



Project REPORT

On

***Determination of Risk Factors associated
With Pneumonia in Children under 5 Years of age***



Submitted to

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LETTER OF TRANSMITTAL

Date: 19 July 2021

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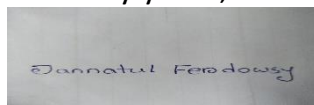
Subject: Submission of Project Report.

Dear Sir,

I am here by submitting my project report on which is a compulsory requirement of the NFE Program curriculum. I have got the opportunity to work in Dhaka Shishu Hospital in Paediatric Gastroenterology, Hepatology & Nutrition department for 15 days, under the supervision of Sabrina Makbul, Senior Nutritionist, of Paediatric Gastroenterology, Hepatology & Nutrition department of DSH.

This internship gave me both academic and practical exposures. First of all I learned about clinical nutritional assessment of Pneumonia, facility-based management of children with severe acute malnutrition guidelines and counselling of children diet. Secondly, the internship gave me the opportunity to develop and enrich my theoretical knowledge I have acquired during the study period.

I am submitting this report for your kind consideration and also shall be highly obliged if you are kind enough to receive this report and provide your valuable judgment
Sincerely yours,



Jannatul Ferdowsy Onti

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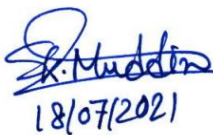
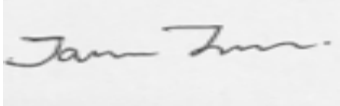
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CERTIFICATE OF APPROVAL

I am pleased to certify that the internship report on conducted by **Jannatul Ferdowsy Onti** bearing student ID No: **171-34-604** of the department of Nutrition and Food Engineering has been approved for presentation and defense/viva-voice. Under my supervision **Jannatul Ferdowsy Onti** worked in Dhaka shishu Hospital as an intern.

We am pleased to hereby certify that the data and finding presented in the report are the authentic work of Jannatul Ferdowsy Onti. We strongly recommended the report presented by Jannatul Ferdowsy Onti for further academic recommendations and defence/viva-voice. Jannatul Ferdowsy Onti bears a strong moral character and a very pleasant personality. It has indeed a great pleasure working with her. We wish her all success in life.

 18/07/2021	
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My deep and sincere thanks to my academic supervisor **Tasmia Tasnim, Lecturer (Senior Scale), Department of Nutrition & Food Engineering, Faculty of Allied Health Sciences, DIU** for guiding me and for giving me the opportunity to initiate this report. It would have been very difficult to prepare this report up to this mark without her guidance.

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I would like to express my warmest thanks to **Ms. Fouzia Akter, Assistant professor**, and my batch advisor for her whole-hearted supervision during my organizational attachment period.

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Abstract

Childhood Pneumonia is the leading cause of death in children under five years of age. 0-5 years children are generally affected by Pneumonia.

The main purpose of the study is to identify the factors associated with pneumonia in children under 5 years of age.

The objective of the study was to collect data of nutritional status of children, children immunization status, the type of cooking fuel their family use and measure the number of cases of pneumonia.

A hospital based study was at Dhaka Shishu Hospital, Shamoly, and Dhaka. The study was conducted over 30 patients and their age was 12 months to 59 months. 60% of them were not completely immunized. They were extreme deadly infected and also malnourished. The age of the mothers of the children were under 25 years of age and had education above secondary level. Half of the main family persons were self-employed. 40–43 percent of families utilized messy fuel for cooking such as biomass/kerosene/stove.

The report may be effective in highlighting the issues and standing at an adequate level to help the government make progress in reducing pneumonia in young people and improving the health of children.

