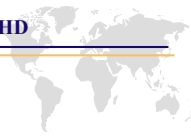


Methylphenidate Prescriptions for Children and Adolescents with ADHD

New Data from Nordbaden, Germany

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OUTLINE

Agenda

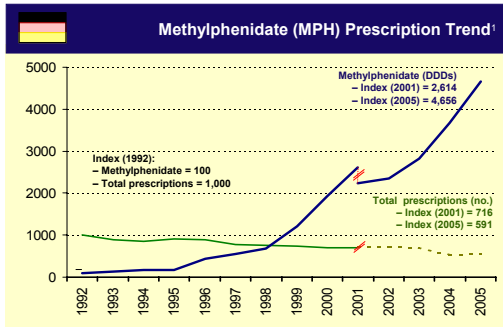
"Are Psychostimulants Overprescribed?"

- ADHD in Nordbaden
 - Administrative Prevalence of ADHD
 - Physician Groups Involved in Care
- MPH Prescription Analysis
by Age, Gender, and Severity of Impairment
 - Treatment Prevalence
 - Treatment Intensity
 - Treatment Duration
- Prescriber Analysis
- Discussion and Conclusions



INTRODUCTION

Psychostimulant Prescription Trend in Germany (SHI only)



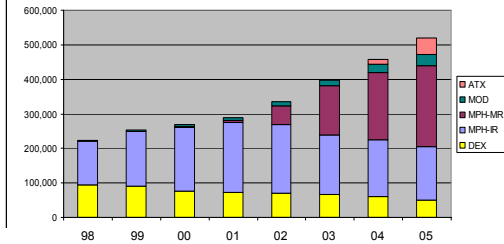
¹Methylphenidate prescriptions grew ~26-fold from 1995 to 2005. During the same period, total prescriptions in Germany declined by 35 percent. Data source: W180 (U. Schwabe, D. Paffrath, 1993 – 2006), note change of database for year 2001/2002. All data refer to prescriptions reimbursed by statutory health insurance (SHI, "GKV", covering ~85 percent of German population), excluding parallel imports. Note that these data include prescriptions for adults with ADHD and also for some other indications (narcolepsy).



INTRODUCTION

Psychostimulant Prescription Trend in England

ADHD-Related Prescriptions (NHS England)



*Prescription items dispensed by category p.a.: DEX, dexamphetamine (Dexedrine® and others); MPH, methylphenidate; IR, immediate-release formulations (Ritalin® and generics); MR, modified-release formulations (Concerta® XL, Equasym® XL, Ritalin® SR imports); MOD, modafinil (Provigil®, licensed for daytime sleepiness); ATX, atomoxetine (Strattera®); PEM, pemoline (Volital®, before 2002 only, not shown due to small volume); data source: NHS Prescription Cost Analysis 1999-2006.

METHODS

The Nordbaden ADHD Project

Project Design

- Population
 - 2.238m persons covered by Statutory Health Insurance (SHI)
 - Full coverage of the regional SHI insured population (all physician and psychotherapist claims data from KV)
 - Representing 82% of the total population in Nordbaden
 - Sample representing ~3% of the total population of Germany
 - Integrating prescription claims data from a major association of sick funds (VdAK)
- Retrospective Claims Database Analysis
- Case Control Technique
 - Matched pairs (by age, gender, type of health insurance)
 - For examination of co-morbidity, utilization, and costs
- Cross-Sectional Study
 - Integrating patient-related data from four quarters of 2003

METHODS

The Nordbaden ADHD Project

Drug Utilization Metrics¹

- DDD: Defined Daily Dose
 - DDD = 30mg for all methylphenidate (MPH) products (available as immediate-release formulations in 2003)
 - except for MPH-OROS (DDD = 36mg), a modified-release formulation that became available in January 2003
- PDD: Prescribed Daily Dose
 - Average dose prescribed according to the Nordbaden sample of ADHD patients (11,245 children and adolescents)
 - PDDs were assessed at the level of individual patients on the basis of actually dispensed (reimbursed) medication.
 - PDDs do not necessarily reflect actual drug utilization, as patients do not always take all the medications that are dispensed.
- Assumed number of treatment days per year of MPH treatment was 201, based on international drug utilization studies, expert estimates, and in line with earlier analyses.

PREVALENCE

Co-occurrence of conduct disorder as a marker for severity of impairment

Co-occurrence of conduct disorders with ADHD is most often reported in male patients age 13-19 years.

