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Mapping The Determinants of Infectious Diseases among Under-Five Children: A Scoping Review

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Abstract. Infectious diseases remain a major cause of morbidity and mortality among children under five, especially in coastal communities characterized by environmental vulnerability and socioeconomic disparities. Understanding the multifactorial determinants of these diseases is essential for effective prevention and policy intervention. This scoping review aimed to map the determinants influencing infectious diseases among under-five children in coastal areas and identify research gaps. The review followed the PRISMA-ScR framework, with literature searches conducted in Scopus, PubMed, and ScienceDirect databases for articles published between 2015 and 2025. Fifteen eligible studies were critically appraised using the Joanna Briggs Institute (JBI) tools, and data were categorized into environmental, socioeconomic, behavioral, and biological determinants. Most studies used a cross-sectional design and were conducted in developing countries across Asia and Africa. Socioeconomic factors—particularly maternal education and household income—were the most frequently reported determinants, followed by biological aspects such as nutritional status and immunization. Environmental quality and hygiene behaviors also significantly contributed to respiratory and diarrheal infections. These findings highlight that infectious diseases among under-five children in coastal settings arise from complex, interrelated factors, underscoring the need for multisectoral, evidence-based prevention strategies.

Keywords: Coastal Communities; Infectious Diseases; Nutrition; Socioeconomic Determinants; Under-Five Children.

Abstrak. Penyakit infeksi masih menjadi penyebab utama morbiditas dan mortalitas pada anak balita, terutama di wilayah pesisir yang lingkungannya rentan dan kesenjangan sosial ekonominya tinggi. Pemahaman terhadap faktor determinan yang mempengaruhi kejadian penyakit infeksi penting untuk dasar perencanaan upaya pencegahan dan kebijakan kesehatan. Kajian berikut ini bertujuan untuk memetakan faktor determinan yang berpengaruh terhadap kejadian penyakit infeksi pada balita di wilayah pesisir serta mengidentifikasi kesenjangan penelitian yang ada. Metode scoping review digunakan dengan mengikuti panduan PRISMA-ScR, melalui penelusuran literatur pada database Scopus, Pubmed, dan ScienceDirect terbitan tahun 2015-2025. Sebanyak lima belas studi yang memenuhi kriteria inklusi diukur menggunakan Joanna Briggs Institute (JBI) Critical Appraisal, kemudian data dikategorikan menjadi determinan lingkungan, sosial ekonomi, perilaku, dan biologis. Sebagian besar studi menggunakan desain cross sectional dan dilakukan di negara berkembang di kawasan Asia dan Afrika. Faktor sosial ekonomi seperti pendidikan ibu dan pendapatan rumah tangga paling sering dilaporkan, diikuti status gizi dan imunisasi. Kualitas lingkungan dan perilaku higiene juga berperan terhadap kejadian infeksi saluran pernapasan dan diare. Hasil ini menegaskan bahwa penyakit infeksi pada balita pesisir dipengaruhi interaksi multifaktorial yang memerlukan pendekatan pencegahan multisektor berbasis bukti.

Kata kunci: Balita; Determinan Sosial Ekonomi; Gizi; Penyakit Infeksi; Wilayah Pesisir.

1. INTRODUCTION

Infectious diseases remain a major challenge in public health, particularly among children (Dita Lazamidarmi, Rico Januar Sitorus, 2021) who represent one of the most vulnerable population groups. Globally, infectious diseases continue to be a leading cause of morbidity and mortality among children under five years old (UNICEF, 2024). Young children are highly susceptible due to their developing immune systems and their dependence on caregivers for hygiene and health practices. Among these infectious diseases, acute respiratory infections (ARI), diarrhea, and febrile illnesses are the most prevalent, alongside neonatal

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complications and prematurity-related condition (UNICEF, 2024). Consequently, research on infectious diseases and their determinants among children has become a central focus within public health. In Indonesia, the 2023 Basic Health Research (Riskesdas) survey reported diarrhea prevalence of 9.1% and ARI prevalence of 9.3% among under-five children, with a higher burden observed in populations with limited access to healthcare services, safe water, and sanitation facilities. (Id et al., 2023) Studies conducted in various geographical settings, including coastal areas such as southwestern Bangladesh, have demonstrated alarmingly high rates of ARI (64.7%), fever (42.2%), and diarrhea (13.5%) (Akter et al., 2025).