Chapter One

Introduction

Youth Pneumonia is the main single reason for mortality in children matured under five. These days Pneumonia is the greatest irresistible enemy of youngsters around the world. It guarantees that, existences of more than 800,000 kids under five consistently, including more than 153,000 babies, who are especially powerless against contamination. That implies a kid bites the dust from pneumonia like clockwork and practically these passings are preventable. There are numerous reasons for pneumonia. It doesn't have one single reason. It can create from microscopic organisms, infections, or parasites noticeable all around. The tainted children lungs are loaded up with liquid and for the kid, it gets hard to relax children whose resistant frameworks are youthful or low, for example, new-conceived or debilitated undernourishment or sickness like HIV are more powerless against Pneumonia. As we probably are aware, the matured from 0-5 years children are generally influenced and bite the dust from Pneumonia. The rate in this age bunch is assessed to be 0.29 scenes each kid year in creating and 0.05 scenes each kid year in created nations. Along these lines, this converts into around 156 million new scenes every year around the world, of which 151 scenes are in the creating scene. Most instances of Pneumonia are happening in India (43 million), China (21 million), and Pakistan (10 million). Furthermore high numbers in Bangladesh, Indonesia, and Nigeria (6 million each). Of all local area cases, 7-13% are adequately serious to be dangerous and they likewise require hospitalization. The generous proof uncovers that the main danger factors adding to pneumonia are absence of elite breastfeeding, under nutrition,

indoor air contamination, low birth weight swarming, and absence of measles vaccination. Pneumonia is liable for 19% of all passing's in children matured under 5 years, over 70% happen in sub-Saharan Africa and southeast Asia. Late investigations have recognized that, Streptococcus pneumonia, Haemophilus, Influenzae, and respiratory syncytial infections as the fundamental microbes related with youth pneumonia. ^[1] ^[2]

Objectives

The objective of the study was to collect data of nutritional status of children, children immunization status, the type of cooking fuel their family use and measure the number of cases of pneumonia.

Chapter Two

Epidemiology and Etiology of Pneumonia:

Absurd decade, there have been some huge changes in kid wellbeing around the world. Because of the financial turn of events, measures to address more extensive social determinants of wellbeing, and the advancement execution of compelling children wellbeing mediation, worldwide kid death rates have been consistently declining. Passings from pneumonia, the main source of baby mortality somewhat recently have gotten the most noteworthy. These progressions have additionally brought about adjusted examples of Pneumonia occurrence, causes, and

hazard factor impacts. Besides, particularly right now, dependable data about Pneumonia scourges in low-pay nations ought to be gathered, scattered, and used to educate youngsters' wellbeing strategy and need setting. Pneumonia is gone before by a viral contamination of the upper respiratory plot, openness to gastric substance, asthma, or openness to allergens or aggravations. Etiologic specialist identification for Pneumonia is fundamental for successful treatment just as for keeping epidemiological records, it is seldom seen in clinical practice. Broad surveys have shown that a solitary reason for Pneumonia was frequently distinguished in under 10% of patients introduced to the crisis division. All things considered, the most well-known creatures that cause Pneumonia can be concentrated under the recently referenced headings. Somewhat recently, the focal point of Pneumonia the study of disease transmission and etiology research has moved from investigations of yearning and postoperative examples of lungs to numerous microbes pointed toward recognizing Pneumococcal sickness. A portion of the significant difficulties confronting present-day Pneumonia Etiology contemplated incorporate hesitant and precarious case definition use, threatening admittance to obsessive lung tissue and test from harmful cases, numerous test outcomes, deficient test result,s, and so forth are distinguished in a particular individual. Later on, the youth Pneumonia etiology examination will require the combination of data identified with the utilization of cutting edge sub-atomic diagnostics and immunization test concentrates from correlative strategies, just as legitimately underscoring the restoration of lung yearnings from the radio. [3]

Pathophysiology of Pneumonia:

Pneumonia brought about by contamination with streptococcus pneumonia is the most well-known and I have considered the bacterial reason for Pneumonia which has pathogenesis which is the most widely recognized reason for disease with streptococcus Pneumonia. Traditional investigations of human neurotic examples have portrayed extreme deadly infection. As of late investigations of the human tests, diseases have affirmed the primary detailed colonization and carriage of rodents. Understanding the methods for development and above all the best approach to shield genuine people from this dangerous bodily fluid contamination.

