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A MULTI-LEVEL STUDY OF A PEDIATRIC POPULATION ATTENDING A TEACHING HOSPITAL IN SOUTH-SOUTH NIGERIA (MuSPePATHS). PART 2: PREVALENCE OF DISEASES AMONG THE CHILDREN

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Abstract

Background

Diseases of various kinds present through the life course of a person. Children are also afflicted by various types of diseases including pathogenic and non-pathogenic diseases. In this second part of our multi-level study, we identify the prevalence of various diseases for which the children were diagnosed.

Method

We applied Chi-square analysis with 1% level of significance to determine the association between various disease categories and sociodemographic factors.

Findings

Our findings showed that neonatal sepsis (5.5%) was the most prevalent disease, while the highest recurring comorbidity was epilepsy (7.0%). Neurological diseases had the highest prevalence (28.3%). There was a statistically significant association between disease categories and disease type ($p < .001$), age ($p < .001$), and educational status ($p < .001$).

Conclusion

Children across all ages, and educational status present with various forms of illnesses. Especially children under the age of 5 years. Non-pathogenic diseases are the most likely cause of illness among children.

Recommendation

Health education and health promotion should be targeted at neurological, hematological, respiratory, and gastroenterological diseases among children below five years of age, and those children who are not attending school.

Keywords: Children, comorbidity, pathogenic diseases, non-pathogenic diseases

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Introduction

The part 1 of this multi-level study showed that there were several unique characteristics associated with the children. Particularly, majority of the children were males, and most of them were less than 5 years of age (Ukwuru and Okeke, 2024). The study also revealed that several of the children were not schooling. In this second part of the study, we intend to identify and show the prevalences of the diseases that were diagnosed. In addition, we will show the relationship between age, sex, and educational status, and the diseases for which the children were diagnosed.

By reviewing existing studies, what we know thus far is that children can present with various types of diseases (Salami et al., 2017). According to Salami et al. (2017), non-communicable diseases such as those associated with dietary patterns may be dominant among children. Similar evidences were provided by Ajakaye and Ibukunoluwa, (2020) who showed that children presented with cases of malnutrition, anaemia, and malaria. In another study, Tagbo et al. (2013) revealed that 24% of pediatric hospital admissions were due to respiratory illnesses. Noriode et al. (2018) also showed evidence of prevalence of parasitic diseases among school-aged children in Edo state. The plethora of findings indicate that children are likely to present with any type, or category of diseases. This is consistent with our expected findings in this study. The above studies encompass Edo state and other parts of the country, they are an indication of the abundance of diseases in various parts of the country, and children are not spared from the experience. Findings from Mordi and Borke, (2014) revealed high cases of malaria among school-aged children between June and October. This is an indication that some diseases are seasonal, and warrant implementation of necessary preventive measures. The expected impact of our findings are to facilitate better decision-making pertaining to pediatric disease prevention and management. For example, findings from Imade and Eghafona, (2015) indicated a 42.6% prevalence of diarrhea causing viral agents in children living in Edo state. Thus, diseases that are identified as the most prevalent will receive the most attention in order to improve child health outcomes.

In this second part of the multi-level study, we begin by presenting the findings on the various diseases for which the children were diagnosed with. We also identify the various comorbidities and their prevalence. We proceed to show an association between the diseases for which children were diagnosed with and the sociodemographic features of the children. We hope that the evidence provided through the associations will make it easier to identify which diseases ought to receive the most attention from government and private spending on health education and health promotion.

Method

Our method is described in part 1 of this study (Ukwuru and Okeke, 2024). Exceptions to the method are based on the approach to data analysis.

Data Analysis

Statistical Package for Social Sciences version (29.0) was used to carry out Chi-Square analysis. Chi-Square analysis identifies the existence of a statistically significant association at $p < 0.001$. It also indicates that the difference lies with the variable that has the large distribution; and such a variable should receive significant attention.

Results

Diagnosis

Among the 1,000 patient records that were entered, a total of 1,000 diseases were recorded; one disease per patient. Some of the diseases only occurred once (0.1%) and were diagnosed among 195 children. Some diseases occurred only twice (0.2% prevalence), and were diagnosed in 64 children. There were some diseases that occurred four times (0.4% prevalence) and they were diagnosed in 44 children. Our observation was that these various diseases differed significantly among the children, being that the highest counts of similarity was 2 diseases that occurred among 9 times each, giving a prevalence of 0.90% for each of them. Thus, this was the highest prevalence for diseases that occurred with prevalence below 1% (figure I).