Share of Patients with Conduct Disorder¹

Age Group [Years]	Total	Male	Female
0-6	24%	24%	22%
7-12	29%	30%	25%
13-19	38%	39%	33%
≥20	16%	15%	16%
All	29%	30%	25%

¹Definitions:
(1) No (HKCD) / No (HKD) + No (HKCD);
(2) HKCD, PKD, I or PKD + No (HKD) +
at least once diagnosed during 2005

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New Data from Nordbaden, Germany



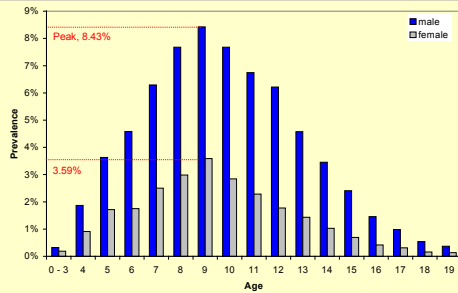
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Methylphenidate Prescriptions for Children and Adolescents with ADHD

PREVALENCE

Administrative Prevalence of ADHD in Nordbaden: Children and Adolescents

Prevalence by Age and Gender



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New Data from Nordbaden, Germany



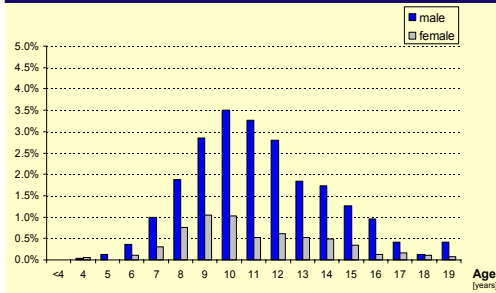
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Methylphenidate Prescriptions for Children and Adolescents with ADHD

PRESCRIPTION ANALYSIS

Methylphenidate Treatment Prevalence in Nordbaden 2003

MPH Treatment Prevalence: Children and Adolescents



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New Data from Nordbaden, Germany



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Methylphenidate Prescriptions for Children and Adolescents with ADHD

PRESCRIPTION ANALYSIS

Methylphenidate Treatment Prevalence in Nordbaden 2003

Methylphenidate Treatment Prevalence					
Age Group	ADHD Patients (Prevalence)		MPH Treatment (Prevalence)		
	n	% (Population ¹)	n	% (ADHD Pat.)	% (Population ¹)
0 – 6	626	1.29%	27	4.31%	0.06%
7 – 12	2,171	4.74%	761	35.05%	1.66%
13 – 19	768	1.36%	355	46.22%	0.63%
20+	266	0.05%	92	34.59%	0.02%
Total	3,831	0.53%	1,235	32.24%	0.17%

¹VDAK Sample, n > 720,000 insured persons
Methylphenidate Prescriptions for Children and Adolescents with ADHD | ISPOR Copenhagen 2006 | *New Data from Nordbaden, Germany

PRESCRIPTION ANALYSIS

Methylphenidate Treatment Prevalence in Nordbaden 2003

Methylphenidate Treatment Prevalence (Males)					
Age Group	ADHD Patients (Prevalence)		MPH Treatment (Prevalence)		
	n	% (Population ¹)	n	% (ADHD Pat.)	% (Population ¹)
0 - 6	427	1.71%	20	4.68%	0.08%
7 - 12	1,624	6.91%	603	37.13%	2.56%
13 - 19	585	2.02%	283	48.38%	0.98%
20+	142	0.05%	56	39.44%	0.02%
Total	2,778	0.82%	962	34.63%	0.29%

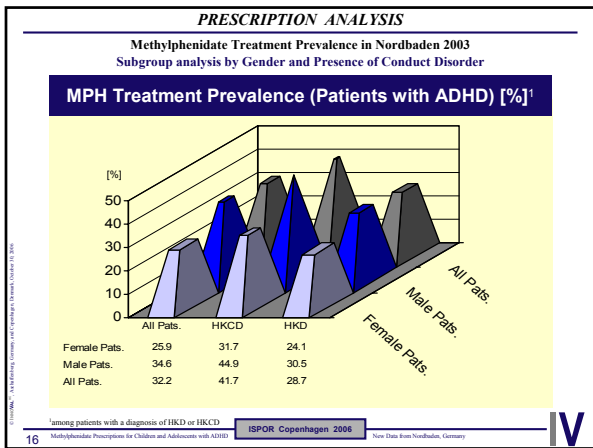
¹VDAK Sample, n ~ 330,000 insured male persons
Methylphenidate Prescriptions for Children and Adolescents with ADHD | ISPOR Copenhagen 2006 | *New Data from Nordbaden, Germany

