en

CONHECIMENTO SOBRE A CÓLERA NUMA ÁREA RURAL EM MOÇAMBIQUE
KNOWLEDGE ABOUT CHOLERA IN A RURAL AREA IN MOZAMBIQUE
CONOCIMIENTOS SOBRE EL CÓLERA EN UNA ZONA RURAL DE MOZAMBIQUE

Atanásio Cinquenta[1,2] iD *https://orcid.org/0000-0002-4550-3301*
Sábado Mauride[3,4] iD *https://orcid.org/0009-0005-3874-3453*
Biter Lia[1] iD *https://orcid.org/0009-0001-2892-8578*

[1] Lúrio University, Nampula, Moçambique
[2] ISPOTEC - instituto Superior Politecnico e de Tecnologias, Moçambique
[3] Serviço Distrital de Saúde Mulher e Ação Social - Ancuabe, Cabo Delgado, Moçambique
[4] Núcleo de Investigação em Saúde dos SDSMAS Ancuabe, Moçambique

Atanásio Cinquenta – atanasiofranciscocinquenta@gmail.com | Sábado Mauride – smauride@gmail.com | Biter Lia - biterfernandolia@gmail.com

Corresponding Author:
Atanásio Cinquenta
Natite neighborhood, road 138
3200 –Cabo Delgado - Moçambique
atanasiofranciscocinquenta@gmail.com

RESUMO

Introdução: A cólera é uma doença com alta incidência e ocasionando mortes em Moçambique. A província de Cabo Delgado é uma das mais afectadas e Metoro é evidenciado como uma área crítica (zona quente) para ocorrência da cólera. A prevenção da doença é fundamental, sendo o conhecimento um factor contribuidor importante.
Objetivos: Avaliar o conhecimento sobre a cólera aos residentes do bairro rural de Cahora Bassa, na sede do posto administrativo de Metoro.
Métodos: Estudo transversal envolvendo 52 participantes, selecionados através de amostragem aleatória simples. Para a recolha de dados, foram usadas entrevistas individuais, aplicadas através de um questionário semi-estruturado adaptado. Para a análise e interpretação dos dados, foi usada a estatística descritiva juntamente com a técnica de análise de conteúdo.
Resultados: 100% dos participantes referiram ter conhecimento prévio sobre a cólera. 86.7% referiram que a cólera era propagada principalmente por água e comida contaminada pelo *víbrio cholerae*. Outras formas correctas de propagação também foram evidenciadas, embora 62% dos participantes referiram erradamente que a cólera era propagada por mosquitos (*plasmodio falciparum*). Quanto à prevenção, higienizar os alimentos e tratar a água para o consumo, foi o grupo de resposta mais evidenciado.
Conclusão: A população possui conhecimento sobre a cólera, especialmente sobre as medidas preventivas. Contudo, erro nos fatores ligados a propagação da cólera foram evidenciados. Reforço de campanhas de educação e promoção de saúde são recomendadas.

Palavras-chave: cólera; conhecimento; prevenção; rural

ABSTRACT

Introduction: Cholera is a disease with a high incidence and causing deaths in Mozambique. Cabo Delgado province is one of the most affected, and Metoro is recognized as a critical area (hot zone) for the occurrence of cholera. Disease prevention is essential, and knowledge is an important contributing factor.
Objectives: To assess the knowledge about cholera among residents of the rural neighborhood of Cahora Bassa in the administrative post of Metoro.
Methods: Cross-sectional study with a sample of 52 participants, selected by simple random sampling. Individual interviews were used to collect data, using an adapted semi-structured questionnaire. Descriptive statistics were used to analyze and interpret the data, along with the content analysis technique.
Results: 100% of the participants reported having previous knowledge of cholera. 86.7% said that cholera was mainly spread by water and food contaminated by *Vibrio cholerae*. Other correct ways of spreading cholera were also highlighted, although 62% of participants wrongly said that cholera was spread by mosquitoes *(plasmodium falciparum*). In terms of prevention, sanitizing food and treating drinking water were the most common responses.
Conclusion: The population is aware of cholera, especially preventative measures. However, errors in the factors linked to the spread of cholera were evident. Reinforcement of education and health promotion campaigns are recommended.