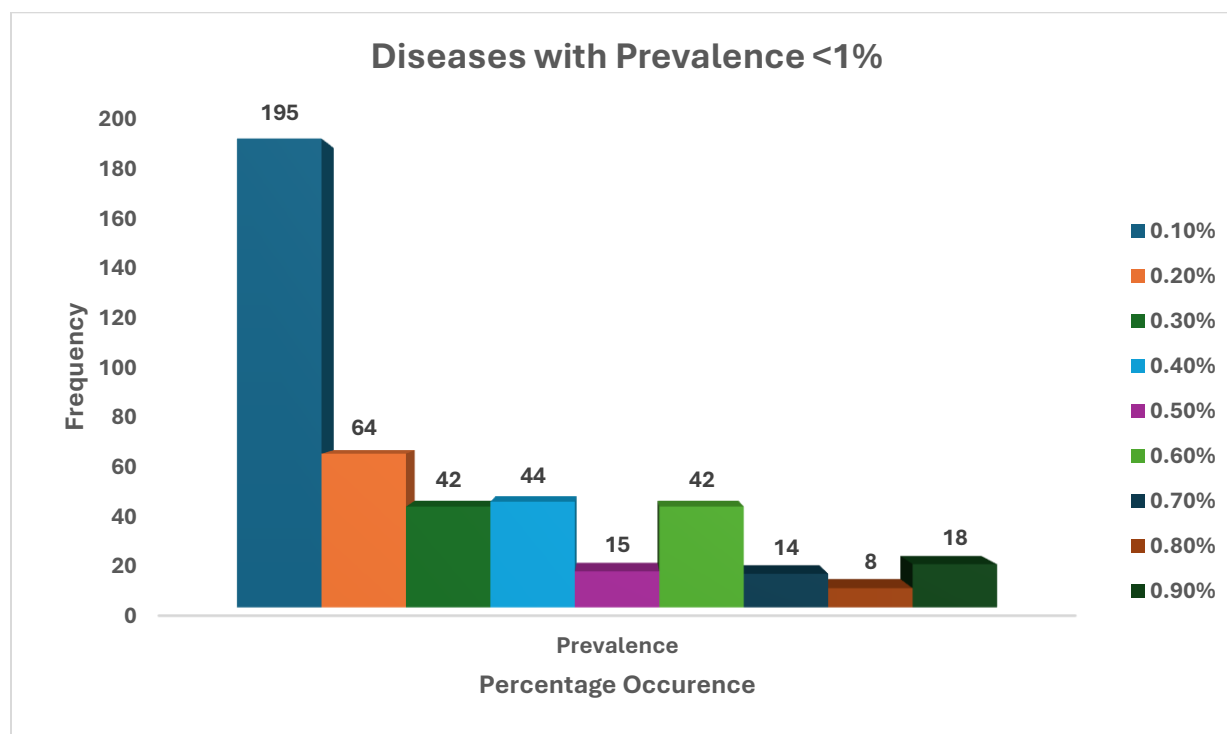


Figure I: Majority of the children presented with unidentical diseases

0.10% Prevalence: ABE induced developmental delay, ABE induced epilepsy, Achondroplasia, Acute bilirubin encephalopathy, Acute bronchitis, Acute constrictive pericarditis, Acute cystitis, Acute dystonic reaction to drug ingestion, Acute hepatitis, Acute intermittent asthma, Acute Kidney Disease, Acute Kidney Injury second degree drug toxicity, Acute malignant exudative tonsillitis, Acute necrotizing fascitis, Acute Peptic ulcer disease, Acute rheumatic fever, Acute severe asthma, Acute tonsillitis with persistent vomiting, Acute hemorrhagic fever, Allergic rhinitis, Anaemia of infancy, Angioedema, Anorectal malfunction, Appendix mass, Arrested hydrocephalus, Asphyxia, Atrial septal defect, Atrio-ventricular septal defect, Avascular necrosis, Bacterial conjunctivitis, Bacterial pneumonia, BCG lymphadenitis, Behavioural epilepsy, Bell's palsy, Benign multinodular goitre, Bilateral cataract, Bilateral Cataract and Strabismus, Bilateral perinephrotic abscess, Bilateral preseptal cellulitis, Biliary atresia, Bleeding Peptic ulcer disease, Blounts disease, Bronchial asthma, Cerebral palsy, Cellulitis of the left leg, Cellulitis of the upper thigh, Cephal hematoma, Cerebral abscess, Cerebral atrophy, Cerebral palsy, Chronic glomerulopathy, Chronic Kidney Disease stage 2, Chronic myelitis, Chronic osteo myelitis of the right femur, Chronic ulcer, Congenital adrenal hyperplasia, Congenital defect, Congenital glaucoma, Congenital hydrocephalus, Congenital meningitis, Congenital microcephaly, Congenital neonatal sepsis, Congenital pneumonia, Congestive cardiac failure, Costochondritis, Croup, Cyanotic congenital heart disease, Delayed juvenile bone, Difficulty breathing, Diffuse leptomeningeal melanocytes, Duodenal atresia, Dyslipidemia, Epilepsy with speech impairment, Epileptic aphasia, Epileptic seizures, Facial abscess, Facial nerve palsy, Febrile infection related epilepsy syndrome, Febrile seizure, Focal awareness epilepsy, Focal seizures, Functional pain, Gastric outlet obstruction, Gastro reflux disease, Gastroesophageal reflux disease, Genital wart, GPC epilepsy, Gynaecomastitis, Half ovum syndrome, Hemangioma, Hemorrhagic, Cardiovascular disease, Hepatitis, Hepatoblastoma, Horner's syndrome, Hydrocephaly, Impetigo, Infant reflux, Infective endocarditis, Intellectual disability, Intermittent malaria, Intravascular septal disease, Intraventricular septal mass, Intussusception, Ischaemic disease, Kuttner's tumour, Large Atrial Septal Defect, Left acute pyelonephritis, Left axillary abscess, Left breast cellulitis, Left femoral chronic osteomyelitis body abscess, Left hemiparesis, Left leg cellulitis, Left multicystic kidney, Left orbital cellulitis, Left pyelonephritis, Left thigh cellulitis, Lipoma, Mastitis, Movement disorder, Multicystic teratoma, Multifocal epilepsy, Multiple cardiac defect, Multiple intracardiac defect, Myelomeningocele, Myoclonic epilepsy, Necroblastoma, Necrotizing fasciitis, Non-atopic wheeze, Obesity, Ophthalmia neonatorum, Osteoid Osteoma, Panic disorder, Paroxysmal disorder, Pericarditis with pericardial fusion, Persistent diarrhea, Pharyngitis, Pick's disease type C, Pneumonia, Poliomyelitis, Poor speech, Post cerebrovascular disease, Post infectious acute glomerulonephritis, Post infectious epilepsy, Post meningitis encephalopathy, Post meningitis paralysis, Post Strep Acute glomerulonephritis, Post traumatic epilepsy, Pott disease, Precocious puberty, Premature ventricular contracture, Prematurity microcephaly, Prenatal asphyxia, Prenatal neonatal sepsis, Presumed Neonatal Sepsis, Priapism, Primary malnutrition, Progressive sepsis, Prolonged jaundice of infancy, Providencia sepsis, Pubertal gynaecomastia, Pulmonary valve stenosis, Quadriplegia, Recurrent arthritis, Recurrent hypoglycemia, Regression of milestone, Renovascular disease, Retinoblastoma, Retropharyngeal abscess, Right arm abscess, Right multicystic kidney, Rodenticide poisoning, Ruptured omphalocele, Sepsis nephrolytic crisis, Septic arthritis of the knee, Septic arthritis of the right hip and knee, Severe acute malnutrition,

Severe anaemia, Severe neonatal jaundice, Spasmodic quadriplegia, Speech delay, Spondylitis, Subacute ventricular septal Defect, Symptomatic anemia, Syndromic Anorectal malfunctions, Tension headache, Transposition of great arteries, Tricuspid regurgitation, Trisomy B, Uncomplicated malaria, Underweight malnutrition, Uraemic encephalopathy, Viral conjunctivitis, Viral hepatitis, Viral myocarditis, and Viral sepsis.

0.2% prevalence: Absence seizure, Bronchitis, Acute gastroenteritis, Dyskinetic cerebral palsy, Complicated meningitis, Adenotonsillitis, Allergic conjunctivitis, Atopic epilepsy, Rickets, Scabies, Generalised tonic-clonic seizures, Lobar pneumonia, Lupoid pneumonia, Hyper hemolytic crisis, Hyperthyroidism, Prolonged jaundice, Pulmonary regurgitation, Juvenile idiopathic arthritis, Sciatic nerve injury, Meningo encephalitis, Multiple knee abscess, Oesophageal varices, Neonatal near miss, Tracheoesophageal fistula, Typhoid septicaemia, Post status encephalopathy, Osteomyelitis, Sickle cell nephropathy, Dysentery, Failure to thrive, Conjunctivitis, Dilated cardiomyopathy.

