

# Increasing Use of Medication for Treatment of Attention-Deficit/Hyperactivity Disorder (ADHD) in Germany Between 2003 and 2009

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## Overview

Between 2003 and 2009, psychostimulant prescriptions in Germany increased 2.75-fold. During the same period, administrative prevalence of ADHD in Nordbaden/Germany grew from 0.53% (overall; age group 6-12 years, 4.74%; age 13-17 years, 1.73%, in 2003) to 0.95% (overall; 8.02% and 4.21%, respectively, in 2009). In our earlier analyses for year 2003, we did not identify overprescribing. The present analysis revisits the use of medication in children and adolescents with ADHD in light of its recent increase.

## Methods

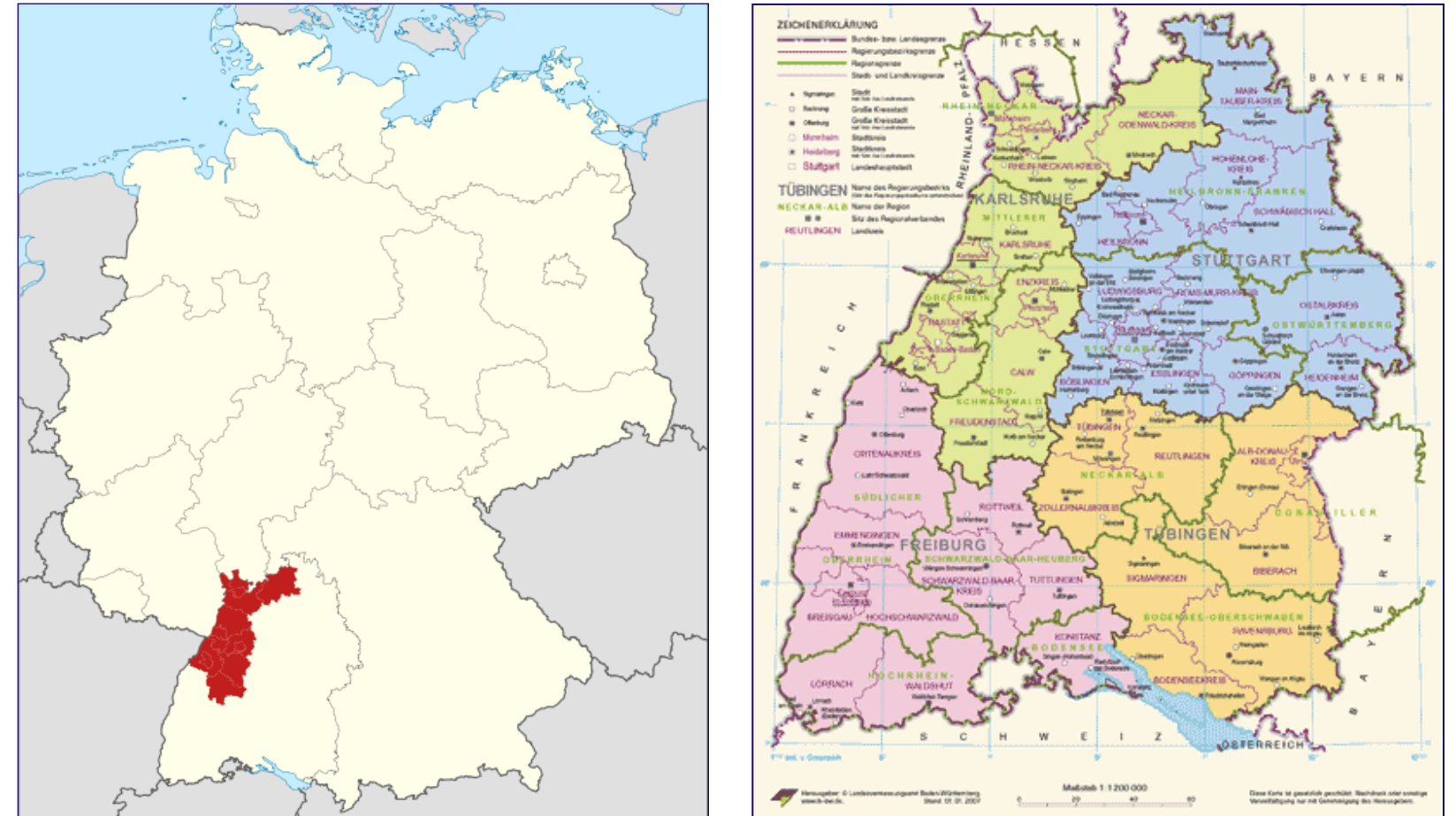
The complete administrative claims database of the organization of physicians registered with statutory health insurance [SHI] (Kassenärztliche Vereinigung, KV) in Nordbaden/Germany was available for analysis, covering the total regional population enrolled in SHI (>2.2 million). Data were available for calendar years 2003 to 2009 and were combined with prescription data from the SHI in order to create a patient-centered database enabling health care utilization research.

