



**Karolinska  
Institutet**

# Swedish Prescribed Drug register

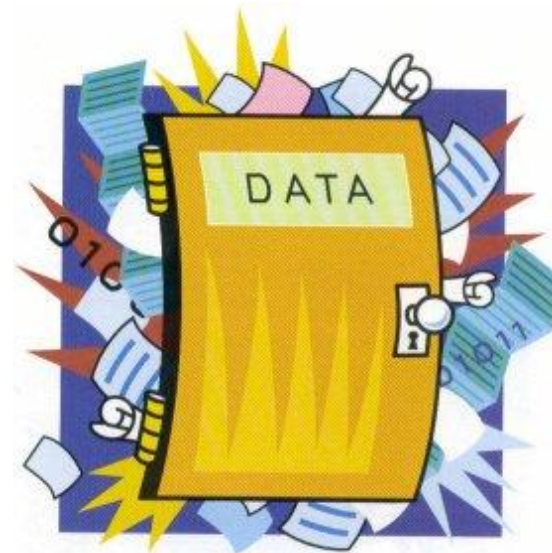
Björn Wettermark  
NorPen 2009



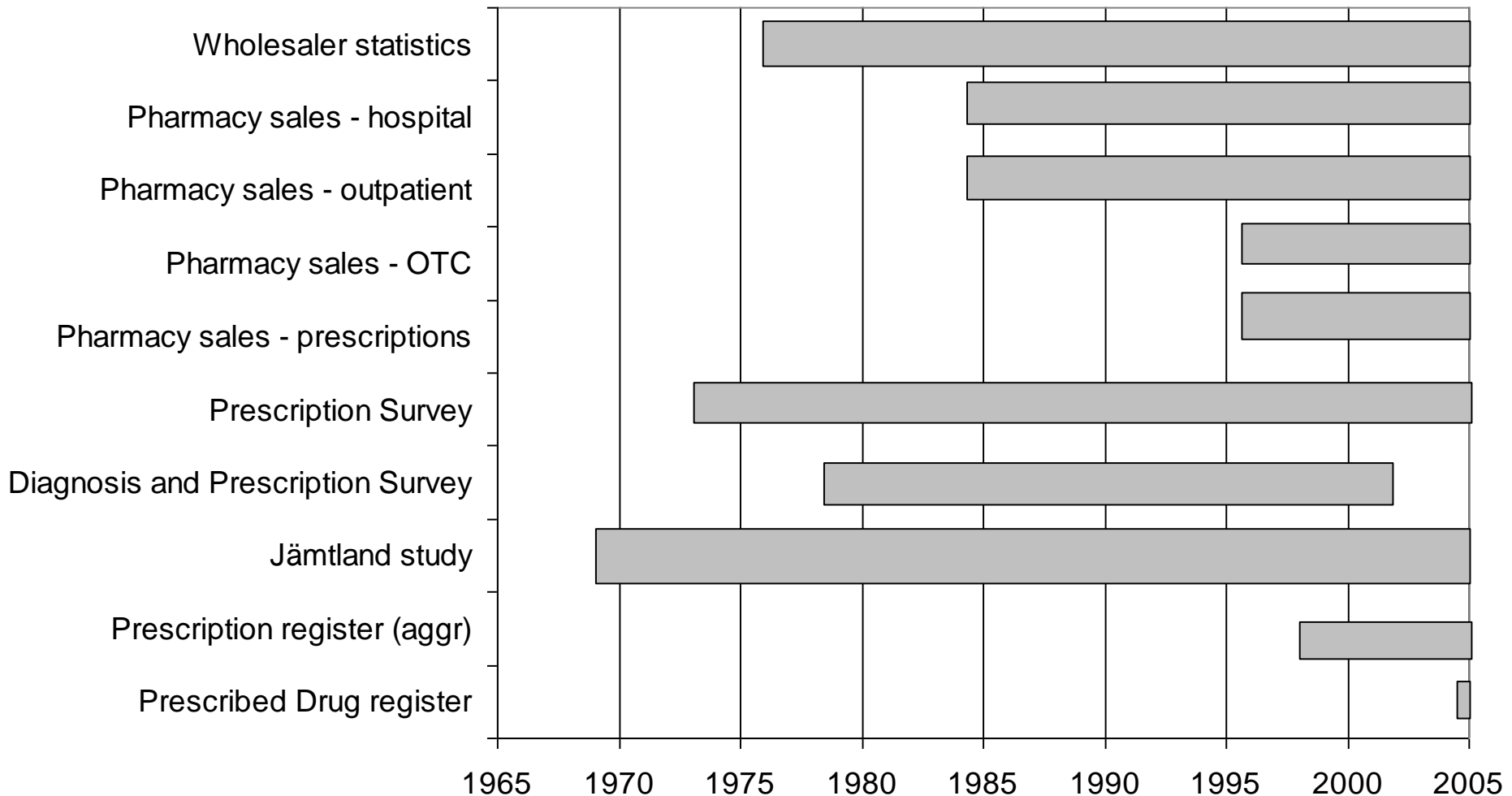
Centre for Pharmacoepidemiology  
CPE

# Outline

*Content, possibilities of record-linkage with other registers, examples of studies*



# Drug utilization data in Sweden



# Swedish Prescribed Drug Register *- established in July 2005*

PHARMACOEPIDEMIOLOGY AND DRUG SAFETY (in press)  
Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/pds.1294

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ORIGINAL REPORT

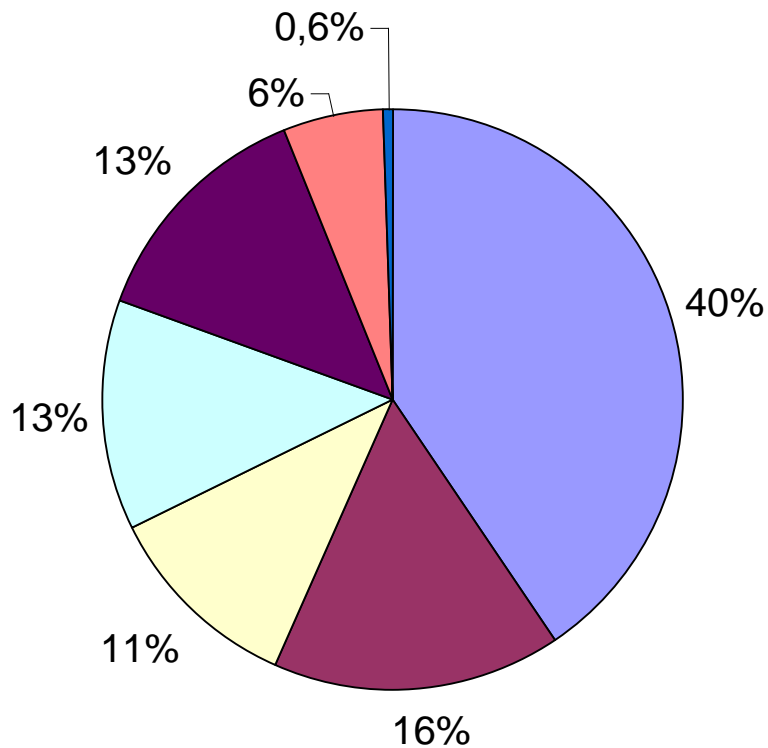
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The new Swedish Prescribed Drug Register—Opportunities for pharmacoepidemiological research and experience from the first six months<sup>†</sup>