Coastal regions possess unique environmental and socioeconomic characteristics that can heighten children's vulnerability to infectious diseases (Akter et al., 2025). Climate-related events such as flooding, salinity intrusion in freshwater sources, and storm surges disrupt livelihoods, damage critical infrastructure and reduce access to clean water (Akter et al., 2025), Moreover, high population density, inadequate sanitation, reliance on contaminated water sources, and low socioeconomic status collectively exacerbate exposure to infectious agents. (Purnama et al., 2024) Moreover, Nutritional conditions in coastal communities are often poorer compared to inland areas due to limited access to diverse food sources and dependence on fluctuating marine catches. (Suminar & Wibowo, 2021) The incidence of infectious diseases in early childhood is strongly influenced by a complex interplay of biological, environmental, and socioeconomic factors (Tahangnacca et al., 2020). Recurrent infections such as chronic diarrhea or repeated respiratory illnesses have been linked to stunting, wasting, and micronutrient malabsorption, ultimately impairing physical growth and cognitive development (Niken et al., 2024). Poor hygiene practices and restricted access to clean water, particularly in densely populated settlements, further reinforce the transmission of pathogens and deteriorate child health outcomes, thereby weakening the environmental systems that should protect children's health (Akter et al., 2025). Evidence also shows that infectious diseases significantly affect nutritional status and developmental outcomes in children (Sapriansyah, 2024). For instance, a study by Inne Susanti (2020) found that respiratory infections in polluted coastal areas were associated with lower height-for-age z-scores (HAZ), a key indicator of chronic malnutrition (Fadjriah et al., 2021).

Although numerous studies have investigated the determinants of infectious diseases among under-five children, most have focused on single disease entities or on urban and rural populations, with limited attention given to coastal areas. There remains a scarcity of comprehensive reviews that map and synthesize diverse determinants affecting infectious diseases among coastal under-five populations. Therefore, this scoping review aims to systematically identify and map existing evidence related to the determinants of infectious

diseases among under-five children living in coastal areas. The study seeks to highlight the breadth of existing research, identify knowledge gaps, and provide a scientific basis for developing evidence-based public health interventions and policies targeted at reducing the burden of infectious diseases in coastal communities.

2. METHOD

This article was compiled using a scoping review method according to the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) guideline. This approach aims to map existing knowledge gaps, various types of research evidence, and underexplored areas related to infectious diseases among under-five children living in coastal areas. The process of review was carried out systematically through several stages: formulation of research questions, identification of relevant studies, screening and selection of studies, data charting, and synthesis of results.

The main research question of this review is: "What are the determinants influencing infectious diseases among under-five children in coastal areas?" The PCC (Population–Concept–Context) framework was applied to guide the search process. The population focused on children aged 0–59 months; the concept referred to studies investigating factors influencing infectious diseases such as diarrhea or acute respiratory infections; and the context covered human studies conducted in coastal or shoreline regions published in peer-reviewed journals.

The literature search was conducted systematically during September – October 2025 using electronic databases including Scopus, PubMed, and Science Direct. The search strategy used the following combination of keywords: ("toddler" OR "infant" OR "child" OR "children") AND ("infection" OR "disease" OR "illness" OR "diarrhea" OR "acute respiratory infection" OR "ARI") AND ("coastal" OR "shoreline" OR "beach" OR "coastal region") AND ("factors OR "influences" OR "determinants" OR "variables") AND ("environment" OR "health" OR "immunity" OR "resilience"). Only original research articles published from 2015 to 2025, written in English or Indonesian, and available in full text were included to ensure data reliability and accessibility.

