

# Children referred for specialist care: a nationwide study in Dutch general practice

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## SUMMARY

**Background.** Insight into referral patterns provides general practitioners (GPs) and specialists with a frame of reference for their own work and enables assessment of the need for secondary care. Only approximate information is available.

**Aim.** To determine how often, to which specialties and for what conditions children in different age groups are referred, as well as how often a condition is referred given the incidence in general practice.

**Method.** From data of the Dutch National Survey of Morbidity and Interventions in General Practice, 63 753 new referrals (acute and non-acute) were analysed for children (0–14 years) from 103 participating practices (161 GPs) who registered. Practices were divided into four groups. Each group of practices participated for three consecutive months covering a whole year altogether. We calculated referral rates per 1000 children per year and referability rates per 100 episodes, which quantifies the a priori chance of a condition being referred for specialist care.

**Results.** The referral rate varied by age from 231 for children under 1 year old to 119 for those aged 10–14 years (mean 159). The specialties mainly involved were ENT, paediatrics, surgery, ophthalmology, dermatology and orthopaedics. Referrals in the first year of life were most frequently to paediatricians (123); among older children the referral rate to paediatricians decreased (mean 36). Referrals to ENT specialists were seen particularly in the age groups 1–4 (71) and 5–9 (53). For surgery, the referral rate increased by age from 19 to 34. Differences between boys and girls were small, except for surgery. The highest referral rates were for problems in the International Classification of Primary Care (ICPC) chapters: respiratory (28); musculoskeletal (25); ear (24) and eye (21). Referability rates were, in general, low for conditions referred to paediatrics and dermatology and high for surgery and ophthalmology. The variation in problems presented to each specialty is indicated by the proportion of all referrals constituted by the

10 most frequently referred diagnoses: from 35% for paediatrics to 81% for ENT; for ophthalmology, five diagnoses accounted for 83% of all referrals.

**Conclusions.** The need for specialist care in childhood is clarified with detailed information for different age categories, specialties involved and variation in morbidity presented to specialists, as well as the proneness of conditions to be referred.

Keywords: children; referral patterns.

## Introduction

*What can be learned from referral patterns in childhood?*

FOR general practitioners (GPs) and other providers of primary care, it is important to know how often and for which problems they judge specialist care for children to be necessary. For specialists, such information provides a frame of reference for their work in relation to primary care: which conditions are referred, and is a referral for a specific condition an exception or the rule?

A European study of referrals from primary to secondary care has demonstrated that the referral rate not only depends on the need for secondary care, but is strongly related to the health care system and availability and accessibility of specialist care.<sup>1</sup> In the Dutch health care system, as in the UK and in some Scandinavian countries, levels of care are clearly distinct for adults as well as for children,<sup>2</sup> in contrast to countries where paediatricians are also involved in preventive and primary care.<sup>3</sup> In The Netherlands, GPs manage the majority of health problems of children themselves;<sup>4</sup> specialist care will only be provided after referral. This enables assessment of the need for secondary care.

Data on referral patterns are known roughly from national statistics. More detailed information is lacking. For the UK, information has been published on new referrals to outpatient clinics for all specialties. The referral rate varies by age and sex: from 132 per 1000 boys and 93 per 1000 girls aged 0–4 years, to 77 per 1000 boys and 70 per 1000 girls aged 5–14 years.<sup>5</sup> A study performed in a district general hospital quantified the paediatric outpatient utilization.<sup>6</sup> Other specialties were not covered. For The Netherlands, overall referral rates are known.<sup>7</sup> More detailed information is only available from a longitudinal study covering a small population.<sup>8</sup> It indicates that referral rates, as well as reasons for referral and specialties referred to, vary by age, sex and social class. Problems may differ in the extent to which they are prone to be referred, but data on this aspect are not published.

Data from the Dutch National Survey enabled us to quantify the referral patterns in childhood.<sup>9</sup> We will address the following questions:

- How often and to which specialties are children in the different age groups referred?
- Which problems are most frequently referred to the various specialties?
- To what extent are conditions referred compared with their incidence in Dutch general practice?

