Scientific Research Publishing

Journal of Biosciences and Medicines, 2026, 14(7), 264-277
https://www.scirp.org/journal/jbm
ISSN Online: 2327-509X
ISSN Print: 2327-5081

# Prevalence of Respiratory Infections and Analysis of Knowledge, Attitudes, and Practices among Residents of Korhogo (Northern Côte d'Ivoire)

**Tanoh Amany Serge Raymond N'Krumah[1,2], Bi Yourou Guillaume Zamina[3], Ellélé Aimé Marius Yapi[3], Boukini Souleymane Coulibaly[1], Ollo Kambiré[1], Issaka Tiembré[3,4]**

[1]Biological Sciences Training and Research Unit, Peleforo Gon Coulibaly University, Korhogo, Côte d'Ivoire
[2]Research and Development Department, Swiss Center for Scientific Research in Côte d'Ivoire, Abidjan, Côte d'Ivoire
[3]National Institute of Public Hygiene, Abidjan, Côte d'Ivoire
[4]Medical Sciences Training and Research Unit, Félix Houphouët Boigny University of Abidjan, Abidjan, Côte d'Ivoire
Email: nktanoh@gmail.com

**How to cite this paper:** N'Krumah, T.A.S.R., Zamina, B.Y.G., Yapi, E.A.M., Coulibaly, B.S., Kambiré, O. and Tiembré, I. (2026) Prevalence of Respiratory Infections and Analysis of Knowledge, Attitudes, and Practices among Residents of Korhogo (Northern Côte d'Ivoire). *Journal of Biosciences and Medicines*, **14**, 264-277.
https://doi.org/10.4236/jbm.2026.147021

**Received:** May 9, 2026
**Accepted:** July 17, 2026
**Published:** July 20, 2026



## Abstract

Background: Respiratory infections are a major public health problem, particu-larly in northern Côte d'Ivoire. The objective of this study is to determine the prevalence of respiratory infections and to analyze the knowledge, attitudes, and practices of the population of Korhogo. Methods: This is a cross-sectional, descriptive study. The survey was conducted in July 2025 (rainy season) and January 2026 (dry season) among 430 residents of the city of Korhogo, selected using a mixed sampling method (convenience and simple random sampling). The data were analyzed using R software version 4.3.3, and statistical tests were performed at a 5% significance level. Results: The overall prevalence of respiratory infections was 22% (95% CI: 17.8 - 25.8). During the rainy season (July 2025), the prevalence was 13%, while during the dry season (January 2026), it was 30%. The knowledge assessment showed that the majority (96%) of respondents had good knowledge about respiratory infections, with an average score of 4/5. With regard to attitudes and practices, nearly 43% of respondents reported purchasing medications directly from a pharmacy at the onset of illness, while 52.1% indicated that they would visit a health center in the event of severe respiratory infections. The assessment of practices and attitudes revealed that more than half of respondents (52%) adopted practices and attitudes considered acceptable to good regarding respiratory infections, with an average score of 2.6/5. Conclusion: These findings underscore the need to strengthen public awareness, prevention, and epide-

miological surveillance in order to reduce the incidence of respiratory infections in Korhogo.

## Keywords

Respiratory Infections, Knowledge, Attitudes, Practices, Prevalence, Korhogo, Côte d'Ivoire

## 1. Introduction

An infection is considered "respiratory" when it affects one of the structures that make up the respiratory system, namely the nose, ears, throat, larynx, trachea, bronchi, or lungs [1]. Respiratory infections affect millions of people worldwide each year and constitute a major public health problem [2]. In temperate zones, they are more common in winter, with approximately 15% to 25% of the population affected during epidemic periods. In tropical regions, respiratory infections are more consistent throughout the year, with infection rates 20% to 40% higher due to the hot and humid climate, which facilitates the survival and transmission of pathogens [3].

The world is increasingly confronted with seasonal influenza, which affects 5 to 10% of the global population each year, peaking between November and March in the Northern Hemisphere [4]. However, lower respiratory tract infections remain one of the leading causes of infectious mortality. In 2023, they caused approximately 2.5 million deaths worldwide [5] [6].

In Africa, according to the World Health Organization (WHO), acute respiratory infections (ARIs) cause approximately 800,000 deaths among children each year. Low- and middle-income countries bear a disproportionately high burden of morbidity and mortality caused by respiratory diseases [7]. Respiratory infections primarily affect children under five, as well as the elderly, and are strongly influenced by environmental, climatic, and socioeconomic factors [6] [8].