0.3% prevalence: Diabetic ketoacidosis, Down syndrome, Bronchiolitis, Bullous impetigo, Cerebral malaria, Rheumatic heart disease, Pulmonary tuberculosis, Seizure disorder, Severe sepsis, Anaemia of prematurity, Pertussis, Warm autoimmune hemolytic anaemia, Post meningitis epilepsy, Suspected meningitis

0.4% prevalence: Chronic kidney disease, ADHD, Acute exacerbation of asthma, Respiratory distress syndrome, HIV, Gastroenteritis, Late onset sepsis, Neonatal meningitis, Prematurity, Upper Gastrointestinal second degree bleeding, Patent ductus arteriosus

0.5% prevalence: Acute chest syndrome, Autism spectrum disorder, Global developmental delay

0.6% prevalence: Delayed developmental milestone, Nephritic Syndrome, Severe microcephaly, Tetralogy of Fallot, Ventricular septal defect, Acute watery diarrhea, Adenotonsillar hypertrophy

0.7 % prevalence: Sepsis, and Aspiration pneumonia.

0.8% prevalence: Type 1 Diabetes Mellitus.

0.9% prevalence: Peptic ulcer disease, and UTI.

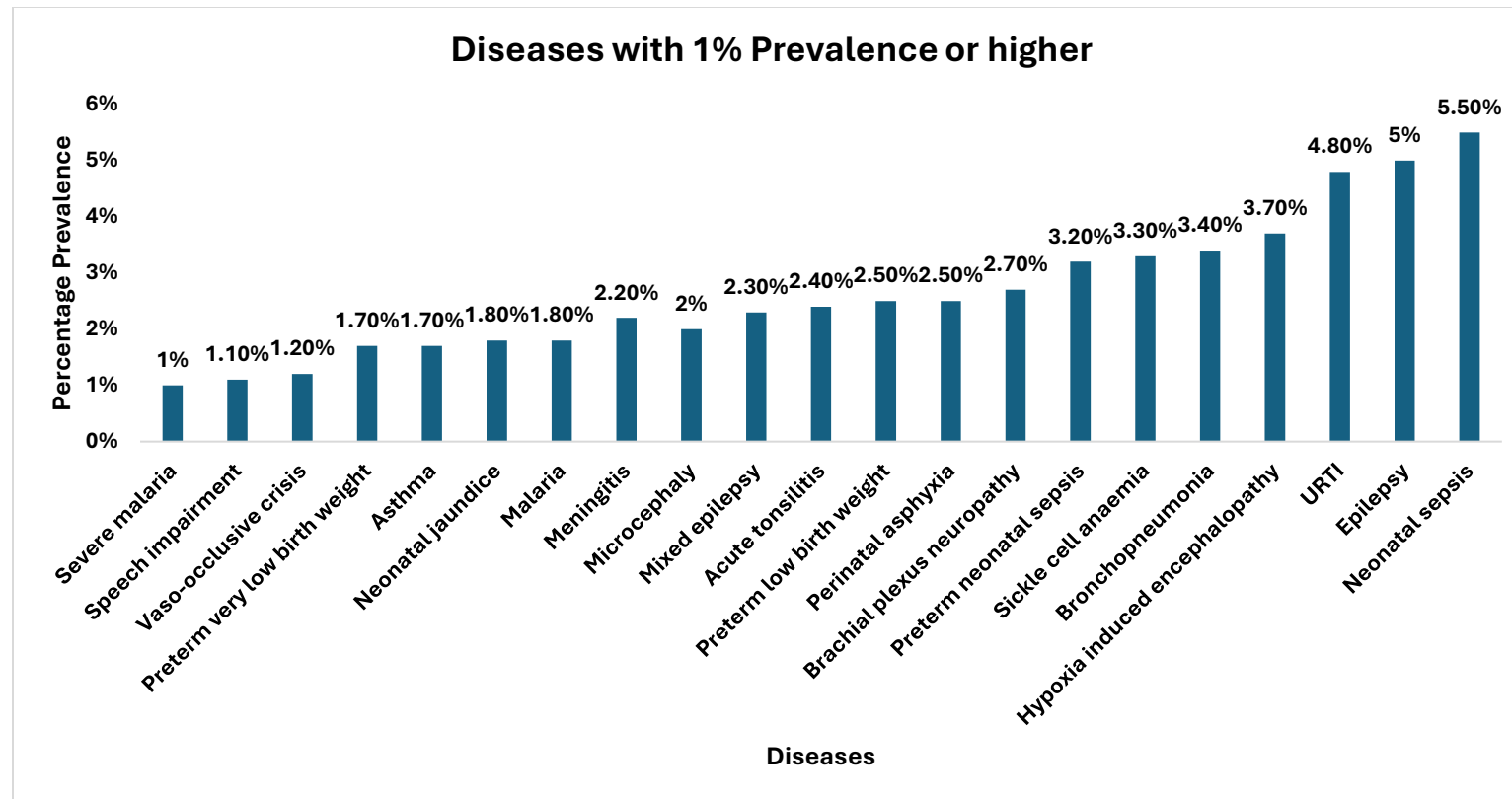


Figure IB: Neonatal sepsis had the highest disease prevalence (5.5%)

Figure IB diseases with a Prevalence >1%: Neonatal sepsis was the disease with the highest prevalence (5.5%). It was identified in 55 children. It was closely followed by epilepsy which had a 5.0% prevalence. Upper respiratory tract infection was the third leading cause of diseases, identified in 48 children. Among diseases with a prevalence of 1% severe malaria was the least, while neonatal jaundice and malaria had a tie of 1.80% prevalence each.

Comorbidities

Majority of children (155) presented with 1(0.1% occurrence) type of disease as a comorbidity. This was followed by 52 children who presented with 2 similar comorbidities (0.2%; 26 diseases occurred 2 times). The third leading population was 40 children who presented with 8 identical comorbidities each (5 diseases occurred 8 times). Overall, there were 585 comorbidities alongside the 1000 diseases identified from each child (figure IIA).

