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## **Attention-Deficit Hyperactivity Disorder (ADHD) in Nordbaden / Germany**

**Administrative Prevalence  
& Implications for Health Care Provision and Future Research**



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### **Administrative Prevalence of Attention-Deficit/Hyperactivity Disorder (ADHD) in Nordbaden / Germany: Implications for Health Care Provision and Future Research**

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## Abstract

*Objectives:* The retrospective analysis determined the age and gender specific one-year administrative prevalence rate of attention-deficit/hyperactivity disorder (ADHD: hyperkinetic disorder, HKD, and hyperkinetic conduct disorder, HKCD, according to ICD-10 based diagnosis coding) in Nordbaden / Germany in 2003. It assessed as well as the specialist physician groups involved in medical care (diagnosis and treatment) of these patients. *Methods:* The comprehensive medical claims database of the Association of Statutory Health Insurance Physicians (Kassenaerztliche Vereinigung) in Nordbaden, covering an insured population of 2.238 million in Southwest Germany, was used to identify patients with a diagnosis of "HKD" or "HKCD", and their physicians, in 2003. *Results:* 11,875 subjects with a diagnosis of ADHD (HKD, HKCD) were identified, resulting in an overall 12-months prevalence rate of 0.5%. Prevalence was highest among children age 7-12 years (5.0%; boys, 7.2%; girls, 2.7%), with a peak of 6.1% at age 9 years (boys, 8.4%; girls, 3.6%). Among adults age years 20 and higher, administrative prevalence was low at 0.04% (males, 0.04%; females, 0.03%). Less than 40% (15%) of children and adolescents, and only 33.5% (12.5%) of adults with a diagnosis of ADHD were seen by a specialized physician at least once (four times) during the year. *Conclusions:* The present analysis provides encounter-based data indicating diagnosis rates compatible with epidemiological estimates for ADHD according

to DSM-IV but higher than expected for ICD-10 based "HKD/HKCD". In the adult population of Nordbaden / Germany, ADHD is rarely diagnosed. These findings point to a need for further health care utilization research.

## **Introduction**

Attention-deficit/hyperactivity disorder (ADHD) is thought to be the most common behavioral problem in children and adolescents in the United States and internationally, affecting up to 1 of out of 20 children (1). Though symptoms tend to decline with age (2), longitudinal studies have shown ADHD persistence into adulthood (3). For adults, however, only few epidemiological data are yet available. Furthermore, in clinical practice detection and accurate diagnosis of ADHD can present specific challenges as the presentation of symptoms may differ in adults (4-6).

Reported prevalence rates of ADHD in children and adolescents depend on diagnostic criteria used. According to the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), ADHD is defined by pervasive presence of symptoms of inattention and/or hyperactivity-impulsivity over a period of at least six months. Studies using DSM-IV criteria consistently report the highest prevalence rates, ranging from 11.4% to 16.1% in children aged 8 to 10 years, excluding outlying values (1). Only recently, in adults a prevalence rate of

4.2% according to DSM-IV was found in a nationally representative sample of workers in the United States (7). In the Netherlands, the prevalence of ADHD in the adult population has been estimated at 1.0% to 2.5% on the basis of self-reports (8).

Diagnostic criteria for Hyperkinetic Disorder (HKD) according to ICD-10 (code F90.0), albeit based on a similar list of symptoms, are stricter as they require the pervasive presence of both inattention (minimum 6 out of 9 symptoms), hyperactivity (3/5) and impulsivity (1/4). If conduct disorder is present, too, a diagnosis of Hyperkinetic Conduct Disorder (HKCD) is made (ICD-10 code F90.1). Obviously, these stricter criteria result in lower prevalence rates, reports of which for European countries converge on about 1.5% (9). In Germany, based upon a mail survey of 165 parents of children aged between 6 and 10 years old using a parent rating scale for ADHD, a prevalence rate of 2.4% according to ICD-10 criteria (or 6.0% according to DSM-IV in the same sample) was reported (10). This is the same magnitude as the prevalence of 2.9% found for Tennessee elementary school children with symptoms of "impaired combined type ADHD", the DSM-IV subtype which corresponds best to ICD-10 criteria (11). For the adult population, no ICD-10 based epidemiological data are available.

