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Prescription of technical aids by general practitioners in the Netherlands

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ABSTRACT

This study focused on the allocation of technical aids, in particular which technical aids general practitioners (GPs) prescribe for what patients. Data was collected by 64 Dutch GPs participating in a nationwide representative sentinel practice network. The GPs gathered information on type of technical aid prescribed, patient characteristics, and diagnosis (coded according to the International Classification of Primary Care (ICPC)). The most frequently prescribed technical aids include incontinence supplies, anti-oedema stockings, and rollators. The number of prescribed technical aids increased strongly with the age of the patients and almost all technical aids were prescribed more often for women than for men. Most technical aids were prescribed based on the initiative of the patients. The GPs made a wide range of diagnoses in the prescription of technical aids. Diagnoses involving the musculoskeletal system, the circulatory system, and the urinary system were the most frequently made. Implications of these findings for policy and further research are discussed.

1. INTRODUCTION

The collective term, technical aids, covers a broad range of products, ranging from injection needles to wheel chairs. The International Organization for Standardization defines a technical aid as 'any product, instrument, equipment or technical system used by a disabled person, especially produced or generally available, preventing, compensating, relieving or neutralizing the impairment, disability or handicap' [1].

Little is known about the provision and costs of technical aids in West European countries. One reason for this lack of information is the decentralized provision of technical aids in countries as Denmark, Sweden, Germany, and Belgium. Furthermore, most West European countries have not (yet) put technical aids on the political agenda, which gives no cause for careful registration. The national data that is available indicates that the costs of technical aids have increased in most West European countries [2-5].

These cost increases can be explained by demographic, political, and technological developments. As technical aids are mainly used by elderly people, the costs are rising as a result of the aging population. Also, costs have increased because policymakers are focusing on the use of technical aids

as a means to substitute expensive intramural care with less expensive home care. The underlying idea is that people will be able to live independently at home for a longer time by the provision of technical aids. Furthermore, costs are increasing as a result of technological developments which lead to a constant supply of new and improved technical aids on the market.

To control the increasing expenses on technical aids, insight into the allocation of technical aids is required. In other words, who receives which technical aids and in what way? Insight into the allocation of technical aids is lacking, however, the market of technical aids is complicated and characterized by an unusual demand and supply system [6–8]. Compared with regular products, more and different actors and regulations mediate between producer and consumer of technical aids.

Important actors in the market of technical aids are prescribers for they are intermediaries between demand and supply. Prescribers have a major role as gatekeeper: they decide which patients receive which kind of technical aids. Because of this filtering function, prescribers are important with respect to efficacy. In most West European countries, technical aids are usually prescribed by physicians, in particular general practitioners (GPs) or medical specialists [3]. As far as we know, no data is available on prescriptions of technical aids by GPs.

Other actors in this market are the consumers or the patients to whom technical aids are prescribed. They have an important influence on the demand of technical aids. This influence is growing as more patients are well informed and have an input in their medical treatment. In particular, the emancipation of patients affects whether, and how patients will ask for certain technical aids.

To gain insight into the allocation of technical aids, in particular the role of the GP and the patient population, this study focuses on the prescription of technical aids by GPs in The Netherlands. This country is one of the few West European countries for which data on the costs and provision of technical aids is available. The costs of technical aids are rising sharply in The Netherlands. Data from 1990 to 1995 shows that the costs of technical aids increased with a greater percentage than the total costs of health care. In particular, the costs of extramural technical aids increased substantially with 11% per year [4]. Provision of extramural technical aids in The Netherlands is largely regulated by the law 'Regulation of Technical Aids 1996' [9]. This regulation applies only to public health insurances, and is followed by most private health insurances. The costs of technical aids supplied on account of this regulation by public health insurances, increased from 373.4 million Euros in 1996 to 574.1 million Euros in 2000. It is expected that these costs will rise with 8.4% in 2001, and 8.0% in 2002 [2]. The costs of extramural technical aids (2.2%) and extramural medication (9.8%) altogether comprise 12% of the total costs of health care in The Netherlands in 2000 [10].

This study focuses both on the prescription of technical aids by GPs and on the characteristics of the patient population. The aims of this study are to describe (1) which technical aids the GP prescribes, (2) how often the GP prescribes these technical aids, (3) on whose initiative the GP prescribes technical aids, and (4) the patient population to whom these aids are prescribed, in particular the diseases of patients.

