

## “Who Cares?”



17<sup>th</sup> World Congress of the **International Association for Child and Adolescent Psychiatry and Allied Professionals** (IACAPAP)

Melbourne, September 12, 2006

### **Who Cares for Patients with Attention-Deficit/Hyperactivity Disorder (ADHD)?**

Insights from Nordbaden, Germany

**Michael Schlander, Oliver Schwarz,  
Goetz-Erik Trott, Michael Viapiano, and Norbert Bonauer**

University of Applied Economic Sciences Ludwigshafen (Germany)  
Institute for Innovation & Valuation in Health Care (INNOVAL<sup>HC</sup>)



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## OUTLINE

### Agenda

- **The Nordbaden Project**
  - Rationale and Methods
  - Database Characteristics
- **Prevalence of ADHD in Nordbaden**
  - Age and Gender Specific Prevalence
  - Co-Existing Conduct Disorder
- **Physician Groups Involved in Care**
  - Specialist Involvement by Age and Gender
  - Concentration of Care within Physician Specialist Groups
- **Some Implications**



## RATIONALE

### The Nordbaden ADHD Project

#### Research Objectives<sup>1</sup>

- **“Real World” Prevalence of ADHD**
  - Administrative prevalence rate by age, gender, and severity
  - Physician groups involved in patient care
- **Co-Existing Conditions**
- **Treatment Patterns**
  - Quality of care compared with existing guidelines
- **Direct Medical Costs Attributable to ADHD**
  - Perspective of the Statutory Health Insurance
  - Types of cost (physicians, medication, psychotherapy, etc.)
- **Baseline for Future Health Care Utilization Research**

<sup>1</sup>cf. Study Protocol (“Projektbeschreibung”), Ludwigshafen, September 2004



## ***METHODS***

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- The Nordbaden Project
- Database Characteristics
- Age and Gender Specific Prevalence
- Co-Existing Conduct Disorder
- Physician Groups Involved in Care by Age and Gender
- Concentration of Care within Physician Specialist Groups

## ***METHODS***

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### **The Nordbaden ADHD Project**

#### **Project Design<sup>1</sup>**

- **Retrospective 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
- **Study Protocol**
  - Including prospectively defined Data Analysis Plan
- **Data Transfer Protocol**
  - Detailed description of procedures for data transfer
  - Approval by KVN Data Protection Officer

<sup>1</sup>cf. Study Protocol ("Projektbeschreibung"),  
Ludwigshafen, September 2004

## METHODS

### Database Characteristics

#### Project Limitations

- ↪ **Potential sources of bias**
  - ↪ “Reporting bias”:
    - ↪ underreporting unlikely, given the fee-for-service reimbursement system
    - ↪ “compliant” reporting (incentives by system?)
  - ↪ “Formulary bias”: represents SHI insured patients only
- ↪ **Limited to the range of services covered**
  - ↪ Example 1: accidents covered by “Unfallversicherung”
  - ↪ Example 2: encounters of patients with (juvenile) justice system
  - ↪ Need to interpret data cautiously!
- ↪ **Claims databases typically do not provide information on clinical outcomes.**



## METHODS

### Database Characteristics

#### The Nordbaden Database

- ↪ **Population**
  - ↪ 2.238m persons covered by Statutory Health Insurance
  - ↪ Full coverage of the regional SHI insured population
  - ↪ Representing 82% of the total population in Nordbaden
  - ↪ Sample representing ~3% of the total population of Germany
- ↪ **Generalizability**
  - ↪ How does the regional population compare to the total German population?



## METHODS

### Database Characteristics

Sociodemographic Data		
[2003]	Nordbaden	Germany
<b>Population</b>		
Total number	2.723m	82.537m
<b>Insured by SHI ("GKV")</b>	2.238m (82.2%)	70.422m (85.3%)
<b>Of those:</b>		
Male/female ratio	0.88 / 1	0.88 / 1
Age 0-6 years	150,476 (6.7%)	4.470m (6.4%)
Age 7-12 years	141,857 (6.3%)	4.166m (5.9%)
Age 13-19 years	175,663 (7.9%)	5.722m (8.1%)
Age ≥20 years	1.770m (79.1%)	56.064m (79.6%)