In the United States and Germany, like elsewhere, escalating diagnosis rates of ADHD in children and adolescents have given rise to concerns and debate about the quality of clinical

diagnoses as well as possible overtreatment (12, 13). Against this background, the objective of the present study is to retrospectively assess the recent administrative prevalence of ADHD by age and gender using the comprehensive claims database of Nordbaden / Germany for 2003, and to discuss potential implications of these data in light of the results of high-quality epidemiological studies. In addition, we analyze the involvement of physician specialist groups in the care of patients with a diagnosis of ADHD. In an attempt to further characterize the involvement of physician groups, we also determine the share of ADHD patients with coexisting conduct disorder by physician group.

## Methods

Nordbaden is a region in the Southwest of Germany with a population of 2.723 million, 82.2% of which (n=2.238m) are insured by Statutory Health Insurance (SHI). On average, in 2003 key sociodemographic population characteristics (14-16) did not substantially deviate from Germany as a whole (with a population of 82.537m, of which 70.422m, or 85.7%, are insured by SHI). For instance, male/female ratios were identical (0.88:1). The age distribution of the Nordbaden sample compared well with the German population (figures in brackets): age 0-6 years, n=150,476 or 6.7% (4.470m or 6.4%), age 7-12 years, n=141,857 or 6.3% (4.166m or 5.9%), age 13-19 years, and age 20 years and above, n=1,770,464 or 79.1% (56.064m or 79.6%). The number of



physicians in private practice in Nordbaden was 4,905 or 219.1 per 100,000 persons insured (Germany: 127,711 or 181.4 / 100,000), of which were: (a) general practitioners including specialists in internal medicine working as family doctors: 2,102 or 93.9 / 100,000 (Germany: 70,747 or 86.3 / 100,000) and (b) pediatricians in private practice 211 or 9.3 / 100,000 (Germany: 6,093 or 8.7 / 100,000). Of note, however, in relative terms the number of child and adolescent psychiatrists in Nordbaden (30 or 1.3 / 100,000) was almost twice as high as the German average (519 or 0.7 / 100,000).

The population under study thus comprised all persons insured by SHI in the region of Nordbaden. An individual monthly gross income exceeding 3,825 Euro (the so called "*Krankenversicherungspflichtgrenze*") was required for parents in 2003 to be allowed to opt out of the SHI system; within the SHI system, children were co-insured with their parents at no extra premiums. The SHI system provided comprehensive coverage of medical services, without co-payments by children and adolescents below age 18 years, and with only moderate out-of-pocket payments required from adults, which were capped by a social hardship clause. Within the SHI system, physicians were reimbursed on a fee-for-service basis, making underreporting unlikely and hence justifying the expectation that patient visits were indeed well captured within the claims database.

In accordance with established policies and principles for protection of privacy and confidentiality (17, 18), the complete administrative datasets from the Nordbaden region for all four quarters of 2003 were given to the researchers, with all personal identifiers (of patients and service providers) replaced by pseudonyms by the Regional Association of the Statutory Health Insurance Physicians (Kassenaerztliche Vereinigung, KV) Nordbaden (now KV Baden-Wuerttemberg). A data analysis plan and formal data transfer protocol had been established and approved by the data protection officer of the KV Nordbaden. Informed patient consent was not required according to relevant German regulations since the use of pseudonyms effectively ensured that no research data could be traced back to individual patients or their physicians (17).