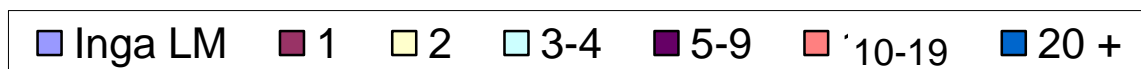
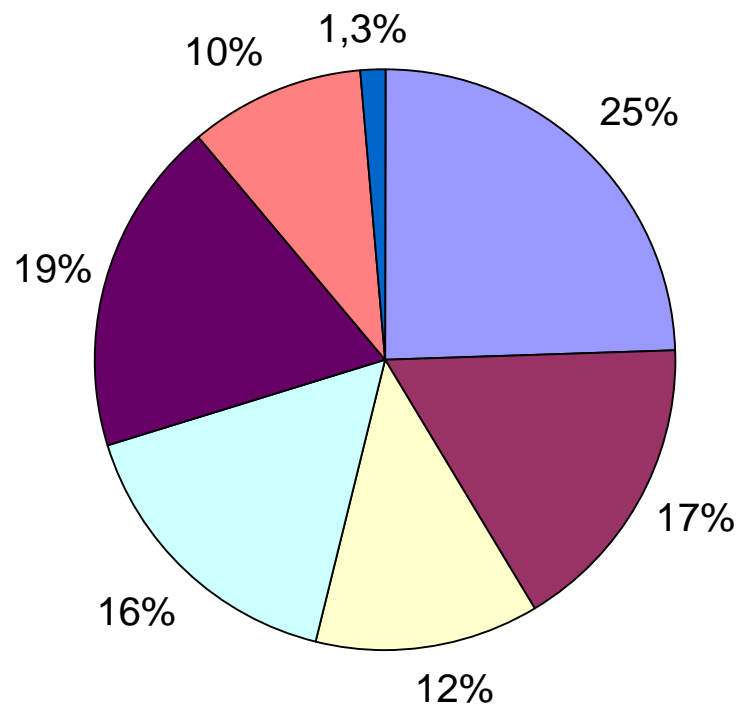
Björn Wettermark, M.Sc.Pharm, PhD<sup>1,2\*,‡</sup>, Niklas Hammar Assoc. professor<sup>3,4‡</sup>, C. MichaelFored MD, PhD<sup>5‡</sup>, Andrejs Leimanis<sup>6</sup>, Petra Otterblad Olausson PhD<sup>6</sup>, Ulf Bergman MD, professor<sup>1</sup>, Ingemar Persson MD, professor<sup>7,8</sup>, Anders Sundström MD, PhD<sup>9</sup>, Barbro Westerholm MD, professor<sup>9</sup> and Måns Rosén MD, professor<sup>6</sup>

