

# The Silent Sting: Customer Insights into Mosquito-Transmitted Infections among RUSUMO Nightclub Attendees.

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**Abstract:** Nightclubs serve as popular venues for social interaction and entertainment, yet they also present unique health risks, particularly concerning mosquito-transmitted infections in regions like Rusumo. The study investigated the behaviors and perceptions of nightclub attendees regarding these health risks. Through a structured survey among 320 participants, data was collected on frequency of nightclub visits, duration of stay, areas frequented within nightclubs, use of mosquito repellents, knowledge about mosquito-transmitted infections, and perception of infection risks. The findings revealed that a significant proportion of attendees visit nightclubs frequently, with 37.5% attending several times a week. The majority spend 1-2 hours per visit and prefer both indoor and outdoor areas. However, there is inconsistent use of mosquito repellents, with only 12.5% always using them. While a quarter of respondents perceived mosquito-borne infections as very serious, substantial knowledge gaps existed regarding preventive measures. These insights emphasize the need for targeted public health interventions to promote consistent use of repellents, enhance environmental controls, and educate patrons about the risks associated with nightclub environments. Such measures aim to mitigate health risks effectively while sustaining the vitality of nightlife as a social activity.

**Keywords—** Nightclub attendance, Mosquito-transmitted infections, Mosquito repellent use, Risk perception, Socio-behavioral factors, Rusumo nightlife.

## 1. INTRODUCTION

Mosquito-transmitted infections pose a significant public health concern worldwide, with millions of individuals affected each year [1]. While much attention has been directed towards preventing these infections in residential areas and outdoor environments, relatively little research has focused on their prevalence and impact within indoor social settings, such as nightclubs.

The studies by [2],[3], [4], [5] collectively highlighted the complex relationship between human behavior, social activities, and mosquito-transmitted infections. Jacobson's [2], work emphasized the potential for increased malaria risk among individuals attending night-time venues, while Murindahabi's [3] findings suggest that citizen-reported mosquito nuisance usually serves as an indicator for malaria vector hotspots. Moshi's [4] study further emphasized the role of outdoor social and cultural gatherings in exposing individuals to mosquito bites and malaria infection. Lastly, Macintyre's [5], research stresses the influence of wealth and education on mosquito-avoidance practices, with wealthier and more educated individuals being more likely to engage in such practices. These studies collectively discuss the need for a comprehensive understanding of the social and environmental factors that contribute to mosquito-transmitted infections, particularly in the context of night-time social activities.

Research on the impact of mosquito bites on quality of life and outdoor activities in New Jersey found that residents reported an average of 7.1 bites per week, with 59.5% experiencing interference with outdoor activities [6]. A study on a British youth expedition to Alaska, however, found that the impact of bites on expedition activities was lower than expected [7]. In a low-transmission setting in Namibia, individuals attending night-time venues were found to have higher rates of malaria infection, with outdoor livelihood activities and lack of protective measures being risk factors [2]. A more recent study has explored the narratives and ethical relations in the encounter between tourists and mosquitoes, emphasizing the need for a post-anthropocentric approach [8-10].

The nightlife scene in Rusumo is a vibrant and popular aspect of the local culture, attracting a diverse clientele. [11] highlighted the significance of nightlife as a social and cultural phenomenon, emphasizing its role in facilitating social interactions and offering a range of activities. This is consistent with [12, 13] discussion of the changing nature of the social cultural environment in modern Russia. The role of nightclubs as a form of leisure and their influence on social and cultural life is further explored by [13], who described the historical development of club culture in the region. The impact of nightlife on the social and cultural development of the area is also evident in [14] exploration of the social and cultural problems of socializing, which are likely influenced by the experiences and interactions in nightclubs.

The growing concern of mosquito-transmitted infections among nightclub attendees in Rusumo is a significant public health issue. This is particularly relevant in light of the increasing prevalence of mosquito-borne diseases in the region, as highlighted by [15] and [16]. The lack of knowledge and preventive measures among the community, as well as the potential for the introduction of new viruses, as discussed by [17], further exacerbate the situation. The emergence of Chikungunya virus, a particularly concerning mosquito-borne disease, as noted by [18], emphasized the urgency of addressing this issue.

A range of studies have highlighted the need for improved knowledge and awareness of mosquito-borne diseases among various populations. [19, 20], they both found low levels of awareness and knowledge about these diseases, with Shidaraddi [19], specifically noting poor understanding of transmission and breeding places. [21, 22], further emphasized the importance of community knowledge and attitudes in controlling mosquito-borne diseases, with [21], noting limited understanding of the role of mosquitoes in disease transmission and [22] highlighting the need for awareness of the risks posed by livelihood and social activities. These findings stress the importance of understanding customer insights into mosquito-transmitted infections among Rusumo nightclub attendees, as it informs targeted educational campaigns and preventive measures.

Research has identified several risk factors for mosquito-transmitted infections in nightclub settings. Outdoor areas, such as those found in night-time venues, have been associated with increased malaria risk due to the potential for mosquito exposure [2]. Proximity to water bodies, a common feature of outdoor areas, sometimes create potential mosquito breeding sites, particularly in residential areas with high numbers of discarded containers [23]. Limited awareness and prevention measures, including lack of protective measures and not seeking care for fever, have also been linked to increased malaria risk [2]. Increased awareness and perceived risk of mosquito-borne diseases, such as dengue virus, have been associated with more effective prevention behaviors, such as removal of standing water [24]. However, knowledge of mosquito-borne diseases can vary among individuals, with predictors including education level, occupation, and source of information [25].

The existing literature on community perceptions of mosquito-borne diseases highlights a significant gap in knowledge, particularly in urban and peri-urban areas of India. Studies by [15, 20, 26, 27] all highlighted the need for increased public awareness and education on the seriousness of these diseases, as well as the importance of community participation in prevention and control efforts. However, these studies do not specifically address the perspectives and experiences of nightclub patrons, a key demographic in the spread of mosquito-transmitted infections. Understanding their insights is crucial for designing effective prevention and intervention strategies in this setting.

