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# Utilisation of outpatient and inpatient health services in Germany

## Results of the German Health Interview and Examination Survey for Adults (DEGS1)

### Background and purpose

Providing need-based healthcare for the population is a great challenge for health policy makers, especially in view of scarce resources and demographic developments. To ensure need-based services within the public health system, a reduction in oversupply and undersupply of services as well as inappropriate supply must be aimed for. In other words, the population must, on the basis of its scientifically established need, be provided with demonstrably needed and adequate services [1]. For this control task, health policy makers need information on the utilisation of different health services. The regularly recurring discussion of practice fees ("Praxisgebühren") and GP-centred gatekeeper models ("Hausarztmodelle") in exemplary fashion shows the significance of utilisation data for planning and control of the public health system [2].

Outpatient and inpatient utilisation depends on different factors which are described in the Behavioral Model of Health Services Use by Andersen et al. [3, 4]. Utilisation levels are influenced by the following directly relevant predisposing demographic and sociocultural factors: gender, age and social status [5], access conditions (enabling resources) such as type of health insurance and place of residence [3] as well as need-related factors such as

assessment of participants' own health status [6].

Data on health system utilisation are collected in different interview studies [7, 8, 9, 10], including the health surveys conducted by the Robert Koch Institute (RKI) [11, 12, 13, 14]. The advantage of representative interview data compared to routine data from payment, treatment or diagnosis statistics [15, 16] is that they provide, across different health insurers, information for the whole population on the utilisation of different health services from the viewpoint of patients. In addition, survey data on utilisation can be linked to data on health insurance, illness and health and also to subjective assessments and social features which in some routine data are not linked to each other or are not available at all. Moreover, from survey data, contact frequencies can be calculated which are no longer available in German routine data, due to changes in invoicing modalities.

On the basis of the German Health Interview and Examination Survey for Adults (DEGS1), this paper provides key data on current utilisation of outpatient and inpatient health services in Germany, taking into account important influential factors. In addition, a first comparison is made between utilisation levels in the time periods between 1997/1998 and 2008–2011.

### Methods

The German Health Interview and Examination Survey for Adults (DEGS) is part of the health monitoring system at the Robert Koch Institute. The concept and design of DEGS are described in detail elsewhere [17, 18, 19, 20, 21]. The first wave (DEGS1) was conducted between 2008 and 2011 and comprised interviews, examinations and tests [22, 23]. The target population comprises the residents of Germany aged 18–79 years. DEGS1 has a mixed design which permits both cross-sectional and longitudinal analyses. For this purpose, a random sample from local population registries was drawn to complete the participants of the German National Health Interview and Examination Survey 1998 (GNHIES98), who re-participated. A total of 8,152 persons participated, including 4,193 first-time participants (response rate 42%) and 3,959 revisiting participants of GNHIES98 (response rate 62%) [21]. There were 7,238 persons who attended one of the 180 examination centres, and 914 were interviewed only. The net sample (n=7,988) permits representative cross-sectional and time trend analyses for the age range of 18–79 years in comparison with GNHIES98 (n=7,124) [21]. The data of the revisiting participants can be used for longitudinal analyses.

The data on utilisation were collected by means of a written questionnaire containing the following questions:

- How often did you use the services of physicians in the following fields of specialisation over the last 12 months?
- Of the therapists listed below, whose services did you use in the last 12 months and how frequently?
- In the last 12 months, how many nights did you spend in a hospital as an inpatient?

This overview presents 12-month prevalence (at least one service utilisation over the last 12 months) and frequency of contact. For utilisation of services provided by doctors, the key figures are reported both for the different fields of specialisation and overall. Whereas overall contact frequency includes all contacts with medical practices (including contacts with doctors mentioned in the “Others” category), for reasons of comparability of the data from DEGS1 and GNHIES98, the number of contacted specialist groups only refers to the 13 fields of specialisation on which data was collected in both surveys.

The analyses were conducted separately by age, sex, social status, residential area, community type, health insurance and self-rated health. Social status was determined using an index which includes information on school education and vocational training, professional status and net household income (weighted by household needs) and which enables a classification into low, middle and high status groups [24]. Participants’ self-rated health was given in response to the question “How is your health generally?” The five-point answer scale was dichotomised into very good/good and average/poor/very poor [25]. Community type was determined by means of the so called “BIK classification”. It represents the city/surrounding area relation at the municipal level for conurbations, city regions as well as mid-sized and small towns, taking into account inhabitant numbers and the commuter rate [26]. For this overview, the ten BIK categories were merged into three groups: (1) communities with less than 50,000 inhabitants which are not considered to be satellite municipali-

ties of larger core cities; (2) communities or cities between 50,000 and 100,000 inhabitants which are not deemed to be satellite municipalities of larger cities, plus satellite municipalities; (3) cities of more than 100,000 inhabitants and their satellite municipalities.

The cross-sectional and trend analyses are conducted with a weighting factor which corrects deviations in the sample from the population structure (as of 31 Dec 2010) with regard to age, sex, region and nationality, as well as community type and education [21]. A separate weighting factor was prepared for the examination part. Calculation of the weighting factor also considered re-participation probability of GNHIES98 participants, based on a logistic regression model. For the purpose of conducting trend analyses, the data from the GNHIES98 were age-adjusted to the population level as of 31 Dec 2010. A non-response analysis and a comparison of selected indicators with data from census statistics indicate a high level of representativity of the net sample for the residential population aged 18–79 years of Germany [21]. To take into account the weighting as well as the correlation of the participants within a community, the confidence intervals were determined with the SPSS 20 survey procedures for complex samples. Differences are regarded as statistically significant if the respective 95% confidence intervals do not overlap.

## Results

The results show that 96.9% of participants aged between 18 and 79 use medical services at least once over the last 12 months prior to the interview. Contacts with medical practices and hospitals as well as services provided by public health officers and company physicians were taken into consideration. Only 1.5% of women and 4.8% of men never made use of medical services in the last 12 months.

### Utilisation of physicians

Of all types of physicians, general practitioners (GPs) were, at 79.4%, the most frequently consulted type of doctor, visited

at least once within a year. They were followed by dentists (71.7%) and, for women, gynaecologists (69.6%) (■ Tab. 1).

The proportion of women who visited a medical practice at least once in the last 12 months is, for most medical specialisations, higher than the proportion for men; only urological medical centres were visited more often by men, while practices specialising in surgery, dermatology and internal medicine show similar visitor numbers for men and women (■ Tab. 1).

Age specific utilisation of the services of at least one physician greatly varies depending on the field of specialisation: By age, utilisation tends to be rather homogeneous for physicians specialising in general medicine, dentistry, ENT medicine, dermatology, and psychotherapy. Only at higher ages can significant deviations be observed, whereas women make less use of dental and psychotherapeutic services, the fields dermatology, ENT medicine and general medicine rises with increasing age, especially for men. For physicians specialising in internal medicine, ophthalmology, urology, radiology, orthopaedics, neurology/psychiatry and surgery, there is a clear increase across age groups. However, for some specialisations, utilisation decreases slightly in the oldest group (70–79 years). For gynaecologists, the opposite trend of a significant decrease with age is observed. Overall, utilisation patterns are rather similar for men and women by age, albeit at a different level (■ Tab. 1).

