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Assessment of Factors Affecting Vaccine Hesitancy in Isoka District, Muchinga Province, Zambia

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ABSTRACT

Background: Vaccine hesitancy poses a serious threat to public health efforts globally, including in Zambia. Despite national immunization programs, Isoka District in Muchinga Province has experienced low vaccination rates. This study aimed to assess the factors contributing to vaccine hesitancy in the district, including individual beliefs, social influences, and health system limitations.
Methods: A mixed-methods cross-sectional study was conducted among 163 community members from Kawenga and Chuwi communities, and a focus group discussion was held with healthcare workers at Kasoka Urban Clinic. Quantitative data were collected using structured questionnaires and analyzed with SPSS version 24. Qualitative data were thematically analyzed to extract health system and socio-cultural insights.
Results: Findings showed that 60% of participants were concerned about vaccine safety, 50% did not believe vaccines prevent disease, and 70% believed social media spreads misinformation. Myths such as vaccines causing infertility (60%) and being part of a Western control plot (40%) were prevalent. Qualitative findings revealed issues with vaccine accessibility, inadequate communication, and mistrust in the healthcare system. Correlation analyses highlighted strong associations between trust in healthcare information and vaccine concerns ($r = 0.795$, $p < 0.01$).
Conclusion: Vaccine hesitancy in Isoka District is driven by misinformation, cultural beliefs, and systemic challenges. Public health interventions should prioritize community engagement, culturally sensitive education, and trust-building measures within the healthcare system to increase vaccine uptake.

Keywords: Vaccine hesitancy, Isoka district, Zambia

BACKGROUND

The vital function of all kinds of vaccines is preventing infectious diseases and establishing herd immunity (WHO, 2019). It emphasizes that widespread vaccination protects not only individuals but also entire communities, including those who cannot be vaccinated due to age or underlying health conditions. There have been significant contributions of vaccines to public health, noting that they are considered one of the most important achievements of the 20th century (Centers for Disease Control and Prevention [CDC], 2023). The introduction of vaccines has led to a dramatic reduction in the incidence of vaccine-preventable

diseases (VPDs), with many diseases experiencing declines of 90 to 100% compared to the pre-vaccine era (Centers for Disease Control and Prevention [CDC], 2023).

Vaccination, a proven and highly successful public health intervention has been facing challenges prior to some of the outbreak of diseases (Karasapan, O., & Mansur, Y. 2019). There are the more practical issues, such as accessibility and cost, along with socio-behavioral ones like vaccine hesitancy. Vaccine hesitancy was previously defined as the delay in acceptance or refusal of vaccination services despite availability (WHO, 2014). This definition was recently replaced in May 2022 by the one proposed by the World Health Organization (WHO) Behavioral and Social Drivers of Vaccination (BeSD) Working Group and endorsed by the WHO Strategic Advisory Group of Experts on immunization (SAGE). It is now defined as a motivational state of being conflicted about, or opposed to, getting vaccinated; this includes intentions and willingness (MacDonald, 2015). Vaccine hesitancy exists on a spectrum between those who accept all vaccines without doubt, to those who refuse all vaccines without doubt. Reluctance to receive vaccinations has hindered vaccination rates and greatly weakened the improvements in public health that vaccinations had previously brought about. Additionally, it has been connected to the reappearance of vaccine-preventable diseases (VPDs) like measles in several communities across the globe (WHO, 2019).

In Zambia, vaccines have also been instrumental in reducing the burden of infectious diseases, contributing to substantial declines in VPD incidence (Ministry of Health, Zambia, 2023). However, recent data indicate a worrying trend of decreasing vaccination coverage, leaving many children susceptible to preventable diseases. This decline has led to a resurgence of certain VPDs, notably measles, which saw a dramatic increase in cases from 55 in 2021 to 2,247 in 2022 (UNICEF, 2023).

On the other hand, the historical context of vaccine myths and misconceptions, trace their roots back to the 18th century. During this period, early anti-vaccine proponents propagated fear-mongering narratives, claiming that the smallpox vaccine would transform children into monstrous creatures or even make them targets of divine wrath (Durbach, 2004, p. 114; Colgrove, 2014). These outlandish claims, while based on fear and misinformation, were widespread during smallpox epidemics in 18th-century England and America. Parents also feared that the smallpox vaccine, derived from cowpox, would turn their children into cows or cow-like creatures (Wolfe & Sharp, 2012). In early American Puritan society, vaccine myths took on a religious dimension, with parents believing that the smallpox vaccine was anti-Christian (Conis, 2015).

