

# Knowledge, Attitudes, and Practices Regarding Chagas Disease in Micro-Territories of Fusagasugá–Cundinamarca, 2020–2022

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**Abstract**

**Introduction:** Chagas disease remains a major neglected tropical disease (NTD) in Latin America, disproportionately affecting rural and socioeconomically vulnerable populations. Limited community knowledge and inadequate preventive practices contribute to persistent transmission. **Objective:** This study aimed to assess knowledge, attitudes, and practices (KAP) regarding Chagas disease among residents of selected rural micro-territories in Fusagasugá, Cundinamarca, between 2020 and 2022. **Methods:** A descriptive cross-sectional quantitative study was conducted among 166 adult residents from three rural micro-territories (Boquerón, El Triunfo, and Chinauta). Data were collected using a 27-item structured KAP questionnaire previously developed for endemic communities. Descriptive statistics were used to summarize frequencies and percentages. **Results:** Only 16.87% of respondents reported being familiar with Chagas disease, and 27.71% correctly identified the insect vector. Although 39.16% reported knowing how the disease is transmitted, knowledge regarding affected organs (9.04%) and vector ecology (31.33%) was limited. Despite these knowledge gaps, 77.11% expressed willingness to undergo diagnostic testing. **Conclusion:** The findings reveal significant deficiencies in community knowledge despite generally positive attitudes toward prevention. Strengthened community-based education strategies and nursing-led public health interventions are necessary to improve awareness and disease control in high-risk rural areas.

**Keywords:**

Chagas Disease, Knowledge, Attitudes, Practices, Neglected Tropical Diseases, Community Nursing



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## INTRODUCTION

Chagas disease, also known as American trypanosomiasis, is a neglected tropical disease caused by the protozoan *Trypanosoma cruzi*. First described in 1909, the disease remains endemic in 21 Latin American countries and continues to pose a significant public health challenge (Coura & Borges-Pereira, 2012). It is estimated that between six and seven million people worldwide are infected, with approximately 10,000 deaths annually (Organización Mundial de la Salud [OMS], 2022).

Transmission occurs primarily through contact with the feces of infected triatomine insects. However, additional routes include congenital transmission, blood transfusion, organ transplantation, oral transmission through contaminated food, and laboratory accidents (OMS, 2022).

Despite global recognition, Chagas disease remains underestimated in official statistics, and surveillance limitations may obscure its true distribution (Instituto Nacional de Salud [INS], 2023). In Colombia, epidemiological reports show fluctuating case numbers, with regional disparities influenced by ecological and socioeconomic factors.

Previous studies have demonstrated that limited knowledge and inadequate preventive practices contribute significantly to continued transmission (Berger et al., 2018; Rodríguez et al., 2021). Research also indicates that sociocultural perceptions influence how communities understand and respond to the disease (Ventura-Garcia et al., 2013; Salm & Gertsch, 2019).

Although several KAP studies have been conducted in Latin America, limited micro-territorial data exist for Fusagasugá, Cundinamarca. Understanding local knowledge and behavioral patterns is essential for designing targeted public health interventions. Therefore, this study aimed to determine the knowledge, attitudes, and practices regarding Chagas disease among residents of selected rural micro-territories in Fusagasugá between 2020 and 2022.

## METHODS

### 1. Design

A descriptive cross-sectional quantitative design was employed to assess knowledge, attitudes, and practices related to Chagas disease.

### 2. Sample Size and Sampling Technique

The study was carried out in three rural micro-territories of Fusagasugá: Boquerón, El Triunfo, and Chinauta. Participants were adult residents ( $\geq 18$  years). The population distribution and estimated sample size are presented in Table 1.

Data were ultimately collected from 166 participants who met inclusion criteria and provided informed consent.

### 3. Instruments

Data were collected using the “Knowledge, Attitudes, and Practices regarding Chagas Disease” questionnaire developed for endemic communities. The instrument consists of 27 closed-ended items covering: (1) sociodemographic characteristics; (2) knowledge about Chagas disease; (3) attitudes toward prevention and diagnosis; and (4) preventive practices. Internal consistency was evaluated, and the instrument demonstrated acceptable reliability (Cronbach’s  $\alpha \geq 0.70$ ).