Microbiology: Pathology viable life forms for microbiology HAP are for the most part altogether not the same as those answerable for the local area obtained pneumonia. The clinical setting in which HAP is developed likely influences conceivably useful creatures. In addition to the fact that this changes influence microbiology fitting treatment, it influences sickness. Rise HAP late-beginning will be additionally separated into two classifications identified with preferred guess over HAP. Beginning stage and late-beginning patients with openness to anti-microbial might be isolated into two classifications. These two classifications would then be able to be additionally isolated into patients without anti-microbial openness and patients without past anti-microbial openness. The most well-known microorganisms are Enterobacteria-ciea, Haemophilus flu, Streptococcus pneumonia, and Methicillin-touchy Staphylococcus aureus.

Gram-positive Bacteria: The most well-known gram-positive cocci that cause pneumonia in hospitalized patients are *S. pneumonia* and *S. aureus*. *S. pneumonia* colonizes the upper aviation routes and is a typical causative specialist of the local area gained pneumonia. Thus, *S. pneumonia* is bound to be related to beginning stage HAP than and late-beginning HAP. *S.pneumonia* is less impervious to regular remedial beta-lactam anti-toxins. *S. aureus* frequently colonizes the upper aviation routes particularly the nasal entries. children pneumonia can happen any time throughout the clinic

Gram-negative Bacteria: Early-beginning HAP is identified with *Haemophilus flu* and lactose-aging Gram-negative bacilli, like *Enterobacteriaceae*. Inordinate development of these creatures might be related to past anti-microbial treatment and increment their danger of viral emergency ailment. ^[4]

Effect of day to day environments and lack of healthy sustenance on the rate of Childhood Pneumonia:

Hazard factors related with the direction for living or day to day environment that increment the danger of pneumonia and include:

Lack of healthy sustenance: Increase the danger of youth pneumonia and adds to it being more extreme, particularly in small kids. It is assessed that hunger is the fundamental reason for death in 45% of kids younger than 45 around the world.

Helpless dental wellbeing: Poor oral cleanliness can add to pneumonia, particularly if kids have teeth.

Openness to creature, compound or natural poisons: Children nearby creatures can open them to contaminated drops that fall into the ground. A few synthetic substances and impurities can expand the danger of youth Pneumonia.

It is essential to know that kids are at expanded danger for pneumonia with each extra wellbeing or way of life hazard factor.

Impact of congestion, utilization of kinds of cooking fuel and proficiency status of parental figure on the rate of Pneumonia in kids:

The effect of congestion on the occurrence of Pneumonia in children is unbelievable. Studies recommend that there might be an autonomous connection between congestion and kids that are influenced by pneumonia however the proof is restricted. A scope of huge scope contemplates has been tracked down that attempted to adapt to the first bewildering factors. Generally speaking, the equilibrium of proof got in the five investigations shows a little connection between blockage and windedness in kids like Pneumonia. Notwithstanding, the possible connection among hardship and congestion in the term of respiratory conditions required further examination, for example, the connection among blockage and other lodging conditions(dump and shape development).

Around 3 billion individuals overall cook utilizing lamp oil, biomass (wood, creature manure, and yield squander), and contaminated open fire or basic oven fuelled by coal. Family air contamination causes an assortment of sicknesses, particularly youth pneumonia or different sorts of lung infections or malignant growth. About portion of all passing's from pneumonia in kids under a long time from family air contamination. Openness to air contamination in the pneumonia family nearly pairs the danger of youth Pneumonia and is answerable

for 45% of Pneumonia passing in children under 5 years old. Family air contamination is likewise a danger factor for the grown-up respiratory framework and that is 28% of all grown-up passing from Pneumonia.