In Côte d'Ivoire, respiratory infections are among the leading causes of hospital and health center visits, following malaria and diarrheal diseases [9]. In 2020, the number of acute respiratory infection cases in the country's general population was 1,448,754, with an incidence of 54.77 cases per 1000 inhabitants. In the Korhogo health district, 41,183 cases of respiratory infections were recorded in the general population that same year, representing an incidence of 60.7 per 1000 inhabitants, which is higher than the national average [9].

Despite the high incidence of respiratory infections in the Korhogo health district, our understanding of the factors driving the transmission of respiratory diseases among the population remains limited.

The objective of this study is to determine the prevalence of respiratory infections and to analyze the knowledge, attitudes, and practices of the population of Korhogo, with the aim of guiding public health strategies and contributing to the

reduction of associated morbidity and mortality.

## 2. Methodology

### 2.1. Study Area

The study was conducted in the city of Korhogo, located in northern Côte d'Ivoire. Korhogo is the capital of the Poro region (Figure 1). It is located approximately 635 km from Abidjan, the economic capital of Côte d'Ivoire. The population of Korhogo is estimated at over 400,000 [10]. The climate is of the Sudanese tropical type, characterized by two main seasons: a dry season dominated by the harmattan, occurring from November to April, and a rainy season that runs from May to October. Average annual precipitation ranges from 1100 to 1300 mm. Temperatures are relatively high throughout the year, with an annual average of approximately 26˚C to 27˚C [11] [12].

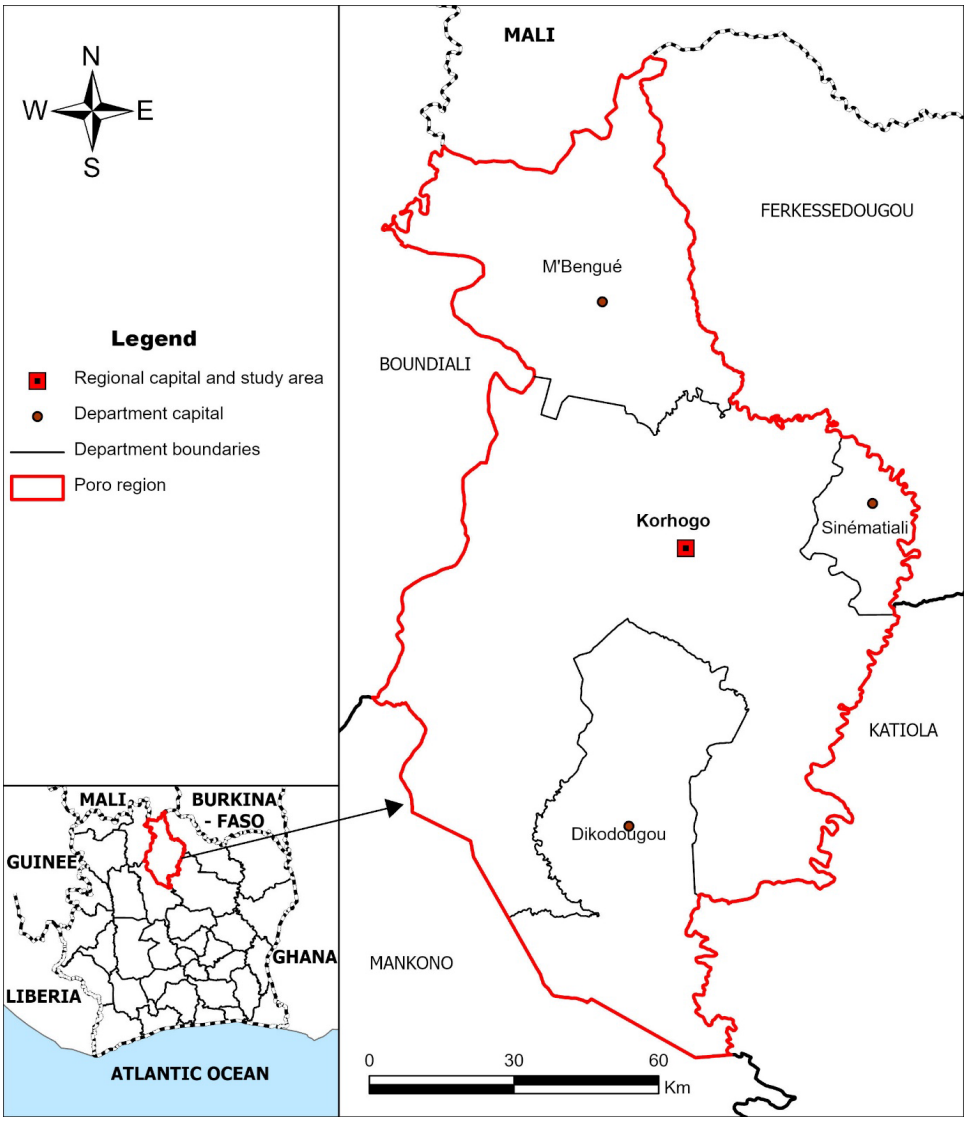


Figure 1. Map of the Poro region, including Korhogo, the study area [13].