Preventive behaviors among nightclub attendees in Rusumo boarder, Tanzania, to mitigate mosquito bites and mosquito-borne diseases during nightlife activities are influenced by a range of factors which includes wealth and education, with wealthier and more educated individuals being more likely to engage in mosquito-avoidance practices [5]. Social and cultural gatherings, which are common in nightlife settings, can also increase exposure to mosquito bites [4]. However, these gatherings are also important for social cohesion, making it challenging to implement preventive measures [4]. Despite high coverage of core vector control interventions, gaps in protection, particularly when outdoors or away from home, have been reported [28]. These findings suggest that while some preventive measures are practiced, there is a need for more targeted interventions to address the specific challenges faced by nightclub attendees in Rusumo.

Despite the vibrant nightlife culture in Rusumo-boarder, there is a notable lack of understanding regarding the prevalence and impact of mosquito-transmitted infections among nightclub attendees. Mosquitoes, known vectors of diseases such as malaria, dengue fever, and Zika virus, poses a significant health risk in tropical regions like Rusumo. However, little attention has been paid to the specific dynamics of mosquito-borne diseases within the context of nightlife settings. Nightclubs in Rusumo serve as hubs for socialization and entertainment, attracting a diverse clientele who may be unaware of the potential health hazards posed by mosquito bites in these environments. Without adequate knowledge, preventive measures, and interventions tailored to the unique circumstances of nightlife patrons, there is a heightened risk of mosquito-transmitted infections spreading among Rusumo's population. Furthermore, the silent and insidious nature of mosquito-transmitted infections exacerbates the problem, as symptoms may not manifest immediately, leading to delayed recognition and treatment. This lack of awareness among nightclub attendees, coupled with inadequate prevention strategies, perpetuates the cycle of transmission and contributes to the burden of mosquito-borne diseases in Rusumo. Therefore, there is an urgent need to investigate customer perspectives on mosquito-transmitted infections among Rusumo nightclub attendees to fill this knowledge gap and inform targeted interventions. By understanding the perceptions, behaviors, and experiences of nightlife patrons in relation to mosquito bites and infections, effective strategies can be developed to mitigate the risk of transmission and promote healthier nightlife environments in Rusumo.

The aim of this study is to explore customer perspectives on mosquito-transmitted infections among Rusumo nightclub attendees by determining the extent of knowledge among Rusumo nightclub attendees regarding mosquito-transmitted infections, including awareness of specific diseases and modes of transmission, investigating the perceptions of nightclub patrons regarding the risks associated with mosquito bites and mosquito-transmitted infections within the nightlife environment and finally identifying the preventive measures practiced by Rusumo nightclub attendees to mitigate the risk

of mosquito bites and mosquito-borne diseases while engaging in nightlife activities.

The significance of the study lies in identifying gaps in knowledge, risk perceptions, and preventive behaviors and by doing so, this study can inform targeted health education campaigns aimed at reducing the transmission of mosquito-borne diseases in the community. The findings of this study can contribute to raising awareness among Rusumo residents about the risks of mosquito-transmitted infections, particularly within the context of nightlife activities and increased awareness can empower individuals to take proactive measures to protect themselves and their communities from mosquito bites and related illnesses. By focusing on customer perspectives, the study provides valuable insights that complement existing knowledge and contribute to the development of evidence-based strategies for disease prevention and control.

The remaining part of the paper is organized as follows: Methodology is presented in part II, while part III is occupied by results and discussion of the findings and finally conclusion is in part IV.

## 2. METHODOLOGY

The study was conducted in the following steps:

1. Development of research instruments: The structured questionnaire and in-depth interview guide were developed by the research team and the instruments were translated into Swahili and back-translated into English to ensure accuracy.
2. Data collection: The survey was administered to 320 respondents ranging from night clubs owners, service providers (bar maids or tenders) and customers (attendees/drinkers). The in-depth interviews were conducted to some respondents who are around Rusumo night clubs.
3. Data analysis: The quantitative data was analyzed using descriptive statistics analysis while qualitative data was analyzed using thematic analysis. Data analysis tools used in this study were Statistical Package for Social Sciences version 26.0 (SPSS v26.0) and Microsoft Excel.

## 3. RESULTS AND DISCUSSIONS

In this part the results and discussion of the findings are presented, they begin with simple demographic information of respondents followed by main indicating factors such in the form of Nightclub Attendance and Behavior, Knowledge and Awareness and Perceptions and Attitudes.

### 3.1 DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

This section presents general information of respondents such as age, gender of the respondents, marital status, education level and occupation of the respondents approached with

interview and questionnaires. All these information are shown in Table 1.

#### 3.1.1 Age of respondent

Table 1 shows the age breakdown of the 320 participants who responded to the questionnaires and interviews in the study the Silent Sting: Customer Insights into Mosquito-Transmitted Infections among Rusumo Nightclub Attendees. The largest proportion of nightclub attendees 140 (43.8%) were found to be in the 20-30 age group. This age group were typically the most active in nightlife and social activities and the high percentage suggests that younger adults were more likely to frequent nightclubs and thus are more exposed to the risk of mosquito-transmitted infections in this setting. Young adults often have more social engagements and are more likely to attend nightclubs, making them more susceptible to environmental risks present in these areas. Furthermore, Young adults (20-30 years old) being the largest group faces higher exposure to mosquito bites if the nightclub environment includes outdoor areas or if attendees spend time outdoors before or after visiting the club.

The second largest group is 31-40, accounting for 21.9% which indicates that middle-aged adults also frequent the nightclub, though less so than younger adults. This suggests that attending nightclubs isn't limited to young adults and that middle-aged adults also form a considerable portion of the clientele at RUSUMO. This age range usually include professionals and individuals with higher disposable incomes, allowing for frequent social outings, albeit with more health awareness compared to younger attendees. Compared to younger patrons who may be just starting their careers, individuals in their 30s and 40s usually have greater financial resources to spend on leisure activities like nightclub outings. By their 30s and 40s, many people have formed strong social circles. These established networks might provide opportunities and encouragement for going out together so Nightclubs offers a space to connect with friends and unwind in a relaxed atmosphere.