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## METHODS

### Database Characteristics

Physicians in Private Practice		
[2003]	Nordbaden	Germany
<b>Physicians (g.p.'s &amp; all specialties)</b>		
Total number	4,905	127,711
No. / 100,000 insured persons	219.1	181.4
<b>Practitioners ("APIs")</b>		
Total number	2,102	70,747
No. / 100,000 insured persons	93.9	86.3
<b>Pediatricians</b>		
Total number	211	6,093
No. / 100,000 insured persons	9.3	8.7
<b>Child &amp; Adolescent Psychiatrists</b>		
Total number	30	519
No. / 100,000 insured persons	1.3	0.7

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## ***PREVALENCE OF ADHD IN NORDBADEN***

- The Nordbaden Project
- Database Characteristics
- Age and Gender Specific Prevalence
- Co-Existing Conduct Disorder
- Physician Groups Involved in Care by Age and Gender
- Concentration of Care within Physician Specialist Groups

## ***PREVALENCE***

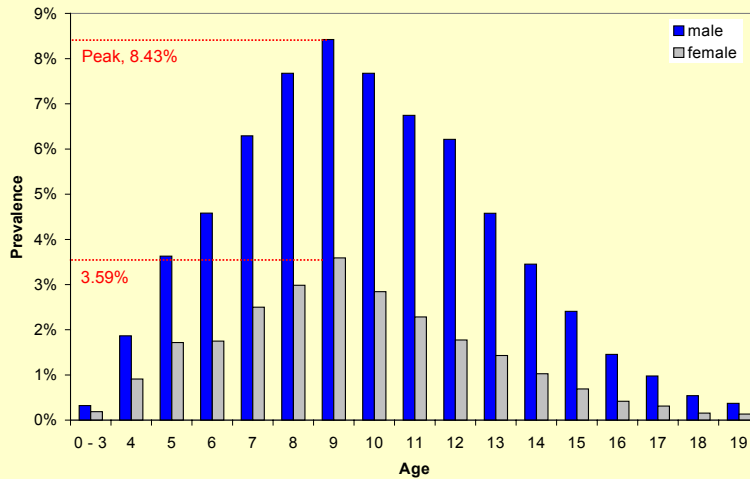
### **Overview of Administrative Prevalence**

<b>Prevalence of ADHD in Nordbaden 2003</b>						
<b>Age group</b>	<b>Overall</b>		<b>Male</b>		<b>Female</b>	
	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>N</b>
0-6 Years	1.26%	1,893	1.72%	1,331	0.77%	562
7-12 Years	4.97%	7,046	7.16%	5,220	2.65%	1,826
13-19 Years	1.31%	2,306	1.99%	1,791	0.60%	515
≥20 Years	0.04%	630	0.04%	356	0.03%	274
<b>Total</b>	<b>0.53%</b>	<b>11,875</b>	<b>0.83%</b>	<b>8,698</b>	<b>0.27%</b>	<b>3,177</b>

## PREVALENCE

### Administrative Prevalence of ADHD in Nordbaden: Children and Adolescents

#### Prevalence by Age and Gender



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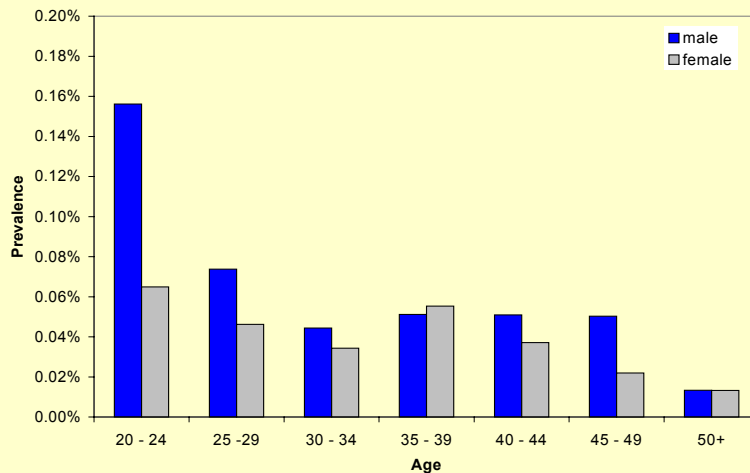
Insights from Nordbaden, Germany