Inclusion criteria covered studies focusing on children under five years old living in coastal areas and examining determinants of infectious diseases. Exclusion criteria included studies involving children with congenital disorders causing chronic illness, subjects older than five years, or studies using animals as samples. All retrieved articles were imported into Mendeley version 1.19.8 or Zotero version 7.0.16 for screening and duplicate removal. The selection process was carried out in two stages: (1) screening of titles and abstracts to exclude

irrelevant studies and (2) full-text review based on inclusion and exclusion criteria. Only articles meeting all criteria were included in the final analysis.

Data from eligible studies were extracted and summarized into a charting table that included the following information: author, year of publication, study design, sample size, country of study, factors investigated, and key findings. These data were then synthesized and grouped according to major themes related to infectious diseases, influencing factors, and study outcomes.

Quality assessment was independently conducted by two reviewers using the Joanna Briggs Institute (JBI) Critical Appraisal Tools according to each study design (cross-sectional, cohort, or quasi-experimental). Only studies with a quality score of ≥70% were included to minimize methodological bias. After completing all stages of the screening and quality appraisal, a total of 15 eligible articles were included for final analysis in this scoping review. The article selection process is illustrated in Figure 1.

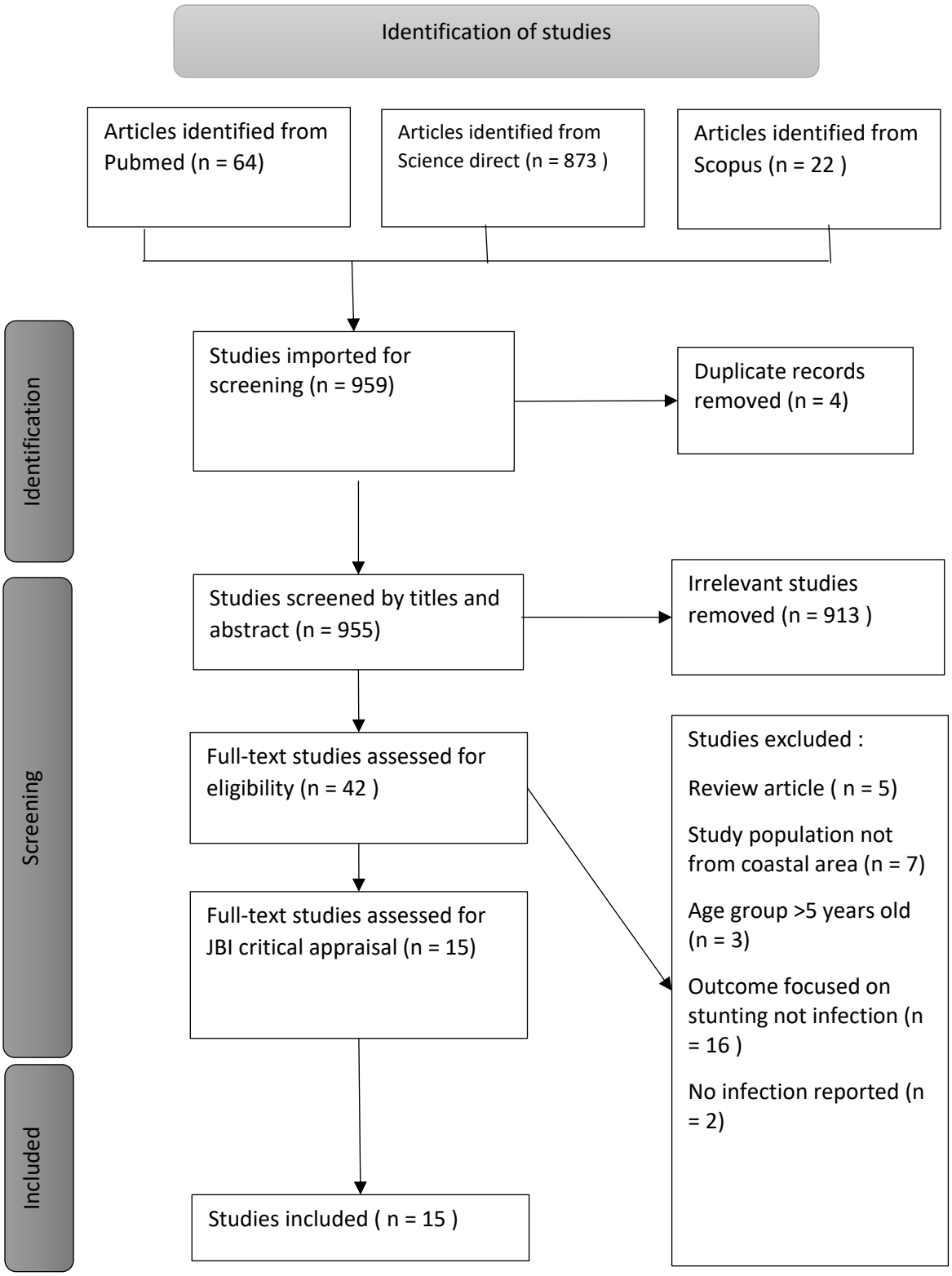

Figure 1. PRISMA-ScR Article Selection Diagram

Table 1. Characteristic of Articles Conducted Analysis

No	Judul	Penulis / tahun	Desain penelitian	Populasi	Hasil	Kesimpulan
1	The Physical Condition of Household Environment and History of ARI to the Stunting Cases in Ogan Ilir Regency	Nita Amelia Putri, 2024	Case control	129 toddlers aged 24–59 months	Housing density, ventilation, and history of ARI are associated with stunting	A history of ARI is a dominant factor contributing to stunting
