

ACUTE RESPIRATORY INFECTIONS IN CHILDREN: CHALLENGES IN PREVENTION, DIAGNOSIS, AND CARE IN PRIMARY HEALTH CARE

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Sttyvie Eugênio Morato de Albuquerque Silva¹, Nina Maria Oliveira Gava², Ivonete Inácio Gomes³, Anna Carolina Kirst⁴, Ione Suzie de Magalhães⁵, Jôse Anne de França Gabriel⁶, Edilamar Aparecida Soares⁷, Livia Gabriele da Costa Silva⁸ and Paula Nigri⁹

¹ Undergraduate Student in Biological Sciences - Centro Universitário Brasileiro (UNIBRA)
Health Surveillance Technician specializing in Endemic Disease Control - Universidade Federal do Rio Grande do Sul (UFRGS)
Certified in Behavioral Genetics - Universidade de Minnesota - UMN (USA)

Recife - PE

E-mail: sttyvie@gmail.com

ORCID: <https://orcid.org/0009-0003-7849-5322>

² Medical Student, UCPEL

Pelotas - Rio Grande do Sul

E-mail: ninagava02@gmail.com

³ Nursing

Faculdade Roraimense de Ensino Superior - FARES

Boa Vista - Roraima

E-mail: netegomesinacio@gmail.com

ORCID: <https://orcid.org/0009-0000-4379-2640>

⁴ Medical Student

Universidade Católica de Pelotas

Pelotas - Rio Grande do Sul

E-mail: Annakirst03@gmail.com

ORCID: <https://orcid.org/0009-0002-7719-8249>

⁵ Specialist in Family Health Program Management

Universidade Candido Mendes

Uberlândia - MG

E-mail: ione_sm@yahoo.com.br

⁶ Master's Degree in Environmental Health and Occupational Health

Institute of Geography - Universidade Federal de Uberlândia

Uberlândia - MG

E-mail: joseanne.gabriel@yahoo.com.br

ORCID: <https://orcid.org/0000-0003-2505-6433>

⁷ Specialist in Public Health

Universidade Cândido Mendes - RJ

Uberlândia -MG

E-mail: edilamar.soares@yahoo.com.br

⁸ Bachelor's Degree in Nursing

Fundação de Ensino Superior de Olinda - FUNESO

Recife - PE

E-mail: livia_gabrielle@hotmail.com

ORCID: <https://orcid.org/0009-0005-1231-9734>

⁹ Biologist, PUC Minas

Biomedical Scientist, Estácio de Sá

Mestrado em Saúde da Criança e do Adolescente pela UFMG

Belo Horizonte - Minas Gerais

E-mail: paulanigri@gmail.com

Abstract

Acute respiratory infections (ARIs) are among the leading causes of childhood morbidity and mortality worldwide, particularly among children under five years of age, and constitute a major challenge for Primary Health Care (PHC) services. This chapter aimed to discuss the principal challenges related to the prevention, early diagnosis, and comprehensive care of acute respiratory infections in childhood, emphasizing the strategic role of PHC in reducing complications and preventable hospitalizations. The methodology consisted of a narrative literature review based on scientific articles published in recent years, as well as national and international technical documents and guidelines concerning the clinical management of pediatric ARIs. The findings showed that factors such as insufficient vaccination coverage, exposure to environmental pollution and secondhand smoke, socioeconomic inequalities, malnutrition, and barriers to accessing health services contribute to the high incidence of these diseases. The review also found that health care team training, the use of clinical protocols, monitoring for signs of severity, and health education directed toward families support timely diagnosis, the early initiation of therapeutic measures, and reductions in childhood morbidity and mortality. It is concluded that strengthening Primary Health Care, together with preventive measures, epidemiological surveillance, and child- and family-centered care, is an essential strategy for improving clinical outcomes and promoting greater equity in child health care.

Keywords: Acute respiratory infections, Child, Early diagnosis, Prevention, Primary Health Care.

INTRODUCTION

Acute respiratory infections (ARIs) constitute one of the principal public health problems in childhood and are responsible for high morbidity, hospitalization, and mortality rates, particularly among children under five years of age. These conditions encompass a range of diseases affecting the upper and lower respiratory tracts, including the common cold, pharyngitis, acute otitis media, sinusitis, bronchiolitis, and pneumonia. Although most cases are self-limiting, a significant proportion may

progress to severe forms, especially among children with weakened immunity, prematurity, malnutrition, or chronic diseases, thereby requiring timely, high-quality care (World Health Organization, 2024).