## Results

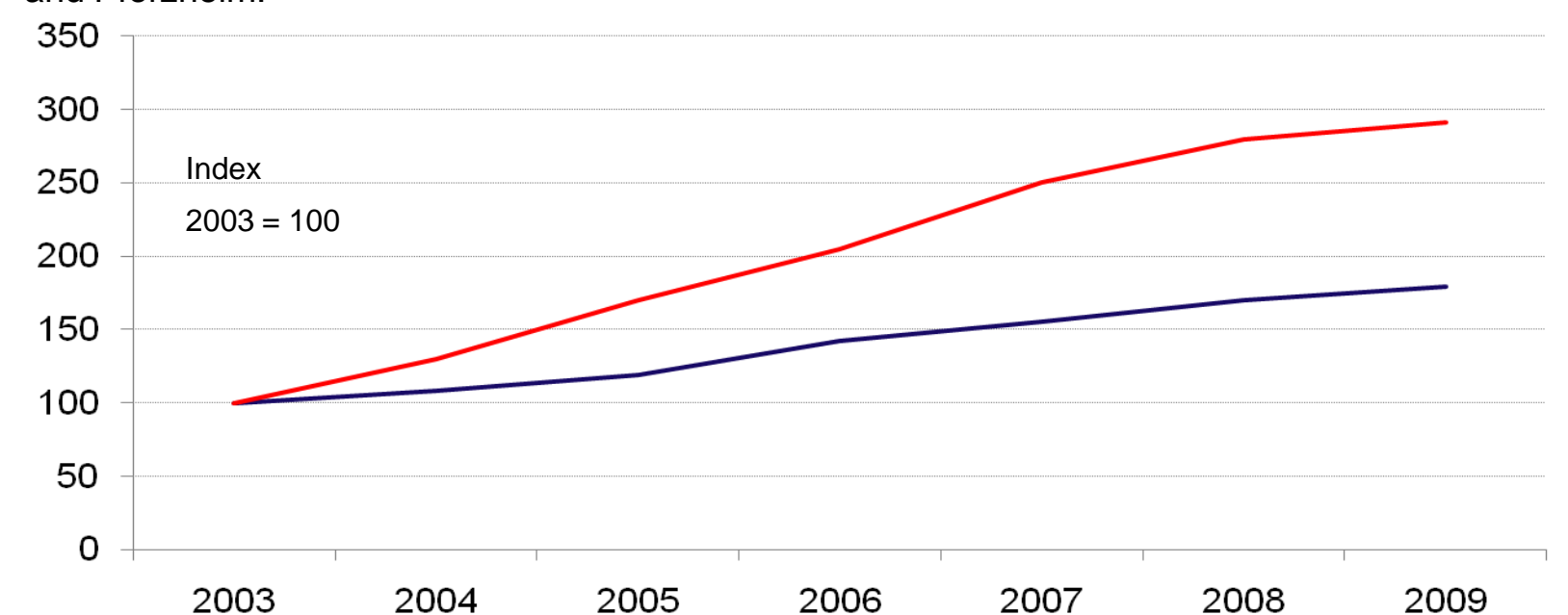
During the observation period, the use of medication among patients diagnosed with ADHD (in Germany, methylphenidate [MPH] and atomoxetine [ATX]) increased continuously in children age 6 to 12 years, from 32.5% (2003) over 35.3% (2006) and 40.9% (2009), whereas the increase flattened in adolescents (45.7% in 2003; 53.9% in 2006, and 54.3% in 2009). Male patients and patients with externalizing comorbidities, in particular conduct disorder, were more likely to receive medication (peak among male adolescents with hyperkinetic conduct disorder: 56.9% in 2003; 60.0% in 2006; 59.5% in 2009). The nonstimulant, atomoxetine (ATX), was prescribed rarely (overall, 3.1% versus 38.2% of patients with ADHD receiving MPH), but used more often in adolescents with externalizing comorbidity (up to 9.7% in male adolescents, 2009). Compared to these numbers, only few control patients without a diagnosis of ADHD (total number, 29) received psychostimulants in 2009.