Keywords: cholera; knowledge; prevention; rural

RESUMEN

Introducción: El cólera es una enfermedad con una alta incidencia y causante de muertes en Mozambique. La provincia de Cabo Delgado es una de las más afectadas y Metoro está reconocida como un área crítica (zona caliente) para la aparición del cólera. La prevención de la enfermedad es fundamental, y el conocimiento es un importante factor que contribuye a ello.
Objetivo: Evaluar los conocimientos de los residentes del barrio rural de Cahora Bassa, en el puesto administrativo de Metoro, sobre el cólera.
Métodos: Estudio transversal con una muestra de 52 participantes, seleccionados por muestreo aleatorio simple. Se utilizaron entrevistas individuales para recoger datos, mediante un cuestionario semiestructurado adaptado. Se utilizaron estadísticas descriptivas para analizar e interpretar los datos, junto con la técnica de análisis de contenido.
Resultados: El 100% de los participantes declaró tener conocimientos previos sobre el cólera. El 86,7% afirmó que el cólera se propaga principalmente a través del agua y los alimentos contaminados por *Vibrio cholerae*. También se destacaron otras formas correctas de propagación del cólera, aunque el 62% de los participantes dijo erróneamente que el cólera lo propagaban los mosquitos*(plasmodium falciparum)*. En cuanto a la prevención, la higienización de los alimentos y el tratamiento del agua potable fueron las respuestas más comunes.
Conclusión: la población es consciente del cólera, especialmente de las medidas preventivas. Sin embargo, se observaron errores en los factores relacionados con la propagación del cólera. Se recomienda reforzar las campañas de educación y promoción de la salud.

Palabras Clave: cólera; conocimientos; prevención; rural

INTRODUCTION

According to the World Health Organization (WHO), *cholera* is defined as an acute diarrhea infection caused by ingestion of food or water contaminated with the bacteria vibrio cholera, predominantly of serogroups 01 and 0139 (WHO, 2023). The main clinical feature of cholera is watery diarrhea, which can lead to death if not treated on time. In addition to watery diarrhea, vomiting, and abdominal cramps are other clinical manifestations found in infected patients (Maleab et al., 2022).

In 2018, during the 71st World Health Assembly, the government of Mozambique, represented by the Ministry of Health (MoH), approved the resolution of the initiative entitled Ending Cholera: A Global Roadmap to 2030 (a New Global Health Strategy) and publicly expressed its commitment to eliminating cholera by the year 2030 (MISAU, 2023).

Cholera is transmitted directly from person to person via the fecal-oral route and can be prevented mainly by good hygiene practices and environmental sanitation (Pires & Abdirazak, 2019). Another factor contributing to the spread of cholera is poor public knowledge and awareness of its modes of transmission and early diagnosis and treatment of cholera symptoms (Ali, Mohamed & Tawhari, 2021).

According to the Centers for Disease Control and Prevention (CDC), cholera prevention is not isolated and should be done in five (5) ways together: Make sure you drink and use clean water; wash your hands frequently with soap and clean water; use safe toilets, treat food well, and clean up after yourself (CDC, n.d). However, the key to preventing cholera outbreaks is improving public hygiene, water sanitation, and sewage systems (Ali et al., 2021). In addition, cholera vaccination can play an important role in infection control and prevention and has also been a measure adopted in recent years by Mozambique's MoH (National Institute of Health [INS], 2023).

Worldwide, cholera remains a significant public health problem, with an estimated 2.86 million cases and 95,000 associated deaths occurring annually, of which only a fraction is reported due to inadequate surveillance systems and inconsistencies in case definitions, as well as economic, political, and social disincentives (Ali et al., 2021; Sousa, 2023).

In Africa, cholera continues to be a serious public health problem, characterized by frequent outbreaks, persistent endemicity, and high incidence rates, especially in the Great Lakes region of Central Africa, where cases occur all year round, with an increase in incidence during the rainy season (Mengel et al., 2014; Niederberger et al., 2023). On the other hand, elsewhere in sub-Saharan Africa (the region to which Mozambique belongs), cholera occurs in outbreaks of varying sizes, with a constant threat of generalized epidemics. In 2011, sub-Saharan Africa accounted for 86% of reported cases and 99% of deaths worldwide (Mengel et al., 2014).