With regard to utilisation of physicians, there are hardly any pronounced differences in terms of the social status of respondents. Only for physicians specialising in gynaecology, dermatology and dentistry are utilisation levels significantly higher in the high than the low status group. In contrast, utilisation of general medical and surgical services is significantly higher for the low and medium social status group (■ Tab. 2).

There are now hardly any differences in use of medical care between the old and new federal states; only urological practices were visited significantly more often in East than in West Germany. A comparison of rural and urban areas shows that persons from rural areas were more likely to visit general practitioners within one year, whereas residents of urban ar-

eas tended to contact physicians specialising in internal medicine, ophthalmology, and ENT medicine. Overall, however, regional differences are hardly observable (■ Tab. 2).

Participants covered under statutory health insurance were significantly more likely to consult a general practitioner at least once in the 12 months prior to the interview than persons with private health insurance. This finding also applies to the specialisations neurology and psychiatry. Gynaecology, dermatology and dentistry show an opposite trend: those insured by Local Health Insurance Funds (AOK) visited such specialists significantly less often than privately insured respondents. Differences between AOK insurees and insurees of other statutory health insurances are less pronounced; those insured under statutory health insurance provided by other health insurers only contacted dental and gynaecological practices significantly more frequently than AOK insurees (■ Tab. 2).

Self-rated health is a very strong influencing factor in the utilisation of outpatient medical services: for all specialisations—with the exception of dermatology—there are significant differences. Whereas utilisation of almost all types of physicians was significantly higher among those with average to poor health than among respondents in very good or good health, the opposite applies to dental and gynaecological practices, which were visited significantly more often by healthy individuals (■ Tab. 2).

On average, respondents stated that they had had 9.2 contacts with a physician in the course of the preceding 12 months (■ Tab. 3). The medical specialisation used most often as an outpatient service is general medicine (3.2), followed by dentistry (1.6) and, for women, gynaecology (1.4). Overall, there are significant differences by age and gender: women reported 10.7 contacts with physicians, as opposed to 7.9 for men. Up to the age of 60–69, the number of contacts increases to 12.9 contacts for women and 10.8 contacts for men, before going down again slightly in the oldest age group (70–79 years). The lowest contact rates can be observed for men in the age group of 30–39 year olds

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### Utilisation of outpatient and inpatient health services in Germany. Results of the German Health Interview and Examination Survey for Adults (DEGS1)

#### Abstract

The article provides representative benchmarks and trends for the use of medical and therapeutic services in Germany on the basis of the German Health Interview and Examination Survey for Adults (DEGS1) and the German National Health Interview and Examination Survey 1998 (GNHIES98) from the years 2008–2011 and 1997/98, respectively. DEGS1 shows that women seek most medical services more often than men. Differences by gender decreased with age. In almost all services, an increase in utilisation is recorded with age. There are large differences in utilisation depending on self-rated health, as opposed to fewer differences by social status,

health insurance and region. At both time points, the proportion of the population that utilised outpatient or inpatient medical assistance at least once a year, is almost unchanged high. At the same time, a significant reduction in the annual number of contacts with medical practices and the length of hospital stay was recorded as well as an increase of the consulted specialist groups. This may be explained due to regulation effects of earlier reforms.

#### Keywords

Health survey · Physicians · Hospital · Physical therapy · Health services research

### Inanspruchnahme der ambulanten und stationären medizinischen Versorgung in Deutschland. Ergebnisse der Studie zur Gesundheit Erwachsener in Deutschland (DEGS1)

#### Zusammenfassung

Der vorliegende Beitrag liefert auf Basis der Studie zur Gesundheit Erwachsener in Deutschland (DEGS1) und des Bundes-Gesundheitssurveys (BGS98) aus den Jahren 2008–2011 und 1997/98 repräsentative Eckdaten und Trends zur Inanspruchnahme ärztlicher und therapeutischer Leistungen der 18- bis 79-jährigen Wohnbevölkerung in Deutschland. Die DEGS1-Daten zeigen, dass Frauen viele der einbezogenen medizinischen Leistungen häufiger in Anspruch nahmen als Männer. Mit dem Alter werden die Unterschiede nach Geschlecht geringer. Bei fast allen Leistungen ist mit zunehmendem Alter ein Anstieg der Inanspruchnahme zu verzeichnen. Große Unterschiede in der Inanspruchnahme bestehen in Abhängigkeit von der selbst einge-

schätzten Gesundheit, geringere Unterschiede nach Sozialstatus, Krankenversicherung und Region. Zu beiden Erhebungszeitpunkten ist der Anteil der Bevölkerung, der mindestens 1-mal im Jahr ärztliche Hilfe (ambulant oder stationär) in Anspruch nahm, nahezu unverändert hoch. Gleichzeitig sind in diesem Zeitraum ein signifikanter Rückgang der Kontakte zu Arztpraxen pro Jahr und der Krankenhausverweildauer sowie eine Zunahme der konsultierten Facharztgruppen zu verzeichnen. Dies verweist auf Steuerungswirkungen früherer Reformen.

#### Schlüsselwörter

Gesundheitssurvey · Niedergelassene Ärzte · Krankenhaus · Physiotherapie · Versorgungsforschung

(5.7) and for women in the age group of 18–29 year olds (9.3) (■ Tab. 3).

Apart from age and gender, self-rated health and social status also have a significant influence on the number of doctor visits. Accordingly, respondents in good or very good health condition visited a medical practice 7.4 times in the past year, whereas respondents with average to very poor health had 15.0 contacts on average. Whereas women and men of low social

status reported 10.4 doctor visits in the 12 months preceding the interview, women and men in the high social status group reported 8.3 visits (■ Tab. 4).

### Utilisation of non-physician therapists

In addition to medical services provided by physicians, two non-physician professions were included in the analysis: phys-

**Tab. 1** Utilisation of outpatient and inpatient services in the last 12 months (proportion of the population in %) by specialisation and sectors (by sex and age)