2	Prevalence and Correlates of Diarrhoea among Children Under Five in Coastal Ghana	Delia Akosua Bandoh, 2024	Cross-sectional	Households with children <5 years	Diarrhea prevalence was 36%, and immunization reduced the risk	Diarrhea remained high despite good access to clean water.
3	Socio-demographics, Dietary Diversity Score, and Nutritional Status of Children in Coastal Area	Vivilia Niken Hastuti, 2024	Cross sectional	130 households with children aged 2–5 years	Maternal education, history of ARI, and exclusive breastfeeding were significantly associated	Sociodemographic factors and infection history influence child nutritional status
4	Prevalence of ARI, Fever, and Diarrhea among Under-five in Coastal Bangladesh	Shahinur Akter, 2025	Cross-sectional survey	348 caregivers of children 6–59 months	ARI prevalence was 64.7%, with contributing factors including sex, meal frequency, birth weight, and housing conditions	Nutrition education and improvements in health services are needed
5	Continuous Invasion by Respiratory Viruses During RSV Outbreak	Patrick K. Munywoki, 2018	Active surveillance	47 households (483 members)	A total of 25.2% of the samples tested positive for respiratory viruses	Viral infections are common and spread rapidly within households
6	Determinants of Childhood Diarrhea in Households with Improved WASH	Biniyam Sahiledengle, 2021	Cross sectional	1,975 mother-child pairs	Child's age, measles immunization, and birth size were significant factors	Child and household level factors influenced diarrhea despite adequate WASH conditions
7	Socioeconomic Factors Associated with Diarrhea among Under-five in Manado Coastal Area	Oksfriani Jufri Sumampouw, 2019	Cross sectional	120 mothers/caregivers of children <5 years old	Socioeconomic factors had a significant influence on diarrhea	Maternal education and household income are important factors
8	Factors Influencing Outbreak of Diarrhoea in Borno State	Lola Nelson, 2025	Cross sectional	400 households	Polygamy, unsafe water, and shared toilets increase the risk	Sanitation and clean water are essential for preventing diarrhea