In Mozambique, cholera is a seasonal disease with a high incidence, causing deaths and many hospitalizations almost every year, overloading the National Health System (MISAU, 2023). In addition to the risk factors associated with a lack of drinking water, as well as poor sanitation and hygiene, high incidents of natural disasters contribute to the outbreak of the disease (OCHA, 2023; Guraj et al., 2016; INS, 2023; & MSF, 2015).

According to the report by the International Federation of Red Cross and Red Crescent Societies (IFRC), in the outbreak that broke out in Mozambique between 2022-2023, there were more than 30,000 confirmed cases and 131 deaths due to the cholera outbreak, where all eleven (11) Mozambican provinces registered cases (OCHA, 2023). Risk factors related to poor water, sanitation, and hygiene conditions, as well as recurrent natural disasters that have deteriorated the hygiene and sanitation conditions of the population, have been reported (UNICEF; Jornal a Carta, 2023).

Another factor to highlight is illiteracy, which can translate into a lack of knowledge about disease prevention and beliefs, a fact that is common in rural communities in Mozambique. According to the 2022 Family Budget Survey (IOF in Portuguese), the illiteracy rate at the national level is 38.3%, with Cabo Delgado province having the highest national rate (61.1%). On the other hand, a report by the MoH showed that between 2017-2021, Cabo Delgado was the province with the most cases of cholera, and Metoro is also considered one of the critical administrative posts (hot zone) for the occurrence of cholera (MISAU, 2023).

Furthermore, according to the Mozambican Information Agency (AIM in Portuguese) (2024), misinformation about cholera has been identified as one of the main causes of the disease's recrudescence. In this case, the lack of scientific knowledge about cholera contributes to the misinformation of rural communities in Mozambique, leading to interpretations about causes that are not scientifically based and, in the worst-case scenario, consider the government and health professionals as the etiological agents of cholera. This fact, in addition to making prevention difficult, leads to acts of violence against these actors, especially community leaders and health professionals (Baptista, 2024), thus urging the need to improve knowledge and communication strategies.

Based on the principle that knowledge helps to prevent diseases, particularly cholera, the aim of this study was to assess knowledge about cholera in the neighborhood of Cahora Bassa, in the rural administrative post of Metoro, Cabo Delgado.

1. METHODS

1.1 Sample

The target group was individuals over the age of 18 living in the rural neighborhood of Cahora Bassa in the administrative post of Metoro, belonging to the Ancuabe district, province of Cabo Delgado, northern Mozambique. The sample involved 52 participants selected by simple random probability sampling, where everyone had the opportunity to take part in the study. To calculate the

sample using this technique and considering the data on the universe of the population in the study area, which is approximately 350 inhabitants, a 95% confidence level and 5% sampling error were set, and the electronic calculator (available on the QuestionPro website) was used to obtain the study sample. After the initial sample, which was larger than the final sample, the eligibility criteria were applied, and only 52 participants met the inclusion criteria to take part in the study.

1.2 Data Collection Procedures and Instruments
Data collection took place between March and April 2023, and for this purpose, a semi-structured interview was carried out with each participant using a questionnaire adapted from the study by Ali et al. in 2021, entitled "Knowledge, attitude, and practice study regarding cholera among the people in Jazan city, KSA." Although the questionnaire was adapted from a study that had been carried out and published, attributing its validity, it had been previously validated by the authors of this work through a pilot study carried out on five (5) participants belonging to another neighborhood in the study area. The questionnaires were administered directly by the researchers over the course of a week. The questionnaire was adapted based on the objectives of the study and the socio-demographic characteristics of the population, focussing on the knowledge variables linked to prior knowledge of the disease, ways of spreading and prevention, and did not explore treatment or technical concepts about cholera (which was a limitation of the study). Based on the content analysis of the answers, they were grouped into categories and subcategories.