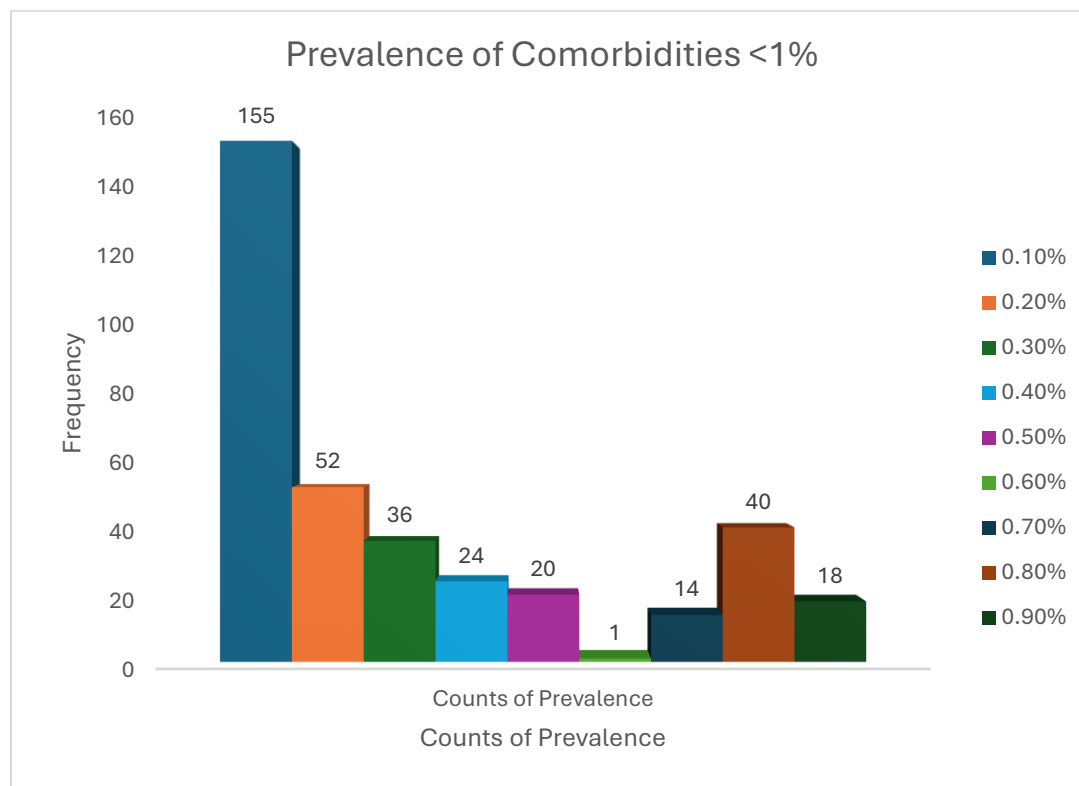


Figure IIA: Most children presented with at least one unidentical comorbidity

0.1% Prevalence: Abe's Affliction, Acute gastro enteritis, Acute glomerulonephritis, Acute intermediate asthma, Acute kidney injury, Perinatal asphyxia, Septicaemia, Adenotonsillar hypertrophy, Epilepsy, Adult congenital heart disease, Allergic conjunctivitis, Allergic dermatitis, Acute coronary syndrome, Anterior Urethral Stricture Disease, Anxiety disorder, Aplastic anaemia, Congestive heart failure, Contact dermatitis, Atopic seizure, Biliary arteria, Atrophy, Febrile seizure, Avascular necrosis of the hip, Bilateral conjunctivitis, Bilateral mumps, Biliary atresia, Bleeding peptic ulcer disease, Body aspiration, Brachial cyst, Hemiparesis, Bronchiectasis, Bronchiolitis, Paraparesis, Bullous impetigo, Cardiovascular disease, Cellulitis, Perinatal Asphyxia, Chronic suppurative otitis media, Cleft palate, CNS lupus, Communicating hydrocephalus, Community exposed pneumonia, Congenital adrenal hyperplasia, Congenital corneal opacity, Congenital malaria, Patent ductus arteriosus, Constipation, Contact Dermatitis, Cushing syndrome, Cystitis, Diabetes mellitus, Dilated cardiomyopathy, Duodenal stenosis, Duplex kidney, Dyskinetic CP, Edward syndrome, First degree malnutrition, Focal seizures, Functional abdominal pain, Speech regression, Steven Johnson syndrome, Haemophilus influenza type B, Heart failure, Henoch Schonlein purpura, Hepatocellular carcinoma, Hepatitis B infection, HIV exposed infant, Horse shoe kidney, Hyperactive airway disorder, Hyperactive disorder, Hypogonadism, Hypoplastic heart syndrome, ID epilepsy, ID Speech impairment, Inguinal lymphadenitis, Intraventricular hemorrhage, Iron deficiency anaemia, Large shoe kidney, Learning disability, Left multicystic kidney, Lipoma, Malnutrition,

Marasmus, Merconium aspiration syndrome, Pyelonephritis, Meningoencephalitis, Metabolic syndrome, Mild persistent asthma, Moderate intermittent asthma, Myasthenia gravis, Myotonic facial nerve palsy, Necrotizing enterocolitis, Non-bullous impetigo, Obesity, Oesophageal varices, Paediatric HIV, Panic attack, Paralysis, Pelvic inflammatory disease, Persistent asthma, Pigment dispersion syndrome, Pneumonia, Presumed neonatal sepsis, Posterior urethral valve, Prolonged jaundice, Psychogenic aphonia, Pyruvate kinase deficiency, Rectovesical fistula, Refractive error, Renovascular disease, Respiratory failure, Second degree hypertension, Second degree hypoxia induced encephalopathy, Second degree INH, second degree intrauterine asphyxia, Second degree post circumcision, Second degree primary malnutrition, Severe acute malnutrition, Severe anaemia, Severe microcephaly, Severe Respiratory Distress Syndrome, Sexual abuse, Sick cell nephropathology, Spastic quadriplegia, Speech regression, Spina bifida Stage 5, Second degree Neonatal Sepsis, Suspected Necrotizing enterocolitis, Tic disorder, Tinea capitis, Transposition of great arteries, Typhoid, Umbilical hernia, Urticaria, UTI, Mixed epilepsy, Myocolic perinatal asphyxia, Post Meningitic hydrocephalus, Preterm Pulmonary stenosis, Recto vestibula fistula, Recurrent aspiration, Respiratory Distress Syndrome in Newborn, Second degree copula hematoma, Second degree tuberculosis, Sick cell anaemia, Type 1 diabetes mellitus, Typhoid sepsis, URTI, UTI, Very Low Birth Weight, Sick cell anemia, speech impairment, Perinatal asphyxia, and Encephalopathy

0.2% prevalence: Anaemic heart failure, Aphasia, Aspiration pneumonia, Adenotonsillitis, Autism, Hypoxia induced encephalopathy epilepsy, Low birth weight, Atrial septal defect, Cerebral palsy, Cortical blindness, Neonatal sepsis, Global developmental delay, Speech impairment, Eisenmenger syndrome, Intellectual disability, Liver cirrhosis, Mitral regurgitation, Recurrent aspiration, Pulmonary stenosis, RVD exposed infant, Septicemia, Severe malaria, Tardive dyskinesia, Tinnitus arteriosus, Type I diabetes mellitus, Multicyclic kidney.

0.3% Prevalence: ADHD, Aspiration pneumonia, Atopy, Delayed developmental disorder, Second degree hypoxia induced encephalopathy, Prematurity, Intermittent asthma, Patent ductus arteriosus, Speech delay, Neonatal meningitis, Typhoid sepsis, Vitamin K deficiency.