From the four separate claims databases received for Q1 through Q4 2003, all records with an ICD-10 code F90.0 or F90.1 were retrieved, patient pseudonyms identified, and for each pseudonym the data sets were searched electronically for all claims data for all quarters of 2003. This way a 12-months patient-based database was established for subsequent retrospective evaluations. Patients with a diagnosis of both HKD (F90.0) and HKCD (F90.1) during 2003 were categorized as having HKCD. Also those patients coded F90.0 with an additional diagnosis of conduct disorders (F91) or mixed disorders of conduct and emotions (F92) during 2003 were reclassified as "HKCD".

For analysis of physician contacts, clinical disciplines were classified as follows: general practitioners (g.p.'s, including specialists in internal medicine working as family doctors, collectively referred to as "APIs"), pediatricians, psychiatrists, neurologists, child and adolescent psychiatrists, behavioral and psychological therapists, and pediatricians, child and adolescent psychiatrists and other physicians employed by hospitals but entitled to treat outpatients under the German SHI system. "Specialists" were defined to include neurologists, psychiatrists, child and adolescent psychiatrists, whether in private practice or in hospitals if entitled to treat SHI patients. Double-counts were identified and eliminated for statistical analyses.

## Results

11,875 patients with a diagnosis of HKD or HKCD were identified in Nordbaden in 2003 (cf. Tabs. 1 and 2), translating into an overall one-year administrative prevalence rate of 0.53%; of these, 8,678 were male (prevalence: 0.83%) and 3,197 were female (prevalence: 0.27%). For children age 6 years or less, 12-month prevalence rates were 1.26% in total, 1.72% for boys and 0.77% for girls; for children age 7-12 years, 4.97% (boys, 7.15%; girls, 2.66%), age 13-19 years, 1.31% (males, 1.99%; females, 0.60%). In addition, n= 630 adults, age 20 years or more, with a diagnosis of HKD or HKCD were identified; of those, n=345 were male (prevalence rate 0.04%) and n=285 were female

(prevalence rate 0.03%). Prevalence was highest at age 9 (peak; overall: 6.1%; boys, 8.4%; girls, 3.6%).

Boys and young male adults were more frequently diagnosed with ADHD than girls and females below age 30 years (ratio 2.8/1 in 6-19 year olds, 2.0/1 in 20-30 year olds). Prevalence differences by gender dissipated with increasing age and disappeared completely in patients over 30 years. The overall share of patients with concomitant conduct disorder (HKCD) was 29% of all with a diagnosis of "hyperkinetic disorder". In the age group below 6 years, it was 23.6%, with a small difference by gender only (boys, 24.3%; girls, 21.0%). The proportion of patients with conduct disorder was higher in boys age 7-12 years (30.0%; as opposed to 24.8% in girls of similar age; overall in this age group, 28.7%); and it was highest in adolescents age 13-19 (37.9%), with increases observed in both males (39.3%) and females (33.0%). In adults, rates of coexisting conduct disorder were lowest (15.6%), with no observable difference by gender (cf. Tab. 2).

The analysis of physicians involved (cf. Tab. 3) showed specialist involvement in medical care of patients with ADHD in 36% of all patients. Across all age groups, less than 15% of patients with a diagnosis of ADHD were seen at least four times during the year by a physician specialist, our proxy for treatment by or under the supervision of specialist (cf. below, Discussion). Except for adult patients, ADHD patients seen by

specialists were more often diagnosed as having coexisting conduct disorder compared with patients not seen by specialists (cf. Tab. 4); this difference was highest among the very young patients (up to age 6 years) and did not exceed 10 percentage points in any of the age groups examined.

## **Discussion**

A key strength of retrospective claims databases is that they allow to examine medical care utilization as it occurs in routine clinical care (19). In principle, administrative prevalence data provide information about the contacts of patients with the respective parts of the health care system. Given the German fee-for-service reimbursement system for physicians in private practice, it seems reasonable to assume that these data reflect the rate at which a disorder is recognized in practice – there is little if any reason to suspect underreporting of such encounters – of course, apart from those cases that have not been recognized by health care providers.