As the number of recommended vaccines increased, so did the number of myths and misconceptions surround them. A pivotal moment in the anti-vaccine movement came in 1982 with a documentary that falsely linked the DPT vaccine to severe side effects like brain damage (DPT: Vaccine Roulette: WRC-TV, Washington, D.C., April 19, 1982] Azhar Hussain, et al 2016). This sensationalized report fueled a culture of fear that continues to influence public opinion today. Despite overwhelming scientific evidence supporting vaccine safety and efficacy, many people still hold onto myths, such as the belief that vaccines cause autism or are unnecessary. These misconceptions are often rooted in sensationalized headlines and a lack of trust in scientific institutions.

Addressing vaccine hesitancy involves not just increasing access but also support from international organizations like UNHCR, WHO and UNICEF is key to coordinating vaccination campaigns in refugee settings work with host Zambian governments to provide refugees access to basic health services, including vaccinations. Still, even

if enough vaccines are available for these kinds of programs to be successful - it depends on the ability of those offering vaccine in being persuasive about its benefits when trying to reach all audiences rollercoaster success story. (World Health Organization.2022).

This study therefore, assesses community as well as health system factors affecting Vaccine hesitancy in communities of Zambia.

METHODOLOGY

Study Design and Setting

A quantitative approach using a cross-sectional survey was conducted in Isoka District, Muchinga Province, Zambia. This study design was appropriate because it was assessing factors influencing vaccine hesitancy in a specified population at a point in time. The research was carried out in two selected communities; namely Kawenga (peri-urban area) and Chuwi (rural area).

Study Population and Sampling Techniques

The study population comprised community members aged 18 years. A sample size of 163 participants was determined using the single population proportion formula, based on an expected vaccine hesitancy prevalence of 12%, a 95% confidence interval, and a 5% margin of error. Stratified sampling was used to ensure representation from both peri-urban and rural areas, followed by convenience sampling within each stratum.

Data Collection Techniques/Tools

Quantitative data were collected using structured, pre-tested questionnaires comprising closed-ended questions on demographics, beliefs, vaccine knowledge, and exposure to misinformation. In Kawenga (peri-urban), questionnaires were self-administered, while in Chuwi (rural), interviews were conducted with the aid of an interpreter.

Data Analysis

Data obtained from the questionnaires was coded and cleaned using Microsoft excel 2016 and was analyzed using SPSS version24. Descriptive statistics, including percentages and cross-tabulations, were generated to summarize the data. Inferential analyses were performed to identify significant associations between variables and identification of the factors contributing to vaccine hesitancy.

Ethical Considerations

Ethical approval was obtained from the University of Lusaka Ethics Committee and the National Health Research Authority (NHRA). Permission was granted by the Isoka District Health Office and local community leaders. Informed consent was obtained from all participants, and confidentiality was assured by anonymizing data and maintaining voluntary participation without coercion.

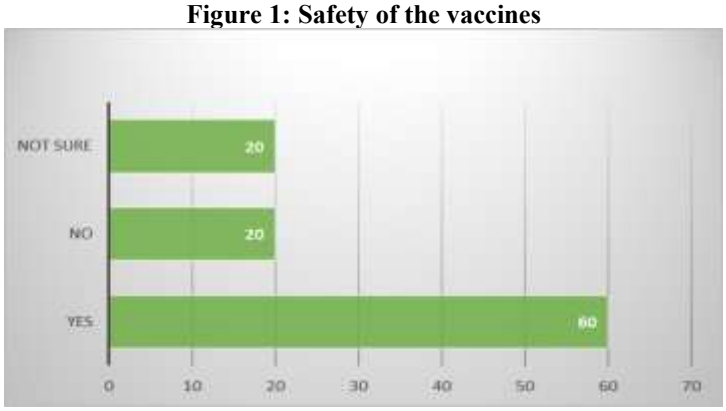
RESULTS

Participant Characteristics

A total of 163 community members participated in the quantitative survey. The majority (50%) were aged between 18 and 35 years, and 60% were female. Most respondents (60%) were married and had between 1 and 5 children. Regarding education, 40% had attained tertiary education, while 35% had no formal education. Employment in the formal sector accounted for 60% of the participants.

1. Participants' Concern on the Safety of Vaccines

Figure 1: Safety of the vaccines

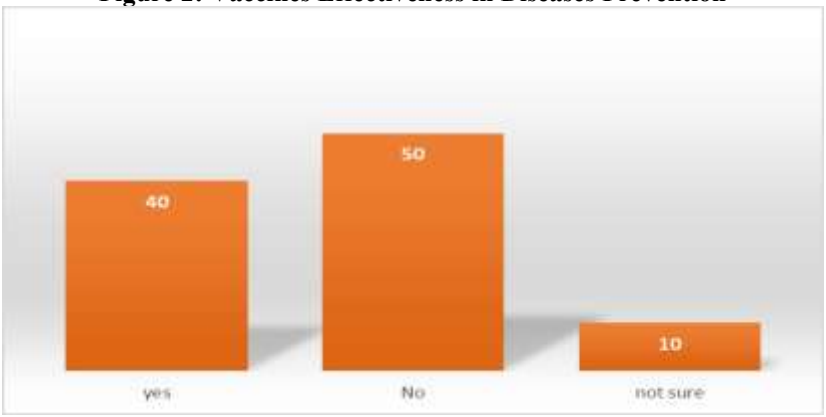


Percentage

60% of the participants were concerned about the safety of the vaccines while 20% of the participants were not concerned and the corresponding 20% were not sure about the safety of the vaccines.