## PREVALENCE

### Administrative Prevalence of ADHD in Nordbaden: Adults

#### Prevalence by Age and Gender



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## PREVALENCE

### Administrative Prevalence of ADHD in Nordbaden

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

#### Share of Patients with Conduct Disorder<sup>1</sup>

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%

<sup>1</sup>Definitions: (1) No.[HKCD] / (No. [HKD] + No. [HKCD]);  
(2) HKCD: F90.1 or F90.x and F91.x  
at least once diagnosed during 2003

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## PREVALENCE

### The Nordbaden ADHD Project

#### Prevalence Findings: Some Implications

##### Discussion

- Administrative prevalence in children and adolescents were high compared to "true prevalence" estimates based on ICD-10 (but consistent with DSM-IV-based prevalence estimates).
- 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, 2.1/1 in 20-30 year olds). Gender differences dissipated with increasing age (also regarding to co-existent conduct disorder).
- Among adults, ADHD was rarely diagnosed (/recognized)

##### Some Research Needs

- Quality of diagnosis (and reporting) in routine clinical care?
- Long-term outcomes of ADHD by treatment (patterns)?
- Quality of care (actual treatment compared to guidelines)?
- Health care resource utilization and direct medical cost?

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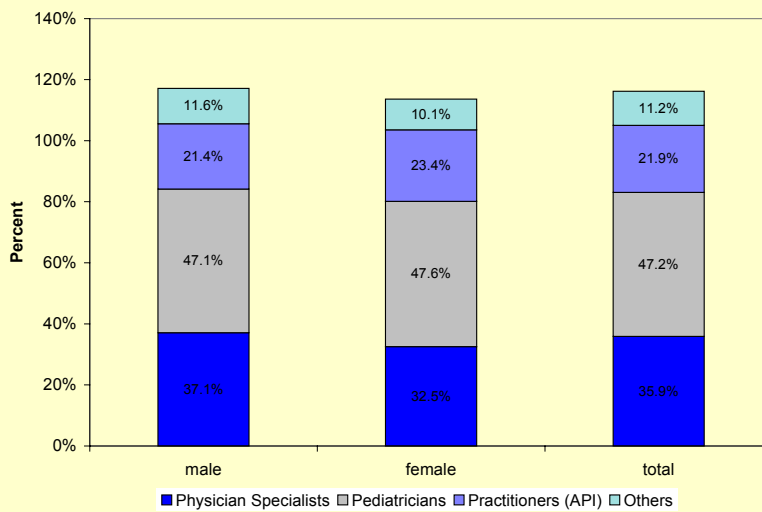
## ***PHYSICIAN INVOLVEMENT IN CARE***

- The Nordbaden Project
- Database Characteristics
- Age and Gender Specific Prevalence
- Co-Existing Conduct Disorder
- Physician Groups Involved in Care by Age and Gender
- Concentration of Care within Physician Specialist Groups

## ***“WHO CARES ?”***

### **Specialist Involvement in Diagnosis and Treatment of ADHD in Nordbaden**

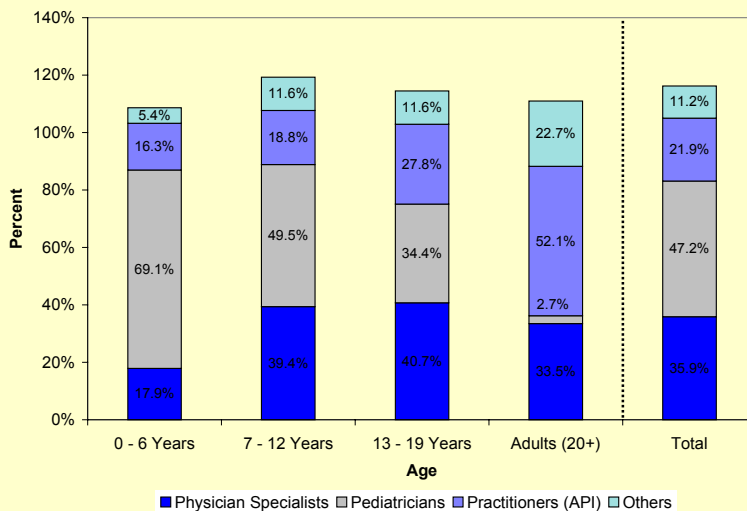
#### **Physician Groups Involved in Care by Gender**