0.4% prevalence: Myoclonic epilepsy, Anaemia of prematurity, G6PD deficiency, Seizure, Tetralogy of fallout, Underweight.

0.5% Prevalence: Meningitis, Preterm very low birth weight, Asthma, Vaso-occlusive crisis

0.6% prevalence: Peptic ulcer disease

0.7% prevalence: Atrioventricular septal defect, Congestive cardiac failure

0.8% prevalence: Acute tonsillitis, Acute watery diarrhea, Brachial plexus neuropathy, Nephrotic syndrome, and Neonatal jaundice

0.9% prevalence: Bronchopneumonia, and Down syndrome

Epilepsy was the comorbidity with the highest prevalence; it was identified in 74 children. This was followed by sickle cell anaemia (4.00%), and preterm neonatal sepsis (3.80%).

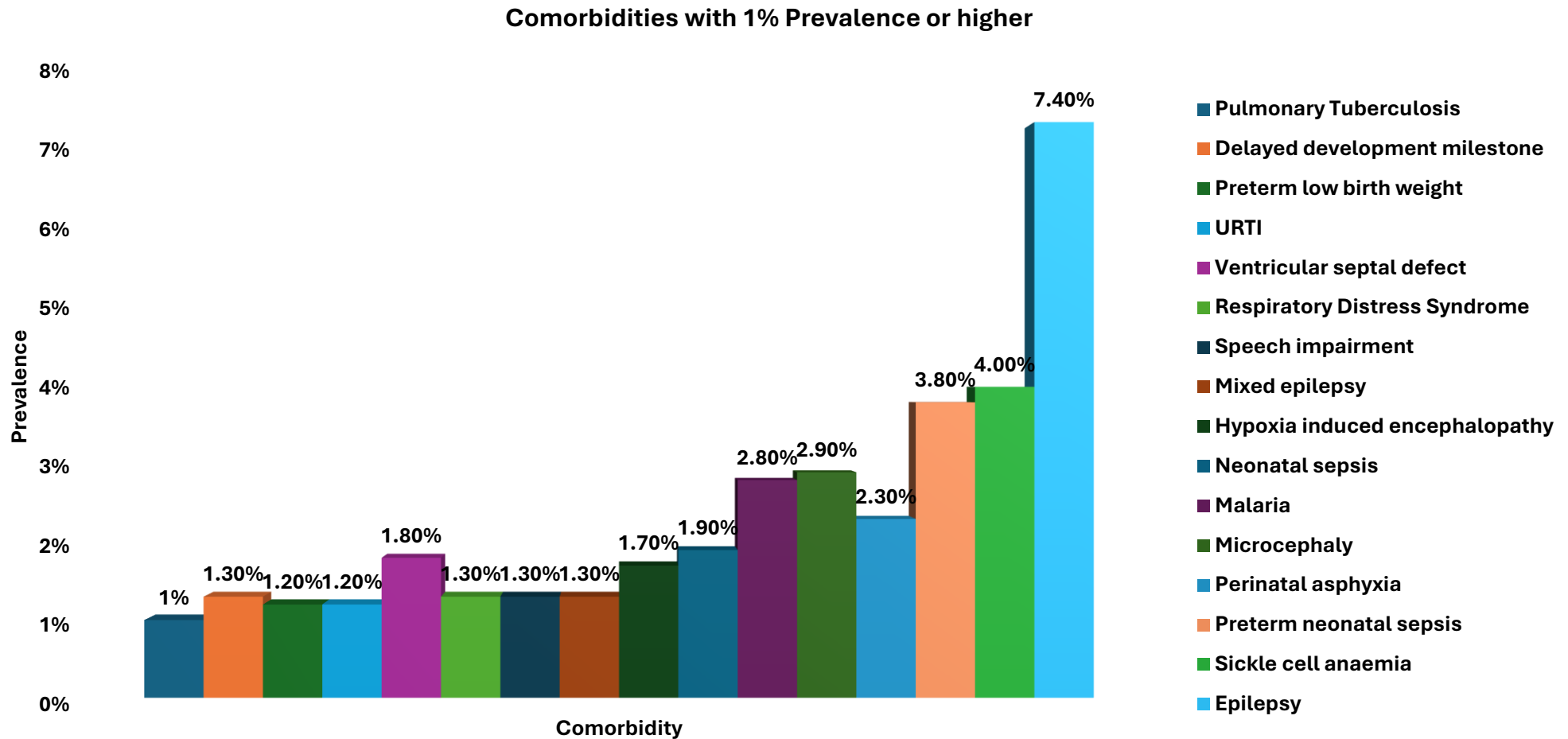


Figure IIB: The most frequently occurring comorbidity was epilepsy

Most of the children presented with 1 comorbidity 524(52.4%). The highest number of comorbidities was 3, and it was recorded among 5 children.

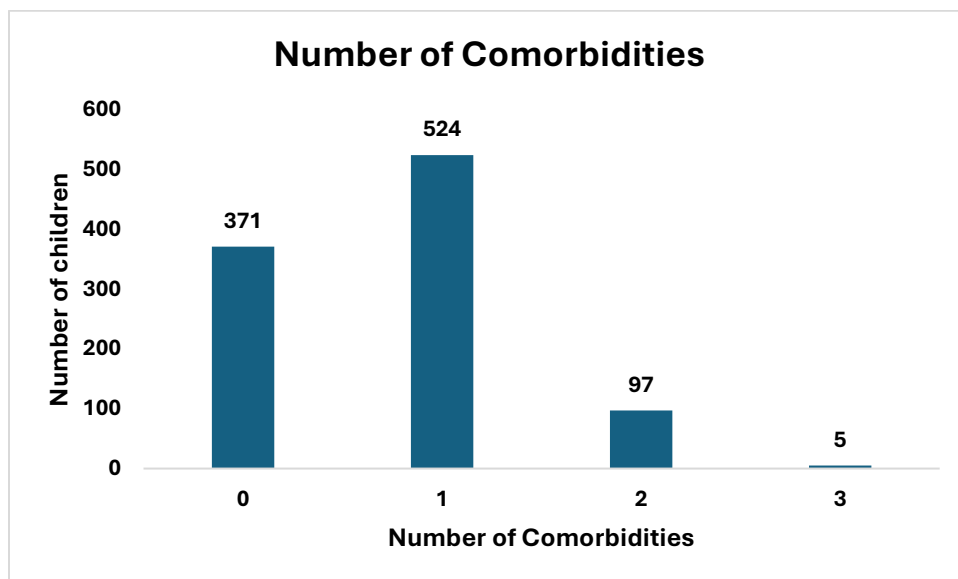


Figure III: Majority of the children presented with 1 comorbidity

Disease Category

Most of the diseases were of neurological origin, accounting for 283 diseases identified in children. This was followed by a parity between haematological and respiratory diseases that were identified in 203 children each. There was a tie between neonatal and nutritional diseases identified in 3 children each (figure IV).