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Submitted: 26 February 1996; accepted: 30 August 1996.

© British Journal of General Practice, 1997, 47, 19–23.

## Method

We used data for children 0–14 years of age from the Dutch National Survey of Morbidity and Interventions in General Practice, carried out by The Netherlands Institute of Primary Health Care (NIVEL) between 1 April 1987 and 31 March 1988. From all 5826 general practitioners, a random, proportionally non-stratified sample of 161 GPs was drawn on 1 January 1985. This sampling method allowed us to take into account factors that might influence practice management and to obtain a representative sample of the Dutch GP population. Sociodemographic data for all persons listed in the participating practices (study population) were gathered. The 161 GPs (103 practices) were divided into four groups of approximately 40 GPs. Each group registered every contact between practice and patient during three consecutive months, so that one whole year was covered. The consultations were recorded on a specially designed registration forms, containing, among other information, consultation characteristics, (provisional) diagnoses and whether the child was referred for that problem and, if so, to which specialty. The GP wrote down the (provisional) diagnosis literally; subsequently well-trained coders coded the diagnosis according to the International Classification of Primary Care (ICPC).<sup>10</sup> The GPs also indicated on five-point scales to what extent they were certain about the diagnosis and to what degree they judged the condition to be somatic or psychosocial. The registration method enabled the clustering of consultations into episodes of care. More detailed information on methods used in the Dutch National Survey are published elsewhere.<sup>9</sup>

In the analysis, we considered only new referrals. The referral diagnosis is the diagnosis made when the patient was referred. To assess the incidence of a problem in general practice, we considered episodes of care and the diagnosis made at the last contact of these episodes.

We calculated referral rate as the number of referrals per 1000 children per year. To gain an insight into the likelihood of a condition being referred, we developed a new measure. This 'referability rate' is the frequency of referring a child with this problem per 100 episodes of this condition encountered in general practice.

The influence of certainty of the diagnosis and the somatic/psychosocial balance on the decision to refer is assessed comparing the referred episodes with non-referred episodes. Differences between the specialties in these aspects are assessed comparing the referred episodes to a specific specialty with all other referred episodes. Statistical significance is determined using a Pearson's  $\chi^2$ -test of association.

## Results

The study population consisted of 63 753 children each partici-

pating in a three-month registration period. The total number of episodes was 37 377. The number of new referrals was 2526, resulting in 159 referrals per 1000 children per year.

Table 1 summarizes the number of referrals in total, and broken down according to the six specialties most referred to, per 1000 children per year for different age categories and for boys and girls.

The overall referral rate decreases with age, a pattern also found for referrals to paediatrics. For surgery and ophthalmology, we observed an increase after the first year of life. For ear, nose and throat (ENT) specialists, 1- to 9-year-olds are the most frequently referred. Differences between boys and girls are small. Overall, boys are referred more often than girls; however, this phenomenon is not observed for each specialty. Most referrals are made during regular hours (92%). Referrals outside surgery hours are mostly to surgeons and paediatricians — 16% and 13% of all referrals.

The distribution of referrals, number of referrals per 1000 children per year and referability rate are shown in Table 2 for the various ICPC morbidity categories. Most referred are problems of the respiratory tract, musculoskeletal system, ear and eye. The high referability rates for the categories eye, ear and musculoskeletal disorders indicate that these problems, if presenting in general practice, are referred often. In contrast, problems of the respiratory tract have a low referability rate but a high referral rate. Problems that are rarely referred in absolute numbers in childhood, such as circulatory (ICPC Chapter K) and psychological and social problems (ICPC Chapters P and Z), have a high and a low referability rate respectively, indicating that cardiovascular problems in children are seldom, and psychosocial problems almost always, handled by the GPs themselves.

An overview of the diagnoses most frequently referred to the most important specialties is given in Table 3. In addition, the number of patients referred to other specialties for the same diagnosis is indicated.

For five specialties, the 10 diagnoses most frequently referred are summarized. These most frequently referred diagnoses account for varying proportions of all referrals to these specialties, e.g. from 5% of all referrals in paediatrics to 81% of all referrals for ENT specialists. For ophthalmology, we restricted ourselves to the five most referred diagnoses because they represent 83% of all referrals.