No	Judul	Penulis / tahun	Desain penelitian	Populasi	Hasil	Kesimpulan
9	Faktor Risiko Lingkungan Fisik Rumah terhadap ISPA di Aceh Besar	Rajwa Waliyyuddin, 2024	Case control	Toddler at Darul Imarah Community Health Center	Ventilation, humidity, and household crowding were significantly associated with respiratory infections	The home environment influences respiratory infections in young children
10	Toddlers Nutritional Status: The Effect of Infection Rate as Mediating Factor	Yuliana Yuliana, 2025	Cross sectional	302 mother-child pairs	Infections mediate the relationship between income and nutritional status	Infection is an important factor influencing the nutritional status of young children
11	Influence of Household Environment and Maternal Behaviors to URI	Reny Fahdiyani, 2015	Case control	55 mothers with toddlers with ARI	Household crowding is significantly associated with acute respiratory infections	Environmental conditions exert a greater influence than maternal behaviors
12	Predictive Factors of Family Health Management for Caring Toddlers with ARI	Marisna Eka Yulianita, 2023	Korelasional prediktif	392 mothers of toddlers with a history of ARI	Maternal knowledge and positive attitudes improve overall family management	Maternal education plays an essential role in preventing respiratory infections
13	Access to Water, Sanitation, and Hygiene (WASH) in Coastal Households	Shuvagato Mondal, 2025	Cross-sectional survey	471 households in 3 coastal zones	Only 10.6% of households had adequate WASH access	Socioeconomic status and maternal education influence household access to WASH services
14	Hygiene Practice and Diarrhea Prevalence among Underfive in Myanmar	Than Kyaw Soe, 2023	Analitik cross-sectional	1207 children 6–59 months	Poor hygiene practices significantly increase the risk of diarrhea (AOR > 2)	Family hygiene is important in preventing diarrhea
15	How Sociodemographic, Water, and Sanitation Factors Influence Diarrhea in Indonesia	Sailent Rizki Sari Simaremare, 2024	Cross-sectional	9,243 children 0–59 months	Child's age, history of ARI, and access to healthcare are significant	Sociodemographics and comorbidities increase the risk of diarrhea

3. RESULT AND DISCUSSION

Based on the screening process, a total of 15 studies met the inclusion criteria and were analyzed in this review. Each selected article was reviewed for essential information, including the study title, authors and publication year, study design, sample size or population, country of study, and major findings (Table 1). Among the identified studies, ten (66.7%) employed a cross-sectional design, three (20%) used a case–control design, one (6.7%) applied a cohort or active surveillance design, and one (6.7%) used a correlational predictive cross-sectional

approach. The correlational predictive design aimed to examine associations between variables without manipulation or follow-up, while the active surveillance study continuously monitored target populations, resembling a prospective cohort design.

The determinants identified in these studies were classified into four main categories: (1) Environmental factors, including air quality, water quality, and climate conditions; (2) Socioeconomic factors, covering income, maternal education, and household living conditions; (3) Behavioral factors, consisting of hygiene practices, indoor smoking, and household air quality; and (4) Biological factors, which included nutritional status, breastfeeding, immune system development, and immunization coverage.

Overall, socioeconomic determinants were the most frequently reported, appearing in 13 out of 15 studies (86.7%). These factors, including low household income, poor maternal education, and inadequate housing, were strongly correlated with higher risks of acute respiratory infections (ARI) and diarrhea due to limited access to clean water, sanitation, and primary healthcare. Biological factors were identified in 10 studies (66.7%), particularly highlighting the role of nutritional status, immunization completeness, and immune system development. Children with poor nutrition and incomplete immunization were found to be more vulnerable to recurrent infections, while those exclusively breastfed demonstrated improved immune protection. Environmental factors appeared in 8 studies (53.3%), emphasizing indoor air pollution, contaminated water, and coastal climatic conditions as significant contributors to infectious diseases. Behavioral factors, identified in 5 studies (33.3%), included poor hygiene practices, household smoking, and the use of biomass fuel or mosquito coils, which deteriorate indoor air quality. Each study was appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Tools, and only studies with a quality score above 70% were included to minimize potential methodological bias.

