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Incidence of Community-Acquired Pneumonia Among Trainees of the 35th Police Cohort at Delta Hospital Center, October 5 to January 22, 2026: A Retrospective Cohort Study

Kenny Fleurant[1*], Ashley Ketxia Sinaïda Ambroise[1] and Lawson Franche[2]

[1]General Practitioner, Delta Hospital Center, Haiti

[2]Obstetrician–Gynecologist, University Professor, Director of the Delta Hospital Center, Haiti

ABSTRACT

Introduction: Community-acquired pneumonia remains a major cause of acute lower respiratory tract infection worldwide. Although its incidence is well documented in the general population, data remain limited in specific settings such as intensive training environments and collective living conditions, particularly among police trainees. Epidemiological information regarding community-acquired pneumonia in this population is scarce. The primary objective of this study was to estimate the cumulative incidence of community-acquired pneumonia among trainees of the 35th cohort of the Haitian National Police referred to Delta Hospital Center, their designated medical referral facility, between October 5, 2025 and January 22, 2026.

Methods: We conducted a retrospective observational cohort study based on a systematic review of medical records of police trainees managed at Delta Hospital Center during the study period. The study population included 877 trainees, among whom 74 medical consultation records were reviewed. Data were extracted and analyzed using Microsoft Excel and SPSS version 20. Cumulative incidence rates and their 95% confidence intervals were calculated to provide precise estimates.

Results: A total of 877 police trainees were included, comprising 156 women (17.8%) and 721 men (82.2%). During the study period, 74 medical consultations were recorded (8.4% of the total population). Among these, 28 cases of community-acquired pneumonia were diagnosed, representing 37.8% of consultation diagnoses and corresponding to an overall cumulative incidence of 3.2%. The cumulative incidence was identical in men and women (3.2%), with no statistically significant difference in risk observed between sexes.

Conclusion: Community-acquired pneumonia represents a frequent reason for medical consultation among police trainees in intensive training settings, with a notable incidence despite the short duration of observation and the young, presumably healthy population. The absence of sex-related differences further underscores the need for environmental, organizational, preventive, and surveillance measures adapted to collective training environments.

***Corresponding author**
Kenny Fleurant, General Practitioner, Delta Hospital Center, Haiti.

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List of Abbreviations
DCH: Delta Hospital Center
PNH: Haitian National Police
WHO: World Health Organization
ENP: National Police Academy
ATS: American Thoracic Society

Introduction

Community-acquired pneumonia is one of the leading causes of acute lower respiratory tract infection worldwide and represents a major contributor to morbidity, hospitalization, and mortality [1]. Its incidence varies considerably according to age, epidemiological context, and living conditions. In the general adult population, the annual incidence of community-acquired pneumonia is estimated to range from 1 to 14 cases per 1,000 person-years, with markedly lower rates among young adults compared with older individuals [1,2]. However, these estimates are largely derived from population-based studies conducted in civilian settings and do not always account for specific environments such as collective living or intensive training conditions.

Studies conducted in closed or semi-closed populations, particularly among military and police recruits, have demonstrated a higher incidence of lower respiratory tract infections, including community-acquired pneumonia [3,4]. These findings suggest that contextual factors such as overcrowding, intense physical activity, and environmental hygiene may significantly influence the risk of pneumonia, independent of age and baseline health status. This effect may be particularly pronounced in low-resource

settings, where training contexts and environmental conditions may differ from those described in studies conducted in high-income countries [5].

Police trainees at the National Police Academy (ENP) represent a distinct population characterized by relative age homogeneity and a low prevalence of major comorbidities, confirmed through systematic biological and radiological screening during the pre-selection phase [6,7]. Trainees are uniformly exposed to specific training conditions involving collective living and sustained physical demands. The ENP training center includes an on-site infirmary and a formal referral pathway to Delta Hospital Center, ensuring standardized medical care.

Despite these structured conditions, trainees remain exposed to the environmental and organizational risk factors associated with respiratory infections. Nevertheless, epidemiological data on community-acquired pneumonia in police training populations remain scarce or nonexistent. This lack of specific data limits the assessment of disease burden and hinders the development of targeted preventive strategies in such environments.

In this context, the primary objective of this study was to estimate the cumulative incidence of community-acquired pneumonia among trainees of the 35th cohort of the Haitian National Police managed at Delta Hospital Center between October 5, 2025 and January 22, 2026. Secondary objectives included describing the distribution of cases by sex and evaluating the proportion of community-acquired pneumonia among medical consultation diagnoses during the study period.