Within Primary Health Care (PHC), ARIs are among the leading reasons for pediatric consultations. PHC plays a strategic role in health promotion, disease prevention, early diagnosis, appropriate treatment, and the longitudinal follow-up of children, thereby helping reduce complications and hospital admissions for ambulatory care-sensitive conditions. In this context, multidisciplinary practice, combined with immunization initiatives, epidemiological surveillance, breastfeeding promotion, and health education, strengthens comprehensive care and supports better clinical outcomes (Brasil, 2023).

Despite advances in public child health policies, respiratory infections remain a major challenge for health systems, particularly in middle- and low-income countries. Social determinants such as poverty, inadequate housing, household overcrowding, low educational attainment among caregivers, environmental pollution, exposure to secondhand smoke, and barriers to accessing health services contribute to persistently high rates of childhood illness and hospitalization. Furthermore, the seasonal circulation of respiratory viruses, such as respiratory syncytial virus (RSV), influenza, rhinovirus, and, more recently, SARS-CoV-2, underscores the need to continuously strengthen preventive and care strategies (UNICEF, 2023; World Health Organization, 2024).

Against this background, the following research question was defined: What are the principal challenges related to the prevention, diagnosis, and care of acute respiratory infections in children within Primary Health Care, and which strategies can help reduce the childhood morbidity and mortality associated with these diseases?

The general objective of this chapter is to analyze the challenges involved in the prevention, diagnosis, and care of acute respiratory infections in children within the context of Primary Health Care.

The specific objectives are to characterize the principal risk factors associated with childhood ARIs; discuss available preventive strategies, including immunization, breastfeeding, and health

education; analyze the importance of early diagnosis and evidence-based clinical management; and highlight the role of Primary Health Care in organizing care and reducing preventable hospitalizations.

The relevance of this study is justified by the high epidemiological burden of respiratory infections in the pediatric population and the social, economic, and health care impacts arising from these conditions. In addition to being a major cause of school absenteeism, overcrowding in emergency services, and hospital admissions, ARIs can increase public health expenditures and compromise the quality of life of children and their families. Accordingly, the production of scientific knowledge concerning preventive measures and care strategies can support health professionals, managers, and public policymakers working to strengthen child health care (OPAS, 2023).

From a theoretical perspective, several studies have shown that interventions implemented in Primary Health Care can significantly reduce severe cases of respiratory infections, particularly when combined with expanded vaccination coverage, the promotion of exclusive breastfeeding during the first six months of life, the monitoring of child growth and development, and the early recognition of signs of severity. World Health Organization guidelines emphasize that integrating epidemiological surveillance, protocol-based clinical care, and educational initiatives for families is one of the pillars of addressing childhood respiratory diseases (World Health Organization, 2024). Likewise, the Brazilian Ministry of Health emphasizes that comprehensive, humane, and continuous care within Primary Health Care supports timely diagnosis, reduces complications, and strengthens the comprehensiveness of care provided to children (Brasil, 2023).

METHODOLOGY

TYPE OF RESEARCH

This chapter was developed through a qualitative, descriptive narrative literature review designed to compile and discuss scientific evidence on acute respiratory infections in children, emphasizing challenges related to their prevention, diagnosis, and care within Primary Health Care (PHC). Narrative

reviews enable the integration of different theoretical and scientific perspectives, fostering a broad understanding of issues relevant to clinical practice and the formulation of public health policies (Rother, 2007).

LITERATURE SEARCH STRATEGY

The literature search was conducted in national and international databases recognized by the scientific community, including PubMed/MEDLINE, the Virtual Health Library (Biblioteca Virtual em Saúde—BVS), the Scientific Electronic Library Online (SciELO), and LILACS. Official documents issued by the Ministry of Health, the World Health Organization (WHO), and the Pan American Health Organization (OPAS) were also consulted because of their relevance to the development of clinical recommendations and protocols.