2. METHODS

Data was gathered by GPs participating in the Dutch sentinel practice network [11]. This registration network consists of 43 sentinel stations (68 GPs) in which data on diseases, disorders, and medical treatments is gathered. Geographical distribution and degree of urbanization have been accounted for in composing the sentinel practice network. Compared with population figures, the patient population comprises a representative sample of 1% of the Dutch population. The northern provinces, however, are slightly over represented, whereas the western provinces and municipalities with 100 000 residents or more, are slightly under-represented [12].

The data refers to technical aids prescribed by GPs during 1999. The GPs completed a questionnaire for each technical aid they prescribed for the first time that year for a particular patient. Therefore, this data does provide information on the number of patients for whom technical aids are prescribed, but provides no information on the total amount of technical aids prescribed. The questionnaire contains questions on demographic information (age, gender, type of insurance), diagnosis, who initiated the prescription, and a list of technical aids that can be marked. Diagnosis was coded according to the International Classification of Primary Care (ICPC) [13].

Three sentinel stations, which registered technical aids incompletely, are excluded from this study. The final results are based upon 40 sentinel stations (64 GPs) with a total patient population of 134 535 patients.

In The Netherlands, provision of technical aids prescribed by GPs is largely regulated by the law 'Regulation of Technical Aids 1996' [9]. Technical aids not regulated by this law (a.o. dressing materials and wheelchairs) are excluded from this study. In total, the 64 GPs prescribed 1874 technical aids during 1999. In this article, technical aids comprising less than 1% of this total number of technical aids, such as stoma aids ($n=18$), are left out of consideration. The remaining 1733 technical aids are classified into disposables, body-worn aids, and aids for activities of daily living (ADL).

Data was analyzed using descriptive statistics. The unit of analysis is the technical aid: if a GP prescribed different technical aids for the same patient, each technical aid is taken into account. Sex- and age-specific frequencies per 10 000 persons were computed by dividing the number of technical aids prescribed for a specific group by the patient population of that group. Differences between men and women were compared with testing, per age group, whether the difference in proportions men and women is statistically significant, and by calculating 95% confidence intervals as recommended by Altman [14]. In addition to the frequencies per 10 000 persons, percentages of the total number of technical aids prescribed were computed for initiative of prescription and diagnosis.

3. RESULTS

3.1. Demographic characteristics

The 64 GPs prescribed a total number of 1733 technical aids. The majority of the patients for whom these aids were prescribed, were women (73%). The mean age of the patients was 69 years (standard deviation (S.D.) 19.8). Half of the technical aids were prescribed for patients of 75 years or older. The majority of the patients (85%) has a public health insurance.

3.2. Frequencies of prescriptions of technical aids

Table 1 shows how often the GPs prescribed each technical aid, per 10 000 persons. In total, the 64 GPs had a joint patient population of 134 535 patients for which they prescribed 1733 technical aids, which means that the GPs prescribed 129 technical aids per 10 000 persons ($1733/134\ 535 \times 10\ 000$)¹. The most frequently prescribed technical aids were incontinence supplies, anti-oedema stockings, and rollators. Together, these three technical aids cover more than half (57%) of all technical aids identified by the GPs. In Table 1, data is also presented separately for men and women. All technical aids, with the exception of catheters and aids for sitting, were prescribed more often for women than for men. In particular, the GPs prescribed incontinence supplies and alarm systems much more often for female than for male patients. In all, the technical aids were prescribed more than 2.5 times as often for women (180 per 10 000 women) than for men (68 per 10 000 men).

[TABLE 1]

Fig. 1 presents the number of prescribed technical aids for different age groups. The number of prescribed technical aids per 10 000 persons increased strongly with the age of the patients. This applies to all technical aids. In particular, the numbers of prescribed disposables and ADL aids raised sharply with age.

[FIGURE 1]

To what extent are the observed gender differences in Table 1 explained by the fact that prescription of technical aids is related to age and that generally, women become older than men? In order to answer this question, the frequencies of prescribed technical aids per age group were calculated for

¹ The numbers per 10 000 persons in Table 1 can be translated easily into numbers for an average GP practice of 2350 patients by dividing the numbers by 4 (for instance, 48 disposables per 10 000 persons is about 12 disposables for an average GP practice of 2350 patients).

men and women separately. Fig. 2 shows that the frequency of prescribed technical aids increased exponentially with age for both men and women. The GPs prescribed technical aids significantly more often for women than for men in all age groups ($P < 0.005$ for each age group, 95% confidence intervals for the age groups are 0.002–0.003 for 54 years and younger, 0.005–0.013 for 55–64 years, 0.334–0.360 for 65–74 years, 0.037–0.063 for 75–84 years, and 0.047–0.114 for 85 years and older). Therefore, technical aids were, in fact, more often prescribed for women than for men (i.e. not just because more women than men fall into the higher age groups), and this gender difference increased with age.