### 2.2. Study Design and Study Period

This is a cross-sectional, descriptive study conducted in July 2025 (rainy season) and January 2026 (dry season) in the city of Korhogo. Data for the rainy season were collected from July 1 to 18, 2025, and data for the dry season from January 7 to 24, 2026.

### 2.3. Study Population, Inclusion and Exclusion Criteria

The study population consisted of residents of the city of Korhogo. Thus, anyone who had lived in the city of Korhogo for at least six (6) months and was 12 years of age or older was included in the study. The decision to include individuals aged 12 and older was based on the fact that, starting at this age, people are generally capable of understanding and communicating effectively to answer questions regarding their health status, knowledge, attitudes, and practices related to respiratory infections. Conversely, individuals under the age of 12 and anyone aged 12 or older who was unable to understand and communicate effectively to answer questions were excluded from the study.

## 3. Sampling

The sample size (n) used for this study was calculated using the following formula [14]:

$$n = z^2 * p(1-p)/e^2 ,$$

where:

*n*: minimum sample size;

*z*: confidence level: 1.96 for a 95% confidence level;

*p*: expected proportion of respiratory infections: a maximum value of 50% was used;

*e*: margin of error: set at 5%.

Using this formula, a minimum sample size of 384 individuals was obtained. To account for non-responses, this size was increased by 5% and rounded up to 410.

### 3.1. Data Collection Tools

A physical questionnaire was developed and sent to public health experts at the National Institute of Public Hygiene in Abidjan for review and validation. The survey form was made available online via the Kobotoolbox application and exported to the Kobocollect application for electronic data collection using an Android smartphone. The questionnaire was structured into three main sections, namely:

1) Sociodemographic characteristics of respondents: This section of the questionnaire focused on the respondents' gender, age, educational level, and occupation.

2) Knowledge, attitudes, and practices regarding respiratory infections: This

section focused on respondents' knowledge of respiratory infections specifically, the causative agents, main symptoms, and modes of transmission, as well as their attitudes and practices in the event of respiratory infections.

3) Prevalence of respiratory infections: This section focuses on cases of respiratory infections reported by respondents during the seven (7) days preceding the survey. In fact, we included all cases of respiratory infections as defined in the case definition [15], with the exception of asthma cases, which are chronic, non-infectious respiratory conditions most often caused by allergies or environmental factors [16].

### 3.2. Data Collection

A pilot survey was conducted from June 15 to 18, 2025, with 40 participants representing 10% of the sample size in a village located near the city of Korhogo. This preliminary phase aimed to test the electronic questionnaire, identify and correct any errors, and familiarize the interviewer with the use of the KoboCollect app. Data collection relied on a mixed-methods sampling approach, combining convenience sampling and simple random sampling [13] [17]. Survey locations were selected in the 13 major neighborhoods of the city of Korhogo using stratified sampling, taking into account the density of foot traffic in each neighborhood. Several collection points were thus chosen to ensure better representativeness of the study population.

Participants were recruited at these various high-traffic locations in the morning between 10 a.m. and 12 p.m. and in the afternoon between 4 p.m. and 6 p.m. Any person presents at the site who agreed to participate in the study, after providing oral informed consent, could be interviewed. In total, 33 people were surveyed in each district across both surveys. When a group of people (two or more) was present at the survey site, a single person was randomly selected to participate in the survey. To do this, each individual in the group was assigned a number, and a simple random draw was conducted to select the participant. The average time required to complete the questionnaire was between 5 and 7 minutes.

### 3.3. Data Processing and Analysis

The data were analyzed using R software (version 4.3.3). Proportions and confidence intervals (95% CI) for the various variables were calculated, as well as the prevalence of respiratory infections. The assessment of respondents' knowledge, attitudes, and practices regarding respiratory infections was conducted by calculating scores [13].

Thus, a correct answer to a question was worth 1 point, and an incorrect answer was worth 0 points. The "knowledge" section was worth a total of 5 points, as was the "attitudes and practices" section. A total score of strictly less than 3 points for knowledge, as well as for attitudes and practices, was considered low. Conversely, a total score of 3 points or more for knowledge, as well as for attitudes and prac-

tices, was considered acceptable or good. The internal consistency of the knowledge scale, as well as that of the attitudes and practices scale, was assessed using the Kuder-Richardson coefficient (KR-20). The coefficient obtained was $\alpha = 0.84$, indicating good internal consistency and thus confirming the validity of the scale as a reliable tool for measuring respondents' knowledge, attitudes, and practices regarding respiratory infections. The chi-square ($\chi^2$) test with a 5% significance level was performed to compare the different proportions.