A potential source of bias is the restriction of the dataset to patients covered by Statutory Health Insurance (SHI), thereby excluding some of the higher income families. Though perhaps tempting, caution should be exercised regarding attempts to extrapolate our findings to the privately insured population, as there may be differences of prevalence by type of insurance (20). With a sample population in excess of two million and coverage

of more than 82% of the regional population in Nordbaden, we believe the data can nevertheless be expected to provide some important insights. Since the population in Nordbaden does not seem to differ substantially from the German average, at least in principle, some generalizations should be possible from the present sample.

By way of caution, we also emphasize that previous studies have indicated regional variation in prevalence rates of ADHD (21, 22). For Germany, relevant data are available on regional variance of psychostimulant prescriptions only (23). Prescribed defined daily doses of methylphenidate were found, in the year 2001, to range from 1.31 in the region of Sachsen-Anhalt to 4.72 in the region of Rheinhessen and 5.82 in the (urban) region of Bremen; the figure for Nordbaden was 3.37, comparing to an average of 2.74 in Germany as a whole.

As for retrospective claims data analyses in general, an important limitation of the data is the lack of verifiable information about the quality of diagnosis and coding. The administrative prevalence of "HKD" and "HKCD" of 4.97% in children age 7 to 12 years in Nordbaden in 2003, coded according to ICD-10, appears extraordinarily high in light of high-quality epidemiological studies indicating a "true prevalence" of hyperkinetic disorder (HKD and HKCD) in the range of 1.5% to 2.9% in school age children (9-11). A number of possible explanations seem conceivable, one being that many

physicians might indeed prefer the broader DSM-IV criteria (9) to establish a diagnosis of ADHD – whereas the reporting system enforces ICD-10 based coding. This hypothesis is supported by a mini-survey we conducted with a convenience sample of six German pediatricians, who indeed without exception confirmed that they adhered to DSM-IV diagnostic criteria but were required by the administrative system to code according to ICD-10. In addition to the common, though not exactly accurate use of ADHD and HKD as interchangeable synonyms in parts of the literature, we believe this interpretation lends justification to our current use of terminology, using the (broader) term “ADHD” instead of hyperkinetic disorder (“HKD”).

Interestingly, only about 40% of children with a diagnosis of ADHD were seen at least once during the year by a specialized physician. Assuming that effective treatment provision or supervision by a specialist requires at least four annual visits, we interpret the number of patients with at least four documented specialist contacts as a proxy, yielding a rate of less than 15%. Even taking into account the existence of data edge effects in the present database (which we cannot quantify in the absence of reliable information on average length of treatment in the population studied), this finding indicates that specialized physicians treat only a minority of ADHD patients in this German region. We consider this finding is especially remarkable in light of the above average number of child and

adolescent psychiatrists in Nordbaden – actually, in relation to the regional population, twice as many compared to Germany as a whole. If anything, the rate of patients treated by or under regular supervision of specialists in Germany should thus be even lower than the numbers found for Nordbaden in 2003. We conclude from this data that community-based pediatricians and general practitioners have an important role in the care of patients with ADHD. As a consequence, pediatricians as well as practitioners, including specialists in internal medicine practicing as family doctors, will need to understand diagnosis, associated comorbidity, and appropriate treatment of patients with ADHD.

Regarding coexisting conduct disorder, our data indicate higher prevalence among boys than girls, and an increasing share of patients with HKCD among those diagnosed with ADHD over time during childhood and adolescence. Prevalence of conduct disorder was more than 50% more likely among adolescents with ADHD (37.9%) compared to preschoolers with ADHD (23.6%). The overall rate of comorbid conduct disorder of 29 percent in our sample is consistent with the rates reported in a large United States study by Wolraich and colleagues (24) and with that found in a systematic review by Green et al. (25). Regarding the age-related pattern that we observed, we cannot infer any causal relationship with hypothetical factors such as disease progression over time, the potential role of preceding conditions like oppositional defiant disorder (26), or of going



through puberty, on the basis of our cross-sectional data analysis. It is noteworthy, however, that conduct disorders were diagnosed less frequently in adults, and gender differences dissipated in the latter group of ADHD patients.