## "WHO CARES?"

### Specialist Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Physician Groups Involved in Care by Age



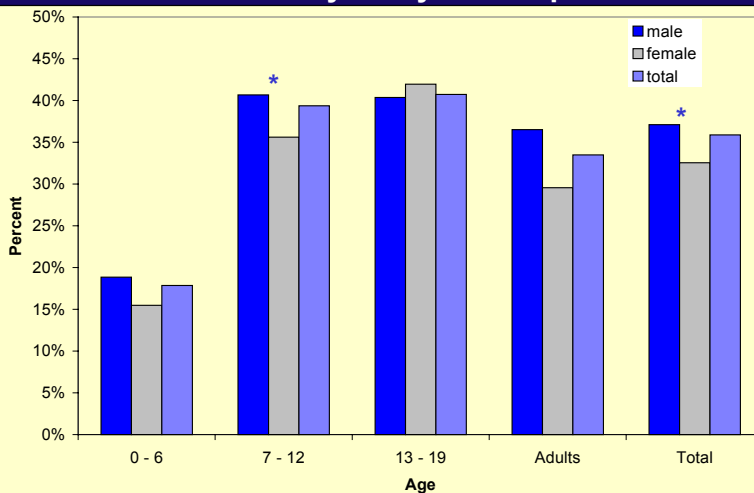
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## "WHO CARES?"

### Specialist Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Subjects with ADHD seen at least once in 2003 by a Physician Specialist



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## "WHO CARES?"

### Specialist Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Subjects with ADHD seen by CAPs or Pediatricians

Age group		Subjects with ADHD		Subjects with ADHD seen in 2003 by Child and AdolscntPsychiatrist			Subjects with ADHD seen in 2003 by Pediatrician		
		n		n	%	95% CI	n	%	95% CI
0 - 6		1,893		290	15.3%	13.7% - 17.0%	1,308	69.1%	67.0% - 71.2%
hereof:	male	1,331		219	16.5%	14.5% - 18.6%	920	69.1%	66.6% - 71.6%
	female	562		71	12.6%	10.0% - 15.7%	388	69.0%	65.0% - 72.8%
7 - 12		7,046		2,283	32.4%	31.3% - 33.5%	3,487	49.5%	48.3% - 50.7%
hereof:	male	5,220		1,745	33.4%	32.1% - 34.7%	2,546	48.8%	47.4% - 50.1%
	female	1,826		538	29.5%	27.4% - 31.6%	941	51.5%	49.2% - 53.8%
13 - 19		2,306		783	34.0%	32.0% - 35.9%	793	34.4%	32.4% - 36.4%
hereof:	male	1,791		600	33.5%	31.3% - 35.7%	617	34.5%	32.2% - 36.7%
	female	515		183	35.5%	31.4% - 39.8%	176	34.2%	30.1% - 38.5%
20 +		630		13	2.1%	1.1% - 3.5%	17	2.7%	1.6% - 4.3%
hereof:	male	356		3	0.8%	0.2% - 2.4%	11	3.1%	1.6% - 5.5%
	female	274		10	3.6%	1.8% - 6.7%	6	2.2%	0.8% - 4.7%
total		11,875		3,369	28.4%	27.6% - 29.2%	5,605	47.2%	46.3% - 48.1%
hereof:	male	8,698		2,567	29.5%	28.6% - 30.5%	4,094	47.1%	46.0% - 48.1%
	female	3,177		802	25.2%	23.7% - 26.8%	1,511	47.6%	45.8% - 49.3%