# Hur många olika receptläkemedel fick svenskarna under 2006

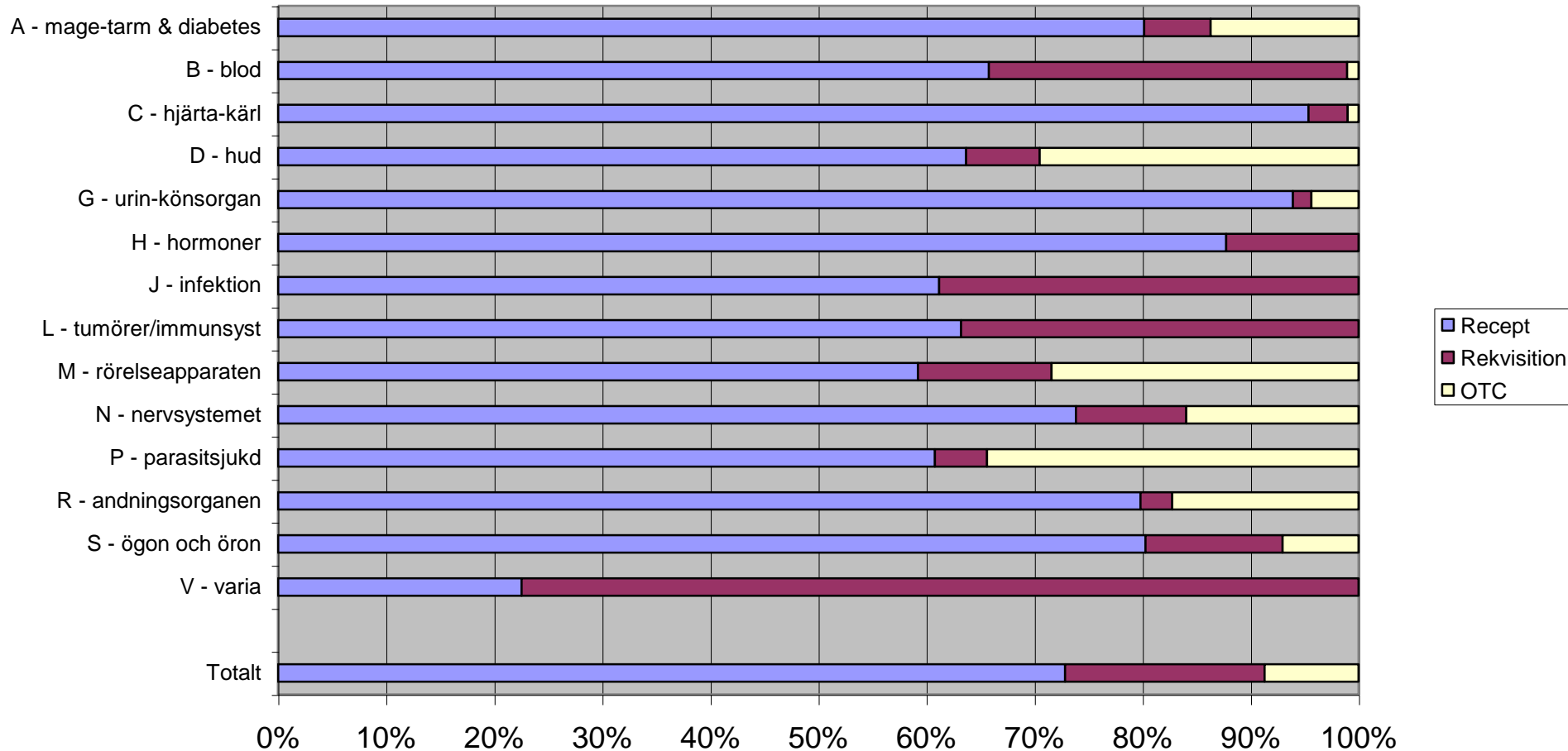
män



kvinnor



## Andel av kostnad per försäljningsätt Läkemedel i riket 2007



# Content

## *patient & prescriber*

- Personal identification number (YYMMDD-NNNC)
- Age & sex
- Residency
  - County, municipality and parish
- **Prescribers practice (workplace code)**
- **Profession**
- **Speciality**

# Content

## *drugs & measures*

- Prescribed *and* dispensed drug
- Date of prescribing *and* dispensing
- Generic substitution
- Dosage
- Volume - number of items, prescriptions & DDD
- Expenditures – total & reimbursed



# National Health data registers

- Cancer register 1958-
- Medical Birth and congenital malformations register (1964) 1973-
- Hospital patient register 1964/1987/2001-
- Cause of death register 1952-
  
- *Other registers...*

# Applications

- Drug statistics
- Quality indicators
- Research
  - drug utilization studies
  - analytical studies

# Statistics

- Number of patients exposed
- Prevalence & incidence
- Waiting-time distribution
- Lorenz-distribution