Table 3 also clarifies the frequency of problems being managed in general practice and shows that children are not referred to one specialty exclusively for some diagnoses. This is most obvious for upper respiratory tract infections, which are frequently managed in general practice (referability rate 2), and for which referrals are addressed to ENT specialists as well as to paediatricians. Problems referred to surgeons and ophthalmol-

**Table 1.** New referrals (total and per specialism) per 1000 children per year by age and sex (n=63 753 children).

	Total (n=2526)	ENT (n=676)	Paediatrics (n=577)	Surgery (n=470)	Ophthalmology (n=365)	Dermatology (n=189)	Orthopaedics (n=177)
All ages	159	42	36	29	23	12	11
Age (years)							
0	231	26	123	19	16	13	29
1–4	195	71	49	30	25	8	8
5–9	154	53	29	27	21	13	6
10–14	119	13	14	34	25	13	15
Gender							
Boys	161	44	39	33	21	11	10
Girls	156	41	34	26	25	13	12

**Table 2.** New Referrals by ICPC morbidity category.

ICPC chapter	Number	Percentage	Referral rate*	Referability rate†
A General and unspecified	148	5.9	9	3
B Blood, blood-forming organs	24	1.0	2	4
D Digestive	180	7.1	11	5
F Eye	329	13.0	21	26
H Ear	383	15.2	24	11
K Circulatory	29	1.1	2	21
L Musculoskeletal	399	15.8	25	14
N Neurological	70	2.8	4	13
P Psychological	42	1.7	3	6
R Respiratory	448	17.7	28	4
S Skin	280	11.1	18	4
T Endocrine, metabolic, nutritional	69	2.7	4	18
U Urology	27	1.1	2	5
X/Y Male and female genital system	74	2.9	5	15
Z Social problems	15	0.6	1	9
Unknown*	9	0.4	—	—
Total		2526	100	159 7

\*Referral rate: per 1000 children per year. †Referability rate: per 100 episodes encountered in general practice. \*\*GP did not report a diagnosis.

ogists often have high referability rates, in contrast to conditions referred to dermatologists and paediatricians.

In Table 4, some of the factors that might influence the decision to refer are presented. In the case of referral, the GP is less certain about the diagnosis than in non-referred episodes, especially for paediatrics. Also, most episodes in cases of referral are considered to be purely somatic; in this respect, referrals to paediatricians constitute an exception. This concerns mainly referrals for problems in the ICPC categories general and unspecified (A), such as general weakness and malaise, digestive (D), notably abdominal pain, neurological (N), psychological (P) and social (Z) problems. In the case of problems of the respiratory tract, we found minor differences between referrals to paediatricians and ENT specialists in somatic/psychosocial balance (88% versus 91% somatic) and uncertainty (80% versus 89% certainty).

## Discussion

This survey gives a complete overview of all new (acute and non-acute) referrals made by GPs for specialist care in childhood in The Netherlands. The design of this national survey and the number of practices studied have enabled us to present detailed information that has not been described elsewhere. This survey is representative of the situation in The Netherlands, where primary care for children is delivered by general practitioners. Other countries with different health care systems, and where primary and secondary care are more interwoven, can obtain from this study an indication of the need for secondary care in childhood.

Sixteen per cent of all children are referred in a year, ranging from 25% of children in the first year of life to 10% of 10- to 14-year-olds. Six specialties are mainly involved: ENT, paediatrics, surgery, ophthalmology, dermatology and orthopaedics. The referral pattern for the different age categories shows that different specialists provide care for children in different age groups. Paediatricians see mostly the very young, whereas ENT specialists see toddlers and younger schoolchildren because of the high incidence of infectious diseases, especially of the respiratory tract, in the younger age groups when immunity to common diseases is acquired. Surgeons are more often involved in the care of older children. It is in this group that differences between boys and girls are the most obvious because of a higher incidence among boys

of inguinal herniae, trauma resulting in fractures, and lacerations and cuts — and, of course, because of disorders of the male genital tract, such as undescended testicles, cryptorchism and phimosis.<sup>4</sup> Referrals outside surgery hours are almost exclusively directed to the specialties of surgery and paediatrics, which indicates that more acute conditions and emergencies are referred to these specialists. It also illustrates the higher out-of-hours workload for these specialties compared with others.