Persons below 18 make up 18.8% of the respondents, which is notable given that nightclubs often have age restrictions. This suggests that the venue may be accessible to younger people or it might reflect that the nightclub hosts a broader range of social events. For instance, the nightclub might hold events specifically targeted at younger audiences, such as teen nights or family-friendly gatherings, thereby attracting a more diverse age group. This accessibility indicates a deliberate effort by the venue to cater to a wider demographic, which includes hosting events that are suitable and appealing for teenagers and younger attendees.

The low percentage of attendees aged 41 and above reflects a common trend where older adults are less likely to participate in nightlife activities. Older adults generally have fewer social engagements at nightclubs and usually prefer different types of social activities or have health concerns that limit their participation.

In summary, the findings indicate that the largest group of attendees (43.8%) is aged 20-30, reflecting their high

engagement in nightlife and increased exposure to mosquito-transmitted infections. The 31-40 age group, comprising 21.9% of attendees, also frequents nightclubs significantly, driven by financial resources and established social networks. Interestingly, 18.8% of attendees are below 18, suggesting the nightclub hosts events appealing to younger audiences. Only a small fraction of attendees are aged 41 and above, as older adults generally have fewer social engagements at nightclubs.

### 3.1.2 Gender of the respondent

The gender distribution among attendees at Rusumo nightclubs provides insights into the demographics of individuals who frequent these venues. With 235 males comprising 73.4% of the total respondents, compared to 85 females making up 26.6%, the data illustrates a significant male predominance in nightclub attendance. This disparity usually stems from various social and cultural factors influencing nightlife participation. Historically, nightclubs have often been associated with male-dominated social scenes, where men always feel more comfortable or inclined to attend for socializing, entertainment, or networking opportunities. Additionally, societal expectations and gender norms might play a role, influencing both attendance patterns and perceptions of nightlife as a predominantly male domain.

On the other hand, the lower representation of females suggests potential barriers or preferences that deter women from frequenting nightclubs as frequently as men. Safety concerns, social stigma, or preferences for alternative social settings could contribute to this disparity. However, the presence of 85 female respondents indicates that women do participate in nightlife activities, albeit in smaller numbers compared to their male counterparts.

From a health perspective, the higher male attendance could have implications for public health interventions related to mosquito-transmitted infections. For instance, men who attend nightclubs may be more exposed to outdoor environments or areas with insufficient mosquito control measures, increasing their risk of bites and potential infections. Addressing this disparity through targeted health education and mosquito prevention strategies could help mitigate these risks and promote safer nightlife environments for all attendees, regardless of gender.

### 3.1.3 Marital Status of the respondents

The majority of nightclub attendees were found to be single (205), constituting 64.1% of the respondents. This high percentage suggests that single individuals are more likely to engage in nightlife activities and this is due to the fact that single individuals often have fewer family responsibilities and more free time, making them more likely to participate in social activities like nightclubs. The high percentage of single attendees suggests that this group may be more exposed to the risk of mosquito-transmitted infections due to their higher frequency of attendance.

Married individuals (80) account for 25.0% of the attendees. While fewer than singles, this group still represents a significant portion of the nightclub clientele. Married individuals may frequent nightclubs for socializing, special events, or to enjoy time with their spouses, although their participation might be less frequent due to family obligations.

Divorced individuals (35) make up 10.9% of the attendees, indicating that they also participate in nightlife, potentially as a way to socialize and reconnect. Divorced individuals might attend nightclubs to rebuild social networks, find new relationships, or simply enjoy a social environment.

While less frequent than singles, married couples still make up a noteworthy portion of the clientele. They usually attend for socializing, special events, or date nights, although family commitments could limit their attendance. Divorced individuals also participate in nightlife, possibly seeking to rebuild social circles, find new relationships, or simply enjoy a social atmosphere.

In general, understanding the relationship status distribution among attendees can help RUSUMO Nightclub develop targeted outreach or awareness campaigns about mosquito-borne illnesses. Focusing on single attendees, while also considering strategies for married and divorced patrons, could be an effective approach.

Table 1: Showing demographic information of respondents

Variable	Attribute	Frequency (n=100)	Percent (%)
Age	Below 18	60	26.7
	20-30	140	37.5
	31-40	70	20.3
	41-50	39	12.2
	Above 50	11	3.3
	<b>Total</b>		<b>320</b>
Gender	Male	235	73.4
	Female	85	26.6
	<b>Total</b>	<b>320</b>	<b>100</b>
Marital Status	Single	205	64
	Married	80	25
	Divorced	35	11
	<b>Total</b>	<b>320</b>	<b>100</b>
Education level	Certificate	50	15.6
	Above Certificate	105	32.8
	Others	165	51.6
	<b>Total</b>	<b>320</b>	<b>100</b>
Occupation	Bar tender/maids	52	16.3
	Business man/woman	80	25
	Drivers	150	46.9
	Others	38	11.8
	<b>Total</b>	<b>320</b>	<b>100</b>

### 3.1.4 Education level of the respondents

The distribution of education levels among customers of the Rusumo nightclub highlights a diverse range of backgrounds and qualifications. The data shows that 50 individuals (15.6%) have attained certificates, which typically include vocational or technical training, indicating a segment of attendees with specialized skills or certifications relevant to specific trades or professions. These individuals might view nightclubs as venues for relaxation and social interaction after work or training sessions.

In contrast, a larger group of 105 attendees (32.8%) have education levels above certificates, which could include diplomas, bachelor's degrees, or higher academic qualifications. This group includes professionals, graduates, and individuals with advanced skills, who participates in nightlife activities for networking opportunities, stress relief, or leisure. Their higher educational attainment also correlates with greater awareness of health risks and preventive measures, suggesting they may be more proactive in protecting themselves against mosquito-transmitted infections.