Given the absence of information on disease severity in claims databases, we used the coexistence of conduct disorder (i.e., HKCD patients expressed as share of all patients with a diagnosis of ADHD [HKD or HKCD]) as a marker for disease severity. We hypothesized that patients seen by specialists might have higher levels of comorbid conduct disorder than those managed in primary care settings. In fact, we found a somewhat higher percentage of children and adolescents with a concomitant diagnosis of conduct disorder among those seen by specialists, but this difference was less pronounced than expected on grounds of other studies (27, 28). On the other hand, Busch and colleagues found no difference in comorbidity or functional impairment between patients referred to psychiatric clinics and children with a diagnosis of ADHD from pediatric sites of a large health maintenance organization (29).

To the best of our knowledge, the present study represents the first report on the administrative prevalence of ADHD in adults in a European sample. Though puzzling, the male-to-female ratio of about 3:2 in adults – compared to approximately 3:1 in children and adolescents – is in line with other findings on ADHD in adults (30). This does not hold, however, for the

overall prevalence rate in the adult population in Nordbaden: in striking contrast to the high administrative prevalence rates found for children and adolescents, we identified only 630 adult patients who were recognized by their physicians to have ADHD. This very low figure (a rate of 0.03% or in absolute terms just one third of the number of children age six years or younger with a diagnosis of ADHD) appears surprising in light of longitudinal studies reporting up to 70% adult persistence of childhood ADHD (31, 32). In particular, it is difficult (if possible at all) to reconcile with the high prevalence rate found in children and adolescents in the same geographical region. Furthermore, it is substantially lower than the prevalence rate of at least 1 percent found in an adult population-based sample in the Netherlands (8). In other studies conducted in the United States, adult ADHD prevalence rates higher than 4 percent were reported (7).

These data suggest a very real risk that a diagnosis of ADHD might be missed in many adults presenting with related problems, such as antisocial behavior, mood and anxiety disorders, alcohol and drug abuse problems, other psychiatric disorders, and criminal behaviors, all known to be associated with ADHD (26, 33).

## Conclusions

These data indicate a need for further research addressing the reliability of ADHD diagnoses in routine clinical practice in Germany. Prevalence rates among children and adolescents in the Nordbaden region exceed ICD-10-based estimates from epidemiological studies but are consistent with international data based on DSM-IV diagnostic criteria. In contrast, the encounter-based “administrative” prevalence rate of ADHD in the adult population is very low and clearly inconsistent with the high diagnosis prevalence of ADHD in children and adolescents in the same geographical region, given the findings from long-term follow up studies. The important role of health service provision by pediatricians and general practitioners implies a high need for expertise in managing this complex clinical condition.

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**Table 1**

12-Months administrative prevalence of ADHD (Hyperkinetic Disorder [HKD, ICD-10 F90.0] and Hyperkinetic Conduct Disorder [HKCD, ICD-10 F-90.1]) in the population covered by Statutory Health Insurance (SHI) in Nordbaden / Germany in 2003 (N=2.238 million)