1.3 Statistical Analysis
A quality-quantitative approach was used. The data was initially processed using descriptive statistics, using Microsoft Excel v.16 to tabulate the data and construct graphs and tables, and presenting the data in terms of relative (%) and absolute (n) frequencies. On the other hand, the content analysis technique was used to interpret and analyze the qualitative data related to knowledge about cholera. The technique aims to analyze data that describes reality but cannot be quantified and has 3 main stages for its execution, namely: Pre-exploration, exploration of the material, treatment, and interpretation respectively (Macário, Boaventura & Basilio, 2020). Due to the research objectives, it was not necessary to use any software or statistical package to analyze the data.

3. RESULTS
The socio-demographic characteristics of the participants were investigated to explore the population profile. Therefore, of the total of 52 participants, 57.6% (n=30) were male, while 42.4% (n=22) were female. As for age, 60.3% (n=32) belonged to the 18-29 age group, while 39.7% (n=20) were in their 30 years onwards. In terms of occupation, 46% (n=24) were students, 36% (n=19) farmers, 8% (n=4) domestic workers, 6% (n=3) guards, and finally 4% (n=2) public servants. As for the level of education, 48% (n=25) of the participants have no level of education, the remaining 48% (n=25) are still attending school between primary and secondary levels, and only 4% (n=2) have higher education.

Cholera-related variables
The graph below (graph 1) shows the answers about prior knowledge of cholera (category 1), and 100% (n=52) of the participants reported having prior knowledge of the disease or having heard of it before.
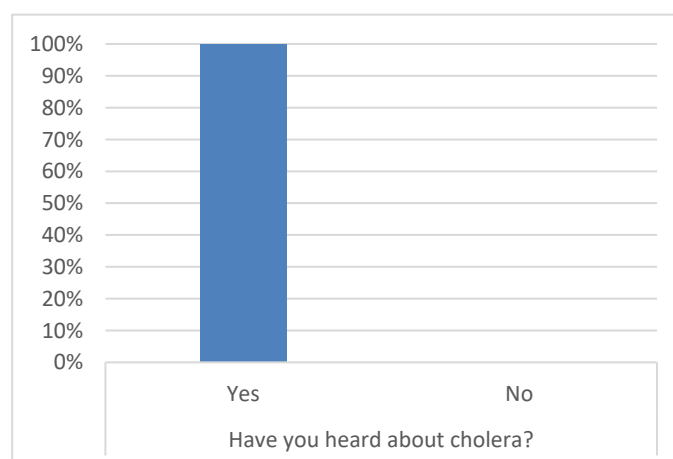
Graph 1 - prior knowledge of cholera

Category 2. Spread of cholera
Due to the complexity of the responses, they were grouped into four (4) subcategories spread in descending order according to the frequency of responses (table 1). The subcategory or form of spread linked to the consumption of **water and food contaminated by the *vibrio cholerae*** was the one most highlighted by the study participants. However, other forms were highlighted, such as poor hygiene and sanitation (90.3%) and direct person-to-person spread (86.6%). One fact that should be highlighted is the spread by flies and mosquitoes as vectors, where only 7.6% stated correctly, i.e., that it only occurred through flies, and over 90% stated the opposite, demonstrating a lack of knowledge of the vectors associated with the spread of cholera and confusing the forms of spread between cholera and malaria, which are two common diseases in rural Mozambican regions. The data is available in the table below.

Table 1 - Subcategories or ways of spreading cholera

Subcategory of the spread of cholera	Responses	Frequencies	
Questions		Absolute (N)	Relatives (%)
If cholera is spread by: **Food and water contaminated by vibrio cholerae?**	Yes	46	86.7
	No	6	13.3
If cholera is spread by: **Flies and mosquitoes**	Yes (ambos)	32	62
	No	16	30.4
	Only flies	4	7.6
If cholera is spread by: **Poor hygiene and sanitation**	Yes	47	90.3
	No	5	9.7
If cholera is spread by: **Person to person**	Yes	45	86.6
	No	7	13.4

Category 3. Cholera prevention
For this category related to cholera prevention measures, four groups of answers (subcategories) were created, with the answer "sanitize food and treat water for consumption" belonging to subcategory "3.1" the most frequently mentioned cholera prevention measure. Other forms of prevention, such as personal and collective hygiene, self-knowledge about cholera and finally sanitation of the appropriate environment, were also highlighted.