The category labeled as "Others," comprising 165 attendees (51.6%), represents persons with varied educational backgrounds that do not fit neatly into the certificate or above-certificate categories. This diverse group includes high school graduates, persons pursuing non-traditional educational paths, or those with vocational training not captured by the certificate category. Their presence emphasizes the inclusive nature of nightlife venues like Rusumo, which attract a broad spectrum of attendees from different educational backgrounds seeking social engagement and entertainment.

From a public health standpoint, understanding the educational diversity among nightclub attendees is crucial for developing targeted health interventions. Effective strategies could include educational campaigns tailored to different educational levels, promoting behaviors that reduce exposure to mosquitoes, and enhancing awareness about the risks of mosquito-transmitted infections among all patrons. By acknowledging and accommodating this diversity, nightclub environments can better support the health and well-being of all attendees.

### 3.1.5 Occupation of the respondents

The occupation distribution among RUSUMO nightclub attendees reveals diverse professional backgrounds, each contributing to the nightlife scene in unique ways. The largest group, comprising 150 individuals (46.9%), are drivers. This significant presence suggests that drivers, who often work irregular hours, might frequent nightclubs as a means of relaxation and socialization after their shifts. The demanding nature of their job, with long hours and the need for periodic breaks, could make nightclubs an attractive option for unwinding.

Business men and women make up the second largest group with 80 attendees (25.0%). This indicates that

professionals engaged in business activities find nightclubs appealing for social networking, stress relief, and leisure. Their participation in nightlife could be influenced by the flexible schedules and higher disposable incomes associated with entrepreneurial and business roles, allowing them to engage more freely in social activities.

Bar tenders represent 52 of the attendees (16.3%), reflecting a significant proportion of individuals who are part of the nightlife industry itself. This group likely frequents nightclubs either as part of their work environment or during their off-hours, seeking similar social environments to relax and connect with peers. Their involvement underscores the overlap between their professional and social lives within the nightclub setting.

The "Others" category includes 38 attendees (11.9%), encompassing a variety of occupations like Rusumo border employees, District Council employees, Migration and TRA officers to mention few. This group might include students, freelancers, and individuals from diverse fields who also contribute to the nightclub's demographic diversity. Their participation suggests that nightlife activities attract a wide range of people, regardless of their specific job roles, highlighting the inclusive nature of nightclub environments.

Overall, the diverse occupational backgrounds of RUSUMO nightclub attendees indicate that nightlife activities appeal to a broad spectrum of individuals seeking relaxation, social interaction, and entertainment, regardless of their professional commitments. This diversity necessitates inclusive and comprehensive public health strategies to address the risk of mosquito-transmitted infections among all attendees.

## 3.2 NIGHTCLUB ATTENDANCE AND BEHAVIOR

Nightclub attendance and behavior are crucial indicators in understanding the dynamics of social interaction and health risks among attendees. In the context of this study, this indicator explores how frequently individuals visit nightclubs, their typical behaviors during these visits, and factors that may influence their exposure to mosquito-transmitted infections which are all explained below.

### 3.2.1 Frequency of Club Attendance

The frequency of nightclub visits is a critical factor in understanding the social habits, lifestyle choices, and potential health risks among attendees. As shown in figure 1, According to the study, the majority of respondents visit the nightclub several times a week (37.5%), indicating a consistent engagement with nightlife activities. This group likely includes individuals who frequent the venue for socializing, entertainment, or relaxation on a regular basis, thereby potentially increasing their exposure to environmental risks such as mosquito bites. As one respondent was quoted:

*"...i go to Rusumo almost every weekend. It's a place to unwind*

*after a long week and catch up with friends..."*

Moreover, those who visit daily (6.3%) represent a smaller yet important segment. This frequency suggests a strong affinity towards nightlife culture, possibly driven by specific social or professional engagements. One respondent mentioned:

*"...I work nearby, so I often stop by RUSUMO after work. It's convenient and a good way to network with colleagues and clients in a relaxed setting..."*

Another respondent responded that:

*"...I work in the entertainment industry, so going to clubs daily is part of my job. It's where I network and promote events..."*

This group's high frequency of attendance highlights their prolonged exposure to environmental risks, such as mosquitoes, which might potentially increase their susceptibility to infections.

On the other hand, those who attend once a week (28.1%) or a few times a month (18.8%) demonstrated a more moderate participation in nightclub activities. This group include persons balancing nightlife with other responsibilities or preferences for less frequent social outings. As highlighted by one participant:

*"...I cross Rusumo border about once a week with friends because I'm driving tankers from Dar es salaam port to Kigali so when am about to cross the border I usually wait for let say one day so in order to not get bored I use that time to visit night clubs around Rusumo to catch up and enjoy some music..."*

Another respondent was quoted saying:

*"...I try to go to Rusumo nightclubs every Saturday night. It's a routine for me to unwind and have fun before starting a new week..."*

Likewise one respondent was quoted:

*"...I usually go to the club once a week, sometimes more if there's a special event. It's a way to relax and have fun with friends..."*

Those who attend rarely (9.4%) most of them have different priorities or constraints that limit their participation. And mostly they prioritize other activities or have concerns about health risks associated with nightlife environments. Like one older respondent was quoted saying:

*"...I used to go more often, but now I'm more cautious about my health. I only go occasionally for special occasions..."*

Another respondent noted:

*"...I rarely go to nightclubs anymore. It's not my scene these days, but I used to enjoy going occasionally when I was younger..."*