Age group	Population		"HKD" prevalence		"HKCD" prevalence		ADHD ("HKD" + "HKCD") prevalence		
	n		n	%	n	%	n	%	95% CI
0 - 6	150,476		1,446	0.96%	447	0.30%	1,893	1.26%	1.20% - 1.32%
hereof:									
male	77,387		1,007	1.30%	324	0.42%	1,331	1.72%	1.63% - 1.81%
female	73,089		439	0.60%	123	0.17%	562	0.77%	0.71% - 0.83%
7 - 12	141,857		5,027	3.54%	2,019	1.42%	7,046	4.97%	4.85% - 5.08%
hereof:									
male	72,901		3,653	5.01%	1,567	2.15%	5,220	7.16%	6.97% - 7.35%
female	68,956		1,374	1.99%	452	0.66%	1,826	2.65%	2.53% - 2.77%
13 - 19	175,663		1,432	0.82%	874	0.50%	2,306	1.31%	1.26% - 1.37%
hereof:									
male	89,935		1,087	1.21%	704	0.78%	1,791	1.99%	1.90% - 2.08%
female	85,728		345	0.40%	170	0.20%	515	0.60%	0.55% - 0.65%
20 +	1,770,464		532	0.03%	98	0.01%	630	0.04%	0.03% - 0.04%
hereof:									
male	805,172		301	0.04%	55	0.01%	356	0.04%	0.04% - 0.05%
female	965,292		231	0.02%	43	0.00%	274	0.03%	0.03% - 0.03%
total	2,238,460		8,437	0.38%	3,438	0.15%	11,875	0.53%	0.52% - 0.54%
hereof:									
male	1,045,395		6,048	0.58%	2,650	0.25%	8,698	0.83%	0.81% - 0.85%
female	1,193,065		2,389	0.20%	788	0.07%	3,177	0.27%	0.26% - 0.28%

**Table 2**

12-Months administrative prevalence of ADHD (Hyperkinetic Disorder [HKD, ICD-10 F90.0] and Hyperkinetic Conduct Disorder [HKCD, ICD-10 F90.1]) in children and adolescents (age 6-19) covered by Statutory Health Insurance (SHI) in Nordbaden / Germany in 2003 (age group comprising N=341,000 subjects)

Age group	Population		"HKD" prevalence		"HKCD" prevalence		ADHD ("HKD" + "HKCD") prevalence		
	n	%	n	%	n	%	n	%	95% CI
6	23,685		575	2.43%	184	0.78%	759	3.20%	2.98% - 3.44%
hereof:									
male	12,156		421	3.46%	136	1.12%	557	4.58%	4.22% - 4.97%
female	11,529		154	1.34%	48	0.42%	202	1.75%	1.52% - 2.01%
7	23,052		758	3.29%	265	1.15%	1,023	4.44%	4.18% - 4.71%
hereof:									
male	11,776		535	4.54%	206	1.75%	741	6.29%	5.86% - 6.75%
female	11,276		223	1.98%	59	0.52%	282	2.50%	2.22% - 2.81%
8	22,754		854	3.75%	376	1.65%	1,230	5.41%	5.12% - 5.71%
hereof:									
male	11,736		621	5.29%	280	2.39%	901	7.68%	7.20% - 8.17%
female	11,018		233	2.11%	96	0.87%	329	2.99%	2.68% - 3.32%
9	23,102		1,023	4.43%	381	1.65%	1,404	6.08%	5.77% - 6.39%
hereof:									
male	11,881		713	6.00%	288	2.42%	1,001	8.43%	7.93% - 8.94%
female	11,221		310	2.76%	93	0.83%	403	3.59%	3.25% - 3.95%
10	23,859		935	3.92%	339	1.42%	1,274	5.34%	5.06% - 5.63%
hereof:									
male	12,324		674	5.47%	272	2.21%	946	7.68%	7.21% - 8.16%
female	11,535		261	2.26%	67	0.58%	328	2.84%	2.55% - 3.16%
11	24,143		793	3.28%	312	1.29%	1,105	4.58%	4.32% - 4.85%
hereof:									
male	12,411		596	4.80%	241	1.94%	837	6.74%	6.31% - 7.20%
female	11,732		197	1.68%	71	0.61%	268	2.28%	2.02% - 2.57%
12	24,947		664	2.66%	346	1.39%	1,010	4.05%	3.81% - 4.30%