Sex	n <sub>unweighted</sub>	Age group													
		18–29 years		30–39 years		40–49 years		50–59 years		60–69 years		70–79 years		Total	
		Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI	Percent	95% CI
<b>Total no. of physicians (outpatient + inpatient)</b>															
Women	4092	98.4	96.2–99.4%	98.9	95.5–99.7%	98.3	96.3–99.2%	98.1	96.4–99.0%	98.6	96.7–99.4%	99.0	97.2–99.7%	98.5	97.9–98.9%
Men	3692	94.0	91.3–96.0%	94.1	91.1–96.2%	94.1	91.2–96.1%	94.4	92.1–96.1%	97.9	95.9–98.9%	99.2	97.7–99.7%	95.2	94.2–96.1%
Total	7784	96.2	94.6–97.3%	96.5	94.7–97.7%	96.1	94.5–97.3%	96.3	95.0–97.2%	98.2	97.0–98.9%	99.1	98.1–99.6%	96.9	96.3–97.3%
<b>Specialisations</b>															
<i>General practitioner</i>															
Women	4092	82.2	77.1–86.4%	81.1	76.7–84.8%	81.3	78.0–84.3%	80.8	77.4–83.8%	84.1	80.4–87.1%	83.4	79.4–86.8%	82.0	80.3–83.7%
Men	3690	74.1	69.6–78.1%	71.2	65.7–76.2%	75.4	70.8–79.6%	77.6	73.7–81.1%	82.0	77.9–85.4%	83.3	79.0–87.0%	76.7	74.8–78.5%
Total	7782	78.1	74.5–81.2%	76.1	72.7–79.2%	78.4	75.5–80.9%	79.2	76.6–81.6%	83.0	80.3–85.5%	83.4	80.3–86.1%	79.4	78.0–80.7%
<i>Ophthalmologist</i>															
Women	4092	20.1	16.8–23.9%	20.4	16.5–25.0%	26.6	23.1–30.5%	34.3	30.5–38.4%	48.7	44.2–53.1%	60.9	55.5–66.1%	33.6	31.9–35.4%
Men	3690	13.7	10.6–17.4%	14.3	11.0–18.5%	19.1	15.9–22.6%	25.3	21.5–29.7%	36.9	32.7–41.3%	56.7	50.9–62.3%	25.0	23.3–26.7%
Total	7782	16.8	14.5–19.4%	17.3	14.5–20.6%	22.8	20.4–25.4%	29.8	27.0–32.8%	42.9	39.7–46.1%	59.0	55.1–62.8%	29.3	28.0–30.6%
<i>Surgeon</i>															
Women	4092	6.0	4.0–8.8%	9.5	6.9–13.1%	10.8	8.3–13.9%	13.4	10.7–16.5%	12.9	10.2–16.1%	10.5	7.8–14.0%	10.4	9.3–11.7%
Men	3690	9.6	6.9–13.2%	9.0	6.4–12.4%	10.8	8.2–14.0%	14.3	11.4–17.7%	14.4	11.3–18.1%	11.5	8.8–14.9%	11.5	10.2–12.9%
Total	7782	7.8	5.8–10.4%	9.3	7.4–11.6%	10.8	8.9–12.9%	13.8	11.7–16.2%	13.6	11.6–15.9%	10.9	8.9–13.3%	11.0	10.0–11.9%
<i>Gynaecologist</i>															
Women	4092	80.4	76.3–84.0%	79.7	75.0–83.8%	75.4	71.4–79.0%	68.7	65.0–72.1%	61.4	57.2–65.4%	44.6	39.5–49.9%	69.6	68.0–71.3%
Men	4092	80.4	76.3–84.0%	79.7	75.0–83.8%	75.4	71.4–79.0%	68.7	65.0–72.1%	61.4	57.2–65.4%	44.6	39.5–49.9%	69.6	68.0–71.3%
<i>ENT specialist</i>															
Women	4092	19.0	15.3–23.3%	16.0	12.4–20.4%	17.6	14.8–20.7%	21.2	18.0–24.8%	19.7	16.3–23.5%	26.4	22.5–30.6%	19.7	18.3–21.3%
Men	3690	14.8	11.6–18.7%	11.2	8.2–15.1%	12.3	9.6–15.6%	16.7	13.7–20.2%	20.7	17.3–24.6%	26.8	22.7–31.4%	16.2	14.7–17.8%
Total	7782	16.8	14.3–19.8%	13.6	11.1–16.4%	14.9	12.9–17.2%	18.9	16.6–21.5%	20.2	17.8–22.8%	26.6	23.8–29.5%	18.0	16.9–19.1%
<i>Dermatologist</i>															
Women	4092	25.3	21.3–29.8%	25.2	20.5–30.6%	19.8	16.9–22.9%	19.5	16.8–22.5%	22.4	18.9–26.4%	23.6	19.5–28.2%	22.4	20.8–24.2%
Men	3690	18.6	15.1–22.7%	16.5	12.6–21.3%	17.6	14.3–21.6%	16.5	13.5–19.9%	22.7	19.0–26.9%	28.5	23.7–33.7%	19.3	17.7–21.0%
Total	7782	21.9	19.2–24.8%	20.8	17.8–24.2%	18.7	16.5–21.1%	18.0	15.8–20.4%	22.6	20.0–25.3%	25.7	22.5–29.2%	20.9	19.7–22.1%
<i>Internist</i>															
Women	4092	9.6	7.3–12.6%	11.9	9.1–15.5%	17.3	14.4–20.6%	23.7	20.5–27.4%	35.9	31.3–40.8%	34.0	29.1–39.3%	21.1	19.7–22.6%
Men	3690	7.3	5.0–10.5%	9.2	6.5–12.7%	18.2	15.0–21.9%	18.9	15.7–22.5%	33.8	29.8–37.9%	38.5	33.2–44.2%	19.2	17.6–20.9%
Total	7782	8.4	6.6–10.7%	10.5	8.6–12.8%	17.7	15.5–20.2%	21.3	19.1–23.7%	34.9	32.0–37.9%	36.1	32.4–39.9%	20.1	19.1–21.3%

**Tab. 1** Utilisation of outpatient and inpatient services in the last 12 months (proportion of the population in %) by specialisation and sectors (by sex and age) (Continued)