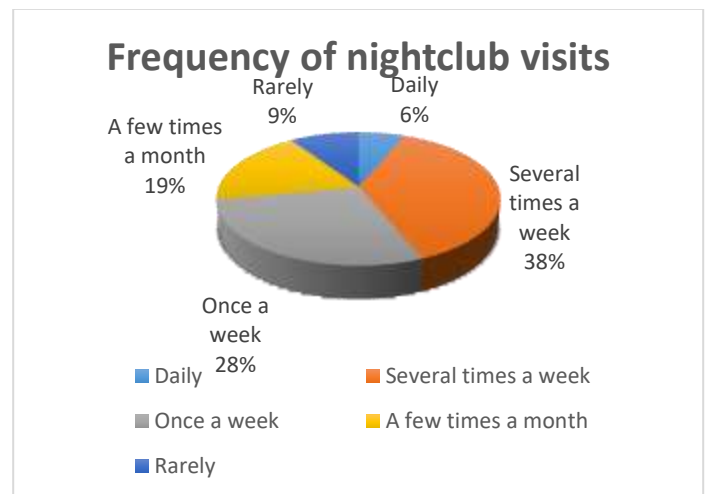


Figure 1: Showing the frequency of nightclub visits

In conclusion, the frequency of nightclub visits among participants at Rusumo provides nuanced insights into their engagement with nightlife activities and corresponding health risks. Tailored public health strategies should consider these patterns, promoting consistent use of mosquito repellents, enhancing environmental controls, and educating attendees about preventive measures to safeguard their health in nightclub settings. This approach ensures that nightlife remains a vibrant social environment while mitigating potential health concerns associated with mosquito-transmitted infections.

### 3.2.2 Duration of stay at nightclub

Nightclubs serve as popular venues for socializing, entertainment, and relaxation, attracting a diverse range of patrons who may spend varying amounts of time within these environments. The duration of stay reflects attendees' preferences, social habits, and the specific activities they engage in while at the nightclub.

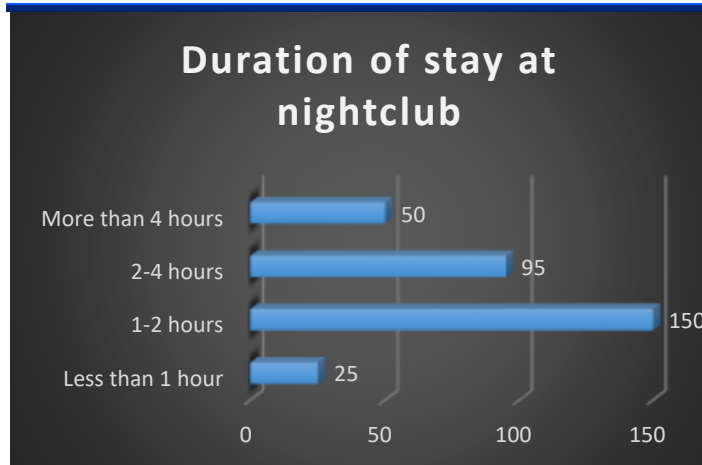


Figure 2: Showing duration of stay at nightclub

According to figure 2, the majority of respondents (150) typically spend 1-2 hours at the nightclub (46.9%), indicating a common pattern of moderate-length visits. This duration suggests attendees engage in social activities and leisure without prolonged exposure to environmental risks. For example one respondent mentioned:

*"...I usually stay at Nightclub for about two hours. It's enough time to meet friends, enjoy the music, and unwind after a busy day..."*

Moreover, those who stay 2-4 hours (29.7%) constitute a significant portion of participants, reflecting a slightly longer engagement with nightlife activities. Those includes persons who participate in extended social interactions or events within the nightclub environment. Like one respondent noted:

*"...when I go out, I like to spend a few hours at the club. It's a chance to relax and have a good time with friends without feeling rushed..."*

This sentiment illustrates a balanced approach to nightlife participation, combining social enjoyment with personal well-being considerations.

Conversely, respondents who stay less than 1 hour (7.8%) or more than 4 hours (15.6%) represent smaller but distinct parts with varying motivations and behaviors. Those staying less than 1 hour might prioritize brief social interactions or visit during specific time windows. As one respondent mentioned:

*"...I usually stop by Rusumo for a quick drink or to meet someone briefly before heading home..."*  
This participant's short stays suggest limited exposure to nightlife environments and

potentially lower risk of health implications.

On the other hand, respondents who stay more than 4 hours may engage in prolonged social activities or participate in late-night events. This extended duration may increase exposure to mosquitoes, especially in outdoor areas, highlighting the importance of protective measures. As one respondent stated:

*"...I sometimes stay late at the club, especially during events or when there's good music playing. It's a chance to unwind and enjoy the atmosphere..."*

This group's longer stays highlight the need for comprehensive health education and proactive measures to mitigate risks associated with prolonged exposure to mosquitoes and other environmental factors.

In general, the analysis of the duration of stay at Rusumo nightclub reveals diverse patterns of engagement among attendees, each influencing their potential exposure to health risks. Tailored strategies should consider these patterns, promoting responsible behaviors, enhancing environmental controls, and educating attendees about preventive measures.

### 3.2.3 Areas spent time in nightclub

Nightclubs at Rusumo typically offer diverse environments, including indoor dance floors, bars, lounges, and outdoor areas. Each of these spaces presents unique characteristics that can influence attendees' behaviors and susceptibility to health risks, such as mosquito-transmitted infections.

As per figure 3, a significant majority of respondents (175) which is about 54.7% frequent both indoor and outdoor areas during their nightclub visits. This indicates a widespread preference for enjoying multiple aspects of the nightlife venue, as one respondent described:

*"...I like to start inside, dance and socialize with friends, and then move outside to get some fresh air and enjoy the ambiance..."*

On the other hand, a smaller section of participants 120 (which is about 37.5% of the total respondents) prefer to stay exclusively indoors. Most of them favors the controlled environment of indoor spaces for socializing and entertainment, potentially minimizing their exposure to outdoor environmental factors like mosquitoes. As one respondent mentioned:

*"...I prefer the comfort and music indoors. It's where I feel most relaxed and can enjoy the night*

*without worrying about bugs or weather..."*

Another respondents echoed:

*"...I usually stay inside because the music and lights are better, and I feel safer indoors..."*

This preference usually reduces their exposure to mosquitoes, which are more prevalent in outdoor areas, thus potentially lowering their risk of mosquito-transmitted infections.