Table 2. Determinants Categories

No.	Judul	Tahun	Desain penelitian	Factor specific	Factor category	Lokasi
1	The Physical Condition of Household Environment and History of ARI to the Stunting Cases in Ogan Ilir Regency(Putri et al., 2024)	2024	Case control	Living condition (housing density, ventilation) Immune system development (History of acute respiratory infection)	Socioeconomic Biological	Indonesia
2	Prevalence and Correlates of Diarrhoea among Children Under Five in Coastal Ghana(Bandoh et al., 2024)	2024	Cross-sectional	Imunization Water quality	Environmental Biological	Ghana
3	Socio-demographics, Dietary Diversity Score, and Nutritional Status of Children in Coastal Area(Niken et al., 2024)	2024	Cross sectional	Education (mother education) Immune system development (History of acute respiratory infection, exclusive breastfeed)	Socioeconomic Biological	Indonesia
4	Prevalence of ARI, Fever, and Diarrhea among Under-five in Coastal Bangladesh(Akter et al., 2025)	2025	Cross-sectional survey	Gender nutrition (meal frequency, birth weight) Living condition (house condition)	Biological Socioeconomic	Bangladesh
5	Continuous Invasion by Respiratory Viruses During RSV Outbreak(Munywoki et al., 2018)	2018	Active surveillance	Indoor air quality Climate	Environmental Behavioral	Kenya
6	Determinants of Childhood Diarrhea in Households with Improved WASH(Sahiledengle & Agho, 2021)	2021	Cross sectional	age at immunization, birth size	Biological	Ethiopia
7	Socioeconomic Factors Associated with Diarrhea among Under-five in Manado Coastal Area(Sumampouw et al., 2019)	2019	Cross sectional	Education (maternal education, family income)	Socioeconomic	Indonesia

No.	Judul	Tahun	Desain penelitian	Factor specific	Factor category	Lokasi
8	Factors Influencing Outbreak of Diarrhoea in Borno State(Teryila et al., 2025)	2025	Cross sectional	Water quality (unsafe water), family condition (Poligami), hygiene practices (sharing toilet)	Environmental Socioeconomic Behavioral	Nigeria
9	Faktor Risiko Lingkungan Fisik Rumah terhadap ISPA di Aceh Besar(Waliyyuddin, 2024)	2024	Case control	Indoor air quality (Ventilation, humidity) Living condition (housing density)	Socioeconomic Behavioral	Indonesia
10	Toddlers Nutritional Status: The Effect of Infection Rate as Mediating Factor(Hasanah et al., 2025)	2025	Cross sectional	Income nutritional status	Socioeconomic Biological	Indonesia
11	Influence of Household Environment and Maternal Behaviors to URI(Fahdiyani, 2016)	2015	Case control	Living condition (housing density)	Socioeconomic	Indonesia
12	Predictive Factors of Family Health Management for Caring Toddlers with ARI(Yulianita et al., 2023)	2023	Korelasional prediktif	Income & education (knowledge, mother's positive attitude)	Socioeconomic	Indonesia
13	Access to Water, Sanitation, and Hygiene (WASH) in Coastal Households(Mondal et al., 2025)	2025	Cross-sectional survey	Sanitation, water quality, income, education	Socioeconomic Environmental	Bangladesh
14	Hygiene Practice and Diarrhea Prevalence among Underfive in Myanmar(Soe et al., 2024)	2023	Analitik cross-sectional	Hygienes practice	Behavioral	Myanmar
15	How Sociodemographic, Water, and Sanitation Factors Influence Diarrhea in Indonesia(Rizki et al., 2025)	2024	Cross-sectional	Child's age, history of ARI, and healthcare access	Sosioeconomic Demografi	Indonesia