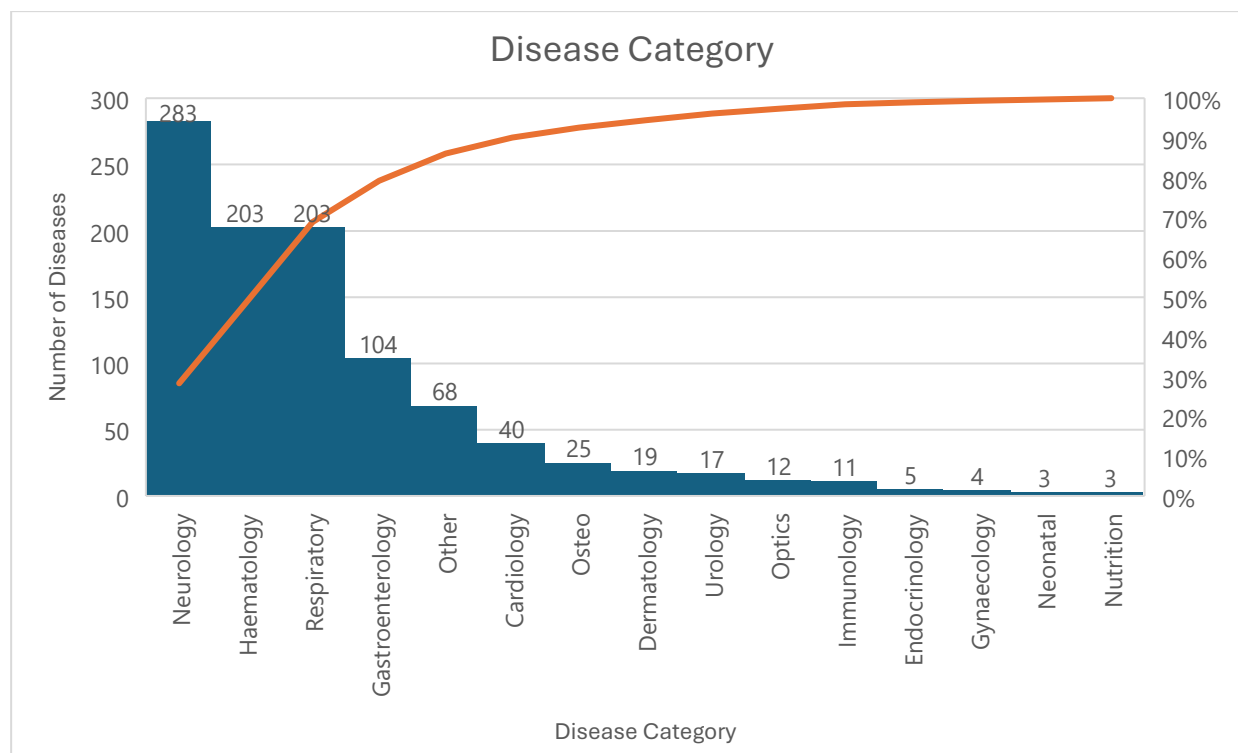


Figure IV: Neurological diseases were the leading cause of illness among children attending the hospital

Disease Type

Majority of the children 610(61%) presented with illnesses that were of non-pathogenic origin. The rest of the 39(39%) presented with illnesses that were of pathogenic origin (figure V).

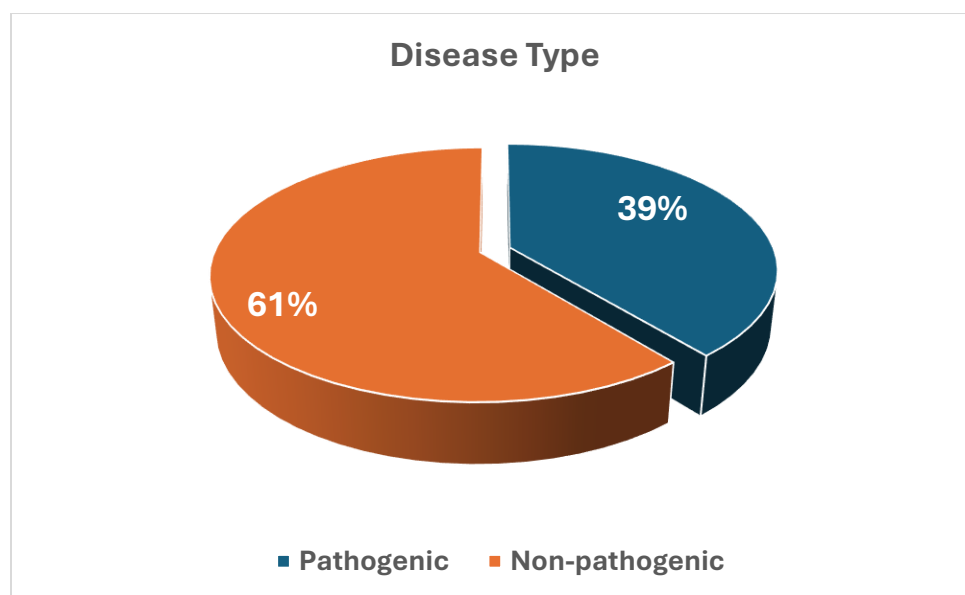


Figure V: Diseases of Non-pathogenic origin were the leading causes of hospital visit