Mother is the primary parental figure of a kid. Pneumonia happens worldwide however in non-industrial nations, about 25% of deadly passing are because of pneumonia that continuous visits to specialists, taking anti-microbial and prescription, loss of parental work, and loss of personal satisfaction. Some Bangladeshi moms have misdiagnosed Pneumonia because of cold air, air, water, or food. A few moms of Bangladesh said that 'insidious breezes' motivation Pneumonia. An overview of Bangladesh tracked down that 45% of moms living in rustic territories utilized natively constructed cures. For instance: rubbing the children chest with a combination of warm oil and garlic or dark seeds. A few moms accepted that Pneumonia was brought about by fiendish impacts and for this situation, the youngsters were treated by otherworldly healers. Therefore, allopathic treatment was deferred or stayed away from. It is significant that the mother needs to know about Pneumonia. ^[4]

Anticipation and control measures against Pneumonia:

Pneumonia is a disease in the lungs that is brought about by microbes, infections, or frequent growths. The air sacs in the lungs and fill them with liquids, which can make it harder for the individual or youngster to inhale and get the oxygen his body needs. Outside pneumonia can likewise cause different sicknesses or complexities

that can be lethal. So it is essential and critical to remain solid and forestall it.

- Get immunized. The individual should converse with his primary care physician or paediatrician about a portion of the drawn-out ailments.
- Must dispose of smoking for own and for family wellbeing.
- Pneumonia can likewise be brought about by different contaminations, like seasonal influenza. Since influenza is the most widely recognized reason for Pneumonia.
- It is imperative to get this season's virus immunization consistently after you arrive at the age of 6. This is particularly significant for children under 5 or 65.
- Those individuals who are investing energy with the patients, ought to likewise get the inoculation. Pneumonia expands their danger of confusion.
- If the child was conceived early or has some treatment issues, for example, a heart or lung condition, the guardians should converse with the specialist about the palivizumab shot. It can forestall serious respiratory syncytial infection (RSV) that can prompt pneumonia.
- Since different contaminations, for example, measles and pertussis can cause Pneumonia. So it is essential to converse with a specialist.

Individuals additionally can decrease the danger of bacterial Pneumonia by doing these things appropriately:

- Wash two hands appropriately particularly subsequent to going to the washroom and prior to eating.

- Eat directly with heaps of leafy foods.
- Have to exercise and practice.
- Get enough rest.
- Quit smoking.
- Stay away from debilitated individuals if conceivable. ^[5]

Pneumonia Vaccination in Bangladesh

In excess of 47 million pneumonia immunizations have been given to children since 2015. Save the kids and its partners have kept on pushing for this consideration as the public pneumonia alliance for over 5 years. This achievement was an enormous advance in forestalling the demise of a kid with pneumonia. Bangladesh has gained critical headway in lessening new-born child mortality somewhat recently from 655 passing for every 1,000 live births in 2007 to 45 passing for every 1,000 live births in 2017-2018. Immunization Against pneumonia was an incredible 97% among one-year-old in 2018. Working with an alliance of kid security accomplices, known as the Integrated Management of Childhood Allergy (IMCA) program of the public pneumonia alliance of Bangladesh. Which in March 2015 effectively catalysed the incorporation of PVC immunization. Drawing in with GAVI and multilateral accomplices, including political and media freedoms to feature the significance of immunizations to save the existence of millions of offspring of Bangladesh. ^[6]

Chapter: Three

Methods and Materials

Methods

Design:

For the current study we adopted the cross-sectional study design method

Study setting:

The current study was implemented in the Pediatric department of Dhaka Shishu hospital targeting subjects both in the outpatient and ward sections after taking permission from institutional ethical committee. Dhaka Shishu (Children) Hospital is Bangladesh's largest children's hospital. It is a 650-bed tertiary level public hospital supported by the government.

Study population

The study included all children under the age limit of 12 years who had acute respiratory illness. Children with coexisting diseases such as congenital heart disease, immunodeficiency, and children admitted outside of the specified time period, as well as children whose parents refused to give consent, were excluded from the study.