A smaller section of attendees 25 which account to 7.8% of the total respondents spends time only in outdoor areas. Most of them are drawn to the fresh air, quieter environment, or scenic views that outdoor spaces offer. As highlighted by one respondent:

*"...I prefer staying outside because it's less crowded, and I can enjoy the night sky and fresh air..."*

However, this preference significantly increases their risk of mosquito bites, especially in regions where mosquitoes are active. Their behavior stresses the need for targeted health interventions, such as providing mosquito repellents and ensuring effective mosquito control measures in outdoor areas.

Another participant echoed that:

*"...I love the outdoor terrace at Rusumo nightclubs. It's quieter and offers a nice view. I don't mind mosquitoes much; I just use repellent if needed..."*

Remaining in the outdoor attendees, another attendee responded that:

*"...I usually stay outside because it's less noisy and I can enjoy a cigarette while talking with friends. The atmosphere is more relaxed...."*

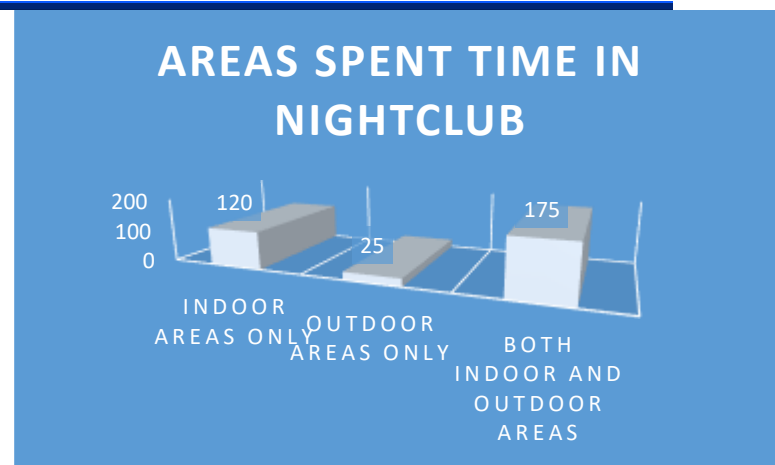


Figure 3: Showing areas spent time in nightclub

The findings emphasizes the importance of targeted public health interventions to mitigate the risks associated with mosquito-transmitted infections. For those frequenting both indoor and outdoor areas, consistent use of mosquito repellent and awareness campaigns about peak mosquito activity times are crucial. Enhancing mosquito control measures, like installing screens and using insecticides around outdoor areas, can further reduce the risk. Furthermore, educating attendees about the benefits of staying indoors during peak mosquito hours can help protect those who spend time exclusively outside.

Generally, the varying preferences for indoor, outdoor, or both areas among nightclub attendees highlight the need for comprehensive strategies to safeguard their health. By understanding these patterns, nightclub operators and public health officials can implement effective measures to minimize exposure to mosquitoes and ensure a safer, more enjoyable nightlife experience for all customers.

### 3.2.4 Use of mosquito repellent by respondents

Nightclubs, particularly those located in regions with high mosquito activity like Rusumo border, present unique challenges for public health. Outdoor areas, in particular, are hotspots for mosquito bites, making the use of repellents critical in reducing the risk of infection. This indicator explores the practices and attitudes of nightclub goers regarding the use of mosquito repellent. Figure 4, shows the responses about the use of use of mosquito repellent by attendees and as shown, only (40) which is about 12.5% of respondents indicated that they always take precautions, such as using mosquito repellent or wearing protective clothing. These represents a small yet conscientious segment of the nightclub population who consistently prioritize their health and safety. One respondent stated:

*"...I always carry mosquito repellent with me and make sure to apply it before heading out. It's better to be safe than sorry..."*



Another respondent articulated this sentiment by saying:

*"...I always make sure to use mosquito repellent before heading out. It's a small step that gives me peace of mind, especially knowing how serious mosquito-borne diseases can be...."*

On the other hand, a substantial 50% of respondents (160 out of 320) indicated that they sometimes use mosquito repellent. This intermittent usage suggests a varying degree of risk perception and situational awareness. Issues like the presence of mosquitoes, outdoor versus indoor settings, and previous experiences with mosquito bites likely influence their behavior. Like one respondent explained:

*"...I use mosquito repellent if I'm going to be outside for a while or if it's particularly buggy. But it's not something I think about every time I go out..."*

Another respondent said:

*"...I put on mosquito repellent if I remember or if someone reminds me, but it's not something I think about every single time. It depends on how much time I plan to spend outside..."*

This highlights a common behavioral pattern where health precautions are taken inconsistently, leaving gaps in protection that could lead to increased vulnerability to mosquito bites and related infections.

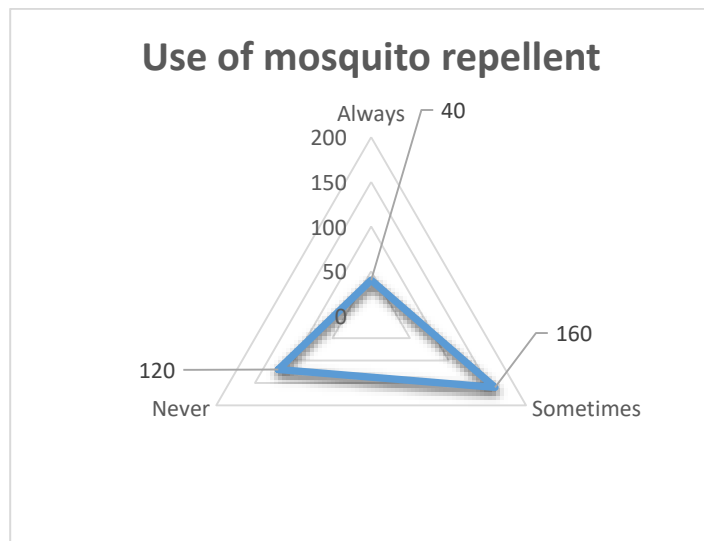


Figure 4: Showing the use of mosquito repellent by attendees

Conversely, a significant 37.5% of respondents (120 out of 320) reported that they never use mosquito repellent when visiting nightclubs. Their behavior points to a substantial gap in awareness or perceived relevance of mosquito-transmitted infection risks in the nightlife context. As one respondent mentioned:

*"...I never really think about mosquitoes when going out to a club. It's just not on my mind. I go there to have fun and socialize, not to worry about bugs..."*

Another respondent expressed a different perspective, highlighting a common misconception:

*"...I don't use repellent because I don't think mosquitoes are that big of a deal, especially at nightclubs where you don't expect to encounter them much..."*

This misunderstanding points to the necessity of increasing awareness about the environments and times when mosquitoes are active and the importance of protection, even in perceived low-risk settings like indoor nightlife venues.