2. Participants' Knowledge of Vaccines Effectiveness in Diseases Prevention

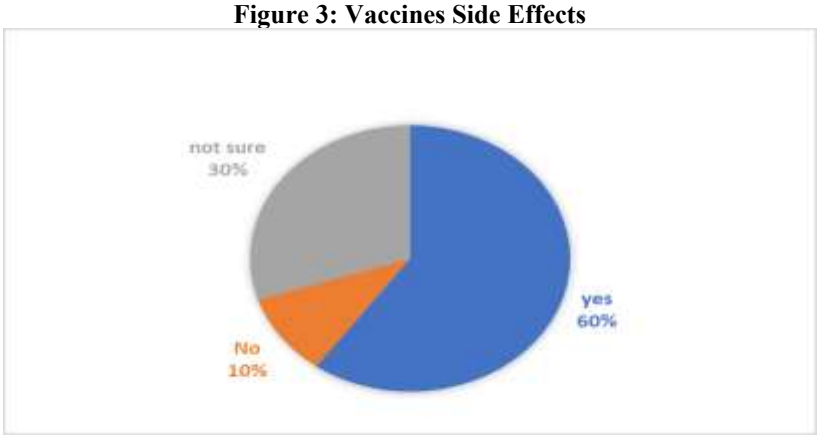
Figure 2: Vaccines Effectiveness in Diseases Prevention



In this study, 40% of the participant's believed vaccines were effective in preventing diseases while 50% of the participants did not believe that vaccines could prevent diseases. 10% of the participants were not sure.

3. Participants' Perception of the Side Effects of Vaccines

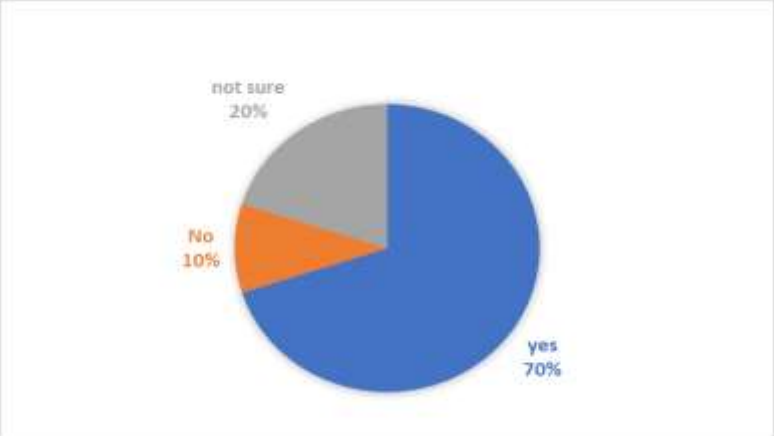
Figure 3: Vaccines Side Effects



In this study, 60% of the participants believed vaccines could cause serious side effects while 10% did not believe and the 30% were not sure if vaccines could cause serious side effects.

4 Participants Opinion of Social Media Misinformation on Vaccines

Figure 3: **Social media Misinformation on vaccines**



In this study 70% of the participants think social media spread misinformation about vaccines while 10% thought social media does not spread mis-information.20% of the participants were not sure if social media spread misinformation.

DISCUSSION

Concerns about Vaccine Safety and Effectiveness

A key finding of the study was the high level of concern among participants about the safety of vaccines (60%). This finding aligns with global trends of increasing vaccine hesitancy fueled by safety concerns (Larson et al., 2016). Interestingly, despite these concerns, a substantial proportion of participants (40%) still believed that vaccines are effective in preventing diseases. This apparent contradiction highlights the complex interplay of factors influencing vaccine decision-making.

The Role of Social Media and Misinformation

The study found that a large majority of participants (70%) believed that social media spreads misinformation about vaccines. This finding is consistent with research highlighting the role of social media in amplifying vaccine hesitancy (Wilson & Wiysonge, 2020). The spread of misinformation on social media can create an environment of distrust and fear, making it challenging individuals to make informed decisions about vaccination. Another study by Mwanasakale indicated similar findings showing that the spread of false information about vaccines, particularly through social media, can significantly influence vaccine confidence and contribute to vaccine hesitancy.

