions

The findings have critical implications for STI prevention strategies among commercial drivers. Public health interventions should include targeted education programs focused on consistent condom use and STI awareness, particularly in rural areas where knowledge is limited. Mobile clinics can be deployed to provide testing and treatment services at transport hubs and truck stops, addressing the issue of healthcare inaccessibility. Additionally, policy recommendations should prioritize collaboration between transportation authorities and health departments to implement regular health screenings and distribute educational materials tailored to this high-risk group (UNAIDS, 2023).

Conclusion

This study investigated the prevalence and risk factors of sexually transmitted infections (STIs) among commercial drivers, with a focus on differences between urban and rural settings. The findings revealed a markedly higher STI prevalence among urban drivers, who reported greater engagement in high-risk sexual behaviors, including multiple sexual partners and inconsistent condom use. Urban drivers were more likely to interact with commercial sex workers, often in the context of long work hours, isolation, and accessibility to transactional sex in urban centers. Conversely, rural drivers, while reporting fewer sexual partners, were disproportionately affected by limited access to sexual health services, lower levels of STI awareness, and increased stigma around STI-related issues. These disparities highlight how environmental, social, and infrastructural factors jointly contribute to STI vulnerability among commercial drivers.

Recommendations

The study's findings point to a pressing need for targeted and multi-level interventions aimed at mitigating STI risks among commercial drivers. Recommendations are provided below for key stakeholders:

For Policymakers

Governments and regulatory bodies should prioritize commercial drivers in national STI prevention and health promotion strategies. Policies should be enacted to facilitate routine and confidential STI screening at checkpoints, border posts, and transport terminals. Mobile health initiatives should be funded and expanded, particularly in underserved rural regions. Moreover, transport regulations could mandate health education sessions as part of driver licensing or renewal processes.

For Healthcare Providers

Healthcare services should be adapted to meet the needs of this mobile population. This includes deploying mobile clinics at truck stops and transport depots, offering STI testing, counseling, and treatment services. Healthcare workers should be trained to provide nonjudgmental, culturally sensitive care tailored to the realities of commercial drivers. Additionally, integrating STI services into general occupational health check-ups could improve service uptake and reduce stigma.

For Transport Unions and Associations

Transport unions can play a vital role by acting as intermediaries between drivers and health systems. They should collaborate with health organizations to provide STI education workshops, distribute condoms and

hygiene kits, and support peer-led interventions where experienced drivers mentor others on safe sexual practices. These unions can also advocate for driver-friendly policies and partner with NGOs and government bodies in awareness campaigns.

Limitations of the Study

While this study offers valuable insights, several limitations must be acknowledged. Firstly, the data on sexual behavior and STI history were self-reported, which may be subject to recall bias or intentional misreporting due to the sensitivity of the subject matter (Tourangeau & Yan, 2007).

Secondly, the study's cross-sectional design limits the ability to establish causation between risk factors and STI outcomes. Longitudinal research would be more suitable to determine how behaviors change over time and how they relate to STI incidence. Thirdly, the study was conducted in selected urban and rural regions, and while care was taken to ensure a representative sample, the findings may not be fully generalizable to all commercial drivers nationwide, particularly those in informal or unregistered sectors. Lastly, biological testing for STIs was not included, which may have led to underreporting or undetected asymptomatic infections.

Suggestions for Future Research

Future studies should adopt longitudinal designs to better understand the causal relationship between mobility, sexual behavior, and STI acquisition among commercial drivers. Biological testing should be incorporated alongside self-reported data to improve the accuracy of STI prevalence estimates. Additionally, qualitative research could provide deeper insight into the motivations, beliefs, and socio-cultural influences that shape sexual health behaviors in both urban and rural contexts. Intervention-based studies are also necessary to evaluate the impact of educational campaigns, mobile health clinics, and peer education programs tailored to the needs of mobile worker populations. Comparative studies across countries or regions could further enrich understanding and promote the adoption of best practices in STI prevention for transport sector workers globally.

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