Case Definition and Enrolment

Pneumonia cases were hospitalized children who fulfilled the following criteria:

- Cough and/or dyspnea, and
- Tachypnea, as characterized by the World Health Organization (WHO) in children between 2 and 12 months of age: breathing rate 50 cycles per minute; in children between 12 and 59 months of age: breathing rate 40 cycles per minute), and
- Absence of wheezing at auscultation, and
- First symptoms appearing within the last 14 days, and
- Radiological confirmation of pneumonia as per WHO guidelines

Data collection

A standardized questionnaire was formulated and pretested, and then questionnaire was filled up through interviewing during data collection. The mothers of children aged 12 to 23 months were questioned about their child's immunization history, which was confirmed using immunization cards. However, only the children who had immunization cards were considered for analysis. Aside from the national immunization schedule, information on vaccines was also gathered. All children's weights and lengths/heights were measured and recorded. In the case of respiratory illnesses, mothers were questioned about seeking treatment and the diagnosis communicated by the doctor or health care provider. An episode of pneumonia was recorded if the treating doctor or health care provider informed her of it. Children who received all vaccines as per

the national immunization schedule, till one year of age were labelled as fully immunized. Children who did not receive at least one vaccine were labelled as partially immunized and the children who did not receive a single vaccine were labelled as non-immunized. Children whose records were not available were excluded from the analysis.

Chapter: Four

Result and Discussion

Results

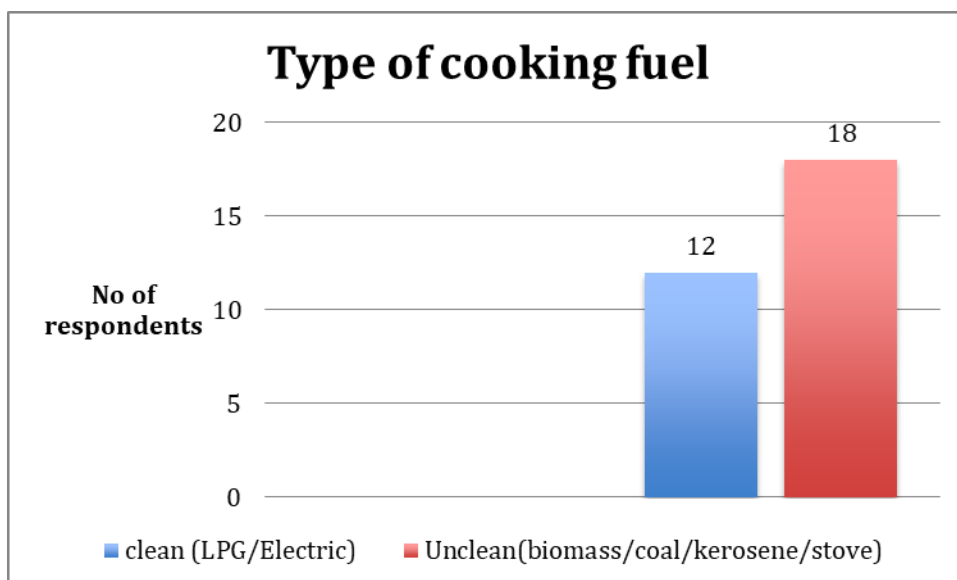
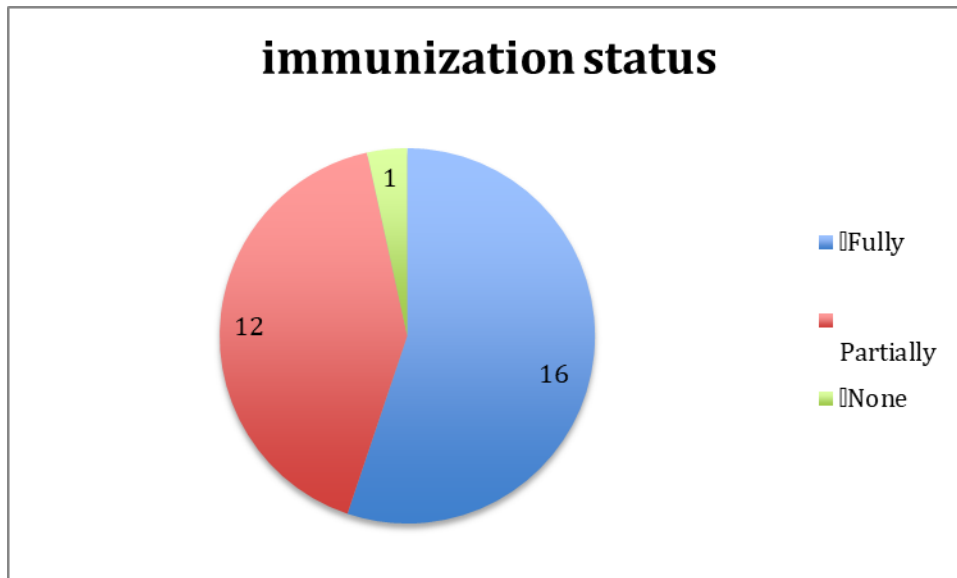
A total of 30 participants were included in the study. Table 1 summarizes all the relevant characteristics of the child, their mother and the situation of their household. Majority of the children admitted in hospital with pneumonia were below 12 months of age and the rest were above 2 years. There is an equal distribution of male and female respondents within the study group. Majority of included patients were <12 months of age. 73% of the respondents had a normal birth weight but less than half of the study population was exclusively breastfed. In spite of that majority of the pneumonia patients were of normal nutritional status according to the WAZ score. Data regarding characteristics of mothers of respondents show that most of them were young i.e. under 25 years of age and had education above secondary level. It can be seen that nearly half of the respondent's families were self-employed. At least 60% of the respondents were not fully or partially vaccinated (fig.1). Majority of