		Age group							Total						
		18-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	Total							
<i>Neurologist/psychiatrist</i>															
Women	4092	4.1	2.8-6.0%	6.6	4.3-9.9%	10.6	8.0-13.8%	12.8	10.5-15.6%	13.1	10.2-16.7%	11.0	7.9-15.2%	9.6	8.6-10.8%
Men	3690	4.4	2.8-6.8%	5.4	3.0-9.3%	7.1	5.0-10.0%	7.8	5.8-10.5%	8.6	6.3-11.6%	8.3	6.1-11.3%	6.8	5.7-8.0%
Total	7782	4.2	3.1-5.7%	6.0	4.3-8.3%	8.8	7.1-10.9%	10.3	8.6-12.3%	10.9	9.1-13.0%	9.8	7.7-12.5%	8.2	7.4-9.0%
<i>Orthopaedist</i>															
Women	4092	19.6	15.6-24.3%	16.4	12.8-20.8%	23.0	19.6-26.9%	29.4	25.9-33.3%	37.9	34.2-41.9%	36.3	31.3-41.6%	26.5	24.7-28.3%
Men	3690	15.0	11.8-18.9%	18.0	13.8-23.1%	18.8	15.2-23.0%	27.1	23.2-31.4%	29.2	25.6-33.0%	24.8	20.4-29.8%	21.6	19.8-23.4%
Total	7782	17.2	14.7-20.2%	17.2	14.2-20.6%	20.9	18.5-23.5%	28.3	25.6-31.1%	33.7	31.0-36.5%	31.2	27.5-35.1%	24.0	22.8-25.4%
<i>Psychotherapist</i>															
Women	4092	4.7	3.0-7.3%	8.2	5.6-11.8%	6.0	4.1-8.6%	6.1	4.3-8.6%	4.7	2.8-7.6%	1.8	0.8-3.8%	5.3	4.5-6.3%
Men	3690	3.3	1.8-6.2%	4.1	2.3-7.0%	3.5	2.1-5.8%	3.7	2.2-6.1%	1.5	0.8-3.0%	2.8	1.2-6.4%	3.2	2.6-4.1%
Total	7782	4.0	2.8-5.7%	6.1	4.4-8.4%	4.7	3.4-6.6%	4.9	3.6-6.6%	3.1	2.0-4.8%	2.2	1.2-3.9%	4.3	3.7-5.0%
<i>Radiologist</i>															
Women	4092	14.8	11.7-18.5%	16.6	13.0-21.1%	19.3	15.9-23.2%	27.3%	23.6-31.5%	33.4	29.5-37.6%	29.3	25.1-33.9%	22.9	21.2-24.7%
Men	3690	11.3	8.5-15.0%	11.0	7.8-15.2%	15.2	12.1-18.9%	17.2	13.9-21.2%	21.8	18.1-25.9%	22.0	17.8-26.9%	15.8	14.3-17.5%
Total	7782	13.0	10.8-15.6%	13.8	11.4-16.6%	17.2	14.7-20.0%	22.3	19.7-25.1%	27.7	25.0-30.7%	26.1	23.1-29.2%	19.4	18.1-20.7%
<i>Urologist</i>															
Women	4092	2.3	1.3-4.0%	1.8	0.9-3.4%	4.4	3.1-6.3%	5.9	4.0-8.5%	8.3	6.1-11.2%	11.6	8.8-15.2%	5.4	4.7-6.3%
Men	3690	5.0	3.2-7.7%	7.7	5.2-11.2%	8.5	6.3-11.4%	18.2	14.7-22.3%	35.0	30.1-40.3%	43.4	38.1-48.9%	17.0	15.5-18.6%
Total	7782	3.7	2.6-5.2%	4.8	3.4-6.6%	6.5	5.2-8.1%	12.1	10.0-14.5%	21.4	18.6-24.4%	25.8	22.7-29.2%	11.1	10.3-12.1%
<i>Dentist/orthodontist</i>															
Women	4092	75.1	70.5-79.2%	72.6	67.2-77.3%	80.1	76.4-83.4%	76.7	73.1-80.0%	76.3	72.1-80.1%	67.4	62.4-72.0%	75.2	73.4-76.9%
Men	3690	64.6	59.5-69.3%	66.9	61.1-72.2%	70.9	66.0-75.4%	69.7	66.1-73.2%	69.6	64.4-74.3%	65.6	60.4-70.5%	68.1	66.1-70.0%
Total	7782	69.7	66.4-72.8%	69.7	65.7-73.4%	75.5	72.3-78.4%	73.2	70.8-75.5%	73.0	69.5-76.3%	66.6	63.1-69.9%	71.7	70.3-73.0%
<b>Therapists</b>															
<i>Alternative practitioners</i>															
Women	3971	4.5	2.8-7.3%	8.0	5.7-11.2%	9.0	7.0-11.5%	6.7	4.9-9.1%	5.5	3.8-8.0%	4.4	2.9-6.7%	6.5	5.6-7.5%
Men	3576	2.4	1.2-4.8%	3.2	1.4-7.4%	3.8	2.1-6.8%	2.6	1.5-4.4%	1.8	0.9-3.4%	4.0	2.0-7.8%	2.9	2.2-3.9%
Total	7547	3.4	2.2-5.2%	5.6	4.0-7.9%	6.4	4.9-8.2%	4.6	3.5-6.1%	3.7	2.6-5.1%	4.2	2.9-6.1%	4.7	4.1-5.4%
<i>Physiotherapist</i>															
Women	3971	15.5	12.3-19.4	20.8	17.0-25.1%	28.1	24.5-32.0%	32.1	28.1-36.3%	32.7	28.8-36.8%	34.3	29.4-39.6%	26.8	25.1-28.6%
Men	3576	11.5	8.4-15.6%	14.3	10.8-18.7%	22.9	19.2-27.1%	23.2	19.7-27.1%	26.7	22.7-31.1%	22.5	18.2-27.5%	19.9	18.1-21.8%
Total	7547	13.5	11.1-16.3%	17.5	14.7-20.8%	25.5	22.9-28.3%	27.6	24.9-30.5%	29.7	26.9-32.7%	29.0	25.3-33.1%	23.4	22.0-24.8%
<b>Acute inpatient care</b>															
<i>Hospital</i>															
Women	4066	11.1	8.5-14.3%	12.3	8.9-16.7%	9.0	6.8-11.9%	12.5	10.0-15.4%	18.8	15.5-22.8%	19.9	16.2-24.2%	13.3	12.0-14.7%
Men	3673	9.1	6.4-12.7%	6.7	4.5-9.9%	8.9	6.6-12.0%	14.3	11.4-17.8%	20.5	16.8-24.7%	20.1	16.5-24.2%	12.4	11.0-14.0%
Total	7739	10.1	8.1-12.4%	9.5	7.3-12.2%	9.0	7.3-11.0%	13.4	11.4-15.6%	19.6	17.0-22.5%	20.0	17.4-22.9%	12.9	11.9-13.9%



**Tab. 2** Utilisation of outpatient and inpatient services in the last 12 months (proportion of the population in %) by specialisation and sectors (by social status, region, community type, insurance type, health insurance and self-rated health)