### 4. Data Collection Process

Data were collected between 2020 and 2022 in three rural micro-territories of Fusagasugá (Boquerón, El Triunfo, and Chinauta). Eligible participants were adult residents ( $\geq 18$  years) who provided informed consent.

The questionnaire was administered directly in the community setting. All responses were checked for completeness before being coded and entered into the database for analysis. Confidentiality of participants was maintained throughout the study.

**Table 1.** Population Distribution and Estimated Sample Size

District	Micro-territory	Population	Percentage	Estimated Sample (Percentage)	Estimated Sample (Population)
Southwestern Rural District	Boquerón, El Triunfo	1,500	15%	56	307
Southwestern Rural District	Chinauta	4,000	40%	149	365
Total Estimated Sample				204	672
Pilot Test (10%)				20	

Source: Official DNP Terridata website (September 30, 2022)

5. Data Analysis

Data were analyzed using descriptive statistics (frequencies and percentages). Findings are presented in tables and narrative summaries.

6. Research Ethics

The study complied with Colombian ethical regulations, including Resolution 8430 of 1993 and Law 911 of 2004. Participation was voluntary, and informed consent was obtained from all respondents. The research was classified as minimal risk.

A very small proportion (4.82%) reported having been bitten by the insect, and only 3.01% indicated that a family member had been diagnosed with Chagas disease. Although 67.47% reported having domestic animals at home, which may serve as potential reservoirs, the association between animal presence and perceived disease risk was not clearly recognized by respondents. These findings suggest a potential underestimation of risk within the community, particularly considering the ecological characteristics of rural Andean regions.

RESULTS

A total of 166 adult residents from three rural micro-territories participated in the study. The findings reveal important gaps in knowledge, exposure awareness, and preventive practices related to Chagas disease.

1. Epidemiological Exposure Factors

As presented in Table 2, only 27.71% of respondents reported being able to identify the insect vector of Chagas disease. This indicates that nearly three-quarters of the population lack basic recognition of the primary transmission agent. Furthermore, only 16.27% reported having seen the insect in their homes or nearby areas, suggesting either low exposure perception or under-recognition of the vector.

2. Knowledge of the Vector

More than half of participants (51.20%) did not know the name of the insect vector (Table 3). While 41.57% identified it as "Pito," other names were mentioned only sporadically. The variability in terminology may reflect local cultural identification but also indicates inconsistent health communication.

3. Knowledge About Chagas Disease

Knowledge regarding the disease itself was limited (Table 4). Only 16.87% reported being familiar with Chagas disease. Although 39.16% indicated knowledge of transmission routes, detailed understanding was lacking: only 9.04% knew which organs could be affected, and only 15.06% knew what the insect feeds on.

Despite these knowledge limitations, 77.11% expressed willingness to undergo diagnostic testing, indicating a positive preventive attitude that may serve as an entry point for community-based interventions.

**Table 2.** Epidemiological Factors Related to Chagas Disease (N=166)

Items	Yes (n)	Yes (%)	No (n)	No (%)
Identifies the insect	46	27.71	120	72.29
Has seen insect at home	27	16.27	139	83.73
Has been bitten	8	4.82	158	95.18
Blood transfusion/transplant	10	6.02	156	93.98
Family member diagnosed	5	3.01	161	96.99
Has animals at home	112	67.47	54	32.53

**Table 3.** Local Name of the Insect Reported

Name	Percentage
Does not know	51.20%
"Pito"	41.57%
"Chinche"	3.61%
Others	0.60% (each)

**Table 4.** Knowledge Regarding Chagas Disease (N=166)

Items	Yes (n)	Yes (%)	No (n)	No (%)
Familiar with disease	28	16.87	138	83.13
Knows transmission route	65	39.16	101	60.84
Knows affected organs	15	9.04	151	90.96
Knows insect habitat	52	31.33	114	68.67
Knows insect feeding	25	15.06	141	84.94

## DISCUSSION

This study identified significant gaps in knowledge regarding Chagas disease among residents of rural micro-territories in Fusagasugá. The low proportion of participants who were familiar with the disease (16.87%) aligns with findings from Rodríguez et al. (2021) and Ruiz-Colorado et al. (2016), who reported limited community awareness in endemic areas.