them used unclean sources of fuel such as biomass/kerosene/stove (fig 2).

Name of variable		N(%)
Age in months	<12 months	19 (63%)
	12-24 months	7 (23%)
	>24 months	4 (14%)
Sex	Male=1	18 (60%)
	Female=2	12 (40%)
Birth weight	<2.5 kg=1	8 (27%)
	2.5 or more= 2	22 (73%)
Exclusive breastfeeding for 6 months	Yes=1	14 (47%)
	No=2	16 (53%)
WAZ score	Underweight =1	10 (33%)
	Normal= 2	20 (67%)
Age of mother	<25 years	18 (60%)
	25 or above	12 (40%)

Marital status of mother	Married=1	27 (90%)
	Widowed=2	2 (7%)
	Divorced=3	1 (3%)
Education level of mother	Primary education=1	14 (47%)
	Secondary or above=2	16 (53%)
Income activities	None=1	0 (0%)
	Business or employed =2	25 (83%)
	Framing =3	5 (17%)

Distribution of nutritional status and sex



Discussion

Pneumonia influences offspring of every financial foundation; the danger of contracting pneumonia is higher in youthful infants, malnourished youngsters, and kids who have been presented to strong powers. The current investigation is a concise endeavor to catch the most applicable danger factors related with the rate of pneumonia. It manages just a small bunch of factors, for example, selective breastfeeding, vaccination status, mother's attributes, and utilization of fuel inside the family. Our investigation reports that most of influenced patients were not completely vaccinated, were exceptionally youthful on age, were malnourished, and had a place with families that utilized messy fuel.

Clinical pneumonia in kids is brought about by a blend of host, environmental, and contamination-related danger factors. In the flow research, most families utilize messy fuel for cooking. Since biomass fuel is promptly accessible in country territories, it is utilized more in rustic regions (24%) than in metropolitan regions in the current report (6%). In a past report done in India, 40–43 percent of families utilized messy fuel for cooking. A family overview in India found a genuinely huge association between detailed family biomass fuel use and revealed respiratory disease frequency in the earlier week among youngsters younger than five.