## Conclusion

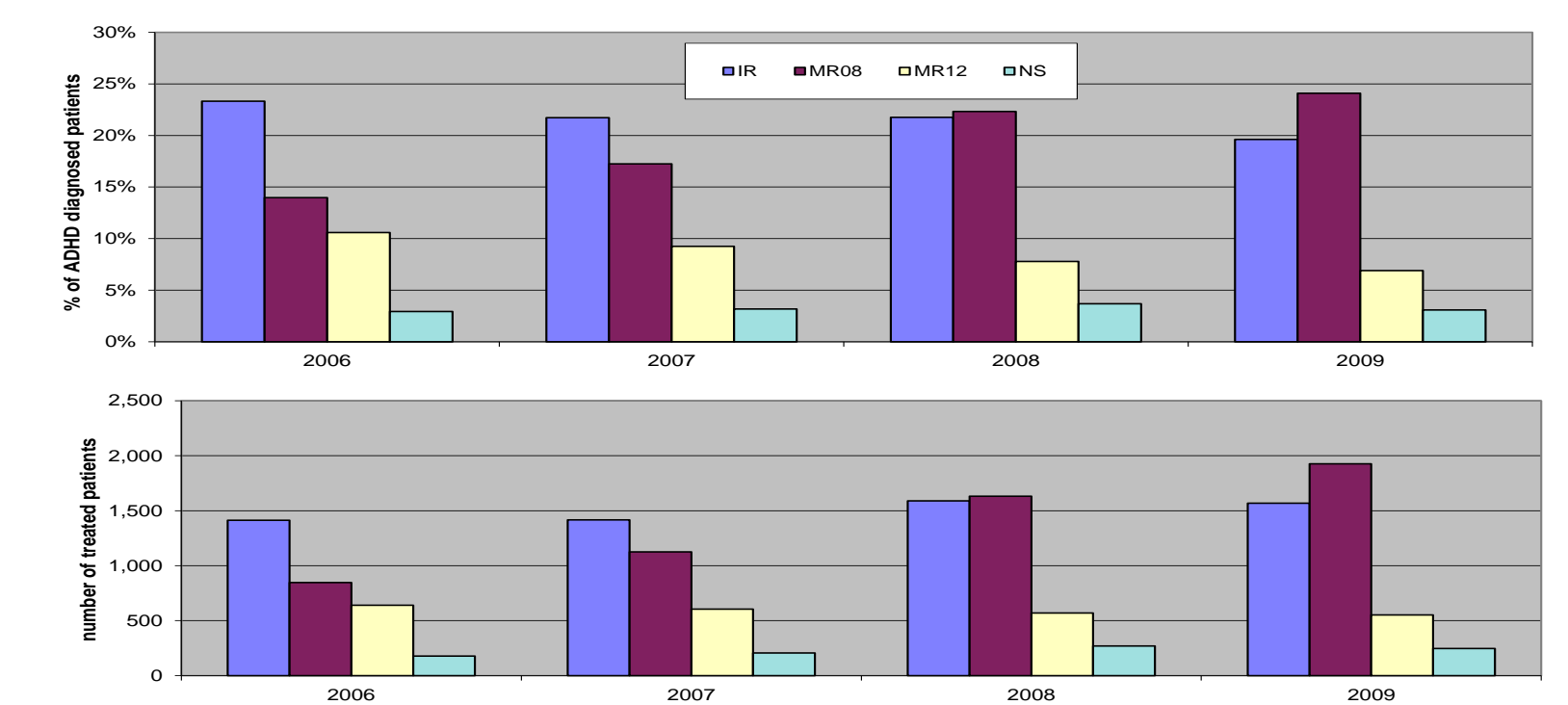
Although medication use grew faster than the number of cases diagnosed with ADHD, our data provide no evidence of overprescribing.



**Figure 1:** Nordbaden (a [left], red; b [right], green), the administrative district of "Karlsruhe" (Regierungsbezirk Karlsruhe) in the German state of Baden-Wuerttemberg, comprises of major parts of the Metropolitan Area Rhine-Neckar (Metropolregion Rhein-Neckar) including the cities of Mannheim and Heidelberg, as well as the urban areas (Stadtkreise) of Karlsruhe and Pforzheim.