[FIGURE 2]

Table 2 displays on whose initiative technical aids were prescribed. In general, most technical aids were prescribed on the initiative of patients (54%) and/or GPs (39%). The initiative of prescription was sometimes also taken by specialists (6%), nurses/attendants (7%) and/or the home care aides (8%). Technical aids were rarely prescribed on the initiative of physiotherapists, occupational therapists, or family members.

[TABLE 2]

Regarding specific technical aids, the findings show that disposables are, in addition to GPs and patients, often prescribed on the initiative of specialists and/or the home care aides. Concerning body-worn aids, it is striking that wigs are almost always prescribed on the initiative of patients (96%). Various people took the initiative of prescription of ADL aids: patients, the GPs, nurses/attendants, home care aides, physiotherapists/ occupational therapists, and/or family members.

Table 3 shows which diagnoses were made in prescribing technical aids. The GPs made a wide range of diagnoses. Diagnoses involving the musculoskeletal system (26%), the circulatory system (21%), and the urinary system (16%) were the most frequently made. About a third of the diagnoses involving the musculoskeletal system consists of degenerative disorders (osteoarthritis (6.7%), osteoporosis (0.9%), and rheumatoid arthritis (0.7%)). GPs often prescribed ADL aids for patients with these diagnoses: about one quarter of all ADL aids was prescribed for patients with degenerative disorders. Another frequently made diagnosis regarding the musculoskeletal system is the diagnosis acquired deformities of limbs, which includes the often made diagnosis pes planus. More than half of all diagnoses involving the circulatory system is made up of the diagnosis varicose veins of leg for which GPs usually prescribe anti-oedema stockings. With regard to the urinary system and endocrine/metabolic/nutritional diseases, the diagnoses urinary incontinence and diabetes mellitus are frequently made, which is not surprising considering the large amounts of prescribed incontinence supplies and aids for diabetics. Regarding the neurological system, the GPs made various diagnoses and often prescribed ADL aids. The GPs prescribed 18% of all ADL aids for patients with diagnoses involving the neurological system.

[TABLE 3]

4. CONCLUSIONS AND DISCUSSION

This is the first study on the role of the GP in the prescription of technical aids. The study provides insight into which technical aids GPs prescribe for which type of patients. The data refers to technical aids prescribed in 1999 by a representative sample of 64 Dutch GPs. The GPs registered each technical aid they prescribed for the first time that year for a particular patient.

Results show that the GPs frequently prescribed three categories of technical aids: disposables, body-worn aids, and ADL aids. Until now, research and policy regarding technical aids were mainly focused on ADL aids. The findings of this study, however, indicate that disposables and body-worn aids are also relevant groups for research and policy. The research findings on separate technical aids show that the GP plays an important role in the prescription of incontinence supplies, anti-oedema stockings,

and rollators. Together, these three technical aids cover more than half of all prescribed technical aids. Therefore, policymakers may consider to control costs by measures directed at these three technical aids, such as negotiating sharp prices for bulk buying.

Almost all technical aids were, at all ages, more often prescribed for women than for men. This data corresponds to well-known findings that women report more health complaints and have a higher medical consumption than men [15]. The current study shows also that the number of prescribed technical aids, especially disposables and ADL aids, increases strongly with the age of the patients. Due to the aging population, the number of prescribed technical aids will probably rise considerably in the future.

Most technical aids were prescribed on the initiative of the patient. Patients who take such an initiative might be more demanding than patients who do not take initiative. Over the last years, the emancipation of patients has grown; more patients are well informed and have an input in their medical treatment. This development might partly explain the increase of prescribed technical aids over the last years.

The GPs made a wide range of diagnoses in the prescription of technical aids. Diagnoses involving the musculoskeletal system, the circulatory system, and the urinary system were frequently made. Within the musculoskeletal system, degenerative disorders are a relatively large group of diagnoses. Since most diagnoses were made involving the musculoskeletal system, this area might be an appropriate focus for policymakers. Such a focus would also follow the declaration of the Bone and Joint Decade 2000–2010, a collaborative initiative supported by the World Health Organization and the United Nations (<http://www.bonejointdecade.org>).