## 4. Ethical Considerations

Verbal informed consent was obtained from each respondent before they answered the questions. Prior to the survey, each respondent was informed of the purpose of the study and that their participation was voluntary. All respondents were assured that the data collected during the study would remain anonymous and strictly confidential. Official ethical approval was not required under local regulations for the conduct of the study.

## 5. Results

### 5.1. Sociodemographic Characteristics of Respondents in Korhogo

Table 1 summarizes the sociodemographic characteristics of respondents in the survey on respiratory infections in the city of Korhogo. A total of 430 people were surveyed, including 276 men (64.2%) and 154 women (35.8%). The minimum and maximum ages of the respondents were 15 and 42 years, respectively, with a median age of 21 years. The majority (75%) of respondents were under 25 years of age. Schoolchildren and students constituted more than half (85.3%) of the respondents.

Table 1. Sociodemographic characteristics of respondents in the city of Korhogo regarding respiratory infections in July 2025 and January 2026.

| Variables | (n, %) | 95% CI percentages |
|---|---|---|
| **Gender** | | |
| Male | 276 (64.2) | 59.5 - 68.7 |
| Female | 154 (35.8) | 31.3 - 40.5 |
| **Total** | **430 (100)** | |
| **Age group (years)** | | |
| 15 - 19 | 160 (37.2) | 32.6 - 42.0 |
| 20 - 24 | 163 (37.9) | 33.3 - 42.7 |
| 25 - 29 | 85 (19.8) | 16.1 - 23.9 |
| 30 - 34 | 15 (3.5) | 2.0 - 5.7 |
| ≥35 | 07 (1.6) | 0.7 - 3.3 |
| Median age (range) | 21 (15 - 42) | |
| **Total** | **430 (100)** | |

Continued

| | | |
|---|---|---|
| **Levels of education** | | |
| No level | 45 (10.5) | 7.7 - 13.8 |
| Middle School/High School | 196 (45.6) | 40.8 - 50.4 |
| University | 189 (44.0) | 39.2 - 48.8 |
| **Total** | **430 (100)** | |
| **Occupations** | | |
| Students | 367 (85.3) | 81.6 - 88.6 |
| Civil servants/Business owners | 30 (7.00) | 4.8 - 9.8 |
| Unemployed | 33 (7.7) | 5.3 - 10.6 |
| **Total** | **430 (100)** | |

## 5.2. Knowledge, Attitudes, and Practices of Respondents in Korhogo Regarding Respiratory Infections

### 5.2.1. Respondents' Knowledge of Respiratory Infections

The majority (98%) of respondents were unaware of the pathogens responsible for respiratory infections. Among the respiratory infections reported by respondents, nasopharyngitis (the common cold) was the most common (50.2%), followed by influenza (38.4%), while COVID-19 accounted for a smaller proportion (11.4%).

The main symptoms of respiratory infections cited by respondents were, in order, the common cold and runny nose (40.7%), general fatigue (20.7%), and cough (15%). The main causes of respiratory infections reported by respondents were exposure to dust (66.5%) and unpleasant odors (15.6%). Regarding prevention, the majority (67.2%) of respondents recommended wearing a mask (face covering). An assessment of respondents' knowledge levels showed that the majority (96.5%) had good knowledge of respiratory infections, with an average score of 4/5 (Table 2).

Table 2. Knowledge of respondents in the city of Korhogo regarding respiratory infections in July 2025 and January 2026.

| Variables | (n, %) | 95% CI percentages |
|---|---|---|
| **Pathogens** | | |
| Microbes (viruses, bacteria) | 10 (2.3) | 1.1 - 4.2 |
| Doesn't know | 420 (97.7) | 95.8 - 98.9 |
| **Total** | **430 (100)** | |
| **Common respiratory infections** | | |
| Nasopharyngitis (common cold) | 216 (50.2) | 45.4 - 55.1 |
| Influenza | 165 (38.4) | 33.8 - 43.2 |
| COVID-19 | 49 (11.4) | 8.6 - 14.8 |
| **Total** | **430 (100)** | |