**Figure 2:** Number of cases with a diagnosis of ADHD in Nordbaden, 2003 to 2009 (blue; index [2003] = 100) and consumption of methylphenidate (red, DDDs; index [2003] = 100)



**Figure 2:** Relative (top) and absolute (below) number of patients with ADHD treated with MPH (IR: immediate-release, MR: modified release) or ATX (atomoxetine; both for years 2006-2009)

## Documentation: Prescription Prevalence by Age, Gender and Comorbidity (2009)

age group	gender	ADHD			Internalizing			Externalizing			Internalizing & Externalizing			ADHD wo Internalizing & Externalizing			true ADHD		
		MPH	ATX	MPH and/or ATX	MPH	ATX	MPH and/or ATX	MPH	ATX	MPH and/or ATX	MPH	ATX	MPH and/or ATX	MPH	ATX	MPH and/or ATX	MPH	ATX	MPH and/or ATX
0 - 5	male	2.30%	0.38%	2.30%	2.33%	0.00%	2.33%	3.66%	0.00%	3.66%	4.17%	0.00%	4.17%	1.88%	0.63%	1.88%	3.70%	1.85%	3.70%
	female	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	total	1.60%	0.27%	1.60%	1.59%	0.00%	1.59%	2.70%	0.00%	2.70%	3.03%	0.00%	3.03%	1.29%	0.43%	1.29%	2.27%	1.14%	2.27%
6 - 12	male	41.00%	3.28%	42.46%	41.76%	4.40%	43.96%	48.46%	5.21%	50.77%	44.64%	4.64%	46.43%	36.75%	1.89%	37.46%	32.65%	0.79%	32.65%
	female	36.20%	2.17%	37.08%	33.33%	2.56%	33.97%	43.03%	4.95%	44.89%	33.65%	4.81%	35.58%	33.99%	1.12%	34.69%	31.06%	1.02%	31.40%
	total	39.62%	2.96%	40.91%	38.99%	3.79%	40.67%	47.17%	5.15%	49.37%	41.67%	4.69%	43.49%	35.93%	1.66%	36.63%	32.14%	0.87%	32.25%
13 - 17	male	52.68%	4.63%	55.39%	49.84%	6.03%	52.70%	54.06%	7.91%	58.76%	48.39%	9.68%	54.84%	52.35%	3.05%	54.46%	49.25%	1.94%	50.32%
	female	48.07%	4.31%	50.57%	50.37%	2.96%	52.59%	47.73%	7.58%	51.52%	50.00%	4.00%	52.00%	47.32%	3.13%	49.11%	44.17%	2.50%	45.00%
	total	51.64%	4.56%	54.30%	50.00%	5.11%	52.67%	52.67%	7.83%	57.17%	48.85%	8.05%	54.02%	51.30%	3.07%	53.35%	48.21%	2.05%	49.23%
18+	male	25.51%	1.79%	26.66%	21.27%	2.54%	23.17%	25.10%	3.77%	26.78%	19.38%	4.65%	22.48%	27.30%	0.84%	28.13%	24.68%	0.43%	25.11%
	female	22.34%	2.70%	24.32%	19.79%	2.34%	21.61%	24.34%	2.63%	26.32%	22.73%	3.03%	25.00%	27.15%	3.97%	29.80%	28.92%	2.41%	31.33%
	total	24.20%	2.17%	25.69%	20.46%	2.43%	22.32%	24.81%	3.32%	26.60%	21.07%	3.83%	23.75%	27.25%	1.76%	28.63%	25.80%	0.96%	26.75%
total	male	40.18%	3.30%	41.87%	37.48%	4.20%	39.69%	44.82%	5.48%	47.56%	37.88%	5.57%	40.93%	38.16%	2.03%	39.24%	35.77%	1.16%	36.21%
	female	33.42%	2.59%	34.82%	29.14%	2.47%	30.55%	37.58%	4.72%	39.78%	30.51%	3.73%	32.54%	33.53%	1.81%	34.65%	31.70%	1.51%	32.45%
	total	38.19%	3.09%	39.79%	34.20%	3.52%	36.09%	42.95%	5.28%	45.55%	35.33%	4.93%	38.03%	36.88%	1.96%	37.97%	34.64%	1.26%	35.16%