Side effects of Vaccines

In relation to side effects of vaccines, the study revealed that majority of the participants, (50%) did not believe that vaccines could prevent diseases, therefore contributing to the low uptake of vaccines in the district. This corresponds with a study that was conducted by Dubé supporting the claim that if individuals perceive the risk of vaccine side effects to outweigh the benefits of vaccination, they may be less likely to accept vaccines.

Knowledge on effectiveness of Vaccines in disease prevention

This study revealed that 50% of the participants did not believe that vaccines

could prevent diseases whilst 40% believed that vaccines could prevent disease. This indicates a lack of knowledge in the communities exhibiting knowledge gaps or misconceptions about vaccine effectiveness. Similar studies have revealed a range of community knowledge levels regarding vaccine effectiveness.

However, some communities demonstrate high levels of understanding, recognizing the importance of vaccines in preventing diseases like measles, polio, and influenza; this is according to a large-scale survey conducted by Larson whose study findings are not the same with this study. This understanding is often linked to positive experiences with vaccination, trust in healthcare providers, and effective public health messaging.

Concern about Vaccine Safety and Trust in Healthcare Providers: A strong positive correlation was found between concern about vaccine safety and trusting the information received from healthcare providers ($r = 0.795$, $p<0.01$). This suggests that individuals who are concerned about vaccine safety are more likely to trust information from healthcare providers. This highlights the importance of building trust and rapport between healthcare providers and patients to address vaccine concerns.

Belief in Vaccine Effectiveness and Importance of Vaccines: A strong positive correlation was observed between believing that vaccines are effective and thinking vaccines are important in public health ($r=0.790$, $p<0.01$). This finding reinforces the importance of promoting the understanding of vaccine effectiveness in increasing vaccine acceptance.

Belief in Vaccine Side Effects and Benefits: A moderate positive correlation was found between thinking vaccines can cause serious side effects and thinking the benefits of vaccines outweigh the risks ($r=0.609$, $p<0.01$). This suggests that even those who are concerned about side effects may still recognize the overall benefits of vaccination.

Social Media Misinformation and Feeling Pressured to Vaccinate: A moderate positive correlation was observed between social media spreading misinformation about vaccines and feeling pressured by others to be vaccinated ($r=0.555$, $p<0.01$). This finding indicates that exposure to misinformation on social media can create a sense of pressure and influence vaccination decisions.

COVID-19 Pandemic and Vaccination Views

The study also explored the impact of the COVID-19 pandemic on participants' views on vaccination. Interestingly, 75% of the participants reported that their views on vaccination had not changed due to the pandemic. This finding suggests that pre-existing beliefs and attitudes towards vaccination may be deeply ingrained and resistant to change, even in the face of a global pandemic.

Mandatory Vaccination Policies

The majority of participants (75%) did not believe that mandatory vaccination policies were important. This finding reflects the ongoing debate surrounding mandatory vaccination and individual liberties. However, it is crucial to consider the public health implications of low vaccination rates and the potential benefits of mandatory vaccination in achieving herd immunity and preventing disease outbreaks.

Personal Decision to Vaccinate

A large majority of participants (75%) believed that people should make a personal decision to get vaccinated. This finding highlights the importance of respecting individual autonomy and informed consent in vaccination decisions. However, it also underscores the need for effective communication and education to ensure that individuals have the necessary information to make informed choices about vaccination.

The findings of this study have important implications for public health interventions

aimed at increasing vaccine uptake in Isoka District. Targeted interventions should focus on addressing specific concerns about vaccine safety and effectiveness, combating misinformation, dispelling myths and misconceptions, and improving the accessibility and quality of vaccination services. Building trust between healthcare providers and the community is also crucial for increasing vaccine acceptance.

CONCLUSION

This study has revealed that vaccine hesitancy in Isoka District is a multifactorial issue rooted in misinformation, cultural beliefs, limited health literacy, and systemic healthcare challenges. A significant proportion of community members expressed concerns about vaccine safety, doubted vaccine effectiveness, and subscribed to persistent myths, including fears of infertility and Western conspiracies. Additionally, health system limitations—such as inadequate communication, vaccine shortages, and access barriers—further undermine confidence in immunization programs.

The findings emphasize the need for context-specific, evidence-based interventions that combine improved health education, effective communication strategies, and stronger community engagement. Enhancing trust between healthcare providers and communities, addressing logistical gaps in vaccine delivery, and integrating cultural and religious leaders into public health efforts will be critical to increasing vaccine acceptance.

By understanding and addressing the underlying drivers of vaccine hesitancy, public health authorities can develop targeted strategies that not only improve vaccination coverage in Isoka District but also contribute to broader efforts to protect vulnerable populations from vaccine-preventable diseases across Zambia.

Declaration by Authors

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