Table 3. JBI Critical Appraisal

Author, Tahun	Desain	Skor berdasarkan kriteria JBI appraisal											Overall appraisal
		1	2	3	4	5	6	7	8	9	10	11	
Nita Amelia Putri, 2024	Case control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	include
Delia Akosua Bandoh, 2024	Cross-sectional	yes	yes	yes	yes	yes	no	yes	yes				include
Vivilia Niken Hastuti, 2024	Cross-sectional	yes	yes	yes	yes	no	no	yes	yes				include
Shahinur Akter, 2025	Cross-sectional	yes	yes	yes	yes	no	no	yes	yes				include
Patrick K. Munywoki, 2018	Active surveillance / cohort	yes	yes	yes	yes	yes	yes	yes	yes	yes	unclear	yes	include
Biniyam Sahiledengle, 2021	Cross-sectional	yes	yes	yes	yes	No	no	yes	yes				include
Oksfriani Jufri Sumampouw, 2019	Cross-sectional	yes	yes	yes	yes	no	no	yes	yes				include
Lola Nelson, 2025	Cross-sectional	yes	yes	yes	Yes	yes	no	yes	yes				Include
Rajwa Waliyyuddin, 2024	Case control	yes	yes	yes	unclear	unclear	no	no	unclear	yes	yes		Seek further info
Yuliana Yuliana, 2025	Cross-sectional	yes	yes	yes	yes	no	no	yes	yes				include
Reny Fahdiyani, 2015	Case control	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	Include
Marisna Eka Yulianita, 2023	Korelasional prediktif / cross-sectional	yes	yes	yes	yes	yes	yes	yes	yes				include
Shuvagato Mondal, 2025	Cross-sectional	yes	yes	yes	yes	yes	yes	yes	yes				Include
Than Kyaw Soe, 2023	Cross-sectional	yes	yes	yes	yes	yes	no	yes	yes				Include
Sailent Rizki Sari Simaremare, 2024	Cross-sectional	yes	yes	yes	yes	no	no	yes	yes				include

JBI : Joanna Briggs Institiute; N, no; NA, not applicable; U, unclear; Y, yes.
*appraisal tools for cross-sectional (8 items), cohort (11 items), and quasi-experimental (9 items) were used.

ENVIRONMENTAL FACTORS

Environmental determinants play a major role in the occurrence of infectious diseases among under-five children in coastal regions. Several studies demonstrated that poor indoor air quality(Putri et al., 2024), high humidity, and inadequate ventilation(Fahdiyani, 2016; Waliyyuddin, 2024) significantly increased the risk of acute respiratory infections (ARI). Exposure to domestic air pollution from cooking with biomass fuels(Akter et al., 2025;

Yulianita et al., 2023), as well as urban and industrial emissions in coastal zones, further exacerbates ARI prevalence(Akter et al., 2025; Fahdiyani, 2016; Munywoki et al., 2018; Waliyyuddin, 2024). In addition, water quality emerged as a crucial factor in diarrheal diseases(Teryila et al., 2025). Contamination by domestic waste and saline intrusion contributes to the high prevalence of diarrhea in countries such as Bangladesh(Mondal et al., 2025), Nigeria(Teryila et al., 2025), and Indonesia(Rizki et al., 2025). Climatic elements, including rainfall, temperature, and humidity, were also found to influence seasonal infection peaks, particularly in areas with poor sanitation infrastructure(Munywoki et al., 2018). Collectively, these findings underline the close relationship between environmental degradation and children's vulnerability to infections in coastal settings.