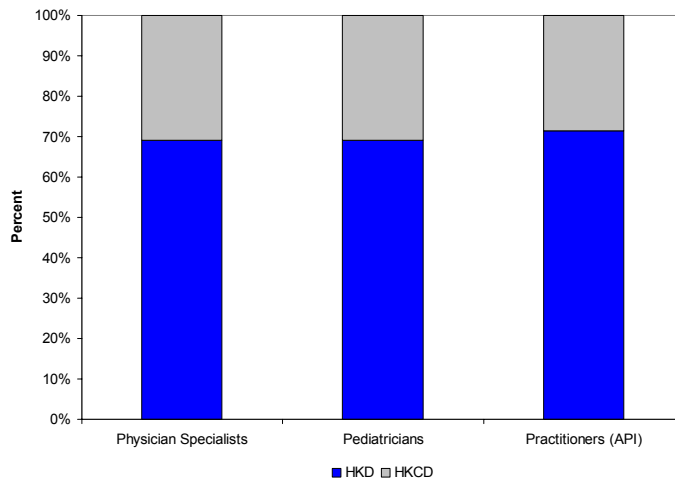
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### Presence of Co-Existing Conduct Disorder as a Marker for Impairment

#### Proportion of HKD and HKCD Patients among Physician Groups



Share of ADHD patients with a diagnosis hyperkinetic disorder with ("HKCD") or without ("HKD") conduct disorder by physician specialist group

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## "WHO CARES?"

### Specialist Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Subjects with ADHD seen in 2003 by Specialists

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:								
male	1,331		251	18.9%	16.8% - 21.1%	70	5.3%	4.1% - 6.6%
female	562		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:								
male	5,220		2,123	40.7%	39.3% - 42.0%	814	15.6%	14.6% - 16.6%
female	1,826		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:								
male	1,791		723	40.4%	38.1% - 42.7%	241	13.5%	11.9% - 15.1%
female	515		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:								
male	356		130	36.5%	31.5% - 41.8%	52	14.6%	11.1% - 18.7%
female	274		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:								
male	8,698		3,227	37.1%	36.1% - 38.1%	1,177	13.5%	12.8% - 14.3%
female	3,177		1,034	32.5%	30.9% - 34.2%	362	11.4%	10.3% - 12.6%

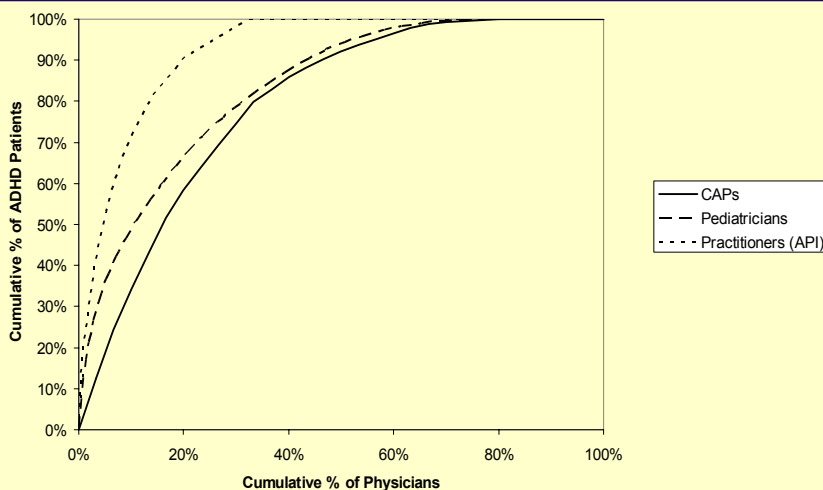
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### Physician Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Concentration Analysis by Specialist Group



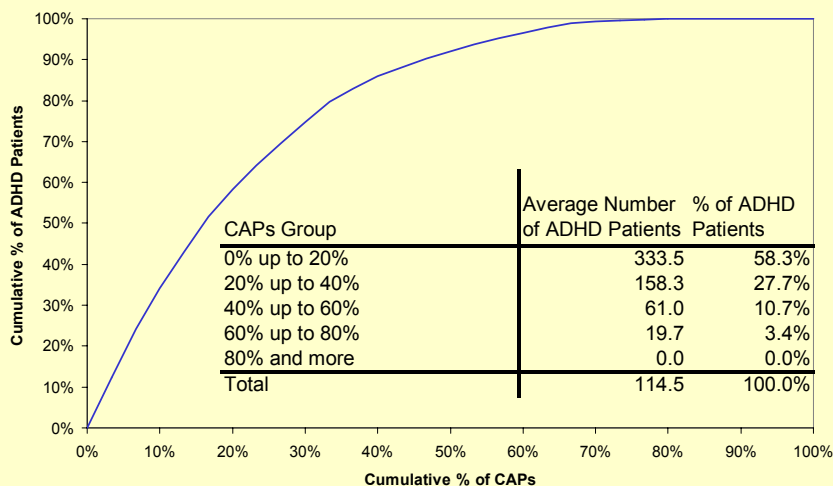
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### Physician Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Concentration Analysis: CAPs