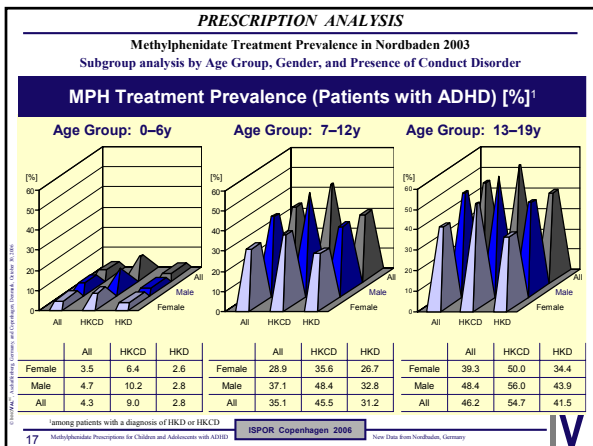
PRESCRIPTION ANALYSIS

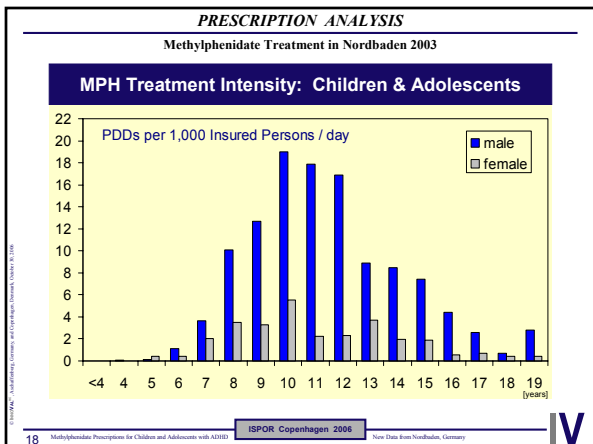
Methylphenidate Treatment Prevalence in Nordbaden 2003

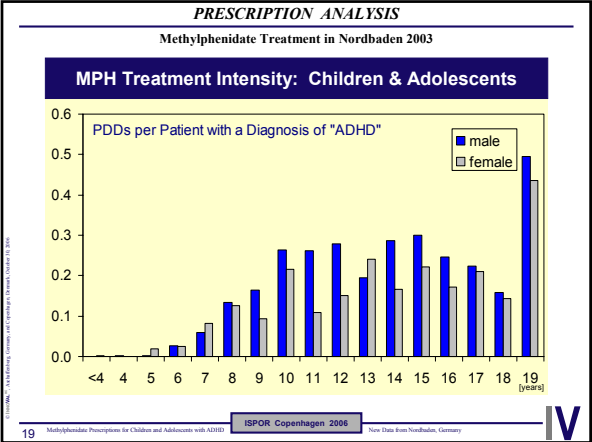
Methylphenidate Treatment Prevalence (Females)					
Age Group	ADHD Patients (Prevalence)		MPH Treatment (Prevalence)		
	n	% (Population ¹)	n	% (ADHD Pat.)	% (Population ¹)
0 - 6	199	0.84%	7	3.52%	0.03%
7 - 12	547	2.46%	158	28.88%	0.71%
13 - 19	183	0.66%	72	39.34%	0.26%
20+	124	0.04%	36	29.03%	0.01%
Total	1,053	0.27%	273	25.93%	0.07%

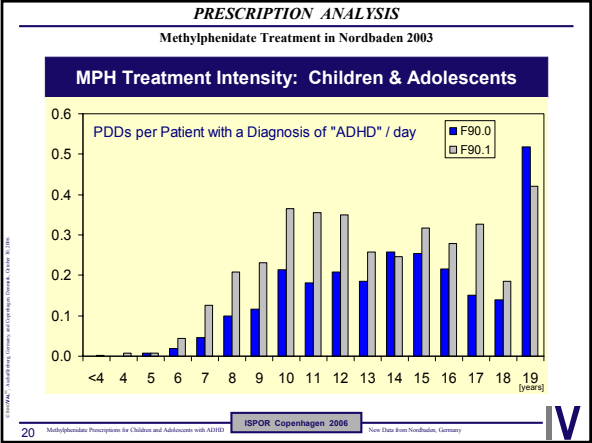
¹VDAK Sample, n ~ 390,000 insured female persons
Methylphenidate Prescriptions for Children and Adolescents with ADHD | ISPOR Copenhagen 2006 | *New Data from Nordbaden, Germany