	Social status			Area		Community type			Health insurance			Self-rated health	
	Low	Medium	High	West	East (including Berlin)	Small <sup>a</sup>	Medium <sup>b</sup>	Large <sup>c</sup>	Local Health Insurance Funds (AOK)	Other statutory health insurance	Private health insurance/allowance	Very good/good	Average/poor/very poor
<b>Dermatologist</b>													
%	18.4%	19.9%	25.8%	21.3%	19.5%	19.6%	18.7%	21.9%	18.8%	21.1%	24.8%	20.5%	22.1%
95% CI	16.0–21.0%	18.6–21.3%	23.2–28.5%	19.9–22.7%	17.3–21.8%	17.4–21.9%	15.7–22.2%	20.4–23.5%	16.6–21.1%	19.8–22.5%	21.2–28.8%	19.1–21.9%	19.8–24.5%
<b>Internist</b>													
%	17.5%	20.6%	21.1%	20.3%	19.4%	18.3%	16.2%	21.8%	19.9%	20.3%	20.4%	15.4%	34.3%
95% CI	14.9–20.4%	19.1–22.1%	19.1–23.3%	19.1–21.6%	17.4–21.6%	16.3–20.5%	13.7–18.9%	20.4–23.1%	17.8–22.2%	18.9–21.8%	17.5–23.7%	14.3–16.6%	31.7–36.9%
<b>Neurologist/psychiatrist</b>													
%	10.2%	7.7%	6.9%	8.3%	7.7%	7.6%	8.5%	8.4%	8.9%	8.6%	4.4%	5.0%	17.6%
95% CI	8.2–12.6%	6.8–8.8%	5.4–8.8%	7.4–9.3%	6.4–9.2%	6.1–9.3%	6.7–10.6%	7.4–9.5%	7.3–10.7%	7.6–9.7%	3.1–6.2%	4.4–5.8%	15.5–19.9%
<b>Orthopaedist</b>													
%	26.0%	24.1%	21.5%	24.5%	22.2%	22.3%	22.3%	25.1%	24.4%	24.4%	21.2%	19.1%	38.9%
95% CI	22.8–29.3%	22.5–25.8%	19.3–23.8%	23.0–26.0%	19.8–24.9%	19.9–24.9%	19.0–25.9%	23.5–26.8%	21.9–27.1%	22.7–26.2%	18.2–24.5%	17.7–20.6%	36.3–41.6%
<b>Psychotherapist</b>													
%	4.3%	4.2%	4.4%	4.4%	4.1%	4.1%	3.3%	4.6%	5.0%	4.1%	4.0%	3.0%	8.2%
95% CI	3.1–6.1%	3.5–5.0%	3.3–5.8%	3.7–5.1%	3.2–5.2%	3.0–5.4%	2.4–4.6%	3.9–5.5%	3.7–6.8%	3.4–4.9%	2.6–6.1%	2.5–3.6%	6.6–10.1%
<b>Radiologist</b>													
%	20.4%	19.7%	17.1%	19.5%	19.0%	19.8%	19.2%	19.2%	19.6%	19.9%	15.9%	15.2%	32.0%
95% CI	17.3–23.8%	18.2–21.4%	15.0–19.4%	18.0–21.0%	16.8–21.3%	17.2–22.6%	16.8–21.9%	17.6–20.9%	17.2–22.1%	18.4–21.4%	13.3–18.9%	14.0–16.4%	29.4–34.7%
<b>Urologist</b>													
%	11.0%	11.1%	11.6%	10.2%	14.6%	10.9%	10.4%	11.4%	10.5%	11.4%	12.4%	8.7%	18.5%
95% CI	8.9–13.4%	10.0–12.4%	10.1–13.4%	9.3–11.2%	12.8–16.7%	9.4–12.6%	8.3–13.0%	10.2–12.7%	8.9–12.2%	10.2–12.7%	10.1–15.2%	7.9–9.6%	16.6–20.6%
<b>Dentist/orthodontist</b>													
%	56.0%	73.6%	80.9%	70.9%	74.7%	70.4%	73.4%	71.9%	63.9%	75.2%	72.0%	73.5%	66.2%
95% CI	52.6–59.4%	71.9–75.3%	78.4–83.1%	69.3–72.4%	72.1–77.2%	67.9–72.8%	69.1–77.3%	70.1–73.6%	61.2–66.5%	73.5–76.8%	67.9–75.7%	71.9–75.1%	63.4–68.9%
<b>Therapists</b>													
<b>Alternative practitioners</b>													
%	3.0%	5.1%	5.5%	5.3%	2.7%	5.4%	4.3%	4.5%	3.5%	4.8%	7.8%	4.1%	6.7%
95% CI	1.9–4.7%	4.2–6.0%	4.3–7.0%	4.5–6.1%	2.0–3.7%	4.1–7.1%	3.2–5.7%	3.8–5.4%	2.5–4.8%	4.0–5.7%	5.7–10.5%	3.5–4.9%	5.4–8.3%
<b>Physiotherapist</b>													
%	20.0%	24.2%	23.6%	22.5%	26.6%	27.8%	22.8%	21.5%	19.8%	23.7%	28.5%	19.2%	36.1%
95% CI	17.2–23.2%	22.5–26.1%	21.2–26.2%	21.0–24.1%	24.2–29.3%	25.4–30.4%	19.9–26.1%	19.9–23.3%	17.8–22.0%	22.0–25.6%	25.3–32.0%	17.9–20.6%	33.1–39.3%

**Tab. 2** Utilisation of outpatient and inpatient services in the last 12 months (proportion of the population in %) by specialisation and sectors (by social status, region, community type, health insurance and self-rated health) (Continued)

	Social status			Area		Community type			Health insurance			Self-rated health	
	Low	Medium	High	West	East (including Berlin)	Small <sup>a</sup>	Medium <sup>b</sup>	Large <sup>c</sup>	Local Health Insurance Funds (AOK)	Other statutory health insurance	Private health insurance/allowance	Very good/good	Average/poor/very poor
<b>Acute inpatient care</b>													
<i>Hospital</i>													
%	16.1%	12.9%	9.8%	13.0%	12.4%	14.3%	11.7%	12.5%	14.6%	12.8%	9.8%	9.2%	24.0%
95% CI	13.6–18.8%	11.7–14.1%	8.5–11.4%	11.9–14.3%	10.8–14.1%	12.6–16.2%	9.5–14.3%	11.2–14.0%	12.6–16.7%	11.6–14.1%	7.9–12.1%	8.3–10.2%	21.5–26.6%

<sup>a</sup><50,000 inhabitants without communities around core cities

<sup>b</sup>Core city 50000 to <100,000 inhabitants plus surrounding communities

<sup>c</sup>Core city ≥100,000 inhabitants and surrounding communities.

acute inpatient care in the 12 months preceding the survey. There is a significant age association in this context: the older the respondents, the more likely they were to be treated as inpatients. Thus one fifth of 60- to 79-year-old women and men received inpatient treatment. The age association is somewhat blurred by the higher treatment frequency of women in the age groups from 18–39 years—the age range with the highest probability of utilisation due to pregnancy and birth (■ **Tab. 1**).

Significant differences can be found in the proportion of persons who spent at least one night in hospital within the last 12 months in relation to social status (a higher social status is associated with less frequent hospitalisation), insurance status (AOK insurees receive inpatient treatment considerably more often than those with private health insurance), and general health (there is a highly significant association between self-assessed average to very poor health and higher treatment frequency) (■ **Tab. 2**).

Provided that they received inpatient care at all, women spent an average of 9.5 nights and men 10.0 nights in hospital. Whereas the number of nights spent in hospital significantly increases for men, women aged between 50 and 59 tend to spend more nights in hospital than both younger and older women (■ **Tab. 3**).

### Trends in the utilisation of medical services

Assuming the same age composition of the population at both points in time (age adjustment), a comparison with GNHIES98 shows only small differences in the level of utilisation over 12 months. Accordingly, the proportion of 18- to 79-year-old respondents who made use of medical services at least once in the 12 months prior to the survey (either as outpatients or inpatients) is 97.4% for GNHIES98 and 96.9% for DEGS1.