The diversity of problems that are encountered in the different specialties shows a large variation. The fact that the paediatrician is confronted with the largest variability in presented problems corresponds with the generalist origin of this specialty. For other specialists the variability is smaller, e.g. for the ophthalmologist only five different problems make up more than 80% of all referrals.

With the referability rate, we introduced a new concept. This reflects the a priori chance of a condition being referred. The extent to which a condition is referred could also be based on the number of referrals compared with the number of consultations or the number of children having the condition. The advantage of using episodes as the denominator is that non-illness-related factors influencing consultation frequency are eliminated. For conditions that a child can have several times (e.g. upper respiratory tract infections), the use of episodes provides a more accurate estimate of the need for secondary care for this condition. For chronic conditions, the rate based on episodes will be approximately similar to the rate with a denominator based on children having the condition. Thus, the referability rate, especially when considered together with the referral rate, provides GPs and specialists with a frame of reference for their own work.

The referability rates for conditions show a large variation. For instance, the high referral rates for problems of the respiratory tract indicate that, in absolute numbers, many children are referred. Hence, the very low referability rate (4) for these indications shows that GPs deal with most children with problems of the respiratory tract themselves. This, combined with the knowledge that parents very frequently manage respiratory problems without even notifying the GP, should make specialists aware that only a small percentage of children with these problems visit their clinics. Hence, it is exceptional for a child to be referred for respiratory tract conditions, and referral only occurs when the GP has an important reason. The purpose of the referral may be

**Table 3.** Diagnoses most frequently referred (by specialty).

	Number referred (to other specialties)	Referral Rate	Referability Rate
<b>Ophthalmology</b>			
F91 Refractive errors	140 (1)	9	82
F05 Other problems with vision	87 (1)	6	81
F99.1 Strabismus	57	4	64
F14 Abnormal eye movements	10	1	32
F80 Blocked lacrimal duct of infant	9	1	64
All referrals	365	23	
<b>Ear, nose and throat</b>			
H71 Acute otitis media	157 (7)	10	8
H72 Serous otitis media/glue ear	105 (1)	7	27
R90 Hypertro/chronic infection T and A	87 (3)	6	46
R76 Acute tonsillitis	55 (2)	4	7
R74 Upper respiratory tract infection	42 (21)	4	2
H02 Hearing complaints	26	2	53
H73 Eustachian salpingitis	26	2	11
H84.9 Deafness NEC	23	1	64
R75 Sinusitis acute	18 (3)	1	5
R97 Hay fever, allergic rhinitis	11 (3)	1	5
All referrals	676	42	
<b>Surgery</b>			
D89 Inguinal hernia	44 (5)	3	77
L72 Fracture: radius/ulna	39 (3)	2	54
D88 Appendicitis	31 (1)	2	78
Y81 Phimosis/redundant prepuce	25	2	40
L74 Fracture: (meta)carpal/(meta)tarsal	20 (2)	1	30
Y83 Undescended testicle/cryptorchism	17 (8)	2	45
S18 Laceration/cut	13 (1)	1	4
L73 Fracture: tibia/fibula	11 (1)	1	46
L76.5 Fracture: clavícula	10 (1)	1	61
L76.6 Fracture: humerus	10 (1)	1	61
All referrals	470	29	
<b>Orthopaedics</b>			
L98.1 Pes Plani	20	1	26
L98.9 Acquired deformities of limbs	19 (1)	1	26
L82.1 Congenital hip dislocation	18 (3)	1	33
L85 Acquired deformities of spine	15 (1)	1	19
L28 Disability/impairment	11 (10)	1	21
L82.9 Congenital anomalies	9 (5)	1	30
L93.9 Tendinitis/synovitis	6 (3)	1	11
L96 Acute meniscus/ligament knee	6 (1)	0.4	50
L98.3 Genua valga/vara	5	0.3	29
L15 Knee symptoms/complaints	5	0.3	13
All referrals	177	11	
<b>Dermatology</b>			
S03.1 Warts	46 (7)	3	5
S88.2 Eczema NEC	22 (2)	2	3
S87 Atopic dermatitis/eczema	19	1	5
S74.9 Dermatophytosis/-mycosis NEC	11	1	4
S76.2 Mollusca contagiosa	11	1	5
S82 Naevus	7 (7)	1	23
S79 Benign neoplasm skin NEC	7 (2)	1	14
S99.9 Disorders skin/subcutaneous tissue	7 (4)	1	12
S05 Generalized multiple swellings/ papules/lumps/skin/subcutaneous tissue	5	0.3	28
S96 Acne	5	0.3	4
All referrals	189	12	
<b>Paediatrics</b>			
R96 Asthma	53 (4)	4	9
R78 Acute bronchitis	27 (7)	2	2
R74 Upper respiratory infection	21 (42)	4	2
A04 General weakness/tiredness	19	1	12
K81 Heart murmur, NOS	15	1	59
T10 Failure to thrive	15 (2)	1	29
N07 Convulsions/seizures	14 (2)	1	34
R81 Pneumonia	14	1	6
D74 Other presumed infections of digestive system	13 (2)	1	2
U71 Cystitis/other urinary infection NOS	12 (5)	1	5
All referrals	577	36	