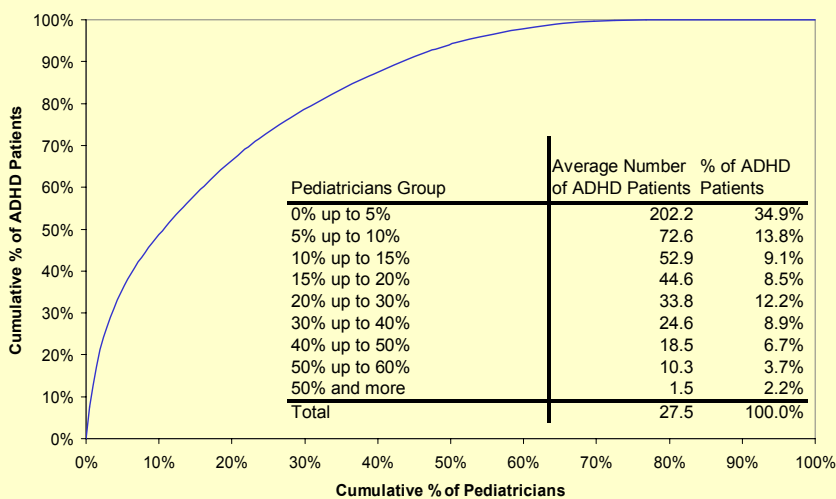
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#### Concentration Analysis: Pediatricians



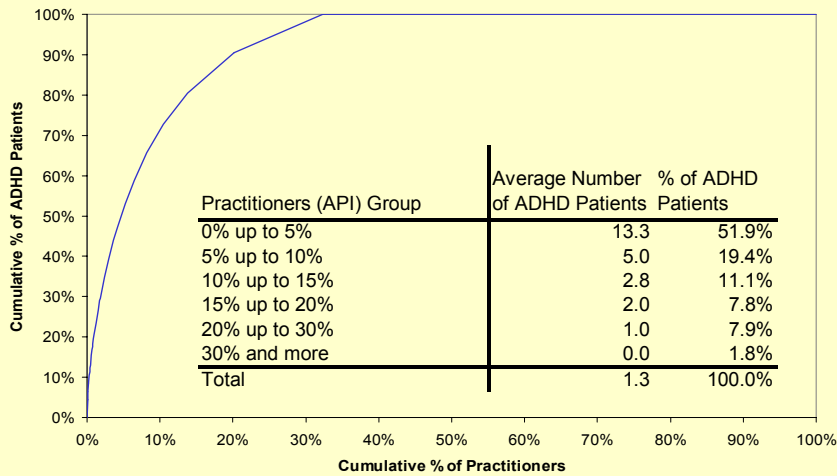
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### Physician Involvement in Diagnosis and Treatment of ADHD in Nordbaden

#### Concentration Analysis: Practitioners



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## “WHO CARES ?”

### Summary and Conclusions

#### Physician Involvement in Care: Some Implications

##### Discussion

- Despite the above-average number of specialists in Nordbaden, most patients (>64%) were not seen (at least once) by a specialist.
- A small number of patients (~13%) only were treated by or under continuous supervision of a specialized physician.
- Boys were somewhat more likely than girls to be seen and treated by specialists, a gender difference that was statistically significant. This observation was not fully explained by the more frequent co-existence of conduct disorder among males (especially boys).
- The high concentration of care within physician specialist groups may reflect the still controversial nature of the disorder.

##### Implications

- Given their important role in health care provision, pediatricians and general practitioners will need to understand diagnosis, associated comorbidity, and appropriate treatment of patients with ADHD.

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