Continued

| | | |
|---|---|---|
| **Main symptoms** | | |
| Cough | 64 (14.9) | 11.7 - 18.6 |
| Colds and runny noses | 185 (43.0) | 38.3 - 47.9 |
| General fatigue | 89 (20.7) | 17.0 - 24.8 |
| Sore throat | 29 (6.7) | 4.6 - 9.5 |
| Headaches | 63 (14.7) | 11.4 - 18.4 |
| **Total** | **430 (100)** | |
| **Possible causes of respiratory infections** | | |
| Exposure to moisture/cold | 36 (8.4) | 5.9 - 11.4 |
| Exposure to fumes (cooking, industrial, etc.) | 18 (4.2) | 2.5 - 6.5 |
| Exposure to dust | 286 (66.5) | 61.8 - 71.0 |
| Exposure to unpleasant odors | 67 (15.6) | 12.3 - 19.4 |
| Other causes of respiratory infections* | 23 (5.3) | 3.4 - 7.9 |
| **Total** | **430 (100)** | |
| **Prevention of respiratory infections** | | |
| Good personal hygiene (hand washing) | 39 (9.1) | 6.5 - 12.2 |
| Avoid breathing in smoke/Avoid smoking | 26 (6.0) | 4.0 - 8.7 |
| Avoid coming into contact with a contaminated person or object | 22 (5.1) | 3.2 - 7.6 |
| Avoid breathing in dust | 38 (8.8) | 6.3 - 11.9 |
| Wear a mask (face covering) | 289 (67.2) | 62.5 - 71.6 |
| Other preventive measures† | 16 (3.7) | 2.1 - 6.00 |
| **Total** | **430 (100)** | |
| **Level of knowledge about respiratory infections** | | |
| Poor knowledge (score < 3 points) | 00 (0) | 0 - 0.9 |
| Acceptable knowledge (score = 3 points) | 15 (3.5) | 2.0 - 5.7 |
| Good knowledge (score > 3 points) | 415 (96.5) | 94.3 - 98.0 |
| **Total** | **430 (100)** | |
| **Average score of respondents** | **3.98/5** | |

Note: *Other causes of respiratory infections mentioned by respondents: exposure to humidity, heredi-tary/genetic conditions, exposure to microbes (viruses/bacteria); †Other preventive measures mentioned by respondents: ventilating the rooms in the house, getting vaccinated, coughing and/or sneezing into the crook of the elbow or into a tissue, and eating clean food.

### 5.2.2. Respondents' Attitudes and Practices Regarding Respiratory Infections

The majority of respondents (67.6%) reported either paying for medications directly at a pharmacy (42.8%) or visiting a health center (24.8%) when the first symptoms of respiratory infections appeared. However, when the respiratory illness lasts

several days, most (52.1%) of those surveyed reported going to a health center or hospital. Nearly half of those surveyed (48.3%) reported having no specific habits or practices when they were unable to sleep at night due to a cold. However, 34.4% of respondents reported applying shea butter or Mentholatum to their nose. Less than half (34.2 %) of those surveyed said they always or often wear a face mask when they have a respiratory infection. More than half of the participants (64 %) reported washing their hands only sometimes or rarely after coughing or sneezing when they had a respiratory infection. The assessment of practices and attitudes revealed that more than half of respondents (52%) adopted practices and attitudes considered acceptable to good regarding respiratory infections, with an average score of 2.6/5 (Table 3).

Table 3. Attitudes and practices of respondents in Korhogo regarding respiratory infections in July 2025 and January 2026.

| Variables | (n, %) | 95% CI percentages |
|---|---|---|
| **What do you do when you feel the first signs of a respiratory infection?** | | |
| I'm going to the hospital/health center | 107 (24.8) | 20.9 - 29.3 |
| I buy medicine at the pharmacy | 184 (42.8) | 38.1 - 47.6 |
| I buy Chinese medicine/from street vendors | 91 (21.2) | 17.4 - 25.3 |
| It doesn't do anything | 24 (5.6) | 3.6 - 8.2 |
| Other attitudes and practices* | 24 (5.6) | 3.6 - 8.2 |
| **Total** | **430 (100)** | |
| **What do you do when you can't sleep at night because you have a cold?** | | |
| I apply shea butter/Mentholatum inside my nose | 148 (34.4) | 29.9 - 39.1 |
| I eat ginger/drink tea | 57 (13.3) | 10.2 - 16.8 |
| It doesn't do anything | 208 (48.3) | 43.6 - 53.2 |
| Other attitudes and practices† | 17 (4.0) | 2.3 - 6.3 |
| **Total** | **430 (100)** | |
| **What do you do when a respiratory illness lasts for several days?** | | |
| I'm going to the hospital/health center | 224 (52.1) | 47.3 - 56.9 |
| I use traditional medicines | 97 (22.5) | 18.7 - 26.8 |
| I buy medicine at the pharmacy | 53 (12.3) | 9.4 - 15.8 |
| I take medication at home | 39 (9.1) | 6.5 - 12.2 |
| Other attitudes and practices‡ | 17 (4.0) | 2.3 - 6.3 |
| **Total** | **430 (100)** | |
| **If you have a respiratory infection, do you wear a face mask?** | | |