The variability in repellent use—ranging from always to never—illustrate the diverse levels of health consciousness and behavioral patterns among nightclub attendees. It highlights the need for targeted interventions to increase consistent use of mosquito repellents. Nightclubs themselves must play a proactive role by providing complimentary mosquito repellent at entrances and informing patrons about the importance of using it.

In conclusion, while a small segment of nightclub attendees consistently takes measures to protect themselves from mosquito bites, the majority exhibit inconsistent or no use of repellents. This behavior suggests a significant need for increased awareness and proactive measures to ensure better health protection.

### 3.3 Knowledge and Awareness about mosquito-transmitted infections to the respondents

Nightclubs, particularly those in regions prone to mosquito activity, present unique challenges for public health. The settings often include outdoor areas where clients are more susceptible to mosquito bites. Therefore, gauging the knowledge and awareness levels of these attendees helps in identifying gaps that may exist in public health education and in implementing effective strategies to mitigate the risks.

#### 3.3.1 Knowledge about mosquito-transmitted infections

Knowledge about mosquito-transmitted infections is a crucial aspect of public health, particularly in regions where these diseases are prevalent. Mosquito-transmitted infections, such as malaria, dengue fever, and Zika virus, pose significant

health risks globally, especially in tropical and subtropical regions. These diseases can lead to severe health complications and, in some cases, can be fatal. Knowledge about the modes of transmission, symptoms, and preventive measures is vital for individuals to mitigate these risks.

According to figure 5, the findings indicated that, 17.2% of respondents (55 out of 320) considered themselves very knowledgeable about mosquito-transmitted infections. They exhibited a high level of awareness regarding the risks associated with mosquito bites and the necessary preventive measures. For example one respondent shared:

*"...I read a lot about health topics, and I know that mosquitoes can carry diseases like malaria and dengue. I always take precautions when I'm out..."*

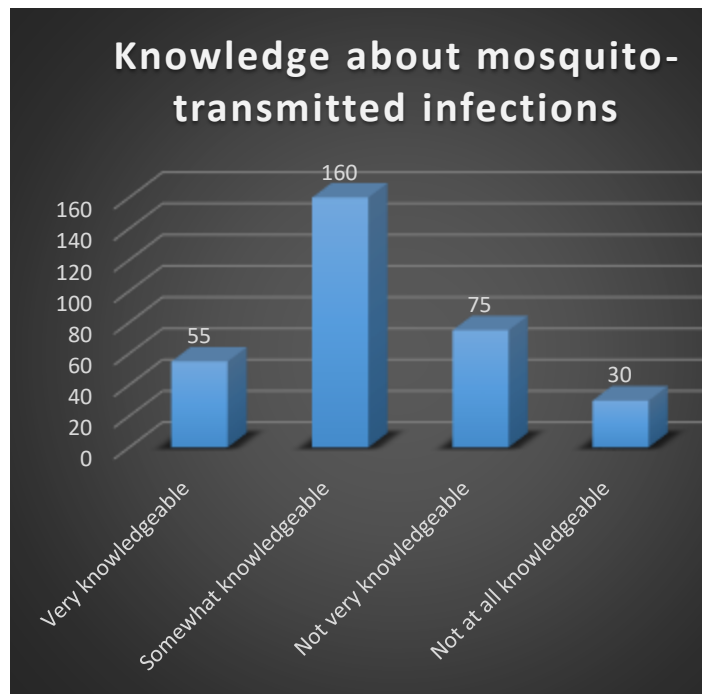


Figure 5: Showing the responses about the knowledge of mosquito-transmitted infections

Another respondent was quoted:

*"...I'm very knowledgeable about mosquito diseases because I've had friends who suffered from malaria. It's important to take precautions, especially in places like nightclubs where there are lots of people and mosquitoes..."*

Among those who considered themselves very knowledgeable, there was a clear sense of understanding and

awareness about the transmission and risks associated with mosquito-borne illnesses.

A larger segment, 50% of respondents (160 out of 320), identified as somewhat knowledgeable. These have general understanding of mosquito-transmitted infections but may lack detailed knowledge about specific diseases or comprehensive preventive strategies. One interviewee noted:

*"...I know mosquitoes can carry diseases, and I try to use repellent when I remember, but I don't know all the details about which diseases they carry..."*

This partial knowledge indicates that while they recognize the risks, their preventive measures may be inconsistent or insufficient due to gaps in their understanding.

Contrariwise, 23.4% of respondents (75 out of 320) reported being not very knowledgeable about mosquito-transmitted infections. They had limited awareness and may not fully grasp the severity of the risks or the importance of consistent preventive actions as echoed by one respondent:

*"I know mosquitoes are annoying, but I didn't realize they could cause serious health problems. I rarely think about using repellent..."*

Another respondent was quoted:

*"...I know mosquitoes can carry diseases, so I try to use repellent when I remember..."*

This lack of awareness can lead to neglect in taking necessary precautions, increasing their vulnerability to infections.

A small but significant 9.4% of respondents (30 out of 320) admitted to being not at all knowledgeable about mosquito-transmitted infections. They were largely unaware of the health risks posed by mosquitoes and the steps they can take to protect themselves. As one respondent stated:

*"...I had no idea mosquitoes could transmit diseases. It's not something I've ever really thought about..."*

The same to another respondent who echoed:

*"...I don't know anything about mosquito diseases. It's not something I've ever had to deal with..."*

This complete lack of knowledge is concerning as it suggests these individuals are at high risk due to their uninformed behavior.