hereof:	male	12,773	514	4.02%	280	2.19%	794	6.22%	5.80% - 6.65%
	female	12,174	150	1.23%	66	0.54%	216	1.77%	1.55% - 2.02%
13		25,456	506	1.99%	271	1.06%	777	3.05%	2.84% - 3.27%
hereof:	male	13,105	385	2.94%	215	1.64%	600	4.58%	4.23% - 4.95%
	female	12,351	121	0.98%	56	0.45%	177	1.43%	1.23% - 1.66%
14		24,986	324	1.30%	242	0.97%	566	2.27%	2.08% - 2.46%
hereof:	male	12,743	247	1.94%	193	1.51%	440	3.45%	3.14% - 3.78%
	female	12,243	77	0.63%	49	0.40%	126	1.03%	0.86% - 1.22%
15		26,005	247	0.95%	164	0.63%	411	1.58%	1.43% - 1.74%
hereof:	male	13,450	189	1.41%	135	1.00%	324	2.41%	2.16% - 2.68%
	female	12,555	58	0.46%	29	0.23%	87	0.69%	0.56% - 0.85%
16		25,137	152	0.60%	87	0.35%	239	0.95%	0.83% - 1.08%
hereof:	male	12,924	114	0.88%	74	0.57%	188	1.45%	1.26% - 1.68%
	female	12,213	38	0.31%	13	0.11%	51	0.42%	0.31% - 0.55%
17		24,846	94	0.38%	69	0.28%	163	0.66%	0.56% - 0.76%
hereof:	male	12,752	72	0.56%	53	0.42%	125	0.98%	0.82% - 1.17%
	female	12,094	22	0.18%	16	0.13%	38	0.31%	0.22% - 0.43%
18		24,281	63	0.26%	23	0.09%	86	0.35%	0.28% - 0.44%
hereof:	male	12,360	47	0.38%	20	0.16%	67	0.54%	0.42% - 0.69%
	female	11,921	16	0.13%	3	0.03%	19	0.16%	0.10% - 0.25%
19		24,952	46	0.18%	18	0.07%	64	0.26%	0.20% - 0.33%
hereof:	male	12,601	33	0.26%	14	0.11%	47	0.37%	0.27% - 0.50%
	female	12,351	13	0.11%	4	0.03%	17	0.14%	0.08% - 0.22%
total		341,205	7,034	2.06%	3,077	0.90%	10,111	2.96%	2.91% - 3.02%
hereof:	male	174,992	5,161	2.95%	2,407	1.38%	7,568	4.32%	4.23% - 4.42%
	female	166,213	1,873	1.13%	670	0.40%	2,543	1.53%	1.47% - 1.59%

**Table 3**

Physician specialists involved in care of patients with a diagnosis of ADHD, data from Nordbaden / Germany, 2003

Age group [years / gender]	Subjects with ADHD		Subjects with ADHD seen at least once in 2003 by a physician specialist			Subjects with ADHD seen at least four times in 2003 by a physician specialist		
	n		n	%	95% CI	n	%	95% CI
0 - 6	1,893		338	17.9%	16.2% - 19.7%	97	5.1%	4.2% - 6.2%
hereof:	1,331	male	251	18.9%	16.8% - 21.1%	70	5.3%	4.1% - 6.6%
	562	female	87	15.5%	12.6% - 18.4%	27	4.8%	3.2% - 6.9%
7 - 12	7,046		2,773	39.4%	38.2% - 40.5%	1,049	14.9%	14.0% - 15.7%
hereof:	5,220	male	2,123	40.7%	39.3% - 42.0%	814	15.6%	14.6% - 16.6%
	1,826	female	650	35.6%	33.4% - 37.8%	235	12.9%	11.4% - 14.5%
13 - 19	2,306		939	40.7%	38.7% - 42.8%	314	13.6%	12.2% - 15.1%
hereof:	1,791	male	723	40.4%	38.1% - 42.7%	241	13.5%	11.9% - 15.1%
	515	female	216	41.9%	36.6% - 46.3%	73	14.2%	11.3% - 17.5%
20 +	630		211	33.5%	29.8% - 37.3%	79	12.5%	10.1% - 15.4%
hereof:	356	male	130	36.5%	31.5% - 41.8%	52	14.6%	11.1% - 18.7%
	274	female	81	29.6%	24.2% - 35.3%	27	9.9%	6.6% - 14.0%
total	11,875		4,261	35.9%	35.0% - 36.8%	1,539	13.0%	12.4% - 13.6%
hereof:	8,698	male	3,227	37.1%	36.1% - 38.1%	1,177	13.5%	12.8% - 14.3%
	3,177	female	1,034	32.5%	30.9% - 34.2%	362	11.4%	10.3% - 12.6%