For general practitioners, there is a marked increase in utilisation from 70.9 to 79.4%. For physicians specialising in dermatology, ENT medicine, neurology/psychiatry, orthopaedics, urology, gynaecology and psychotherapy, DEGS1 reports significantly higher utilisation rates than GNHIES98. For almost all groups of spe-

**Tab. 3** Number of doctor visits, contacted specialisation groups and nights spent in hospital in the last 12 months (mean values by sex and age)

Sex	n <sub>unweighted</sub>	Age group													
		18–29 years		30–39 years		40–49 years		50–59 years		60–69 years		70–79 years		Total	
		Ø	95% CI	Ø	95% CI	Ø	95% CI	Ø	95% CI	Ø	95% CI	Ø	95% CI	Ø	95% CI
<b>Contact frequency (physicians)</b>															
Women	3714	9.3	8.5–10.1	9.8	8.7–11.0	9.6	8.7–10.4	11.2	10.1–12.4	12.9	11.7–14.2	12.3	11.2–13.4	10.7	10.3–11.1
Men	3493	6.1	5.2–6.9	5.7	5.0–6.4	7.2	6.4–8.1	8.6	7.7–9.5	10.8	9.0–12.6	10.6	9.8–11.4	7.9	7.4–8.3
Total	7207	7.6	7.0–8.2	7.7	7.1–8.4	8.4	7.8–9.0	9.9	9.2–10.6	11.9	10.8–12.9	11.5	10.8–12.2	9.2	8.9–9.5
<b>Contacted specialist groups (physicians)</b>															
Women	4092	3.6	3.5–3.8	3.7	3.5–3.8	3.9	3.7–4.1	4.2	4.0–4.4	4.6	4.4–4.8	4.4	4.2–4.6	4.0	4.0–4.1
Men	3690	2.4	2.3–2.6	2.4	2.3–2.6	2.8	2.6–2.9	3.1	3.0–3.3	3.8	3.6–4.0	4.1	3.9–4.3	3.0	2.9–3.1
Total	7782	3.0	2.9–3.1	3.0	2.9–3.2	3.3	3.2–3.5	3.7	3.5–3.8	4.2	4.0–4.3	4.3	4.1–4.4	3.5	3.5–3.6
<b>Hospital stay duration</b>															
Women	594	7.3	5.5–9.0	7.4	5.7–9.1	10.6	4.8–16.4	12.9	8.3–17.4	9.6	7.0–12.2	9.1	7.1–11.1	9.5	8.2–10.9
Men	524	6.0	4.5–7.6	5.9	1.7–10.0	11.0	7.7–14.4	9.6	7.3–12.0	11.7	8.7–14.8	12.3	9.1–15.5	10.0	8.7–11.2
Total	1118	6.7	5.5–7.8	6.9	5.1–8.7	10.8	7.5–14.1	11.1	8.7–13.6	10.7	8.7–12.6	10.5	8.7–12.4	9.7	8.8–10.6

Ø mean.

**Tab. 4** Number of doctor visits, contacted specialisation groups and nights spent in hospital in the last 12 months (mean value by social status, area, community type, health insurance and self-rated health)

	Social status			Area		Community type			Health insurance			Self-rated health	
	Low	Me- dium	High	West	East (in- cluding Berlin)	Small <sup>a</sup>	Me- di- um <sup>b</sup>	Large <sup>c</sup>	Local Health Insur- ance Funds (AOK)	Other statu- tory health insur- ance	Private health insur- ance/ allow- ance	Very good/ good	Average/ poor/ very poor
<b>Contact frequency (physicians)</b>													
Mean	10.4	9.2	8.3	9.3	9.1	9.1	8.6	9.4	9.8	9.3	7.9	7.4	15.0
95% CI	9.5–11.4	8.9–9.6	7.8–8.7	8.9–9.6	8.6–9.6	8.5–9.7	7.9–9.3	9.0–9.8	9.0–10.5	8.9–9.6	7.2–8.7	7.2–7.6	14.1–15.9
<b>Contacted specialist groups (physicians)</b>													
Mean	3.3	3.6	3.6	3.5	3.6	3.5	3.4	3.6	3.5	3.6	3.3	3.2	4.4
95% CI	3.2–3.5	3.5–3.6	3.4–3.7	3.4–3.6	3.5–3.7	3.4–3.6	3.3–3.5	3.5–3.6	3.3–3.6	3.5–3.7	3.2–3.5	3.2–3.3	4.3–4.5
<b>Hospital stay duration</b>													
Mean	10.1	10.1	7.9	9.7	10.0	11.4	9.6	8.9	10.9	9.4	7.1	7.3	12.6
95% CI	8.3–11.9	8.8– 11.4	6.2–9.7	8.6–10.7	8.6–11.4	9.2– 13.6	7.3– 11.9	8.0–9.9	9.2–12.6	8.3–10.6	4.6–9.6	6.4–8.3	11.0–14.1

<sup>a</sup><50,000 inhabitants without communities around core cities<sup>b</sup>Core city 50,000 to <100,000 inhabitants plus surrounding communities<sup>c</sup>Core city ≥100,000 inhabitants and surrounding communities.

iotherapists and alternative practitioners. In the 12 months before the survey 23.4% of respondents had undergone physiotherapeutic treatment (■ Tab. 1). The highest utilisation rates are found among persons who describe their health as average or worse (■ Tab. 2). In addition, utilisation of physiotherapeutic services varies depending on the age and gender of respondents. Significantly increased utilisation rates can be found in East Germany and for respondents with private health insurance as opposed to AOK insurances. The average number of contacts

with physiotherapists for the year prior to the interview is 2.6. The highest average number of contacts is observed in persons with average to poor health. Since many complaints leading to physiotherapeutic treatment are age-associated, contact frequencies clearly increase with age. However, men from the age of 70 show a slight decrease in contact frequencies.

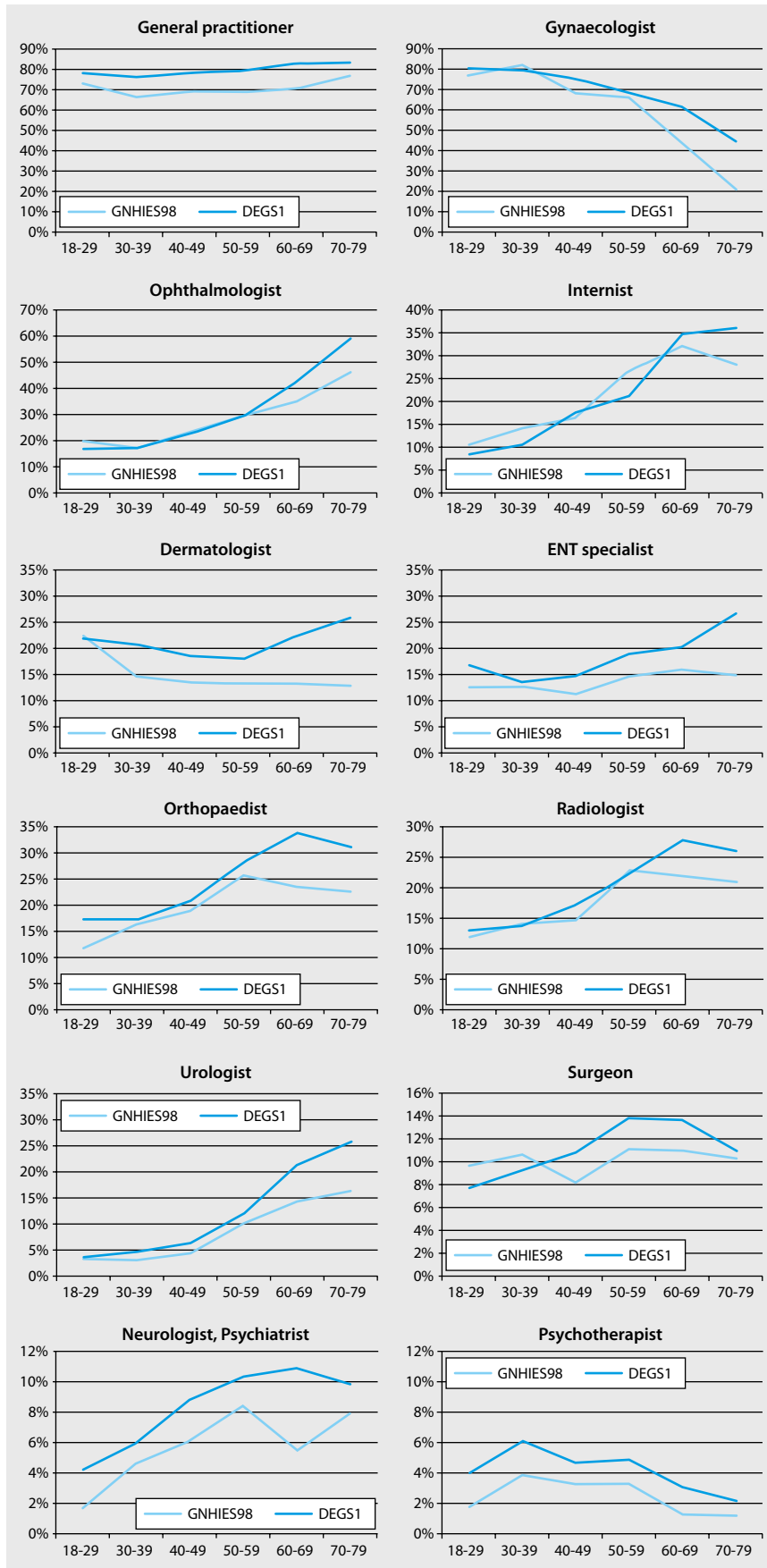
Compared to physiotherapy, services provided by alternative practitioners are used considerably less frequently. Only 4.7% of all respondents stated that they had seen an alternative practitioner in the