SOCIOECONOMIC FACTORS

Socioeconomic conditions were the most dominant determinants identified in this review. Thirteen of the fifteen studies highlighted household income(Putri et al., 2024), maternal education (Niken et al., 2024; Rizki et al., 2025; Sumampouw et al., 2019; Yulianita et al., 2023), and housing density as major risk factors for childhood infections(Fahdiyani, 2016; Putri et al., 2024; Rizki et al., 2025). Low maternal education levels were linked to poor knowledge of nutrition and hygiene, both of which directly contribute to diarrheal and respiratory infections(Niken et al., 2024; Rizki et al., 2025; Sumampouw et al., 2019). Households with limited income often lack access to clean water, adequate sanitation, and healthcare services, increasing infection transmission. Overcrowded homes with poor ventilation further facilitate the spread of respiratory diseases. Studies from Indonesia and Ghana reported that children from low-income families were twice as likely to experience recurrent infections compared to those from middle-income households(Bandoh et al., 2024; Sumampouw et al., 2019). Socioeconomic constraints also indirectly influence infection risk through inadequate nutrition and incomplete immunization coverage.(Yulianita et al., 2023).

BEHAVIORAL FACTORS

Behavioral determinants significantly contribute to the transmission of infectious diseases in coastal communities. Studies from Nigeria, Myanmar, and Indonesia revealed that poor household hygiene practices, such as failure to wash hands after defecation and the use of unsafe water for food preparation, were strongly associated with high diarrhea prevalence(Soe et al., 2024; Sumampouw et al., 2019; Teryila et al., 2025) In addition, indoor smoking and mosquito coil use were reported to increase exposure to household pollutants, elevating the risk of ARI among young children.(Putri et al., 2024). Caregivers' behaviors in managing household waste, keeping domestic animals near living areas, and maintaining environmental cleanliness were also influential in preventing disease transmission(Soe et al., 2024;

Sumampouw et al., 2019). These findings highlight the importance of community-based behavior change interventions to improve hygiene and reduce environmental exposure among coastal families.

BIOLOGICAL FACTORS

Biological determinants, including nutritional status, immunization history, and immune system development, play a critical role in shaping children's susceptibility to infectious diseases. Studies from Ethiopia, Indonesia, and Bangladesh consistently showed that malnourished children have higher risks of recurrent infections due to weakened immune responses(Akter et al., 2025; Niken et al., 2024; Sahiledengle & Agho, 2021). Immunization coverage was found to be protective, with under-immunized children having twice the risk of contracting ARI or diarrhea compared to those who received complete vaccinations(Bandoh et al., 2024; Sahiledengle & Agho, 2021). Moreover, exclusive breastfeeding was associated with enhanced immunity through mucosal and maternal antibody mechanisms, providing natural protection against infections(Niken et al., 2024; Yulianita et al., 2023). These results emphasize the importance of integrating nutrition, immunization, and hygiene promotion as synergistic preventive strategies to reduce the infectious disease burden among under-five children in coastal regions.

LIMITATIONS OF THE STUDY

The main objective of this scoping review was to map and synthesize the determinants of infectious diseases among under-five children living in coastal areas. However, several limitations were identified. The number of studies focusing specifically on integrated determinants in coastal populations remains limited, resulting in variations in the scope, design, and data collection methods across studies. Additionally, most included studies employed cross-sectional designs, which restrict the ability to infer causality between environmental, socioeconomic, behavioral, and biological factors. The heterogeneity of study settings and measurement indicators, such as nutritional status, infection diagnosis, and socio-environmental variables, also presents challenges in drawing generalizable conclusions. Further quantitative and longitudinal studies are needed to validate and strengthen these findings.

4. CONCLUSIONS AND RECOMMENDATIONS

This scoping review highlights that infectious diseases among under-five children in coastal areas are the result of a complex, multisectoral interaction among environmental, socioeconomic, behavioral, and biological factors. Socioeconomic determinants—particularly maternal education and household income—along with biological factors such as nutritional

status and immunization coverage, emerged as the most influential predictors of infection vulnerability. These findings emphasize the importance of implementing integrated prevention strategies across health, education, and environmental sectors. Strengthening maternal education, improving access to clean water and sanitation, ensuring complete immunization, and promoting adequate nutrition are key steps toward reducing infection burden in these vulnerable populations. Future research employing quantitative and longitudinal approaches is recommended to explore causal relationships between acute respiratory infections, immunization status, and nutritional status, providing stronger evidence to inform coastal health policy and community-based interventions.

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