**Table 4:**

Share of patients with Hyperkinetic Conduct Disorder (HKCD) as an indicator of disease severity by specialist involvement:

Age group	Subjects with ADHD		Of those, subjects with HKD (F90.0)			Of those, subjects with HKCD (F90.1)		
	n	%	n	%	95% CI	n	%	95% CI
[years / gender]								
0 - 6	1,893	76.4%	1,446	76.4%	74.4% - 78.3%	447	23.6%	21.7% - 25.6%
hereof: Patients not seen by specialists	1,555	78.3%	1,217	78.3%	76.1% - 80.3%	338	21.7%	19.7% - 23.9%
Patients seen at least once by specialists	338	67.8%	229	67.8%	62.5% - 72.7%	109	32.2%	27.3% - 37.5%
Patients seen at least four times by specialists	96	68.8%	66	68.8%	58.5% - 77.8%	30	31.3%	22.2% - 41.5%
7 - 12	7,046	71.3%	5,027	71.3%	70.3% - 72.4%	2,019	28.7%	27.6% - 29.7%
hereof: Patients not seen by specialists	4,273	72.3%	3,091	72.3%	71.0% - 73.7%	1,182	27.7%	26.3% - 29.0%
Patients seen at least once by specialists	2,773	69.8%	1,936	69.8%	68.1% - 71.5%	837	30.2%	28.5% - 31.9%
Patients seen at least four times by specialists	1,026	64.4%	661	64.4%	61.4% - 67.4%	365	35.6%	32.6% - 38.6%
13 - 19	2,306	62.1%	1,432	62.1%	60.1% - 64.1%	874	37.9%	35.9% - 39.9%
hereof: Patients not seen by specialists	1,367	62.1%	849	62.1%	59.5% - 64.7%	518	37.9%	35.3% - 40.5%
Patients seen at least once by specialists	939	62.1%	583	62.1%	58.9% - 65.2%	356	37.9%	34.8% - 41.1%
Patients seen at least four times by specialists	310	57.1%	177	57.1%	51.4% - 62.7%	133	42.9%	37.3% - 48.6%
20 +	630	84.4%	532	84.4%	81.4% - 87.2%	98	15.6%	12.8% - 18.6%

hereof:	Patients not seen by specialists	419	336	80.2%	76.0% - 83.9%	83	19.8%	16.1% - 24.0%
	Patients seen at least once by specialists	211	196	92.9%	88.5% - 96.0%	15	7.1%	4.0% - 11.5%
	Patients seen at least four times by specialists	77	71	92.2%	83.8% - 97.1%	6	7.8%	2.9% - 16.2%
total		11,875	8,437	71.0%	70.2% - 71.9%	3,438	29.0%	28.1% - 29.8%
hereof:	Patients not seen by specialists	7,614	5,493	72.1%	71.1% - 73.1%	2,121	27.9%	26.9% - 28.9%
	Patients seen at least once by specialists	4,261	2,944	69.1%	67.7% - 70.5%	1,317	30.9%	29.5% - 32.3%
	Patients seen at least four times by specialists	1,509	975	64.6%	62.1% - 67.0%	534	35.4%	33.0% - 37.9%



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