Subcategory 3.1: Food and water safety
In this subcategory, the answer most often given by the participants for preventing cholera is "sanitizing food and treating drinking water", as can be seen in the statements below.
P1 *"To prevent cholera we have to treat the food we eat well."*
P4 *"..., you have to drink treated water for sure or boil it and wash your food well before cooking.*
P5 *"..., wash food well."*
P6 *"..., treat water thoroughly and wash food."*
P9 *"..., wash food well before eating."*
P14 *"..., wash food well and boil water."*
P18 *"..., drink boiled water and eat well to avoid diarrhoea."*
P25 *"..., drink treated water and wash vegetables."*
P26 *"..., drinking clean water and taking good care of the food we eat."*

Subcategory 3.2: Personal and collective hygiene
In this subcategory, the answer most often highlighted by the participants as a cholera prevention measure is "wash your hands frequently using ash and/or soap", as can be seen in the passages below.
P1 *"To prevent cholera you have to wash your hands with soap and water."*
P3 *"..., wash your hands with soap, hygiene or ash."*
P9 *"..., wash your hands with soap and water."*
P20 *"..., always wash your hands with soap and ash."*
P28 *"..., wash your hands often and have personal hygiene."*

Subcategory 3.3: Self-knowledge about cholera
In this subcategory, the answer most often given as a measure to prevent cholera is "to be self-aware and wear personal protective equipment (PPE) when dealing with these patients", as the passages below illustrate.
P21 *"To prevent Cholera we have to warn people about the disease."*
P22 *"..., We have to know and not approach people who have the disease or wear a mask."*
P23 *"..., We have to know about the disease and not use the same nail clippers with those who have cholera."*
P16 *"We have to know and if we're going to visit, we have to wear a mask, gloves and long shirts."*

Subcategory 3.4: Sanitation of the appropriate environment
In this subcategory, they referred to eliminating stagnant water as the main method for preventing cholera, linked to the sanitation of the environment, supported by the fact that this can be a source of risk. We can see this in the passages below.
P17 *"To avoid cholera, we have to avoid standing water."*
P27 *"...We have to eliminate stagnant water and maintain hygiene around the house."*

4. DISCUSSION

In this study, most of the participants were male and young (18-29 years old). These data differ from those found in the studies on cholera carried out in Lebanon, Yemen, and the city of Jazan, respectively, which found that most of the participants were female (Dureab et al., 2018; Ali et al., 2021; Maleab et al., 2022;). Subjectively, this result may also be due to the gender disparity that starts from an early age in families in Mozambique, where women are more likely to stay at home doing domestic activities, and men are more likely to be involved in other activities, including research (Dadá & Mosca, 2022). This reality is no exception in Metoro.

The study also revealed the prevalence of the young age group (18-29 years) among the participants, which may be since 62.4% of the population in Mozambique lives in rural areas and the country's demographic pyramid is extensive, i.e., most of the population is concentrated in younger age groups (Instituto Nacional de Estatística [INE], 2022). On the other hand, Metoro has a younger population, which is detrimental to older people. Regarding occupation, the study revealed a considerable number of students belonging to the primary and secondary school levels. In Metro, there are many young people over the age of 18 in school due to the delay in entering school, which is also a common characteristic in rural areas in Mozambique. Similarly, the study found a greater number of farmers with no level of schooling, which can be understood from the fact that more than 90% of the population in Metoro depends on agriculture (MISAU, 2023). On the other hand, it is generally known that most of the Mozambican population practices agriculture as their main source of income (INE, 2022).

All the participants in this study reported having heard of cholera before. In addition to knowledge due to experience with the disease, rather than frequent exposure to it, since Metoro is considered by the national health authorities to be a critical area for cholera, there is also evidence of health education and promotion policies and strategies carried out by the local health authorities, although they are done during periods when outbreaks are imminent. This fact, which is related to weak cholera surveillance systems, not only makes it difficult to prevent cholera, but also leads to a lack of control over the evolution of cases (MISAU, 2023).