Methods

Study Design and Setting

Study Design

This study was a retrospective observational cohort study conducted to estimate the cumulative incidence of community-acquired pneumonia among police trainees during the study period.

Study Setting

The study was conducted through a systematic review of medical records of all trainees belonging to the 35th cohort of the Haitian National Police who were referred to Delta Hospital Center (DHC), the designated referral hospital for medical care of police trainees. A total of 74 consultation records were reviewed. The study covered all medical records registered between October 5, 2025 and January 22, 2026.

Study Population and Inclusion Criteria

Study Population

The study population consisted of all 877 police trainees from the 35th cohort (adults aged ≥18 years), including 156 women and 721 men, for whom a medical diagnosis was established and documented at Delta Hospital Center during the study period. Delta Hospital Center receives all trainees from the ENP training center. The trainees originate from diverse geographic regions, contributing to population heterogeneity and enhancing the representativeness of the cohort.

Table 1: General Characteristics of Police Recruits (N = 877)

Variable	Number (n)	Percentage (%)
Total population	877	100
Male	721	82.2
Female	156	17.8

Table 2: Frequency of Medical Consultations for all Causes

Variable	Number (n)	Percentage (%)
Recruits seen in consultation	74	8.44
Recruits not seen in consultation	803	91.56
Total	877	100

Selection of Participants and Inclusion/Exclusion Criteria

A Non-Probability Exhaustive Sampling Method was Used, Including All Records that Met the following Criteria

Group	Inclusion Criteria	Exclusion Criteria
Cases	• Confirmed diagnosis of community-acquired pneumonia	Incomplete or unusable records, or absence of radiologic confirmation
	• Age ≥ 18 years	• Diagnoses other than community-acquired pneumonia
	• Present in the cohort during the study period (October 5 - January 22)	• Other forms of pneumonia

The diagnosis of community-acquired pneumonia was documented in the trainees' medical records, and affected individuals received a standardized treatment protocol for community-acquired pneumonia. The diagnosis followed the American Thoracic Society (ATS) guidelines, which define community-acquired pneumonia as an acute infection of the pulmonary parenchyma occurring in a non-hospitalized patient or within 48 hours of hospital admission, in the absence of recent healthcare exposure.

Data Collection and Analysis

Data Collection

Data were collected through a systematic retrospective review of archived medical records. A standardized data extraction form created in Microsoft Excel was used to uniformly code study variables and participant identifiers.

Outcome Measures and Statistical Analysis

The primary outcome of the study was the cumulative incidence of community-acquired pneumonia among police trainees during the study period. Cumulative incidence was defined as the number of new cases occurring between October 5, 2025 and January 22, 2026 divided by the number of trainees at risk at the beginning of the period.

Data were analyzed using IBM SPSS Statistics version 20 and Microsoft Excel. Cumulative incidence estimates and their 95% confidence intervals were calculated to improve precision and interpretability.

Ethical Considerations

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and national bioethics guidelines. Given the retrospective nature of the study and the use of existing medical records, written authorization to access hospital archives was obtained from the administration of Delta Hospital Center prior to data collection.

To protect patient privacy, all extracted data were anonymized through coding. No directly identifiable information (names, record numbers, or addresses) was collected or published. Data files were password-protected, and access was restricted to authorized members of the research team. No contact was established with patients, and no modification of prior medical care occurred.

Results

Table 3: Distribution of Diagnoses Among Recruits Seen in Consultation (n = 74)

Diagnosis	Number (n)	Percentage (%)
Community-acquired pneumonia	28	37.84
Other diagnoses	46	62.16
Total consultations	74	100

The data from this cohort study included 877 recruits, among whom 28 were diagnosed with community-acquired pneumonia and 46 had other diagnoses, representing a total of 74 consultation records among recruits at the Delta Hospital Center.

Table 4: Cumulative Incidence of Community-Acquired Pneumonia Among Recruits (October-January)

Variable	Cases / Total	Incidence (%)	95% CI
Community-acquired pneumonia (overall)	28 / 877	3.19	2.22 - 4.58

The cumulative incidence of community-acquired pneumonia among recruits during the study period was 3.19%.

Table 5: Cumulative Incidence of Community-Acquired Pneumonia by Sex

Sex	Cases (n)	Total (n)	Incidence (%)	95% CI
Male	23	721	3.19	2.13 – 4.74
Female	5	156	3.21	1.38 – 7.28
Total	28	877	3.19	2.22 – 4.58

The cumulative incidence of community-acquired pneumonia during the study period was 3.19% among male recruits and 3.21% among female recruits.