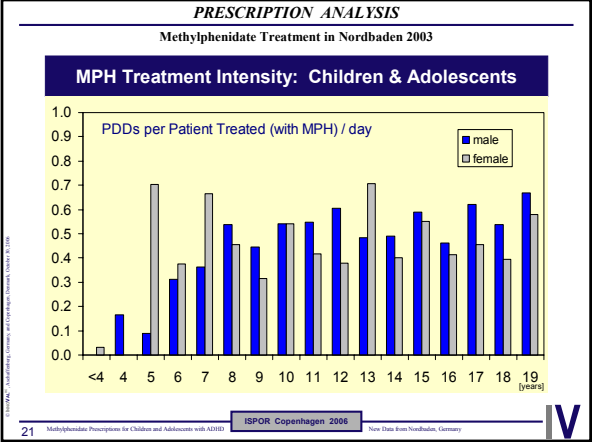








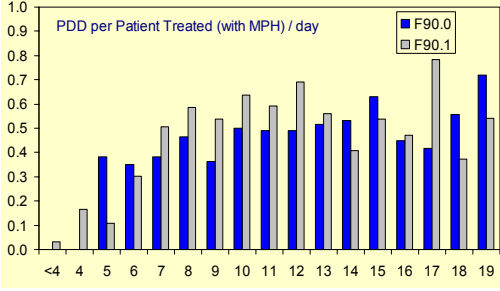




PRESCRIPTION ANALYSIS

Methylphenidate Treatment in Nordbaden 2003

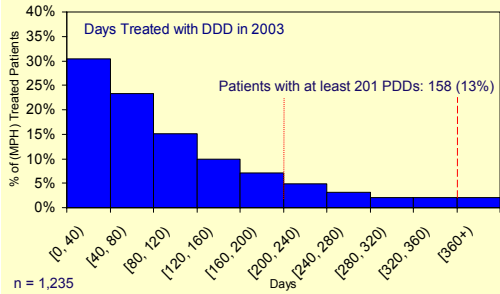
MPH Treatment Intensity: Children & Adolescents



PRESCRIPTION ANALYSIS

Methylphenidate Treatment in Nordbaden 2003

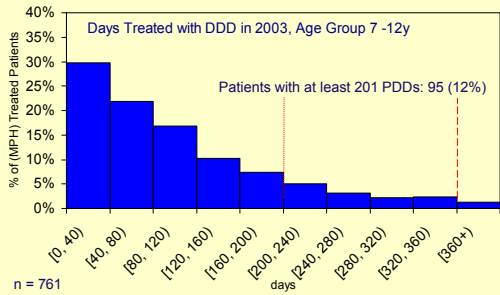
MPH Treatment Duration¹: Children and Adolescents



PRESCRIPTION ANALYSIS

Methylphenidate Treatment in Nordbaden 2003

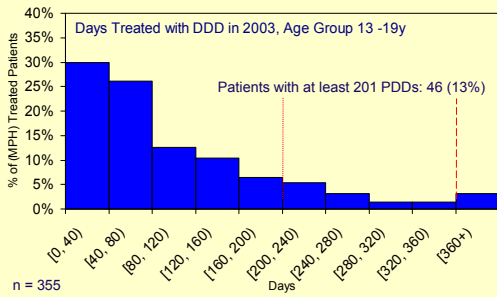
MPH Treatment Duration¹: Children and Adolescents



PRESCRIPTION ANALYSIS

Methylphenidate Treatment in Nordbaden 2003

MPH Treatment Duration¹: Children and Adolescents



¹Note that treatment duration refers to calendar year 2003 only. This may result in underestimates of true treatment duration due to data edge effects.