Regarding the spread of *cholera*, the study participants revealed that it occurs mainly through the consumption of food contaminated by the *cholera vibrio*, a result that *corroborates* the study carried out in the city of Jazam and in Lebanon, differing from the study carried out in Nampula by Pires and Abdirazak, where the physical contact of the carrier patient was the main form of propagation (Pires & Abdirazaq, 2019; Ali et al., 2021; Malead et al., 2022). The WHO in the document on cholera published in 2022, as well as the study by Dureab et al in 2018 entitled "Knowledge on and preventive practices of cholera in Al-Mahweet - Yemen, 2018: a cross-sectional study," argues that although there are several forms of transmission, the main one is via oral-fecal, i.e., consumption of water and food contaminated by the *vibrio cholerae.*

On the other hand, fewer participants explained that cholera could be spread by mosquitoes *(plasmodium falciparum)*. This scientifically incorrect knowledge may be due to the mixing of the etiological agents of cholera and malaria, i.e. since cholera and malaria are common in that area, the propagating agents are confused. This can be translated into low health literacy coupled with misinformation. Misinformation about cholera has been a reason for violence against health professionals and members of the government in Mozambican communities, particularly in rural areas of Cabo Delgado (Rádio Moçambique, 2024). As an example, in March 2023, ten (10) members of local structures in the district of Mecufi, south of Cabo Delgado, had their homes destroyed due to popular anger motivated by misinformation about the origin of cholera (Jornal a Carta, 2024). On the other hand, In Metoro, local health sources consulted also point to beliefs about the origin of cholera as one of the major challenges in dealing with the disease, such as the employee of a local NGO who pointed out that some young people in the Cahora Bassa neighborhood were singled out as the etiological agents of cholera, creating discrimination (A. Agostinho, personal communication, 2024, 20 February).

Regarding prevention, the majority said that it occurs mainly by sanitizing food and drinking treated water, contrary to the study by Dureab et al (2018) in a high cholera prevalence area in Yemen, where the proper disposal of human waste was considered an essential cholera prevention measure and only 11% of participants knew that proper washing of fruit and vegetables reduces the risk of cholera infection. In addition to these prevention measures, others were reported correctly.

According to Ali et al (2021), cholera prevention depends a lot on the general population's knowledge and attitude towards cholera symptoms and preventive measures, which was also pointed out as a preventive measure in this study. According to AIM (2024), the lack of knowledge and misinformation about cholera is pointed out by the government of Cabo Delgado as the main factor in the recrudescence of cholera in that area, being important to take measures to strengthen the community about cholera, as well as to review and improve communication strategies. Similarly, Chicamisso (2011), in his study on cholera carried out in the Polana Caniço neighborhood in Maputo (the Mozambican capital), concluded that residents naturalize the risks of cholera occurring, as the disease is not perceived as an illness that occurs due to individual conduct, but rather as an external situation that we can all be subject due to the existence of social conditions that favor the emergence of cholera, showing a poor knowledge about cholera. Thus, knowing the risk factors related to the disease will help to prevent it, reduce the incidence, and provide quality health for the population, helping

Mozambique to achieve its commitment to eliminate *cholera* by the year 2030 through the *Ending Cholera: A Global Roadmap to 20*30 initiative.

CONCLUSION

The population of the rural neighborhood of Cahora Bassa in Metoro has knowledge about cholera, with an emphasis on general prevention measures, which can help with self-prevention of the disease. However, difficulties in understanding the correct ways of spreading cholera were evidenced, which suggests intensifying education and health promotion campaigns.

The study had some **limitations**: The lack of financial resources made it difficult to cover other areas (villages) of the Metoro administrative post; Knowledge involves several dimensions, and it is recognized that not all variables have been addressed in this study, prioritizing the variables to enhance prevention; Despite using a representative sampling technique, the results cannot be generalized to all rural areas of the country, since different contexts can be found, but they do serve as an important baseline; Finally, the study cannot conclude whether the level of knowledge is associated with cholera cases in that region since this disease has multifactorial causes and some of them are not within reach of the population but rather of decision-makers.

As **recommendations**, we suggest that future studies cover more rural areas and explore the main risk factors and/or associated causes; they should also develop research that addresses knowledge in all its dimensions; and finally, for health authorities and their cooperation partners, they should strengthen regular health promotion activities at the community level in order to improve knowledge of diseases increasingly, in particular cholera, increasing health literacy and reducing the incidence of the disease.