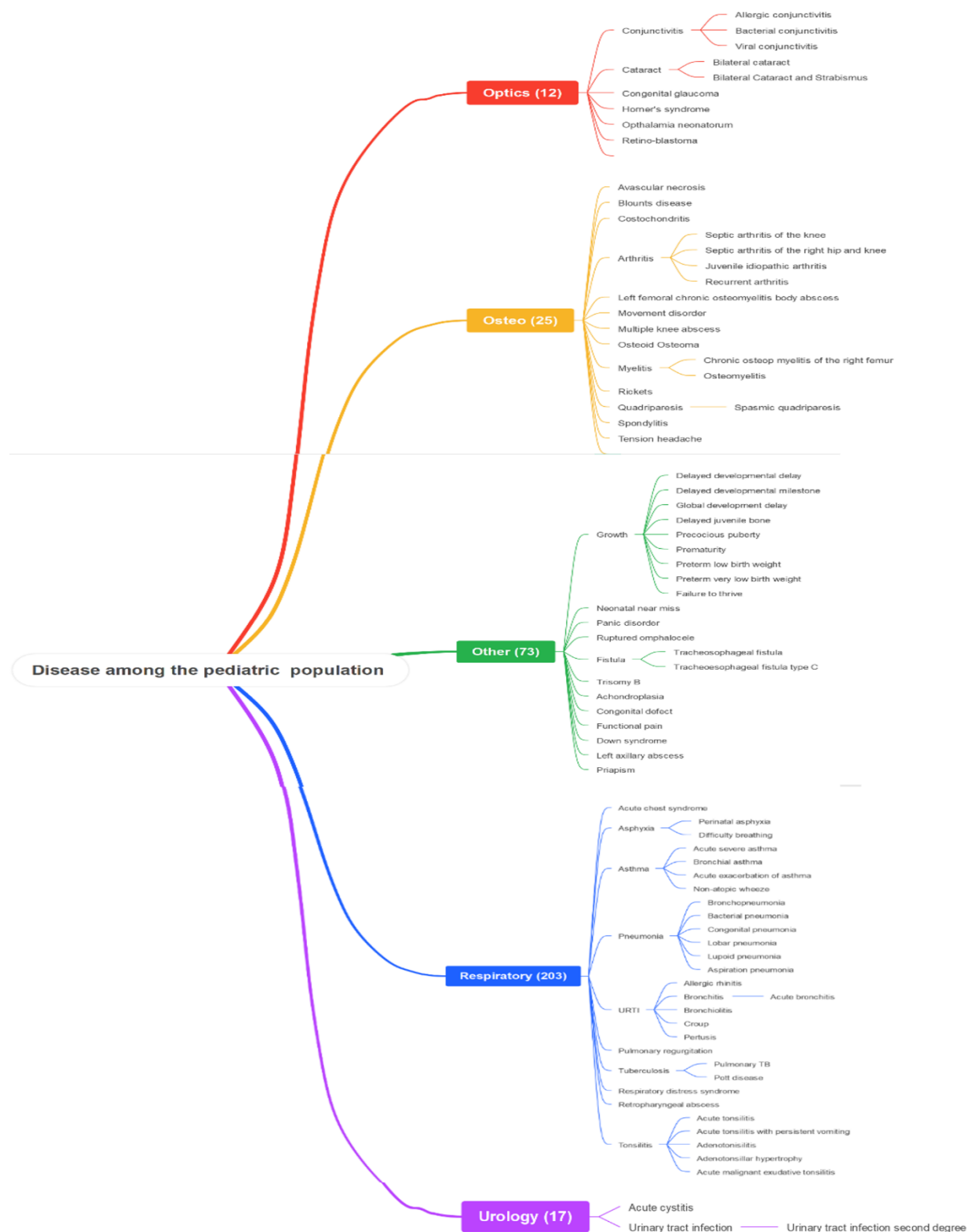


Figure VI: Mind map Showing Disease Category and the associated disease types among the pediatric population

Associations between Disease Category and Demographic Factors of the Children

There is a statistically significant association ($p < .001$) between diseases category and disease type. This association is strongest between neurological diseases and non-pathogenic diseases. This is because most of the children presented with a neurological diseases 283, and 239 were of non-pathogenic origin. Overall, the significant association between disease category and disease type leans towards non-pathogenic diseases. This confirms the findings above, majority of the children presented with non-pathogenic diseases, and most of these diseases were neurological (table I).

Table I: There is a statistically significant relationship between non-pathogenic disease type and all disease categories.

Disease Category	Disease Type			
	Undefined	Non-pathogenic	Pathogenic	Total
Neurology	2	239	42	283
Cardiology	0	38	2	40
Dermatology	0	4	15	19
Endocrinology	0	5	0	5
Gastroenterology	1	67	36	104
Gynaecology	0	4	0	4
Haematology	0	60	143	203
Immunology	0	7	4	11
Neonatal	0	3	0	3
Nutrition	0	3	0	3
Optics	0	6	6	12
Osteo	0	22	3	25
Other	1	66	1	68
Respiratory	0	79	124	203
Urology	0	4	13	17
Total	4	607	389	1000
	0.4%	60.7%	38.9%	100.0%

Chi Square Significance; $p < 0.001$

Disease Category and Sex

Sex was not associated significantly with disease category ($p = 0.645$). What this implies is that both male and female children have a somewhat equal distribution within various disease categories (table II).

Table II: Sex is not a determinant of disease category

Disease Category	Sex of the child			Total
	Undefined	Female	Male	
Neurology	1	108	174	283
Cardiology	0	18	22	40
Dermatology	0	10	9	19
Endocrinology	0	3	2	5
Gastroenterology	0	55	49	104
Gynaecology	0	0	4	4
Haematology	1	98	104	203
Immunology	0	6	5	11
Neonatal	0	3	0	3
Nutrition	0	0	3	3
Optics	0	7	5	12
Osteo	0	13	12	25
Other	0	38	30	68
Respiratory	1	84	118	203
Urology	0	7	10	17
Total	3	450	547	1000

Chi Square $p=0.645$

Disease Category and Education

There is a statistically significant relationship ($p<0.001$) between educational status and disease category. The strength of this relationship lies between children who were not schooling and disease category. This is followed by children receiving nursery education. What this implies is that as children increase in educational status, they are less likely to be associated with any of the disease categories (table III).

Table III: Lower educational status is associated with high number of disease categories

Disease Category	Educational Status					Total
	Undefined	Not Schooling	Nursery	Primary	Secondary	
Neurology	2	118	75	49	39	283
Cardiology	0	14	8	9	9	40
Dermatology	0	13	1	3	2	19
Endocrinology	0	2	0	0	3	5
Gastroenterology	1	44	8	25	26	104
Gynaecology	0	1	2	0	1	4

Haematology	2	134	25	23	18	203
Immunology	0	5	1	3	2	11
Neonatal	0	3	0	0	0	3
Nutrition	0	3	0	0	0	3
Optics	1	9	1	1	0	12
Osteo	0	8	6	1	10	25
other	0	1	0	0	0	1
Other	0	62	2	2	1	67
Respiratory	4	125	31	20	23	203
Urology	0	7	4	4	2	17
Total	10	550	164	140	136	1000

Chi Square $p < 0.001$

Disease Category and Age

Age was statistically significant in relation to disease category. Children who were below the age of 5 years showed the highest level of association, and this was strongest between Age and neurological diseases ($p < .001$), age and haematological diseases ($p < .001$), and age and respiratory diseases ($p < .001$) (table IV).

Table IV: Age below 5 years was significantly associated with disease category

Disease Category	<5 years	6-12 years	13-18 years	Total
Neurology	186	61	35	282
Cardiology	20	11	9	40
Dermatology	14	4	1	19
Endocrinology	2	0	3	5
Gastroenterology	52	31	21	104
Gynaecology	1	2	1	4
Haematology	158	30	14	202
Immunology	6	4	1	11
Neonatal	3	0	0	3
Nutrition	3	0	0	3
Optics	10	2	0	12
Osteo	13	5	7	25
Other	64	2	2	68
Respiratory	157	32	13	202
Urology	9	6	2	17
Total	698	190	109	997

Chi square $p < 0.001$

Discussion

Our observation was that for such a large study population, the prevalence of any individual disease was likely to be low since no specific disease received special attention. Also, we assume that the presence of any 1 disease can be projected by doubling the sample size, based on prevalence theory. Meaning that those diseases that occurred only once (0.1% prevalence) may be observed twice if the population was doubled to 2000. Hence, in line with this stance, we believe that the most prominent disease neonatal sepsis (5.5% prevalence) would have an 11% prevalence if the population was doubled to 2000. A more keen assumption to ensure accuracy is that various factors would have to remain stable. For example, the high prevalence of children below 1 month of age, 1 year of age, and five months of age resulted in the high prevalence recorded for neonatal sepsis. The implication is that in different instance in which there was a reduction in this population size for any reason, then the prevalence of neonatal sepsis would decline. However, our patient files were withdrawn at random without any bias to any specific factor; meaning that our evidence is highly reliable and can be generalized as supported by the philosophy of positivism. Overall, the presence of any specific disease is enough indication that children's health is at risk.

Findings from Imade and Eghafona, (2015) revealed the presence of viral agents that were capable of causing diarrhea in young children. In our study, viruses were not identified, but the children presented with watery diarrhea, acute diarrhea, gastroenteritis, and various forms of stomach upset that may have resulted from bacterial or viral etiologies or both. Since our study did not focus on the causative agents, it is not possible to determine. However, the evidences agree that children in Edo state are at risk of diarrheal diseases; apparently because of the water sources from the environment. In another study, Izevbuwa et al. (2024) revealed that children in Edo state presented with measles. This study did not identify any case of measles within the study population; however, various dermatological diseases were identified among the children. Some of such dermatological diseases were due to allergies, bacteria, and fungi. Nonetheless, by expanding the sample size, there is a possibility that one or more participants would have presented with measles. This aligns with the earlier assumption that a 0.1% prevalence should not be neglected because, by expanding the population, it is possible to identify such a disease in large numbers. In support of this, the number of children who visited the hospital between 2022 and 2023 were 97,277, considerably larger than the sample size used in this study.

Astride communicable diseases, non-communicable diseases were also identified. In the study by Olutomi et al. (2024) non-communicable diseases were also identified; but they focused on adolescents, and the non-communicable diseases were mainly linked to diet and lack of physical activity. In our study, dietary diseases were not abundant, example diabetes and dyslipidemia which were organized into the category of endocrinology diseases account for 0.5% prevalence. Similarly, nutrition diseases accounted for 0.3% prevalence. In general, non-communicable diseases had the highest prevalence (61%),

compared to communicable diseases (39%). Our findings are somewhat consistent with the findings of Atimati et al. (2023) in which non-communicable diseases such as sickle cell diseases, cardiovascular diseases, neoplasms, and neurological diseases were the most prevalent forms of non-communicable diseases. In this study, neurological diseases had the highest prevalence. Neurological diseases may also be a combination of pathogenic (communicable) and non-pathogenic diseases; however, we found a statistically significant association ($p < .001$) in favour of non-pathogenic diseases as the more dominant neurological diseases. In general, our analysis showed that there was a statistically significant association ($p < .001$) in favour of non-pathogenic diseases across all disease categories. This confirms our assumption that non-pathogenic diseases were indeed the most dominant causes of disease among children in Edo state, and it was reflected across all categories.

Our analysis did not reveal any statistically significant relationship between sex and disease category. Meaning that any child, regardless of their sex, could present with any disease category. In contrast, age was a strong determinant, and children below the age of 5 years were likely to present with neurological diseases than any other group of children. Similarly, across other categories, children were highly likely to present with diseases if they were below the age of five years. Although, there were more children below 5 years of age, than children above five years of age; this sought of potential bias is eliminated by the fact that we retrieved files at random. Meaning that children below five years of age were always likely to present with more diseases across any category, than children above five years of age. Children below five years of age are highly prone to diseases because their immune systems are poorly developed to combat diseases (Obasohan et al., 2024). Similarly, children born to parents who are not equipped with appropriate resources for care are likely to face poor health outcomes. Although, our evidence in Ukwuru and Okeke, (2024) suggests that the majority of parents were properly educated and were employed. Not to mention, majority of the children live in urban areas. This leads to the assumption that some of the health conditions such as neurological diseases may have stemmed from maternal factors (not within the scope of this study). This is like the findings from Ujuanbi et al. (2019) in which several children presented with congenital heart diseases. In our study, 4% of children presented with cardiology associated diseases. Also, hematological diseases which were highly prevalent in this study (20.3%) may have been the function of the environment. For example, sepsis due to diarrhea and malaria. Findings from Ezeife et al. (2021) revealed that several children below the age of 5 years (14.27%) presented with diarrheal diseases, this prevalence increased to 75% during the dry season, and decreased to 25% during the wet season. This is also consistent with our findings in which age below five years was strongly associated with categories of illnesses.

Our study revealed the presence of comorbidities. Most children presented with one comorbidity. Findings from Adedokun, (2020) assume that comorbidities among children; especially those below the age of five years, was associated with having older siblings. They implied that first born children received more attention and care than those children

who were the second and third in line. We are not able to assert on this form of assumption because it is not within the scope of our study; however, it makes for a possible explanation when considering the economic burden of caring for more than one child. Among the various comorbidities, there were cases of pneumonia and malnutrition. This is in line with the findings from King et al. (2022) in which children presented with these diseases. In general, children in this study presented with pneumonia and malnutrition as primary diagnosis. To further assert the vulnerability of children below the age of five years, Uzosike and Jaja, (2022) revealed a 45.2% prevalence of fever, 2.1% prevalence of diarrhea, 6.1% prevalence of dyspnea, and 44.9% prevalence of cough. Thus, our findings in this study are consistent with the findings from various existing evidences.

Conclusion

The children in this study presented with various types of diseases. Although some diseases were more prevalent than others within our 1,000 sample size. We acknowledged that the large difference between the sample size and the total population of children who visited the hospital between 2022 and 2023 has implications on the outcome of our evidence. However, it is possible to project prevalences based on our evidence. For example, assuming that a prevalence of 0.1% would mean, 9 times higher prevalence when considering the total number of children who visited the hospital. We found that neurological diseases were the most dominant, followed by haematological, respiratory, and gastroenterological diseases. These high prevalences are an indication that preventive efforts should be targeted at these health conditions. The existence of associations between age and educational status provides sufficient clarity for health education and health promotion targets. Meaning that public health professionals should targeted parents of children below the age of five years, and those children who are not schooling should also be targeted for implementation of preventive measures.

Limitation

Our Scope did not include Causative factors such as the level of knowledge and factors within the environment that might have contributed to health outcomes.

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Competing Interests

There are no competing interests for this study.

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