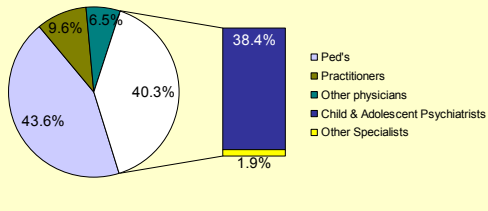
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PRESCRIPTION ANALYSIS

Methylphenidate Treatment in Nordbaden 2003
Children and Adolescents with a Diagnosis of ADHD¹

Prescriber Analysis²



¹HKD or HKCD;
²Share of prescribers

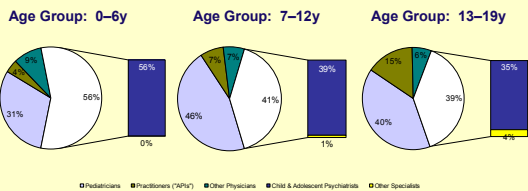
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PRESCRIPTION ANALYSIS

Methylphenidate Treatment in Nordbaden 2003
Children and Adolescents with a Diagnosis of ADHD¹

Prescriber Analysis by Age Group²



¹HKD or HKCD;
²Share of prescribers

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CONCLUSIONS

**Children and Adolescents with ADHD in Germany:
MPH Prescription Analysis 2003**

Observations (1)

- ↳ **Basis: Nordbaden Project (>2.2 million SHI insured persons)**
 - ↳ 11,245 children and adolescents with a diagnosis of "HKD" or "HKCD"
 - ↳ Of these, >720,000 insured by VdAK sick funds (3,831 with "HKD"/"HKCD")
- ↳ **ADHD is diagnosed increasingly frequently.**
 - ↳ Administrative prevalence ~5% in age group 7-12 years
 - ↳ Prevalence rates consistent with DSM-IV-based epidemiological data ("ADHD") but exceeding ICD-10-based estimates (for the hyperkinetic disorders).
 - ↳ Limited involvement in diagnosis (<~40% of patients?) and treatment (<15% of physicians specialized in mental health care may be a concern.
- ↳ **Need to keep in mind limitations of claims database analyses.**
 - ↳ Including assumptions (DDDs, average treatment duration, etc.) required for specific prescription analyses.

¹Number of children and adolescents with a diagnosis of "HKD" / "HKCD" insured by VdAK: 3,565 (2003)
²encounter-based analysis, cf. Schlander et al. (2006)



CONCLUSIONS

**Children and Adolescents with ADHD in Germany:
MPH Prescription Analysis 2003**

Observations (2)

- ↳ **MPH prescriptions continue to increase at a fast pace.**
 - ↳ Treatment prevalence: ~1.7% among children age 7-12 years; ~0.6% among adolescents age 13-19 years; peak at ~3.5% for ten-year old boys.
- ↳ Very few children age 6 or below (n=27) receive MPH prescriptions (treatment prevalence 0.03%), most of them having a diagnosis of "HKCD".
- ↳ 32.2% of children and adolescents with a diagnosis of ADHD (age group 7-12: 35.1%; age group 13-19: 46.2%) are prescribed MPH.
- ↳ Male ADHD patients and patients with a concomitant diagnosis of conduct problems are more likely to receive MPH prescriptions.
- ↳ Many patients appear¹ to receive MPH prescriptions for short periods of time only (>50% of patients for <3 months).
- ↳ Most MPH prescriptions are written by pediatricians (44%), child and adolescent psychiatrists (38%), and general practitioners ("APs", 10%).

¹Note that treatment duration estimates are based on data for calendar year 2003 only. This may result in underestimates of true treatment duration due to data edge effects.



CONCLUSIONS

**Children and Adolescents with ADHD in Germany:
MPH Prescription Analysis 2003**

Observations (3)

- ↳ **There is no evidence for overprescribing of MPH in ADHD patients Nordbaden in 2003.**
 - ↳ Very few patients receive higher doses than expected.
 - ↳ Very few children age 6 years or below are prescribed MPH.
- ↳ This conclusion appears justified by the present analysis¹ although MPH utilization rates found in Nordbaden in 2003 are substantially higher than those previously reported in smaller German samples².
- ↳ However, since 2003 MPH prescriptions have continued to grow.
- ↳ **There appears to be a strong need for further health care utilization research in ADHD.**

¹Note that (a) the present analysis was restricted to patients with a diagnosis of ADHD (HKD or HKCD) and (b) claims data analyses do not enable independent confirmation of diagnostic accuracy.
²von Ferber et al. (2003) reported a peak MPH treatment prevalence rate of 1.10% (year 2000) in 7-11-year old children, based on a regional sample (from Hesse) of n=26,091 (for most of these patients, no information on diagnosis was available) compared to 1.66% in 2003 in 7-12-year old children from Nordbaden; n=141,857; the Nordbaden data are more conservative than the data from the Hesse sample (von Ferber et al., 2003), since the Nordbaden treatment prevalence data reported here are based on a *prior* diagnosis of ADHD. Note that formal comparisons of different regions need to account for regional variation.