ACKNOWLEDGEMENTS

AUTHOR CONTRIBUTIONS

Conceptualization, A.C., C.T. and R.B.; data curation, A.C. and C.T.; formal analysis, A.C., C.T. and R.B.; funding acquisition, A.C., C.T. and R.B.; investigation, A.C., C.T. and R.B.; methodology A.C., C.T. and R.B.; project administration, A.C. and C.T.; resources, A.C., C.T. and R.B.; software, A.C. and C.T.; supervision, A.C. and R.B.; validation, A.C. and R.B.; visualization, A.C. and R.B.; writing-original draft, C.T.; writing-review and editing, A.C. and R.B.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Agência de Informação de Moçambique (AIM). (2024). *Desinformação apontada como principal factor de recrudescimento de cólera em Cabo Delgado*. Agência de Informação de Moçambique. https://aimnews.org/2024/02/10/desinformacao-apontada-como-principal-factor-de-recrudescimento-de-colera-em-cabo-delgado/

Ali, E. M., Mohamed, M. B., & Tawhari, M. (2021). Knowledge, attitude, and practice study regarding cholera among the people in Jazan city, KSA. *Journal of Family Medicine and Primary Care, 10*(2), 712–717. https://doi.org/10.4103/jfmpc.jfmpc_965_20

Baptista, A. (2024). *Cólera alastra-se em Moçambique e desinformação causa confrontos*. Canal Voz de América: voaportuguês. https://www.voaportugues.com/a/cólera-alastra-se-em-moçambique-e-desinformação-causa-confrontos/7458873.html

Boru, W., Xiao,S., Amoth, P., Kareko, D., Langat, D., Were, I., Ali, M., Sack, D., Lee, E., & Debes, A. (2023). *Prioritizing interventions for cholera control in Kenya, 17*(5*)* 2015– 2020. Plos Neglected Tropical Diseases. https://doi.org/10.1371/journal.pntd.0010928.

Carta de Moçambique (2024). *Desinformação sobre origem da cólera: População destrói residências de dez membros da autoridade em Mecufí*. https://www.cartamz.com/index.php/sociedade/item/16117-desinformacao-sobre-origem-da-colera-populacao-destroi-residencias-de-dez-membros-da-autoridade-em-mecufi.

Center for Disease Control and Prevention (2024). *Preventing Cholera: Five Basic Steps*. Center for Disease Control and Prevention. https://www.cdc.gov/cholera/prevention/index.html

Cinquenta, A., Mauride, S., & Lia, B. (2024). Knowledge about cholera in a rural area in Mozambique.
Millenium - Journal of Education, Technologies, and Health, 2(25), e32817

7

Chicamisse, R. (2011). *Construção social do risco: um estudo de caso da epidemia de cólera no bairro Polana Caniço "A".* [Monografia, Universidade Eduardo Mondlane]. Repositório UEM Monografias. https://abrir.link/ubwif

Dada, Y., & Mosca, J. (2022). *Demografia e implicações para a economia e o meio rural*. Observatório do Meio Rural n° 190. pp 02-12. https://omrmz.org/destaque_rural/dr-190-demografia-e-implicacoes-para-a-economia-e-o-meio-rural/

Dureab, F., Al-Qadasi, Y., Nasr, H., Al-Zumair, M., & Al-Mahbashi, T. (2021). Knowledge on and preventive practices of cholera in Al-Mahweet - Yemen, 2018: A cross-sectional study. *Journal of Water and Health, 19*(6), 1002–1013. https://doi.org/10.2166/wh.2021.139

Gujral., L., Matsinhe, M., Luis, M., Gonçalves, B., Langa, J., & Baloí, L. (2016). *Manual de Prevenção e Controlo da Cólera e de outras diarréias agudas. Ministério da Saúde*, 4ª edição. Direcção Nacional de Saúde Pública, Departamento de Epidemiologia. https://www.afro.who.int/sites/default/files/2018-07/MANUAL%20DE%20COLERA%202017.pdf

Instituto Nacional de Estatística (INE) (2022). Inquérito sobre orçamento familiar – IOF: Relatório final. Instituto Nacional de Estatística. https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_publicacoes&PUBLICACOESpub_boui=439486878&PUBLICACOESmodo=2

Instituto Nacional de Estatística (INE) (2023). *Vacinação contra a cólera não deve substituir outras medidas de prevenção*. Instituto Nacional de Estatística. https://ins.gov.mz/vacinacao-contra-a-colera-nao-deve-substituir-outras-medidas-de-prevencao/.