Overall, the varying levels of knowledge among nightclub attendees highlight opportunities for targeted public health education and awareness campaigns. Strengthening knowledge about mosquito-transmitted infections can empower individuals to adopt more effective preventive measures, such as consistent use of mosquito repellent and understanding when and where mosquitoes pose the greatest risk. By bridging these knowledge gaps, public health initiatives can enhance community resilience against mosquito-borne diseases and promote safer nightlife environments for all attendees.

### 3.3.2 Perception of infection risk by respondents

Perception of infection risk refers to how individuals perceive the likelihood and severity of contracting diseases such as malaria, dengue fever, and Zika virus from mosquito bites during their nightlife activities. Figure 6, shows the results from respondents about the perception of infection risk, and as shown 25% of respondents (80 out of 320) perceive mosquito-transmitted infections as very serious. They acknowledged the severe health consequences of diseases such as malaria, dengue fever, and Zika virus, and demonstrated a high level of concern for their own health like one respondent highlighted this seriousness by stating:

*"...I take mosquito diseases very seriously. I know people who've gotten sick, so I always try to protect myself..."*

Another respondent articulated this viewpoint by stating:

*"...I take mosquito bites seriously because I know the diseases they can transmit are severe. It's not something to ignore..."*

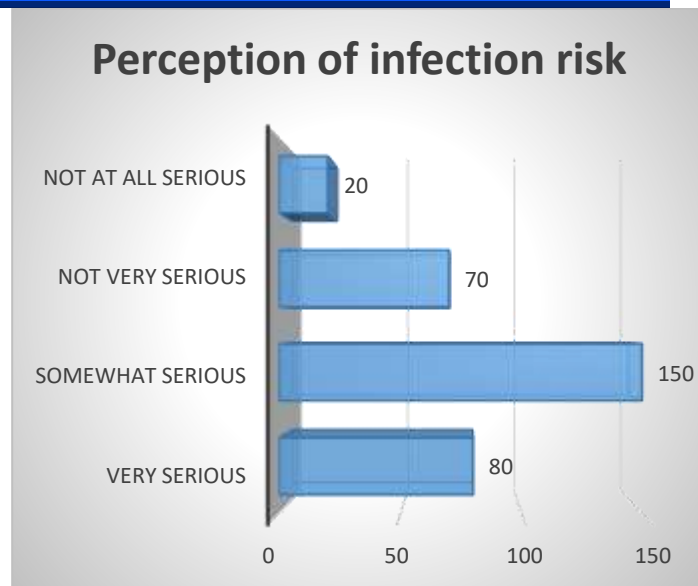


Figure 6: Showing the perception of infection risk by respondents

A larger portion, comprising 46.9% of respondents (150 out of 320), considered mosquito-transmitted infections somewhat serious. They acknowledged the risks but may not fully grasp the extent of health implications or the specific preventive measures needed. Their perception reflected a cautious approach, as expressed by one participant:

*"...I think mosquito bites can be serious, so I try to avoid getting bitten when I'm out, especially in areas with a lot of mosquitoes..."*

Conversely, 21.9% of respondents (70 out of 320) indicated that they perceive mosquito-transmitted infections as not very serious. They underestimated the health risks associated with mosquito bites or believed they are not personally vulnerable and this is evidenced by one respondent who explained:

*"...I don't think mosquito bites are that serious. I've been bitten before and never had any issues..."*

A smaller but notable segment of respondents, 6.3% (20 out of 320), reported that they perceive mosquito-transmitted infections as not at all serious and they minimized or dismissed the health risks posed by mosquitoes. As one respondent mentioned:

*"...I don't worry about mosquito bites at all. I think people make a big deal out of nothing..."*

In general, these varying perceptions of infection risk underlines the opportunities for targeted health education

initiatives. Strengthening awareness about the severity and potential health impacts of mosquito-transmitted infections is crucial for promoting more informed and proactive behaviors among nightclub attendees. By addressing misconceptions and enhancing risk perception accuracy, public health efforts can effectively mitigate the incidence of these infections and foster safer nightlife environments for all attendees.

#### 4.0 CONCLUSION AND FUTURE WORK

The study on nightclub attendance and behavior among patrons at Rusumo provides crucial insights into their social habits and associated health risks, particularly concerning mosquito-transmitted infections. The data reveals diverse patterns in the frequency and duration of nightclub visits, with a significant number of respondents frequenting nightclubs multiple times a week or even daily. This frequent engagement with nightlife activities increases their exposure to environmental risks, including mosquito bites. The preferences for spending time in both indoor and outdoor areas further highlight the varied risk profiles among patrons, as outdoor areas pose a higher threat for mosquito encounters. Moreover, the inconsistent use of mosquito repellent among attendees underscores a significant gap in preventive health behavior, with only a small portion always taking necessary precautions.

The results emphasize the necessity for comprehensive public health strategies tailored to nightlife environments. These should include enhanced educational campaigns to raise awareness about the severity of mosquito-borne diseases and promote consistent use of mosquito repellents. Additionally, implementing effective mosquito control measures in and around nightclub premises, particularly in outdoor areas, is crucial. By addressing the specific attendance patterns and behaviors of nightclub goers, public health officials and nightclub operators can work together to mitigate health risks, ensuring a safer and more enjoyable nightlife experience.

In the future research must carried out on:

- ✓ Conducting longitudinal studies to track nightclub attendees over an extended period to understand how their behaviors and perceptions regarding mosquito-transmitted infections evolve.
- ✓ Assessing the effectiveness of educational campaigns, incentive programs, or technological solutions (e.g., mobile apps for reminders) in increasing adherence to preventive measures.
- ✓ Assessing the impact of different communication channels (e.g., social media, posters, peer education) on increasing knowledge about mosquito-transmitted infections and influencing behavior change.
- ✓ Conducting the comparative studies across different nightlife settings or geographic regions to examine

variations in nightclub attendees' behaviors, risk perceptions, and preventive practices.

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