This sample of GPs and their patient population is representative for Dutch GPs and for the Dutch population. We cannot know for sure, however, whether the registered number of prescribed technical aids corresponds to the real number of prescribed technical aids. For instance, under-registration may have occurred as a result of the high workload of GPs in The Netherlands. We examined the response of the GPs over time for indications of under-registration. Although the registration was fairly constant over time, a slight decrease in the course of time was found [16]. These findings indicate that under-registration may have occurred to a limited extent. In the absence of comparable studies, however, it is not possible to validate our findings with results from other sources.

The generalizability of this study is limited to the prescription of technical aids by GPs in The Netherlands. An important aspect of the Dutch health care system is that GPs function as gatekeepers, i.e. patients need to be referred by GPs to other health care providers. In a number of other West European countries, such as Belgium, Germany, and France, patients have free access to other health care providers. Therefore, Dutch GPs probably prescribe more technical aids than GPs in West European countries without this gate-keeping system.

This study has shed some light on the role of the GP in the allocation of technical aids, in particular who receives which technical aids and in what way. As yet, little is known about this field. Further research should aim at describing the allocation of technical aids, including the contribution of GPs in the total number of prescribed technical aids. Next, attention should be directed at fine-tuning in order to develop an allocation system and policy that provides patients with the appropriate technical aids in the right way and at the right moment. To make sure that fine-tuning is effective, especially in preventing non-use of prescribed technical aids, it is essential that the perspective of the patient is taken into account [17].

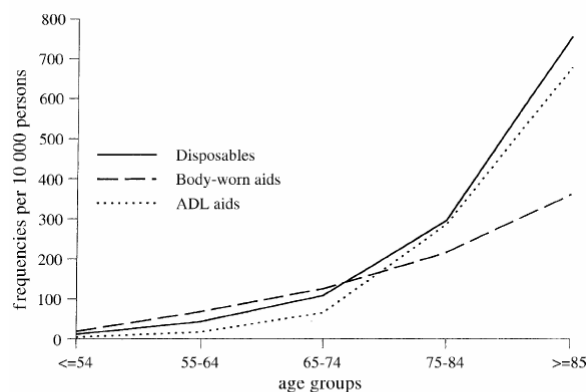
TABLES

Table 1

Sex-specific frequencies of prescriptions of technical aids, per 10 000 persons

Technical aids	Men (n = 449)	Women (n = 1241)	Total (n = 1733)
<i>Disposables</i>			
Incontinence supplies	11	54	34
Catheters and accessories	3	2	3
Aids for diabetics	7	13	11
Subtotal	22	70	48
<i>Body-worn aids</i>			
Anti-oedema stockings	12	33	23
(Orthopaedic) footwear	10	16	13
Prostheses/orthoses	4	14	9
Wigs	1	3	2
Subtotal	26	64	47
<i>ADL aids</i>			
Rollators	8	24	17
Other walking aids	2	3	3
Aids for sitting	3	3	3
Aids for lying/sleeping	5	9	7
Alarm systems	1	7	4
Subtotal	20	46	34
Total	68	180	129

Missing values for sex (n = 43) have been excluded; results refer to technical aids prescribed for the first time for a particular patient in 1999; the total patient population is 134 535 patients (65 663 men and 68 872 women).

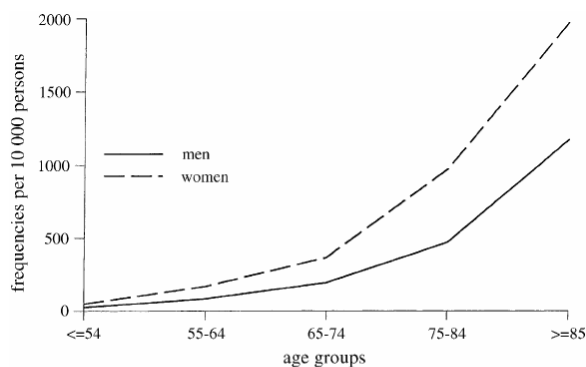


^aMissing values for age (n=27) have been excluded.

^bResults refer to technical aids prescribed for the first time for a particular patient in 1999.

^cThe total patient population is 134 535 patients.

Fig. 1. Age-specific frequencies of prescriptions of technical aids, per 10 000 persons^{abc}.