Although 39.16% reported knowing how the disease is transmitted, only a minority demonstrated comprehensive understanding of organ involvement or vector ecology. Similar patterns were observed in Mexico and Bolivia, where knowledge of vector presence did not necessarily translate into accurate understanding of transmission mechanisms (Berger et al., 2018; Salm & Gertsch, 2019).

Environmental factors may also contribute to exposure risk. Coura and Borges-Pereira (2012) emphasized the influence of ecological and climatic conditions on vector distribution. Studies on urban–rural gradients have demonstrated adaptation of triatomine insects to peri-urban environments (Montes de Oca-Aguilar et al., 2022), suggesting that micro-territorial surveillance remains crucial.

The high percentage of households with domestic animals (67.47%) may represent potential reservoirs, as highlighted in epidemiological reviews (Rosas et al., 2007). However, community recognition of this risk appears limited.

The limited awareness of chronic complications is particularly concerning. Chronic cardiac and neurological manifestations of Chagas disease have been well documented (Campos et al., 2020; Montoya, 2021; Reis Lag et al., 2022; Hasslocher-Moreno et al., 2021). Failure to recognize these consequences may delay early diagnosis and treatment.

Sociocultural dimensions also influence perception. Ventura-Garcia et al. (2013) and Parisi et al. (2020) demonstrated that perceived low severity and normalization of vector presence reduce preventive behavior. Similar dynamics may be occurring in Fusagasugá, where limited perceived susceptibility coexists with environmental risk.

Despite knowledge gaps, the high willingness to undergo testing (77.11%) is encouraging. This finding suggests openness to health interventions and aligns with community-based approaches described in Nava-Doctor et al. (2021) and Pineda et al. (2021).

From a nursing perspective, these findings highlight the need for strengthened health education programs tailored to local terminology and community contexts. These strategies should include home-based vector surveillance, environmental assessment, and early screening initiatives, particularly among women of childbearing age, given concerns about congenital transmission (OMS, 2022).

Community nurses play a central role in bridging knowledge gaps, promoting early detection, and reinforcing preventive practices in endemic settings.

## Implications for Practice and Future Research

The findings highlight significant gaps in community knowledge of Chagas disease, emphasizing the need for targeted, culturally appropriate health education and community-based interventions led by nurses and primary healthcare providers. Strengthening the integration of Chagas disease education, surveillance, and vector control into primary healthcare programs is essential, particularly in high-risk rural areas. Future studies should incorporate analytical and intervention-based approaches to evaluate strategies for improving knowledge and reducing disease transmission.

## Limitations

This study has several limitations. Its cross-sectional design does not allow causal inferences between knowledge, attitudes, and practices. Data were self-reported, which may introduce recall and social desirability bias. The study was conducted in selected rural micro-territories, limiting generalizability to other regions. Additionally, the analysis was primarily descriptive, restricting deeper examination of associations between sociodemographic variables and KAP outcomes.

## CONCLUSION

This study identified significant gaps in knowledge regarding Chagas disease among residents of rural micro-territories in Fusagasugá, Cundinamarca, particularly in relation to vector identification, transmission routes, and clinical consequences. Despite limited knowledge, participants demonstrated positive attitudes toward prevention and a high willingness to undergo diagnostic testing. These findings suggest that strengthening culturally adapted community education and targeted vector-control strategies in high-risk areas such as Chinauta and Boquerón is essential. Integrating KAP-based assessments into primary health care services may enhance early detection and community engagement in Chagas disease control.

## Author Contributions

Conceptualization: Edison Huertas Bustos; Methodology: Edison Huertas Bustos, Hugo Fernando Ramírez Jaramillo; Data Collection: Natalia Bocanegra Gómez, Daniela Losada Salazar; Analysis: Edison Huertas Bustos; Investigation: Edison Huertas Bustos, Daniela Losada Salazar;

Validation: Hugo Fernando Ramírez Jaramillo; Software: Natalia Bocanegra Gómez; Visualization: Natalia Bocanegra Gómez; Project Administration: Edison Huertas Bustos; Writing—Original Draft: Edison Huertas Bustos; Writing—Review & Editing: Edison Huertas Bustos, Hugo Fernando Ramírez Jaramillo.

#### Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to ethical and privacy restrictions to protect participant confidentiality.

#### Conflict of Interest

The authors declare that they have no conflict of interest.

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