In the current investigation, Pneumonia was accounted for to be higher in a mostly inoculated youngster than in completely vaccinated kids. Different investigations have revealed incomplete or absence of vaccination as a huge danger factor for pneumonia^{1, 2, and 3}. The kids here with pneumonia, however for the most part malnourished, were solely breastfed from birth. Further examination on the reasons for hunger should be done, for example, the circumstance and nature of integral taking care of and presence of

other disease prompting medical issues like loose bowels, measles, or serious unhealthiest. A past report directed in India didn't track down any solid relationship of selective breastfeeding with the frequency of pneumonia. In our examination, a large portion of the respondents was accounted for to have a typical birth weight

Different examinations directed in local area settings had found a scope of other plausible elements that have seemed contributory in pneumonia cases. This incorporates the absence of admittance to medical care and social factor and the presence of existing together infections. Information, disposition, and practice of moms in regards to cleanliness rehearses have additionally been researched with respect to its identification with the recurrence of washing of hands which is vital in the anticipation of pneumonia in youngsters. Future examinations led in local area settings alongside the expansion of a greater amount of these connected factors will assist us with acquiring a more clear thought regarding the real causative components behind the commonness of pneumonia among youngsters in Bangladesh. [7] [8] [9]

Chapter: Five

Conclusion

Pneumonia is the significant mortality of youngsters in agricultural nations. The examination was led especially given a lot of spotlight on the children, the age range is under 5 years. Besides, as an agricultural nation, Bangladesh has for quite some time been attempting to improve kids' wellbeing and to diminish the kid's death rate. Pneumonia seriously affects kids, in this manner it needs more consideration. The public authority of Bangladesh has chipped away at taking a connected strategy structure in reducing the pace of youth pneumonia. In the greater part of the country, children have been experiencing pneumonia most. Along these lines, it raises more consideration with respect to the likelihood of being experiencing youth pneumonia. The examination could be useful in standing out enough to be noticed to bring issues to light and help to make government strides in decreasing youngsters' pneumonia and improving kids' wellbeing. In any case, the investigation would assist with getting the fundamental data about the treatment of youth pneumonia in Bangladesh.

Chapter Six

References

- [1] "www.medicinenet.com | 524: A timeout occurred."
https://www.medicinenet.com/pneumonia_facts/article.htm (accessed Jul. 09, 2021).
- [2] "Pneumonia - Wikipedia." <https://en.wikipedia.org/wiki/Pneumonia> (accessed Jul. 09, 2021).
- [3] "SciELO - Public Health - Epidemiology and etiology of childhood pneumonia
Epidemiology and etiology of childhood pneumonia."
<https://www.scielo.org/article/bwho/2008.v86n5/408-416B/en/> (accessed Jul. 09, 2021).
- [4] "Pneumonia Pathology - StatPearls - NCBI Bookshelf."
<https://www.ncbi.nlm.nih.gov/books/NBK526116/> (accessed Jul. 09, 2021).
- [5] "Preventing Pneumonia | American Lung Association."
<https://www.lung.org/lung-health-diseases/lung-disease-lookup/pneumonia/preventing-pneumonia> (accessed Jul. 09, 2021).
- [6] "5 Years of Pneumonia Vaccination in Bangladesh | Resource Centre."
<https://resourcecentre.savethechildren.net/library/5-years-pneumonia-vaccination-bangladesh> (accessed Jul. 09, 2021).
- [7] J. Gothankar *et al.*, "Reported incidence and risk factors of childhood pneumonia in India: a community-based cross-sectional study," *BMC Public Heal.* 2018 181, vol. 18, no. 1, pp. 1–11, Sep. 2018, doi: 10.1186/S12889-018-5996-2.
- [8] "Reported incidence and risk factors of childhood pneumonia in India: a community-based cross-sectional study | BMC Public Health | Full Text."
<https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-018-5996-2> (accessed Jul. 09, 2021).
- [9] B. R, S. A, K. K, and S. S, "Does Measles Vaccination Reduce the Risk of Acute Respiratory Infection (ARI) and Diarrhea in Children: A Multi-Country Study?," *PLoS One*, vol. 12, no. 1, pp. e0169713–e0169713, Jan. 2017, doi: 10.1371/JOURNAL.PONE.0169713.