last 12 months prior to the survey. Women (6.5%) seek more often alternative practitioners than men (2.9%) (■ Tab. 1). In addition, people who rate their health as average or worse have a higher probability to seek alternative therapies (■ Tab. 2).

### Utilisation of acute inpatient care

In addition to the utilisation of outpatient services, acute inpatient care in hospitals is a fundamental pillar of the public health system. Accordingly, 13.3% of female and 12.4% of male respondents made use of





cialists, this increase is observed mainly in elderly participants (■ Fig. 1). For physicians specialising in ophthalmology, radiology and surgery, there is also a slight but not significant increase. A slight but not significant decrease in utilisation is found only for treatments in the fields of internal medicine and dentistry.

Even the number of specialist groups contacted shows a significant increase both for men (from 2.7 to 3.0) and women (from 3.6 to 4.0) compared to 1997/1998. This increase is largely attributable to higher utilisation of different groups of specialists by the age group of 60–79 year olds (■ Fig. 2).

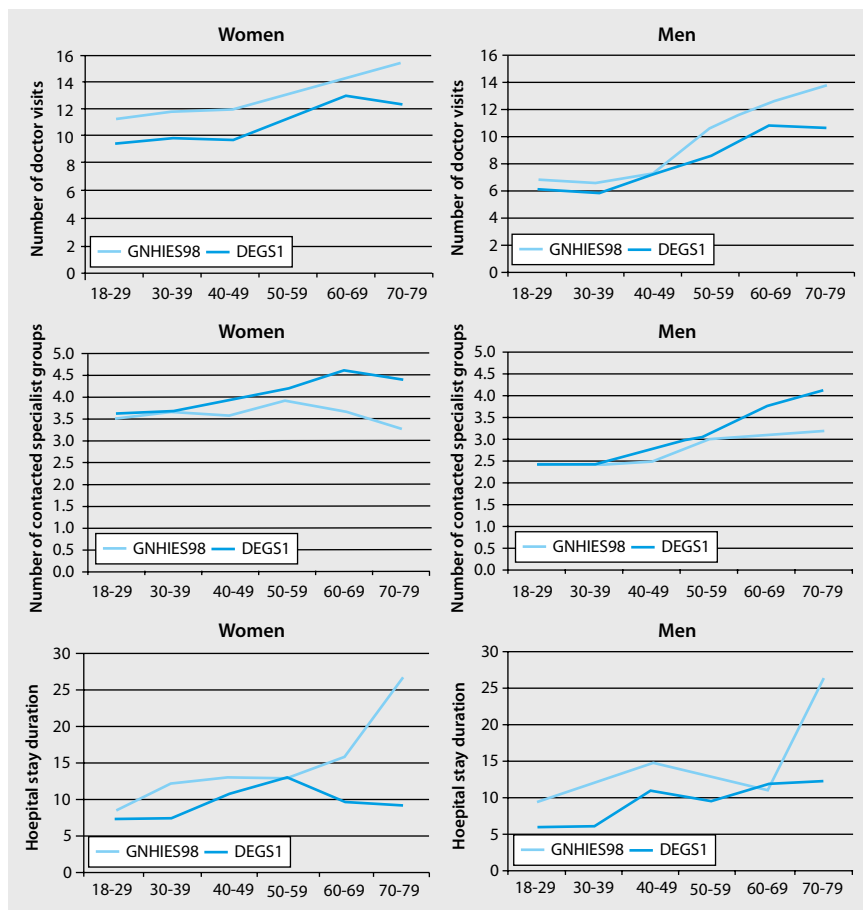
The trend for the number of consultations is also shown in ■ Fig. 2. A development contrary to the two indicators described above is found here: with 7.9 visits for men and 10.7 for women per year, respondents on average consulted a physician less often than at the end of the 1990s (men 9.1; women 12.7). Whereas for men the decline only occurs from the age group of 50–59 year olds onwards, it is observed in women of all age groups.

A significant reduction in the average duration of hospital stays is found for acute inpatient care: whereas women treated as inpatients stayed in hospital for an average of 14.5 nights in 1997/1998, this figure went down to 9.5 nights in 2008–2011. For male patients, the duration of hospital stays fell from 15.8 to 10.0 nights (■ Fig. 2).

## Discussion

The presented DEGS1 data on the utilisation of medical services constitute important indicators for demand-based health reporting. As regards distribution by age and sex, some typical patterns in utilisation behaviour can be observed which stay relatively constant over time. For women is observed a higher degree of utilisation for many of the covered medical services, especially during child-bearing years. This applies to both the majority

**Fig. 1** ◀ Utilisation of physicians in the last 12 months, by specialisation and age groups (proportion of the population in %) comparing GNHIES98 with DEGS1



**Fig. 2** ▲ Number of doctor visits, contacted specialisation groups and nights spent in hospital in the last 12 months (mean values) comparing GNHIES98 with DEGS1 (by gender and age groups)

of outpatient services provided by physicians or non-medical therapists and acute inpatient care. Apart from differences in the reproductive systems, possible reasons for higher utilisation levels among women currently discussed include higher sensitivity to body and health issues as well as greater willingness to accept help [27]. Frequently, for men it is only when an illness manifests itself that they make use of medical services to the same extent as women [28]. It is not surprising, therefore, that the differences decrease or disappear over time, as the need of men for treatment increases with age. In addition, women make use of preventive services more often than men [29, 30, 31, 32]. Accordingly, gender differences are especially striking for those groups of specialists in whose spectrum of services preventive measures such as screening for early detection play an important role. Differences in utilisation by social status are also particularly pronounced for groups of

physicians with a strong focus on prevention (gynaecology, dentistry, dermatology). This is confirmed by analyses according to which there is less demand for preventive services among socially disadvantaged groups [13].