Carta de Moçambique (2023). *Moçambique sofre a pior epidemia da cólera em uma década*. Carta de Moçambique. https://www.cartamz.com/index.php/sociedade/item/13366-mocambique-sofre-a-pior-epidemia-da-colera-em-uma-decada.

Macário, D., Boaventura, B., & Basilio, T. (2020). *Breastfeeding in Women Who Work Outside Home: An Analysis Based on Workers at 1º de Maio Health Centre, Northern Mozambique*. International Journal of Science and Research (IJSR), 395-402. https://www.ijsr.net/archive/v10i12/SR211119170327.pdf

Malaeb, D., Sallam, M., Younes, S., Mourad, N., Sarray El Dine, A., Obeid, S., Hallit, S., & Hallit, R. (2022). Knowledge, Attitude, and Practice in a Sample of the Lebanese Population Regarding Cholera*. International Journal of Environmental Research and Public Health, 19*(23), 16243. https://doi.org/10.3390/ijerph192316243

Mengel, M. A., Delrieu, I., Heyerdahl, L., & Gessner, B. D. (2014). Cholera outbreaks in Africa. *Current Topics in Microbiology and Immunology, 379*, 117–144. https://doi.org/10.1007/82_2014_369

Simões, M., Major, S., Mahomed, M., Luiz, N., Mucache, A., & Langa, L. (2023). *Relatório final de áreas críticas de cólera em Moçambique*. Ministério da Saúde, Instituto Nacional de Saúde. https://ins.gov.mz/wp-content/uploads/2023/09/Relatorio-Final-do-Mapeamento-de-Areas-Criticas-de-Colera-em-Mocambique-2017-2021_compressed.pdf

Médicos Sem Fronteiras (2015). *Cólera em Moçambique: uma situação preocupante*. Médicos Sem Fronteiras. https://www.msf.org.br/noticias/colera-em-mocambique-uma-situacao-preocupante/.

Niederberger, E., Tanner, L., & Karam, S. (2023). *Key Considerations: Socio-Behavioral Insight for Community-Centered Cholera Preparedness and Response in Mozambique*. Social Science in Humanitarian Action Platform - SSHAP. https://www.socialscienceinaction.org/resources/key-considerations-socio-behavioural-insight-for-community-centred-cholera-preparedness-and-response-in-mozambique-2023/

OCHA (2023). *Mozambique Humanitarian Response Plan*. OCHA. https://reliefweb.int/report/mozambique/2023-mozambique-humanitarian-response-plan-february-2023.

Pires, P., & Abdirazak, A. (2019*).* Conhecimento da população urbana sobre a cólera, Nampula, Moçambique*. Revista Moçambicana de Ciências de Saude, 5* (1). https://ins.gov.mz/wp-content/uploads/2022/11/RMCS-V5_2019.pdf

Rádio Moçambique (2024). *Cabo Delgado: Desinformação sobre a origem da cólera preocupa autoridades*. Rádio Moçambique. https://www.rm.co.mz/cabo-delgado-desinformacao-sobre-origem-da-colera-preocupa-autoridades/

Sousa, V., Franco, A., & Silva, M. (2023). *Cólera: Série Histórica 2010-2021, Informe Epidemiológico*, (*20*), 219. Boletim Epidemiológico Paulista. https://doi.org/10.57148/bepa.2022.v.19.37865

UNICEF Moçambique (2019). *Segunda fase da campanha de vacinação contra a cólera em Cabo Delgado*. UNICEF Moçambique. https://www.unicef.org/mozambique/comunicados-de-imprensa/segunda-fase-da-campanha-de-vacinação-contra-cólera-em-cabo-delgado

World Health Organization (2023). *Disease Outbreak news: Cholera – Global* situation. World Health Organization. https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON437