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MORBIDITY AND MORTALITY PATTERNS AMONG PEDIATRIC PATIENTS IN DOMINICA (WEST INDIES)

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An informal study of pediatric patients at Dominica's Princess Margaret Hospital has provided some insight into childhood morbidity patterns on the island. This article reports the results of that study.

Introduction

Statistical data on morbidity patterns in developing countries are often compiled with information from a number of medical centers by various, mostly nonmedical, health service employees. This involvement of multiple personnel and centers markedly diminishes the reliability of the data.

On a small island like Dominica, with 81,000 inhabitants (as of 1978) and 289.5 square miles, the only pediatrician in the only referral hospital is reasonably sure of seeing virtually all referred pediatric patients. Therefore, morbidity data collected through a special personal registration system could produce a relatively sound picture of referred patient morbidity patterns on the island. This study describes various characteristics of children seen by the consultant pediatrician at the Princess Margaret Hospital on Dominica during a nine-month period in 1978-1979.

Materials and Methods

Dominica, where 77 per cent of the population lives in rural areas, is one of the poorest Caribbean islands in terms of national income. Basic demographic data and vital statistics, as of the time of the study reported here, are presented in Table 1. In essence, the health service system provides two levels of care—through a physical infrastructure consisting of 45 health centers and three small rural hospitals, both providing primary care, and one national referral hospital with 240 beds providing secondary care. Six district medical officers deliver medical care in the outlying areas. Most of them also maintain private practices, as do a number of other doctors. At the time of this study, three family nurse practitioners had recently joined the primary health care teams.

During the time of the study, the Department of Pediatrics at the Princess Margaret Hospital consisted of three wards: one for general pediatrics (Winston Ward, 26 beds), one for malnutrition and gastroenteritis (Ward C_2, 12 beds), and one for neonatal care (the nursery, 8-12 cots). Patients were referred for admission by district medical officers, private physicians, and casualty officers. The hospital pediatrician conducted one outpatient clinic per week for referred and followup patients.

Table 1. Figures showing the population size and selected vital statistics for Dominica, 1978.

Total estimated 1978 mid-year population	81,293
Births per 1,000 population	21.3
Deaths per 1,000 population	5.1
Stillbirths per 1,000 births	13.1
Infant deaths per 1,000 live births	21.9
Neonatal deaths per 1,000 live births	15.0
Maternal deaths per 1,000 live births	1.1

Source: Statistical Office, Department of Health, Dominica.

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On 3 November 1978, the day when Dominica became independent from Britain, a new registration system for pediatric patients was introduced. Basic information was recorded on a commercially available 14.7 x 10.2 cm cardboard card at the first contact with each pediatric patient. Both inpatient and outpatient data were recorded in this manner, together with the dates and nature of diagnoses and treatments provided at each subsequent admission or outpatient visit. In November 1979 the cards of patients seen from 3 November 1978 through 2 August 1979 were assessed. This nine-month period (instead of a full year) was chosen because of the major disruption of health services caused by Hurricane David on 29 August 1979. In all, 968 children were included in the study. They accounted for a total of 660 pediatric ward admissions, 192 nursery admissions, and a total of 807 visits to the outpatient clinic.

Later, in March 1980, the family status of 1,400 patients (including the initial 968 study children) was assessed. In addition, the number of referrals abroad was determined using the files of the Ministry of Health; the period selected in this case was a twelve-month period (3 November 1978-3 November 1979), since referrals abroad were not hindered by the post-hurricane situation.

Results

Family Status

The family status of the 1,400 pediatric department patients referred to above is shown in Table 2. The large percentage of children being raised by their mothers alone reflects a family pattern that is a common feature of West Indian life.

Table 2. Family status of 1,400 pediatric patients for whom registration cards had been completed as of March 1980.

	Children living with	Children maintained by
Mother and father	499	912
Mother alone	505	142
Father alone	28	42
Others	135	70
Not recorded	233	234
Total	1,400	1,400

Admitted Patients

Basic data on pediatric admissions, as tabulated from the cards, are shown in Table 3. Although all patients were to have been regis-

Table 3. Survey card records of admissions to the three pediatrics wards at the Princess Margaret Hospital (Winston Ward for general pediatrics, Ward C_2 for malnutrition and gastroenteritis, and the nursery for neonatal care) during the period 3 November 1978-2 August 1979.

Ward	Number of admissions	Mean length of stay (days)	Mean percentage occupancy of ward
Winston Ward (26 beds)	603	9.1	83% occupancy
Ward C_2 (12 beds)	77[a]	14.2	36% occupancy
The nursery	192	5.9	4.5 cots occupied
Total	872	8.8	

[a]Of these 77 patients, 20 had been transferred from Winston Ward; so although only 852 patients were involved, the total number of admissions to the three wards was 872.

Table 4. Ages of pediatric patients included in the study, not including nursery patients.

Age group	Patients admitted		Days spent in hospital		Mean length of stay (days)
	No.	% of total	No.	% of total	
0-6 months	78	11.8	820	12.5	10.5
7 months-4 years	354	53.6	3,176	48.5	9.0
5-13 years	225	34.0	2,548	38.8	11.3
Unknown	3	0.5	14	0.2	4.7
Total	660	100	6,558	100	9.9

tered, the staff nurses assigned this task appear not to have completed cards in some instances, especially in the case of surgical patients. This is demonstrated by a discrepancy between the number of admissions reported by the hospital's statistical department (671 for Winston Ward, 109 for C_2 Ward) and the admissions (603 and 77, respectively) recorded on the cards. The mean occupancy rates derived from the statistical department's data for the period in question were 94 per cent in Winston Ward and 51 per cent in C_2 Ward.

Table 4 shows the age distribution of the patients covered by this study (those for whom cards were completed). Over 65 per cent of these patients (not including nursery patients) were less than five years old.

Morbidity

Table 5 (see next page) shows the diagnoses arrived at for all patients admitted to the wards and all patients seen at the outpatient clinic. A more detailed breakdown of these diagnoses appears in Annex 1. In many individual cases more than one problem was diagnosed, which accounts for the fact that the diagnoses listed in the Table and Annex greatly outnumber the combined total of admissions and outpatient visits. Overall, the prevalence of infectious disease problems was high, 477 being diagnosed among the inpatients alone.

Whenever it was practically feasible, stool specimens were obtained and examined. Table 6, which shows the results of these examinations, indicates that roughly half of the patients tested had parasites, mostly *Trichuris,* in their stools.

As in most developing countries, the diseases with which the pediatrician is confronted are mostly of an acute character. This is contrary to the normal situation in industrialized countries. However, chronic diseases do constitute a major challenge for pediatricians in developing countries, since factors such as drug shortages, transportation difficulties, expensive health services, and poor education tend to give rise to a poor quality of care for chronic disease patients.

Table 6. Results of all stool examinations (for ova, cysts, and adult parasites) performed with specimens obtained from 340 patients admitted to the pediatric wards and 175 patients seen at the pediatric outpatient clinic during the study period.

Results	No. of pediatric ward patients	No. of outpatient clinic patients
Positive for:		
Trichuris	108	64
Ascaris	72	37
Giardia lamblia	7	7
Hookworm	6	1
Entamoeba histolytica	2	1
Strongyloides	2	–
Balantidium	1	–
Positive for 1 type of parasite	146	74
Positive for 2 types of parasites	23	18
Positive for 3 types of parasites	2	–
Negative	169	83
Total patients examined	340	175

Table 5. Tabulation of morbidity among all study patients—including 660 patients admitted to Winston Ward or Ward C_2, 192 nursery patients, and patients making a total of 807 visits to the pediatric outpatient clinic during 3 November 1978-2 August 1979.

Disease or condition	Category[a]	Care facility		
		Pediatric ward (Winston or C_2)	Nursery	Outpatient clinic[b]
Typhoid, paratyphoid, and other salmonella infections	C_1	11		1
Bacillary dysentery, amebiasis	C_2	3		4
Enteritis and other diarrheal diseases	C_3	63	9	16
Tuberculosis of the respiratory system	C_4	3		
Streptococcal sore throat and scarlet fever	C_9	3		4
Measles	C_{11}	33		8
Infectious hepatitis	C_{13}	4		2
Syphilis	C_{16}		4	4
Helminthiases	C_{18}	188		107
All other infective and parasitic diseases	C_{19}	52	15	39
Malignant neoplasms	C_{20}	2		
Benign neoplasms	C_{21}			1
Diabetes mellitus	C_{23}			1
Avitaminosis and other nutritional deficiencies	C_{24}	35		3
Other endocrine and metabolic diseases	C_{25}	2		2
Anemias	C_{26}	47	5	20
Mental disorders	C_{27}	2		2
Inflammatory diseases of the eye	C_{28}	2	12	5
Otitis media	C_{30}	18		12
Other diseases of the nervous system and sense organs	C_{31}	38	8	16
Acute rheumatic fever	C_{32}	12		3
Chronic rheumatic heart disease	C_{33}	3		17
Other diseases of the circulatory system	C_{38}	4		
Acute respiratory infections	C_{39}	77	3	64
Pneumonia	C_{41}	94		1
Bronchitis, emphysema, asthma	C_{42}	46		5
Hypertrophy of the tonsils and adenoids	C_{43}	5		
Other diseases of the respiratory system	C_{45}	7		
Diseases of the teeth and supporting structures	C_{46}	1		
Appendicitis	C_{48}	4		
Intestinal obstruction and hernia	C_{49}	28		3
Other diseases of the digestive system	C_{51}	35	11	18
Nephritis and nephrosis	C_{52}	3		
Other diseases of the genitourinary system	C_{55}	20		5
Complications of childbirth	C_{57}		7	
Infections of the skin and subcutaneous tissue	C_{59}	42	23	32
Other diseases of the skin and subcutaneous tissue	C_{60}	24		19
Arthritis and spondylitis	C_{61}	2		1
Other diseases of the musculoskeletal system and connective tissue	C_{62}	6		3
Congenital anomalies	C_{63}	18	7	7
Certain causes of perinatal morbidity	C_{64}	3	170	6
Other specified and ill-defined diseases	C_{65}	100	10	87
Road transport accidents	CE_{66}	10		
All other accidents	CE_{67}	11		
Fractures	CN_{66}	21		
Intracranial and internal injuries	CN_{67}	22		
Burns	CN_{68}	8		
Adverse effects of chemical substances	CN_{69}	1		
All other injuries	CN_{70}	26		
Total		1,139	284	518

[a]World Health Organization, *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death (eighth revision)*, Geneva, 1967. List of 70 causes for tabulation of morbidity (List C).

[b]Most of the patients seen at the outpatient clinic had previously been inpatients and had been asked to return to the clinic for followup purposes. Only if these clinic visits resulted in diagnosis of one or more new problems were such diagnoses listed in the "outpatient clinic" column.

Table 7. Chronic disease cases encountered among the study population, 3 November 1978-2 August 1979.

Disease entity	No. of cases
Rheumatic fever, chronic rheumatic heart disease, chorea	34
Epilepsy	31
Mental retardation	28
Sickle cell anemia	21
Congenital heart disease	19
Pulmonary tuberculosis	3
Other	10
Total	146

Table 7 lists the chronic diseases entities encountered during the study period. As may be seen, there were relatively high prevalences of rheumatic heart disease, mental retardation, epilepsy, and sickle cell anemia. It should also be noted that the numbers of such patients seen by the pediatrician probably represented only a small proportion of those afflicted with these problems. This conclusion has been reinforced by growing awareness, subsequent to the study, that a large portion of those with such problems are followed on a more or less irregular basis by private physicians, and that such care tends to be followed in turn by irregular drug use.

Mortality

During the study period, nine patients died in the pediatric wards and 25 died in the nursery. Their causes of death are listed in Table 8. The unusually high mortality in the nursery during this period is attributed to an unusually high incidence of prematurity and an epidemic of septicemia. In addition, the hospital's oxygen supply at the time was very irregular and insufficient, and this resulted in at least two unnecessary infant deaths. For purposes of comparison, the numbers of infant deaths occurring in the calendar years 1978-1980 were 38 in 1978, 33 in 1979, and 24 in 1980.

Malnutrition

In order to obtain an impression of the hospitalized children's nutritional status, the hospital records of all 161 children between six months and five years of age who were admitted to the pediatric wards (Winston and C_2) between 3 November 1978 and 3 March 1979 were reviewed. However, a considerable number of these records were missing or deficient. That is, no records could be found for 28 patients, and the records of 33 others failed to indicate the patient's weight. Therefore, only 100 patients were included in the actual

Table 8. Causes of the 34 deaths occurring among the study population during the study period.

Mortality in the pediatric wards (Winston and C_2)		Mortality in the nursery	
Cause of death	No. of deaths	Cause of death	No. of deaths
Congenital heart disease with heart failure	3	Septicemia	8
Septicemia	2	Immaturity (°28 weeks)	5
Extreme marasmic kwashiorkor	1	Cord bleeding	2
Reye's syndrome	1	Cerebral hemorrhage	2
Intussusception with peritonitis	1	Congenital syphilis	2
Kidney failure (congenital bilateral hydronephrosis)	1	Respiratory distress syndrome	2
		Asphyxia	2
		Aspiration pneumonia	1
		Clotting disorder	1
Total	9	Total	25

review; of these, 20 were classified as surgical patients (medically well patients admitted for surgery), 60 as medical patients (admitted for pediatric illnesses other than diarrhea) and 20 as gastroenteritis patients.

Table 9 shows the nutritional status of the admitted children between six months and five years of age, in terms of both the WHO and Gómez classifications *(1, 2)*. The markedly greater number of children considered "malnourished" according to the Gómez classification is due mainly to the high cutoff point (90 per cent of standard weight-for-age) adopted by the Gómez classification. Many authors *(1, 3, 4)* have suggested that 80 per cent would provide a more appropriate upper limit; and it would also appear that the international classification system proposed by WHO would be a suitable alternative to the Gómez classification and would provide a more realistic picture of the prevalence of malnutrition.

Using the WHO classification, the high prevalence of low weight-for-age children (34 per cent) among those admitted to the Princess Margaret Hospital suggests the importance of protein calorie malnutrition among Dominican preschoolers. A survey performed after this one, that was done a few months after the disastrous Hurricane David struck Dominica, showed similar results *(5)*. As can be seen in the Annex, kwashiorkor was relatively uncommon among the patients—there being only four cases in nine months as compared to 31 cases of overt clinical marasmus.

Referrals Abroad

Partly because of Dominica's small size, the country lacks facilities for providing specialized "tertiary" medical care. Therefore, it is necessary to seek off-island medical treatment for certain patients. In this regard, 10 such referrals abroad were made for pediatric inpatients at the Princess Margaret Hospital during the twelve-month period between 3 November 1978 and 3 November 1979 (Table 10).

Several factors limit the number of such referrals by the health system. These include typically extended delays before a patient can be referred and the important financial drain such outside treatment imposes on the Dominican health services. In this regard, dif-

Table 9. Nutritional status of 100 pediatric patients ages 0.5-5 years admitted to Winston Ward and Ward C_2 between 3 November 1978 and 3 March 1979, according to the WHO and Gómez classifications.

	WHO weight-for-age classification		Gómez weight-for-age classification	
	Criteria	No. of children	Criteria	No. of children
"Normal" children	A: Above 97th percentile	0	>100% of standard weight-for-age	15
	B: In percentiles 51-97	17		
	C: In percentiles 3-50	49	90-100% of standard	21
"Malnourished" children	D: Below 3rd percentile and up to 3 standard deviations below the median	22	Grade I malnutrition (75-89% of standard)	37
	E: Between 3 and 4 standard deviations below the median	10	Grade II malnutrition (60-74% of standard)	24
	F: Over 4 standard deviations below the median	2	Grade III malnutrition (<60% of standard)	3

Table 10. Health problems and destinations of the 10 pediatric patients referred abroad for treatment during the period 3 November 1978-2 November 1979.

Diagnosis	No. of patients	Place of referral
Hydrocephalus	2	Martinique (neurosurgery)
Foreign body in lung	2	Barbados (surgery)
Spina bifida	1	Barbados (surgery)
Lymphoblastoma	1	Barbados (pediatrics)
Lymphatic leukemia	1	Barbados (pediatrics)
Precoma hepaticum	1	Barbados (pediatrics)
Arthrogryposis with multiple congenital anomalies	1	Barbados (surgery)
Hirschsprung's disease	1	Jamaica (pediatric surgery)

ficult ethical questions can arise relating to the selection of patients in view of the limited financing and opportunities that exist.

Types of Pediatric Care Provided

Data were also derived from the Winston Ward and Ward C_2 cards regarding how much time the patients would have spent in each of five divisions of a hypothetically reorganized pediatrics department—these divisions being an isolation ward, a malnutrition ward, a semi-intensive care unit, a general pediatrics division, and a pediatric surgery division. These retrospective estimates were made in an effort to calculate the number of beds needed by each division, and thereby to assist plans for building a new pediatrics ward.

These tentative estimates are reported here (in Table 11) because they could prove useful to health planners facing similar situations. Nevertheless, it is necessary to view the figures with considerable caution. For one thing, the data were collected in a period (3 November 1978-2 August 1979) when the existing wards' physical and other facilities were

Table 11. Hypothetical assignment of 660 Winston Ward and Ward C_2 pediatric patients admitted during the period 3 November 1978-2 August 1979 to each of the five proposed divisions of a reorganized pediatrics department.

Proposed division	No. of patients hypothetically assigned	Hospital days involved	Mean length of stay (in days)	Mean beds occupied	Estimated need for beds[b]
Isolation ward	174 (16)[a]	1,595	9.1	6.3	9
Malnutrition ward	23 (2)	785	34.1	3.1	5
Semi-intensive care unit	62 (28)	367	5.9	1.5	3
General pediatrics	302 (32)	2,506	8.3	9.9	13
Pediatric surgery	139[c]	1,292	9.3	5.1	7
Total	660	6,545	9.9	2.6	37

[a]Numbers in parentheses are the numbers of patients who would also have been admitted to another ward during the same admission period. These patients are included in the overall number assigned to the ward in question.

[b]These estimates are based on 80 per cent occupancy.

[c]Some surgical patients (burn patients) were included among the patients assigned to the isolation ward.

minimal, and when quite often some beds were occupied by more than one child. For another, with regard to malnutrition, only children with severe cases were hospitalized—because of the poor physical facilities, lack of stimulation for the child, and difficulty keeping the mother interested and visiting her child. Finally, as previously noted, comparison of the card data with data on admissions maintained by the statistics department indicates that roughly 100 admissions were not recorded on the cards; most of these were probably short surgical admissions.

Discussion

The described morbidity patterns of the pediatric patients studied are obviously not the same as the morbidity patterns of the whole population of Dominican children in the affected age groups. For one thing, it is to be expected that average patients seen by the Princess Margaret Hospital pediatrician would present more serious and complex problems than would average pediatric patients seen by general practitioners or those seen by district nurses. For another, various factors (including the availability, interests, and attitudes of the personnel involved) affect the distribution of children receiving care from these three sources, as well as the distribution of children with problems who for one reason or other receive no care. By and large, it seems likely that the figures presented here give a more accurate impression of the patterns of the more serious diseases than of the simpler and more common ones.

Despite these limitations, the foregoing description gives some insight into childhood morbidity patterns in Dominica and provides information that could be helpful in planning preventive as well as other health measures. Among other things, for example, the high prevalences of malnutrition and anemia emphasize the need for actions such as more nutrition education and better nutritional screening procedures. Similarly, the noteworthy incidences of diarrhea, typhoid fever, and helminthiases point to problems with the general state of hygiene, latrines, and water supplies. And the frequent occurrences of rheumatic heart disease and sickle cell anemia demonstrate the need for facilities permitting regular followup of all patients who require it.

Another disease requiring regular followup, as well as provision of free drugs, is epilepsy. This latter disease, which is far more prevalent than the figures cited in Table 6 indicate, warrants regular treatment measures in order that intellectual deterioration be minimized.

In a like manner, the high mortality occurring among the nursery patients studied reflects a number of problems: many low birth-weight infants; poor facilities; inadequate systems for supplying oxygen and drugs; shortages of midwives and maternity nurses that are aggravated by insufficient training of such personnel in neonatology; and poor hygiene and sanitation. As already noted, however, the figures obtained during the nine-month study period were higher than those obtained in comparable later periods—partly because of unusually high incidences of prematurity, immaturity, and septicemia in the study period, and partly because of some improvement in hospital standards and facilities later on.

As expected, the prevalence of malnutrition found in our hospital study was somewhat higher than that found by surveying a random sample of the population in 1976 *(7)*. In that 1976 sample of 339 children, 14 per cent of those between six months and five years of age showed grade II or grade III malnutrition (according to the Gómez classification), compared to the 27 per cent of our hospital sample. Nevertheless, the results of both surveys demonstrate the problem's importance and provide information that can serve as baseline data for future studies seeking to evaluate current measures in this area—such as nutrition education, promotion of breast-feeding, promotion of vegetable-raising, and introduc-

tion of a home-based growth chart called "the child health passport" *(8)*.

Providing tertiary health care imposes a tremendous additional burden on a small developing country like Dominica, which encounters plenty of difficulty merely coping with the demands involved in providing acceptable primary and secondary care. Therefore, regional cooperation vis-a-vis tertiary care is extremely important, and there is certainly scope for the existing regional bodies to play a vital role in improving the existing tertiary care arrangements. In this regard, geographic proximity should be taken into account as well as history and language. From Dominica's point of view, it is particularly to be hoped that the French-speaking territories will be involved in such arrangements.

Despite the justifiable importance currently accorded primary care, the significance of secondary (hospital) care should not be underestimated. Specifically, given the circumstances now prevailing in Dominica, it would appear that substantial improvement of infant and childhood mortality figures will depend mainly on hospital facilities and pediatric know-how. In this light, efforts should be directed at providing better pediatric and neonatology wards. Within this context, hypothetical division of the ward into five parts, as described previously, could serve as a useful conceptual aid for hospital planners in Dominica and elsewhere. In particular, establishing an area capable of giving semi-intensive care, one provided with oxygen and suction equipment and good nursing supervision, would constitute an important improvement.

At the same time it should also be stressed, as the high percentage of children brought up by their mothers alone helps to demonstrate, that factors other than health care and economics influence the well-being of Dominican children. Indeed, if one postulates that the development of a community depends greatly upon the active involvement of its members—and upon their willing assumption of responsibility for each other—then it stands to reason that sociocultural changes outside the health sector must constitute a key part of such development.

SUMMARY

A study was made of morbidity and mortality among pediatric patients on the island of Dominica during the period 3 November 1978-2 August 1979. The study, made by the island's only consultant pediatrician, included 852 patients (including 192 newborns) admitted to the pediatric wards of the Princess Margaret Hospital, together with referral and followup patients making a total of 807 visits to the hospital's pediatric outpatient clinic.

Overall, infectious disease cases were common, 477 being diagnosed among the inpatients alone. Examination of stools collected from a subsample of the study group revealed parasites (mostly *Trichuris)* in roughly half of those patients. Noteworthy prevalences of malnutrition and certain chronic health problems (rheumatic heart disease, mental retardation, epilepsy, and sickle cell anemia) were also found.

Regarding mortality, 34 of the inpatients studied died, 25 in the nursery and 9 in other pediatric wards. The unusually high nursery mortality was attributed to unusually high incidences of immaturity and prematurity, an irregular and insufficient hospital oxygen supply, and an epidemic of septicemia.

Despite major limitations (including incomplete records and the nonrepresentative nature of the study sample), the data presented provide a significant insight into childhood morbidity problems on Dominica that could prove useful in planning preventive and other health measures, and in assessing pediatric health problems elsewhere in the Caribbean.

ANNEX 1

Tabulation of morbidity among all study patients according to the WHO *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death (eighth revision).* The patients covered included 660 admitted to Winston Ward or Ward C_2, 192 nursery patients, and patients making a total of 807 visits to the pediatric outpatient clinic during 3 November 1978-2 August 1979.

Disease or condition	WHO Classification Category[a]	Care facility: Pediatric ward (Winston or C_2)	Nursery	Outpatient clinic[b]
Typhoid fever	001	9		
Other salmonelloses	003	2		1
Dysentery	004	1		3
Food poisoning	005.9	1		
Amebiasis	006	2		1
Balantidiasis	007.0	1		
Giardiasis	007.1	7		7
Diarrhea	009.2	63	9	16
Pulmonary tuberculosis	011	3		
Streptococcal sore throat	034.0	3		4
Septicemia	038	13	10	
Measles	055	33		8
Hepatitis	070	4		2
Mumps	072	1		
Infectious mononucleosis	075	2		
Warts	079.1	1(S)[c]		
Other viral diseases	079.9	12		
Congenital syphilis	090		4	4
Yaws	102	1		
Pityriasis versicolor	111.0			2
Dermatomycosis (unspecified)	111.9	1		13
Thrush	112	4	4	6
Ancylostomiasis	126	6		1
Ascariasis	127.0	72		37
Strongyloidiasis	127.1	2		
Trichuriasis	127.2	108		64
Enterobiasis (suspected)	127.3			1
Intestinal helminthiasis (unspecified)	127.9			4
Scabies	133.0	8	1	11
Lymphoblastoma	200.1	1		
Acute lymphatic leukemia	204	1		
Hemangioma	227			1
Cretinism	243	1		
Diabetes mellitus	250			1
Protein malnutrition	267	4		
Nutritional marasmus	268	31		3
Obesity	277			1
Metabolic diseases (unspecified)	279	1		1
Iron deficiency anemia	280	29	5	14
Sickle cell anemia	282.5	16		5
Other hereditary hemolytic anemia	282.9	1		1
Autoimmune hemolytic anemia	283.9	1		
Hemophilia	286.0	1		
Hystero-epilepsy	300.1	2		
Behavior disorders	308			2
Mental retardation	310	16		13
Meningitis	320	9		
Brain abscess	322	1		
Paralysis following meningitis	324			1

Disease or condition	WHO Classification Category[a]	Care facility: Pediatric ward (Winston or C_2)	Care facility: Nursery	Care facility: Outpatient clinic[b]
Hydrocephalus following meningitis	324	1		
Epilepsy	345	19	2	10
Jitteryness	345.9		6	
Bell's palsy	350	1		
Conjunctivitis	360	2	12	5
Eye problems	378	7(S)		3
Blindness	379			1
Otitis media	381	18		12
Deafness	388			1
Rheumatic fever (without heart involvement)	390	1		1
Rheumatic fever with heart involvement	391	10		2
Chorea	392	1		
Chronic rheumatic heart disease	393	3		17
Endocarditis	421.9	2		
Arrhythmia	427.9	2		
Acute sinusitis	461	1		2
Acute pharyngitis	462	9		4
Acute laryngitis subglottica	464	4		
Upper respiratory tract infection	465	61	3	58
Bronchiolitis	466	2		
Pneumonia	486	94		1
Lung cyst	492	1		
Asthma	493	45		5
Tonsillectomy for chronic tonsillitis	500	5(S)		
Empyema	510	2		
Pleurisy	511	4		
Lung abscess	513	1		
Denticles	522.2	1		
Stomatitis	528.0	1		3
Vomiting (gastritis)	535	26	11	11
Appendicitis	540	4(S)		
Inguinal hernia	550	14(S)		1
Umbilical hernia	551.1	13(S)		2
Intussusception	560.0	1		
Constipation	564	5		4
Rectal prolapse	569	1		
Liver abscess	572	2		
Nephritis	580	2		
Nephrotic syndrome	581	1		
Pyelitis	590	2		
Hydronephrosis	591	1		
Cystitis	595	3		
Meatus stenosis	598			1
Urethral prolapse	599	3(S)		
Hydrocele	603	5(S)		3
Phimosis	605	6(S)		
Vaginal discharge	622.1			1
Face presentation	656		1	
Breech presentation	656		6	
Boils	680.9	3		5
Cellulitis	682	3		
Abscess	682.9	13		
Impetigo	684	22	1	26
Omphalitis	686.9		17	1
Sinus (fistula)	686.9	1(S)		
Septic spots	686.9		5	

Disease or condition	WHO Classification Category[a]	Care facility: Pediatric ward (Winston or C_2)	Care facility: Nursery	Care facility: Outpatient clinic[b]
Eczema	691	11		11
Napkin rash	692.8	2		2
Dermatitis herpetiformis	693	1		
Keratosis	701.1	1(S)		
Keloid	701.3	1(S)		
Heatrash	705			5
Cyst	706.2	5(S)		
Urticaria	708.9	2		
Café au lait spot	709			1
Blood-bulla	709	1		
Acute arthritis	710	2		1
Osteomyelitis	720	6		
Hyperextension of foot	729			2
Hyperabduction of hip	729			1
Meningocele and hydrocephalus	741		1	
Congenital heart diseases	746	14		5
Patent ductus arteriosus	747.0		1	
Cleft lip	749		1	
Short frenulum	750.0	1(S)		
Hirschsprung's disease	751.3	1		
Fused labia	752.6	1		1
Talipes	754		2	
Hypoplasia of the sternum	756.3			1
Hemihypertrophy	759.8	1		
Multiple congenital anomalies	759.9		1	
Alcoholic mother	759.9		1	
Eclamptic mother	762.2		3	
Infected amniotic fluid	763.9		1	
Twin	769.4		8	
Brain hemorrhage	772		4	
Erb's palsy	772.2		1	
Forceps delivery	772.9		8	
Vacuum extraction	772.9		2	
Caesarean section	772.9		38	
Face trauma	772.9		1	
Cephalic hematoma	772.9		2	1
Aspiration	776.0		1	
Respiratory distress syndrome	776.2		2	
Asphyxia of the newborn	776.9		10	
Prematurity	777		41	
Dysmaturity	777		7	
Jaundice	778.9		37[d]	2
Bleeding from navel	778.9		4	1
Failure to thrive	778.9	3		2
Coma	780.0	2		
Febrile convulsions	780.2	25		1
Giddiness	780.5			1
Paralysis tongue	781.4	1		
Enlarged lymph glands	782.7	3		4
Nose bleeding	783	4		1
Chest pain	783.7	1		
Anorexia	784.0	3		16
Hepatomegaly	785.1	3		1
Abdominal distension	785.4			1
Abdominal pain	785.5	3		2
Bladder retention	786.1	1		

Disease or condition	WHO Classification Category[a]	Care facility: Pediatric ward (Winston or C_2)	Care facility: Nursery	Care facility: Outpatient clinic[b]
Dehydration	788.0	2		
Fever of unknown origin	788.8	33	1	5
Hematuria	789.3	1		
Headache	791			5
Sudden death	795			1
Unknown	796.9		9	
Motor vehicle accident	E814	10(S)		
Accidental poisoning	E859	11		
Fracture	N829	21(S)		
Sprain, etc.	N848	7(S)		
Head injury	N854	22(S)		
Vulva laceration	N879	2(S)		
Aspiration milk	N934	2		
Foreign body	N938	7		
Burn	N949	8(S)		
Insect bite	N989.4	1		
Injury to penis	N996.1	1(S)		
Battering	N996.8	1		
Laceration	N998.2	6(S)		
Followup	Y34.9			36
Contact tuberculosis	Y40.0	1		
Total		1,139	284	518

[a]World Health Organization, *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death (eighth revision),* Geneva, 1967.

[b]Most of the patients seen in the outpatient clinic had previously been inpatients and had been asked to return to the clinic for followup purposes. Only if these clinic visits resulted in diagnosis of one or more new problems were such diagnoses listed in the "outpatient clinic" column.

[c](S) = seen and treated by the surgeon.

[d]Eleven exchange transfusions were performed.

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