Table 6: Association between Sex and Occurrence of Community-Acquired Pneumonia Among Recruits

Sex	Pneumonia (n)	No pneumonia (n)	Total (n)	Incidence (%)	RR (95% CI)	p-value
Male	23	698	721	3.19	1.00 (0.38–2.63)	0.99
Female	5	151	156	3.21	Reference	—
Total	28	849	877	3.19	—	—

The relative risk (RR) of pneumonia in males compared with females was 0.99 (≈ 1.00), with a 95% confidence interval of 0.38 to 2.63 and a p-value of 0.99, indicating no statistically significant association between sex and the occurrence of community-acquired pneumonia.

Discussion

This cohort study estimated the incidence of community-acquired pneumonia among police trainees during an approximately 15-week training period from October 5, 2025 to January 22, 2026 [8]. The cumulative incidence was identical in women and men (3.2%). The observed cumulative incidence was 3.19% (95% CI: 2.22–4.48), indicating that nearly one in thirty trainees experienced an episode of community-acquired pneumonia during the study period. Moreover, pneumonia accounted for nearly 40% of medical consultations. These findings warrant careful interpretation regarding their epidemiological magnitude and significance. When considered in a population of young adults presumed healthy following mandatory pre-selection medical screening at the ENP, the incidence can be regarded as non-negligible, and potentially high, given the demographic profile and health standards required prior to police training [6,7].

Contextualization of Risk and Comparison with the Literature

In the general adult population, the annual incidence of community-acquired pneumonia is typically estimated between 1 and 14 cases per 1,000 person-years, with higher rates observed in elderly individuals or those with chronic comorbidities [1,2]. Among young adults under 40 years of age without major comorbidities, several population-based studies report annual incidences generally below 5 cases per 1,000 person-years, and sometimes substantially lower [9,10]. In this context, a cumulative incidence of 3.2% observed over less than four months appears disproportionately elevated relative to expectations for healthy young adults.

This discrepancy suggests that police trainees may be exposed to a context-specific excess risk of community-acquired pneumonia driven less by classical individual risk factors than by organizational and environmental conditions inherent to training environments. Military and police training camps share structural characteristics known to facilitate respiratory pathogen transmission, including prolonged collective living, dormitory overcrowding, repeated close contact, intense physical training, suboptimal hygiene conditions, and cumulative fatigue [3-11]. Although these factors were not directly measured in our study, they represent plausible determinants of the excess risk observed. Previous studies among military and police recruits have documented markedly higher respiratory infection rates than those seen in age-matched civilian populations[3]. The elevated incidence reported in our cohort therefore aligns with patterns previously described in collective training environments. These findings highlight the need to consider targeted preventive strategies, particularly during high-risk seasonal periods.

Methodological Limitations and Perspectives

While this study provides meaningful epidemiological data, interpretation of the cumulative incidence must consider methodological limitations and potential biases. Overall, many of these biases likely contribute to an underestimation of the true incidence within the study population.

Potential Sources of Overestimation

Access to a centralized medical facility may have facilitated earlier or more systematic case detection compared with the general population, potentially inflating the apparent incidence [12]. Additionally, the study period coincided with the winter season, a known peak for respiratory infections [11-13]. The presence of an infirmary with inpatient beds within the training center introduces a classification gray zone: pneumonias developing

during temporary infirmary stays might, under strict definitions, qualify as healthcare-associated rather than community-acquired pneumonia prior to referral to Delta Hospital Center, potentially leading to modest overestimation [14,15].

Potential Sources of Underestimation

Conversely, trainees with mild or paucisymptomatic respiratory illness may not have sought medical evaluation, either due to symptom minimization or training constraints [16-18]. The absence of systematic screening increases the likelihood of missed cases, particularly among individuals with atypical or mild presentations [14]. Training demands may also delay healthcare-seeking behaviour, a phenomenon well documented in military and paramilitary populations [18]. Strict diagnostic criteria, while enhancing specificity, may reduce sensitivity and exclude early or atypical cases. Furthermore, some cases treated successfully within the infirmary may not have been formally captured in hospital records, contributing to underestimation.

Additional Methodological Considerations

The study lacked detailed information on individual-level risk factors such as smoking status, prior respiratory disease, influenza vaccination, housing density, or exposure to respiratory irritants[3]. While this limitation does not affect the incidence estimate itself, it restricts causal interpretation and adjustment for known confounders. The relatively small number of female cases also limits statistical power to detect modest sex-based differences and results in wider confidence intervals.

Overall, although these biases necessitate cautious interpretation, they do not negate the elevated incidence observed. Despite its limitations, this study provides a valuable contextualized estimate of community-acquired pneumonia incidence in a police training population and establishes a foundation for future prospective investigations.

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