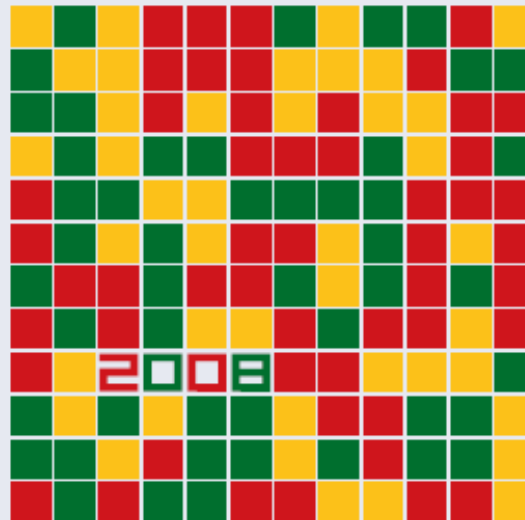
*Riket: Sammanfattningstabell*

Läkemedelsgrupp	Patienter	Andel män	Snittålder	DDD/TID	Prevalence/1000 invånare	Incidence rate/1000 personår	Lorenz 1-percentile	Lorenz 50-percentile
A02B Medel vid magsår och gastroesofageal reflux	717 177	0,41	60,55	37,58	78,70	37,92	5,16	85,22
A06 Laxantia	459 109	0,38	64,91	23,77	50,38	31,91	9,28	89,36
A08 Medel vid obesitas	56 098	0,31	50,42	3,22	6,16	2,82	5,38	81,06
A10 Diabetesmedel	329 208	0,56	64,10	46,10	36,12	5,01	4,50	79,02
A10A Insuliner	165 585	0,56	60,83	23,60	18,17	2,71	4,28	76,08
A10B Perorala diabetesmedel	230 110	0,55	67,25	22,50	25,25	4,56	4,66	79,20
B01AA Dikumarolgruppen	144 016	0,59	72,08	8,18	15,80	4,40	3,38	73,00
B01AC Trombocyttaggregationshämmande medel	744 441	0,52	72,86	77,20	81,69	14,78	2,68	65,26
B03BA Vitamin B12	289 362	0,37	71,07	29,66	31,75	10,68	4,44	68,98
B03BB Folsyra och derivat	161 157	0,36	66,49	182,41	17,68	7,26	3,40	74,88
C01A Hjärtglykosider	76 169	0,46	79,35	4,56	8,36	1,36	3,14	71,12
C01D Kärilvidgande medel för hjärtsjukdomar	254 060	0,50	74,80	18,66	27,88	12,13	7,72	94,88
C03A+C03E+C09BA+C09DA Tiazider inkl kombinationer	510 124	0,42	68,56	53,77	55,98	13,13	3,00	67,58
C03C Loop-diuretika	383 055	0,40	75,72	45,71	42,03	10,89	10,76	80,20
C07 Beta-receptorblockerande medel	939 057	0,47	68,24	55,04	103,04	19,57	3,92	77,38
C08 Kalciumantagonister	452 545	0,49	69,76	48,46	49,66	10,71	3,32	72,94
C09 Medel som påverkar renin-angiotensinsystemet	823 276	0,53	67,78	117,58	90,34	21,28	4,34	75,78
C09A+C09B ACE-hämmare inkl kombinationer	456 377	0,56	68,41	67,77	50,08	15,62	4,18	81,36
C09C+C09D ARB inkl kombinationer	366 702	0,49	66,94	44,53	40,24	8,81	4,12	70,66
C10A Kolesterol- och triglyceridsänkande medel	699 743	0,54	67,02	107,67	76,78	18,84	5,08	74,72

*Official statistics available from NBHW*

# Öppna jämförelser av hälso- och sjukvårdens kvalitet och effektivitet

Jämförelser mellan landsting  
2008



# Examples of Quality Indicators

- % of people >80 years purchasing three or more psychotropic drugs
- Proportion of children 0 to 6 years treated with antibiotics for respiratory tract infections (RTI)
- % of patients with prescribed and dispensed diabetes drugs who are also prescribed lipid lowering drugs
- % of stroke patients with atrial fibrillation dispensed anticoagulation therapy 12 months after discharge

# Examples of studies

# Kvalitets- indikatorer för antibiotika- förskrivning i primärvården

Bygger på data från Socialstyrelsens  
läkemedelsregister



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Epidemiologiskt centrum,  
Socialstyrelsen



# Fortsatta fråge- tecken kring bantningsmedlet rimonabant

**Inte godkänt i USA på grund av  
risken för psykiska biverkningar**



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holms läns landstings speciallä-  
kemedelsprojekt

PHARMACOEPIDEMIOLOGY AND DRUG SAFETY 2008; 17: 37–42

Published online 6 November 2007 in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/pds.1515

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ORIGINAL REPORT

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# Prevalence of purchase of antihypertensive and serum lipid-reducing drugs in Sweden—individual data from national registers<sup>†</sup>