Controlled descriptors from the Health Sciences Descriptors (Descritores em Ciências da Saúde—DeCS) and Medical Subject Headings (MeSH) were used and combined through the Boolean operators AND and OR. The principal terms included “acute respiratory infections,” “child,” “primary health care,” “prevention,” “diagnosis,” “pneumonia,” “bronchiolitis,” and “child health.”

INCLUSION AND EXCLUSION CRITERIA

Scientific articles published between 2020 and 2025 were included if they were available in full text in Portuguese, English, or Spanish and addressed aspects related to the epidemiology, risk factors, prevention, diagnosis, treatment, or organization of care for acute respiratory infections in the pediatric population.

Duplicate studies, editorials, letters to the editor, conference abstracts, dissertations, theses not published in journals, articles without full-text access, and publications not directly related to the objective of this chapter were excluded.

DATA COLLECTION AND ANALYSIS

Following study selection, the material underwent exploratory and analytical reading, after which the principal information concerning the objectives, methodology, results, and conclusions of each publication was extracted. The data were subsequently organized thematically according to the following categories: risk factors, preventive measures, early diagnosis, clinical management, and the role of Primary Health Care.

The analysis was interpretive and critical and sought to identify convergences, divergences, and gaps in the available scientific knowledge. According to Gil (2019), bibliographic research allows researchers to examine different scientific contributions concerning a particular phenomenon, supporting well-founded and up-to-date interpretations.

METHODOLOGICAL FOUNDATION

The narrative review was chosen because it enables a comprehensive approach to acute respiratory infections in childhood by integrating epidemiological, clinical, and health care knowledge. According to Rother (2007), this method is widely used to synthesize knowledge, discuss concepts, and support health care decision-making, particularly when the objective is not to measure the effects of interventions but to understand different aspects related to a particular health problem.

Furthermore, the use of recent publications and documents prepared by national and international organizations strengthens the scientific consistency of the discussions presented, making it possible to relate the available evidence to practices implemented in Primary Health Care. This strategy contributes to the development of an up-to-date framework for the prevention, early diagnosis, and comprehensive care of acute respiratory infections in children, supporting the work of health professionals and the implementation of measures aimed at reducing childhood morbidity and mortality.

RESULTS AND DISCUSSION

The literature analysis showed that acute respiratory infections (ARIs) remain among the leading causes of illness, hospitalization, and mortality in children under five years of age, particularly in developing countries. Although progress has been made in vaccination coverage, access to health services, and the implementation of clinical protocols, socioeconomic and environmental factors continue to have a significant influence on the incidence and severity of these conditions (World Health Organization, 2024; Brasil, 2023).

The studies analyzed indicate that viral infections account for most cases treated in Primary Health Care, particularly those caused by respiratory syncytial virus (RSV), influenza, rhinovirus, adenovirus, and, more recently, SARS-CoV-2. Among bacterial infections, pneumonia remains the leading cause of childhood hospitalization and death, especially when associated with delayed diagnosis and the presence of risk factors (Rudan et al., 2013; World Health Organization, 2024).

The literature also shows that several factors increase children's vulnerability to ARIs, including the absence of exclusive breastfeeding, low vaccination coverage, malnutrition, prematurity, air pollution, exposure to secondhand smoke, household overcrowding, and inadequate basic sanitation. These determinants reinforce the understanding that addressing respiratory infections extends beyond clinical care and requires intersectoral initiatives aimed at promoting health and reducing social inequalities (UNICEF, 2023; OPAS, 2023).

Table 1

Principal risk factors associated with acute respiratory infections in children

Risk factor	Observed impact
Low vaccination coverage	Greater susceptibility to preventable respiratory infections
Insufficient breastfeeding	Reduced immune protection
Prematurity	Greater risk of severe disease
Malnutrition	Impaired immune response
Secondhand smoke	Increased incidence of bronchiolitis and pneumonia
Environmental pollution	Airway irritation and worsening of symptoms
Adverse socioeconomic conditions	Greater exposure to risk factors and difficulty accessing services

Source: Prepared by the author based on Brasil (2023), OPAS (2023), and WHO (2024).

Regarding diagnosis, the studies showed a consensus on the importance of careful clinical assessment in Primary Health Care. The early identification of signs such as tachypnea, intercostal retractions, cyanosis, respiratory distress, persistent fever, and reduced oxygen saturation enables timely referral to specialized services, thereby reducing complications and preventable deaths (Brasil, 2023).