**Continued**

| | | |
|---|---|---|
| Always | 55 (12.8) | 9.8 - 16.3 |
| Often | 92 (21.4) | 17.6 - 25.6 |
| Sometimes | 121 (28.1) | 23.9 - 32.6 |
| Rarely | 162 (37.7) | 33.1 - 42.4 |
| **Total** | **430 (100)** | |
| **If you have a respiratory infection, do you wash your hands after coughing or sneezing?** | | |
| Always | 57 (13.3) | 10.2 - 16.8 |
| Often | 98 (22.7) | 18.9 - 27.1 |
| Sometimes | 116 (27.0) | 22.8 - 31.4 |
| Rarely | 159 (37.0) | 32.4 - 41.7 |
| **Total** | **430 (100)** | |
| **Level of attitudes and practices regarding respiratory infections** | | |
| Inappropriate attitudes and practices (score < 3 points) | 206 (47.9) | 43.1 - 52.7 |
| Acceptable attitudes and practices (score = 3 points) | 148 (34.4) | 29.9 - 39.1 |
| Good attitudes and practices (score > 3 points) | 76 (17.7) | 14.2 - 21.6 |
| **Total** | **430 (100)** | |
| **Average score for respondents' attitudes and practices** | **2.60/5** | |

Note: *Other behaviors and practices mentioned by respondents: use of traditional medicines, self-medication (use of over-the-counter medications found at home), consumption of ginger or herbal tea; †Other behaviors and practices mentioned by respondents: use of nasal decongestants, breathing through the mouth, use of traditional medicines; ‡Other behaviors and practices mentioned by respondents: consumption of ginger and/or herbal tea, application of shea butter and/or Mentholatum to the nose.

## 5.3. Prevalence of Respiratory Infections in the City of Korhogo

**Table 4.** Prevalence of respiratory infections in the city of Korhogo in July 2025 and January 2026.

| Variables | July 2025 (Rainy season) | January 2026 (Dry season) | p | Combined data for both seasons |
|---|---|---|---|---|
| | n (%) | n (%) | | n (%) |
| **Have you had a respiratory infection in the seven (7) days prior to this questionnaire?** | | | | |
| Yes | 27 (13.0) | 66 (30.0) | **0.001** | 93 (21.6) |
| No | 183 (87.0) | 154 (70.0) | 0.153 | 337 (78.4) |
| **Total** | **210 (100)** | **220 (100)** | | **430 (100)** |

The overall prevalence of respiratory infections among respondents in the city of Korhogo in 2025 and 2026 was 21.6% (95% CI: 17.8 - 25.8). During the rainy season (July 2025), the prevalence was 13% (95% CI: 8.6 - 18.2), and during the dry season, it was 30% (95% CI: 24.0 - 36.5). There is a statistically significant difference (p-value = 0.001) between the prevalence of respiratory infections in Korhogo during the two climatic seasons (**Table 4**).

## 6. Discussion

Respiratory infections are a major public health problem, particularly in Korhogo [11]. The objective of this study is to determine the prevalence of respiratory infections and to analyze the knowledge, attitudes, and practices of the population of Korhogo.

Three-quarters (75%) of the population surveyed in the city of Korhogo consisted mainly of young students, with a median age of 21, reflecting the demographic structure of this city and, more broadly, that of urban areas in Côte d'Ivoire [10]. This predominance of young adults is likely to facilitate the transmission of respiratory infections due to the close contact observed in schools and universities, as well as high social mobility, as reported in a study conducted in sub-Saharan Africa [18].

Although nearly all (98%) of the respondents were unaware of the pathogens responsible for respiratory infections, the overall level of knowledge about this disease was deemed satisfactory, suggesting that knowledge of respiratory infections is primarily viewed from an environmental rather than a biological perspective. Dust and unpleasant odors were cited by the majority (82%) of respondents as the main causes of respiratory infections, which is consistent with the climatic context of Korhogo, characterized by recurring episodes of the harmattan. Previous studies have shown that in many African urban settings, people associate respiratory diseases with visible environmental factors, such as dust or smoke, rather than with invisible microbial agents [19] [20]. The overall assessment of practices and attitudes shows that 52% of participants scored at an acceptable to good level, with an average score of 2.6 out of 5. Although this result indicates that a slight majority of respondents exhibit relatively favorable behaviors, the average score remains moderate and highlights significant room for improvement. This situation could be explained by the combined influence of the level of health education, sociocultural beliefs, access to health services, and individual perceptions of the risk associated with respiratory infections.