NEC = not elsewhere classified. NOS = not otherwise specified.

**Table 4.** Factors influencing the decision to refer (by specialty referred for).

	All non-referred (%)	All referred (%)	ENT (%)	Paediatrics (%)	Surgery (%)	Ophthalmology (%)	Dermatology (%)	Orthopaedics (%)
<b>Certainty of diagnosis</b>								
Very uncertain	2	4	2	9	3	3	4	5
Uncertain	2	4	1	6	4	3	4	5
Certain/uncertain	6	13	7	23	13	9	11	19
Certain	18	18	20	20	16	21	12	12
Very certain	73	61 *	70 *	41 *	65	66	69	58
<b>Somatic/psychosocial balance</b>								
Pure somatic	84	84	88*	69*	92*	88*	85	89
Somatic	7	6	6	9	4	4	9	6
Somatic/psychosocial	6	7	4	16	3	4	5	4
Psychosocial	1	1	1	3	1	2	1	0
Pure psychosocial	3	2	1	3	1	1	1	1

\*Chi-square test, P&lt;0.05.

purely somatic or for the reassurance of parents who insist on a referral.<sup>11</sup> Previous research has shown that the aim of referrals to paediatricians compared with other specialties is more often to reassure patient and GP.<sup>12,13</sup> We have demonstrated that GPs are less certain about their diagnosis and more often judge conditions not to be purely somatic when referring to the paediatrician. This regularity is most pronounced for non-specific conditions and problems.

The high referability rates for problems referred to surgeons and ophthalmologists indicate that GPs lack the training, facilities or equipment to deal with these particular conditions. Thus, the conditions of referral to these specialties are mainly somatic, as shown in previous studies.<sup>12</sup>

Some peculiarities in the results, (e.g. a child with an appendicitis who was not referred) are caused by the method of registration in this survey, in which a GP could also write down a provisional diagnosis or working hypothesis in case of suspicion.

We have to keep in mind that the results do not give a complete insight into the problems presented to specialists. Only referrals initiated by GPs were studied. Referrals made by other care providers, such as other specialists, and self-referrals are missing. For example, referrals to paediatricians during the neonatal period are often initiated by the gynaecologist.<sup>14</sup> In the case of self-referrals, parents seek specialist care directly. This occurs more frequently in larger cities and for surgery after trauma.<sup>15</sup>

Armed with this detailed information on referral patterns, GPs and specialists can obtain a frame of reference for their own work, which is also helpful when designing training programmes. The morbidity spectra encountered by doctors at different levels and in different specialties vary greatly, which has implications for the value of diagnostic procedures and management. Insight into the a priori chance of a condition being referred can make the specialist alert to reasons for referral other than purely somatic ones.

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