Louise Silwer MScPharm, PhD<sup>1,2\*</sup>, Cecilia Stålsby Lundborg MScPharm, PhD<sup>1,2,3‡</sup>  
and Max Petzold PhD<sup>1,3§</sup>

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Eur J Clin Pharmacol (2008) 64:1223–1229  
DOI 10.1007/s00228-008-0495-5

PHARMACOEPIDEMIOLOGY AND PRESCRIPTION

# Utilisation of angiotensin receptor blockers in Sweden: combining survey and register data to study adherence to prescribing guidelines

Pia Frisk • Tor-Olov Mellgren • Niklas Hedberg •  
Anita Berlin • Fredrik Granath • Björn Wettermark



# Concomitant Use of Gastroprotective Drugs among Elderly NSAID/COX-2 Selective Inhibitor Users

## A Nationwide Register-Based Study

*Kristina Johnell and Johan Fastbom*

Aging Research Center, Karolinska Institutet, Stockholm, Sweden

Acta Diabetol

DOI 10.1007/s00592-008-0076-1

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ORIGINAL ARTICLE

## Refill adherence to oral antihyperglycaemic drugs in Sweden

Dan Haupt · Gunilla Ringbäck Weitoft ·  
J. Lars G. Nilsson

## INTERNATIONAL REPORTS

# Inappropriate Drug Use in the Elderly: a Nationwide Register-Based Study

Kristina Johnell, Johan Fastbom, Måns Rosén, and Andrejs Leimanis

Eur J Clin Pharmacol  
DOI 10.1007/s00228-009-0623-x

PHARMACOEPIDEMIOLOGY AND PRESCRIPTION

# **To what extent does the indicator “concurrent use of three or more psychotropic drugs” capture use of potentially inappropriate psychotropics among the elderly?**

Eva Lesén • Max Petzold • Karolina Andersson •  
Anders Carlsten

PHARMACOEPIDEMIOLOGY AND DRUG SAFETY 2008; **17**: 1020–1028

Published online 21 August 2008 in Wiley InterScience (www.interscience.wiley.com) DOI: 10.1002/pds.1635

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ORIGINAL REPORT

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# Education and drug use in Sweden—a nationwide register-based study<sup>†,‡</sup>

G. Ringbäck Weitoft BSc, PhD<sup>1\*</sup>, M. Rosén Prof<sup>2,3</sup>, Ö. Ericsson PharmD<sup>1</sup> and R. Ljung MD, PhD<sup>1,4</sup>

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<sup>4</sup>*Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden*



# Secondary Prevention in a Large Stroke Population

## A Study of Patients' Purchase of Recommended Drugs

Björn Wettermark, MSc, PhD; Anna Persson, MSc; Mia von Euler, MD, PhD

**Background and Purpose**—In this study, linked, anonymous data from The National Hospital Discharge Register and the Swedish Prescribed Drug Register were used for studying to what extent recommended drugs for secondary prevention after stroke and TIA were purchased by patients in the region of Stockholm, Sweden (2 million inhabitants).

**Methods**—Data on purchased drugs for secondary stroke prevention during July 2005 to June 2006 by 17 902 patients >18 years discharged after stroke or TIA during the period 1997 to June 2005 were analyzed by age, gender, and year of discharge.

**Results**—Antiplatelets and warfarin were purchased by 87% of all stroke and 83% of all TIA patients, antihypertensives by 74% and 70%, and lipid lowering drugs by 41% and 39%, respectively.

**Conclusion**—Time after discharge had only a minor influence on the proportion of patients purchasing the medicines. (*Stroke*. 2008;39:000-000.)

**Key Words:** stroke ■ TIA ■ secondary prevention ■ guidelines ■ drug therapy

## Conclusion

- A comprehensive register with high quality
- Approx. 30 scientific studies published (?)
- Mainly descriptive drug utilization studies – with or without record linkage
- Good opportunities for record linkage, many studies are ongoing
- Many methodological challenges...
- Some discussion on legal aspects and access

# Thank you for your attention