The overall prevalence of respiratory infections among respondents in Korhogo was estimated at 22%. On a seasonal basis, prevalence rates were 13% and 30% during the rainy season and dry season, respectively. The significant difference in prevalence between these seasons (p-value = 0.001) underscores the decisive role of climatic conditions in the occurrence of respiratory infections.

The dry season in January in northern Côte d'Ivoire in general, and in Korhogo in particular, is characterized by relatively low temperatures, low humidity, and

high dust concentrations associated with the harmattan, a dry, dusty wind that creates an environment conducive to respiratory tract irritation [21] [22]. The prevalence of respiratory infections in the city of Korhogo was twice as high during the dry season (30%) as during the rainy season (13%). Our findings are consistent with those of other studies conducted in West Africa. A study conducted in Nigeria showed that hospitalizations for certain respiratory illnesses were significantly more frequent during the dry season than during the rainy season [23].

Our study has certain limitations, including the possibility of recall bias and reporting bias. Indeed, some of the data collected relied on the respondents' memories, particularly regarding their history of respiratory infections, which may have influenced the results. However, to reduce recall bias regarding participants' history of respiratory infections, the information collected focused only on episodes of respiratory infections that occurred during the seven days prior to the survey. Furthermore, biases were minimized through the use of a questionnaire revised and validated by public health specialists, which was then pre-tested on 10% of the sample for quality control purposes. Furthermore, recruitment in public places during the day, the high concentration of young students, and the lack of clinical confirmation limit the generalizability of the results to the entire population of Korhogo.

Despite the potential biases in this study, our findings highlight an urgent need to strengthen public health education and call for climate considerations to be incorporated into the epidemiological surveillance of respiratory infections in Korhogo.

## 7. Conclusion

This study estimated the prevalence of respiratory infections and analyzed the knowledge, attitudes, and practices of the population in Korhogo regarding this disease. The observed seasonal variation, characterized by a higher prevalence during the dry season, highlights the decisive influence of environmental factors such as the harmattan and dust. Although generally considered satisfactory, the population's knowledge remains more focused on environmental causes than on biological agents. These results underscore the need to strengthen health education efforts and to incorporate climatic factors into strategies for the prevention and epidemiological surveillance of respiratory infections in Korhogo.

## Contributions from the Authors

Study Design: TASRN.
Data collection: TASRN.
Methodology: TASRN, YGZB, EAMY, BSC, OK, TI.
Data analysis and interpretation: TASRN, YGZB, EAMY, BSC, OK.
Writing and editing the article: TASRN, YGZB, EAMY, BSC, OK, TI.
All authors have read and approved the final version of the manuscript.

## Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this article.

## References


[1] WHO (2014) Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Infections in Health Care. https://www.ncbi.nlm.nih.gov/books/NBK214360/?utm

[2] Abubakar, A., Malik, M., Pebody, R., Elkholy, A., Khan, W., Bellos, A., *et al.* (2016) Burden of Acute Respiratory Disease of Epidemic and Pandemic Potential in the WHO Eastern Mediterranean Region: A Literature Review. *Eastern Mediterranean Health Journal*, **22**, 509-522. https://doi.org/10.26719/2016.22.7.509

[3] He, Y., Liu, W.J., Jia, N., Richardson, S. and Huang, C. (2023) Viral Respiratory Infections in a Rapidly Changing Climate: The Need to Prepare for the Next Pandemic. *eBioMedicine*, **93**, Article 104593. https://doi.org/10.1016/j.ebiom.2023.104593

[4] WHO (2018) Influenza (Seasonal): Fact Sheet. https://www.who.int/teams/health-product-policy-and-standards/standards-and-specifications/norms-and-standards/vaccine-standardization/influenza?utm

[5] Global Burden of Diseases (2025) Global Burden of Lower Respiratory Infections and Aetiologies, 1990-2023: A Systematic Analysis for the Global Burden of Disease Study 2023. *The Lancet Infectious Diseases*, **26**, 343-361. https://doi.org/10.1016/S1473-3099(25)00689-9

[6] WHO (2025) Respiratory Syncytial Virus (RSV) Fact Sheet. https://www.who.int/news-room/fact-sheets/detail/respiratory-syncytial-virus-%28rsv%29