By age, a clear increase in the utilisation of services can be found in specialties which are closely related to the health status of the respondents. The same does not apply to the utilisation of specialists whose services are more focused on preventive measures (dentists and gynaecologists). Moreover, rising multimorbidity with increasing age is not only accompanied by a rise in utilisation of most physician groups within one year, but also goes along with an increase in the overall number of doctor visits as well as the number of specialties that are consulted. It is striking that in the oldest population group, no further increase but rather a slight drop is observed for many types of services. This decrease could be linked to the fact that

medical consultations become more and more of an upheaval for this age group and that in weighing up effort versus benefits of utilising a given health service, the elderly are more likely to conclude that a visit is not worth the effort [33]. In addition, it is to be assumed that at a higher age, people get used to physical restrictions and health complaints to some extent and that they do not longer classify impairments in daily life to the same degree as in younger age groups [34].

A time comparison between 1997/1998 and 2008–2011 shows trends, explanations for which could be found in the rising prevalence of multimorbidity but also in the change of the German health system. Whereas compared to GNHIES98 the number of contacted specialists increased among the elderly, contact frequency to physicians and also the duration of hospital stays has declined noticeably.

On the one hand, the trend to see specialists has intensified, especially among older age groups for which the healthcare needs of multimorbid patients are increasingly emphasised. It appears that this expansion of services has not occurred at the expense of GPs. On the contrary, the group of general practitioners who is responsible for the majority of general medical services is marked by growth in utilisation. This suggests that control of the health system by means of a gatekeeper function of general practices as has been aimed for through instruments such as practice fees (“Praxisgebühr”) and primary physician models (“Hausarztverträge”) may be accompanied by a further medical specialisation and a stronger utilisation of these groups of specialists, correspondingly. Thus, the comparison between GNHIES98 and DEGS1 corroborates the conclusions of earlier findings according to which the use of general practitioners does not necessarily lead to an overall reduction of physician contacts [6].

On the other hand, dwindling contact frequencies and reductions in the length of hospital stays may be attributable to the effects of earlier health reforms. The decline in the average length of a hospital stay for acute inpatient care has continued as a result of the introduction of diagnosis-related groups since 2004 [35], not at least because economic pressure on hos-

pitals is constantly increasing [36]. This tendency is confirmed by hospital statistics [37] and entails a shift in service provision towards the area of medical rehabilitation [38]. Similarly, the overall decrease in the number of physician contacts may be linked to changed invoicing modalities. Since 2008 flat rates paid for insurees who are undergoing treatment can be invoiced only once a quarter. Thus the reform of the invoicing system of the so-called "Einheitlicher Bewertungsmaßstab" (EBM) entails that doctors have less of an incentive for encouraging patients to make frequent appointments.

### Comparison with other data

According to an analysis of health insurance data of Barmer GEK, 93% of all Barmer GEK policyholders visited a medical practice at least once a year in 2009 [15]. For AOK insurees, a proportion of 87.3% was established for 2007 [39]. A survey of the Federal Association of Statutory Health Insurance Physicians (KBV) found that in the year 2011, 83% of the German-speaking population visited a medical practice in the last 12 months (excluding dentist visits) [8]. In telephone interviews conducted by the RKI in 2009, 87.8% stated that their last visit had occurred within the last 12 months. This figure was 88.5% in 2010 [13, 14]. Comparison with the utilisation rate of 96.9% reported in this paper is limited, however, because the calculation included both outpatient and inpatient medical care, considering dentistry and services provided by company physicians and public health officers.

For 2009, Barmer GEK reports 14.4 doctor visits [15] for their insurees and AOK 11.5 doctor visits for the year 2007 [39]. An analysis of the Central Research Institute of Ambulatory Health Care in Germany (ZI) even found 17 doctor visits per person insured under statutory health insurance in 2007. However, this is calculated on the basis of insured persons who saw a doctor at least once in 2007 [16], whereas the average contact frequency in DEGS1 refers to all respondents.

In terms of physiotherapeutic health-care, the payment data of Barmer GEK for 2010 compared to DEGS1 show a low-

er utilisation of about 15% [40]. Apart from the limited representativeness of insurance data, some of the differences are probably attributable to the fact that physiotherapeutic services are also used without medical prescriptions and thus privately financed. This type of utilisation is recorded in DEGS1 but not in the data of health insurers. Compared to physiotherapeutic services, utilisation of alternative services is very low in DEGS1. The figures largely concur with earlier surveys [41, 42]. However, statements about general acceptance of alternative types of treatment cannot be inferred from this [41, 42, 43].

The hospital statistics of the Federal Statistical Office (StBA) for inpatient cases shows an average hospital stay of 8.4 days for adults for the year 2010. In contrast, respondents reported 9.7 nights of hospitalisation in DEGS1. One of the possible causes of this difference is that the diagnosis-related hospital statistics are case statistics, meaning that due repeated hospital stays patients may be counted more than once. In consequence, an individual case has a somewhat shorter hospital stay duration than persons with several hospital stays. However, the clear reduction in the average hospital stay duration shown by a comparison of GNHIES98 and DEGS1 concurs with the diagnosis-related hospital statistics and the results of several other studies [37, 44].

Overall, the comparability of survey and payment data is limited by the fact that the two data sources face different methodological limitations [45]. Thus for survey data, there is the problem of recall bias which—especially when a longer period of time such as the last 12 months is recorded—can lead to a certain underestimation of contact prevalence and frequencies. On the other hand, statistics based on payment data also show limits which can relate, for example, to the specified purpose of the data [21, 22] or changes to the legal framework of invoicing. Examples include the introduction of diagnosis-related flat-rate charges per case in acute inpatient care and the case-based compensation for outpatient services introduced as part of the reform of the so called EBM. Other deviations can result from the different age groups

studied and from different age standardisations. Overall, it must be emphasised that none of the various data sources can be used for the purpose of utilisation research without restrictions.

### Outlook

Our results presented on the utilisation of medical services complement the data from official statistics and service providers by adding representative data of the German population. These data represent the service provision situation from the viewpoint of patients. In conjunction with structural data (for example on physician density) and data of service providers, it is possible to describe the health-care situation for Germany across individual insurees.

Through the type of weighting used, time comparisons presented here control for the effects of demographic ageing. This only makes possible statements on the trends of medical services which are independent of population ageing. Plans exist to conduct further analyses which will also represent the changes in utilisation levels resulting from demographic ageing.

In addition, multivariate analyses will take into account interactions between the different influencing factors. Furthermore, health status as an important explaining variable must be incorporated into the analysis in more complex ways. Apart from trend analyses, the DEGS1 data also permit longitudinal analyses on the utilisation of medical services in the course of a lifetime.

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