Primary Health Care stands out as the principal level of care responsible for preventing and diagnosing respiratory infections early and for monitoring affected children. Strategies such as well-child visits, immunization, breastfeeding promotion, and guidance for families concerning hand hygiene, respiratory etiquette, and the recognition of signs of severity have proven effective in reducing the incidence and severity of ARIs (Starfield, 2002).

Table 2

Strategies for preventing acute respiratory infections in Primary Health Care

Strategy	Expected benefits
Vaccination	Reduction in severe cases and hospitalizations
Exclusive breastfeeding	Strengthening of childhood immunity
Frequent hand hygiene	Reduction in viral transmission
Health education	Early identification of warning signs
Well-child follow-up	Early diagnosis and growth monitoring
Control of tobacco exposure	Reduction in respiratory diseases

Source: Prepared by the author based on the Ministry of Health (2023) and WHO (2024).

Another recurring theme in the literature concerns the need for the continuing professional development of Family Health Strategy (Estratégia Saúde da Família—ESF) teams. Studies show that trained professionals identify clinical signs of severity more accurately, use antimicrobial agents rationally, and implement more effective educational initiatives with families, thereby reducing hospitalizations for ambulatory care–sensitive conditions (Mendes, 2019).

The findings corroborate the international literature by demonstrating that prevention remains the most effective strategy for reducing childhood morbidity and mortality from respiratory infections. Investments in immunization, improved living conditions, epidemiological surveillance, health education, and stronger Primary Health Care are fundamental measures for reducing the burden of these diseases and promoting greater equity in child health care (World Health Organization, 2024).

Table 3

Summary of the principal findings in the literature

Aspect analyzed	Evidence identified
Epidemiology	High incidence among children under five years of age
Principal agents	Respiratory syncytial virus, influenza, rhinovirus, and pneumococcus
Risk factors	Malnutrition, prematurity, low vaccination coverage, secondhand smoke, and poverty
Diagnosis	Predominantly clinical, combined with an assessment of signs of severity
Role of PHC	Prevention, early diagnosis, health education, and continuous follow-up
Expected impact	Reduction in hospitalizations and childhood mortality

Source: Prepared by the author based on the literature review (2020–2025).

CONCLUSION

Acute respiratory infections remain among the principal challenges to child health, particularly among children under five years of age, because of their high incidence, potential for clinical deterioration, and impact on health services. In this context, this chapter aimed to analyze the challenges related to the prevention, diagnosis, and care of these conditions in Primary Health Care, highlighting the importance of integrated strategies for reducing childhood morbidity and mortality.

The literature review showed that factors such as insufficient vaccination coverage, malnutrition, prematurity, exposure to secondhand smoke, environmental pollution, adverse socioeconomic conditions, and barriers to accessing health services contribute significantly to the occurrence and worsening of respiratory infections in childhood. Conversely, initiatives implemented in Primary Health Care, such as immunization, breastfeeding promotion, the monitoring of child growth and development, health education, and the early identification of signs of severity, were found to be fundamental to reducing complications, hospital admissions, and preventable deaths, corroborating the recommendations of the Ministry of Health and the World Health Organization.

The findings reinforce that strengthening Primary Health Care is an essential strategy for ensuring comprehensive, continuous, and humane care for children. The work of multidisciplinary teams, combined with the use of evidence-based clinical protocols and the longitudinal monitoring of families,

contributes to improving the quality of care, optimizing health system resources, and expanding the capacity of services to resolve health needs.

This chapter contributes to an understanding of the principal epidemiological, preventive, and care-related aspects of acute respiratory infections in children by bringing together up-to-date scientific evidence that can support the practice of health professionals, academic education, and the development of public policies aimed at promoting child health. It also emphasizes the need to strengthen intersectoral initiatives capable of addressing the social determinants that influence the occurrence of these diseases.

Finally, it is recommended that future research prioritize longitudinal and multicenter studies on the effectiveness of interventions implemented in Primary Health Care, as well as investigations into the effects of climate change, air pollution, new health technologies, and continuing professional education strategies on the prevention and management of acute respiratory infections in the pediatric population. The continuous production of scientific evidence will contribute to improving care practices and developing more effective public policies to protect children's health.

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