[7] Meghji, J., Jayasooriya, S., Khoo, E.M., Mulupi, S. and Mortimer, K. (2022) Chronic Respiratory Disease in Low-Income and Middle-Income Countries: From Challenges to Solutions. *Journal of the Pan African Thoracic Society*, **3**, 92-97. https://doi.org/10.25259/jpats_10_2022

[8] WHO (2001) Acute Respiratory Infections in Children: Case Management in Small Hospitals in Developing Countries. https://iris.who.int/items/ec063a07-2da9-4bc1-80b3-ef4d44f07a40

[9] Ministère de la Santé, de l'Hygiène Publique et de la Couverture Maladie Universelle (2021) Direction de l'Informatique et de l'Information Sanitaire (DIIS). Rapport Annuel sur la Situation Sanitaire (RASS) de la Côte d'Ivoire en 2020.

[10] Institut National de la Statistique (2022) Synthèse des résultats définitifs du Recensement Général de la Population et de l'Habitat de la Côte d'Ivoire (RGPH-2021): Résultats globaux définitifs.

[11] Diobo-Doudou, K.S. (2025) Rainfall Seasons and Living Environment in the Development of Acute Respiratory Infections (ARI) in Korhogo. *Georeview*, **35**, 98-109. https://doi.org/10.4316/georeview.2025.02.07

[12] M'Bra, R.K., Kone, B., Soro, D.P., N'krumah, R.T.A.S., Soro, N., Ndione, J.A., *et al.* (2018) Impact of Climate Variability on the Transmission Risk of Malaria in Northern Côte d'Ivoire. *PLOS ONE*, **13**, e0182304. https://doi.org/10.1371/journal.pone.0182304

[13] N'Krumah, T.A.S.R., Yapi, E.A.M., Satognon, D.D., Kambiré, O., Howélé, O. and Tiembré, I. (2025) Assessment of Knowledge and Vaccination Coverage against Epi-

demic Meningitis among Students at the Université Peléforo Gon Coulibaly (UPGC) of Korhogo (Northern Côte d'Ivoire). *Open Journal of Epidemiology*, **15**, 802-817. https://doi.org/10.4236/ojepi.2025.154052

[14] Bouyer, J., Hénom, D., Cordier, S., *et al.* (2009) Epidémiologie: Principes et méthodes quantitatives. INSERM, 498p.

[15] Ministère de la Santé et de l'Hygiène Publique (MSHP) (2020) Guide technique pour la Surveillance Intégrée de la Maladie et la Riposte (SIMR). Troisième édition. Abidjan.

[16] World Health Organization (2024) Asthma—Fact Sheet. WHO. https://www.who.int/en/news-room/fact-sheets/detail//asthma

[17] Teddlie, C. and Yu, F. (2007) Mixed Methods Sampling: A Typology with Examples. *Journal of Mixed Methods Research*, **1**, 77-100. https://doi.org/10.1177/1558689806292430

[18] Bigogo, G.M., Breiman, R.F., Feikin, D.R., Audi, A.O., Aura, B., Cosmas, L., *et al.* (2013) Epidemiology of Respiratory Syncytial Virus Infection in Rural and Urban Kenya. *The Journal of Infectious Diseases*, **208**, S207-S216. https://doi.org/10.1093/infdis/jit489

[19] Diop, M.M., Camara, E., Barry, I.K., *et al.* (2020) Facteurs Associés à la Survenue des Infections Respiratoires Aigües chez les Enfants de 0 à 5 Ans Hospitalisés à l'Hôpital National Donka à Conakry. *Health Sciences and Disease*, **21**, 35-38.

[20] Tekle, A.G., Worku, A. and Berhane, Y. (2015) Factors Associated with Acute Respiratory Infection in Children under the Age of 5 Years: Evidence from the 2011 Ethiopia Demographic and Health Survey. *Pediatric Health, Medicine and Therapeutics*, **6**, 9-13. https://doi.org/10.2147/phmt.s77915

[21] Moriyama, M., Hugentobler, W.J. and Iwasaki, A. (2020) Seasonality of Respiratory Viral Infections. *Annual Review of Virology*, **7**, 83-101. https://doi.org/10.1146/annurev-virology-012420-022445

[22] Pica, N. and Bouvier, N.M. (2012) Environmental Factors Affecting the Transmission of Respiratory Viruses. *Current Opinion in Virology*, **2**, 90-95. https://doi.org/10.1016/j.coviro.2011.12.003

[23] Desalu, O.O. (2011) Seasonal Variation in Hospitalisation for Respiratory Diseases in the Tropical Rain Forest of South Western Nigeria. *Nigerian Postgraduate Medical Journal*, **18**, 39-43. https://doi.org/10.4103/1117-1936.170300