^aMissing values for age or sex (n=63) have been excluded.

^bResults refer to technical aids prescribed for the first time for a particular patient in 1999.

^cThe total patient population is 134 535 patients.

Fig. 2. Sex- and age-specific frequencies of prescriptions of technical aids, per 10 000 persons^{abc}.

Table 2
 Initiative of prescription of technical aids, in percentages

Technical aids	Patient	General practitioner	Specialist	Nurse/ attendant	Home care	Physio/ occupational therapy	Family	Other initiator
<i>Disposables</i>								
Incontinence supplies (N=352)	66	36	1	7	13	0	5	2
Catheters and accessories (N=33)	21	46	18	9	24	0	0	9
Aids for diabetics (N=100)	46	31	24	3	2	0	0	6
Subtotal (N=485)	59	36	7	6	12	0	4	3
<i>Body-worn aids</i>								
Anti-oedema stockings (N=253)	44	51	6	4	5	1	0	4
(Orthopaedic) footwear (N=157)	64	40	9	1	0	3	1	5
Prostheses/orthoses (N=114)	54	40	9	3	1	10	0	2
Wigs (N=24)	96	13	0	0	0	0	0	0
Subtotal (N=548)	54	44	7	2	3	3	0	3
<i>ADL aids</i>								
Rollators (N=207)	57	41	4	10	5	8	10	1
Other walking aids (N=41)	61	24	7	7	0	10	2	2
Aids for sitting (N=38)	29	29	0	8	18	26	5	5
Aids for lying/sleeping (N=92)	24	37	2	25	28	3	3	1
Alarm systems (N=51)	53	33	4	6	6	0	31	2
Subtotal (N=429)	47	37	4	12	11	8	10	1
Total (N=1462)	54	39	6	7	8	4	4	3

Missing values for initiative of prescription ($n=271$) have been excluded; categories are not mutually exclusive for multiple answers to this question were allowed. Results refer to technical aids prescribed for the first time for a particular patient in 1999.

Table 3
 Prescription of technical aids according to diagnosis, in percentages

ICPC chapter diagnoses	Disposables	Body-worn aids	ADL aids	Total
Musculoskeletal	0.3	13.9	12.0	26.2
Acquired deformities of limbs	0.0	6.6	0.1	6.7
Other osteoarthritis and allied conditions	0.1	0.5	2.1	2.7
Disability/impairment	0.1	0.1	2.2	2.5
Osteoarthritis of hip	0.0	0.3	1.3	1.7
Osteoarthritis of knee	0.0	0.3	1.1	1.4
Fracture femur	0.0	0.1	0.9	1.0
Circulatory	0.7	17.3	3.1	21.1
Varicose veins of leg	0.0	11.6	0.1	11.7
Swollen ankles/edema	0.0	3.2	0.0	3.2
Stroke/cerebrovascular accident	0.5	0.4	1.8	2.7
Phlebitis and thrombophlebitis	0.1	1.0	0.0	1.1
Urology	15.7	0.1	0.1	15.9
Incontinence, urine	14.6	0.1	0.1	14.7
Endocrine, metabolic and nutritional	7.5	0.3	0.5	8.3
Diabetes mellitus	7.3	0.1	0.4	7.8
Neurological	1.2	1.2	4.9	7.3
Other symptoms/complications neurological system	0.0	0.0	1.1	1.1
Vertigo/dizziness	0.0	0.0	1.0	1.0
Female genital system (including breasts)	4.8	1.9	0.3	7.0
Uterovaginal prolapse	4.5	0.0	0.1	4.5
Malignant neoplasm breast	0.3	1.5	0.2	1.9
General and unspecified	1.1	0.5	1.9	3.4
Skin	0.2	2.3	0.5	3.1
Baldness, losing hair (including alopecia)	0.0	1.3	0.0	1.3
Chronic ulcer skin/bedsore (including varicose ulcer)	0.1	0.4	0.5	1.0
Respiratory	0.2	0.2	1.7	2.1
Psychological	1.1	0.0	0.7	1.8
Total	34.2	38.7	27.1	100.0

Missing values for diagnosis ($n=233$) have been excluded; ICPC chapters and diagnoses comprising less than 1% of the total number of technical aids ($n=1500$) are not included in the table. Therefore, the sum of the subtotals is not equal to the total; results refer to technical aids prescribed for the first time for a particular patient in 1999.

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