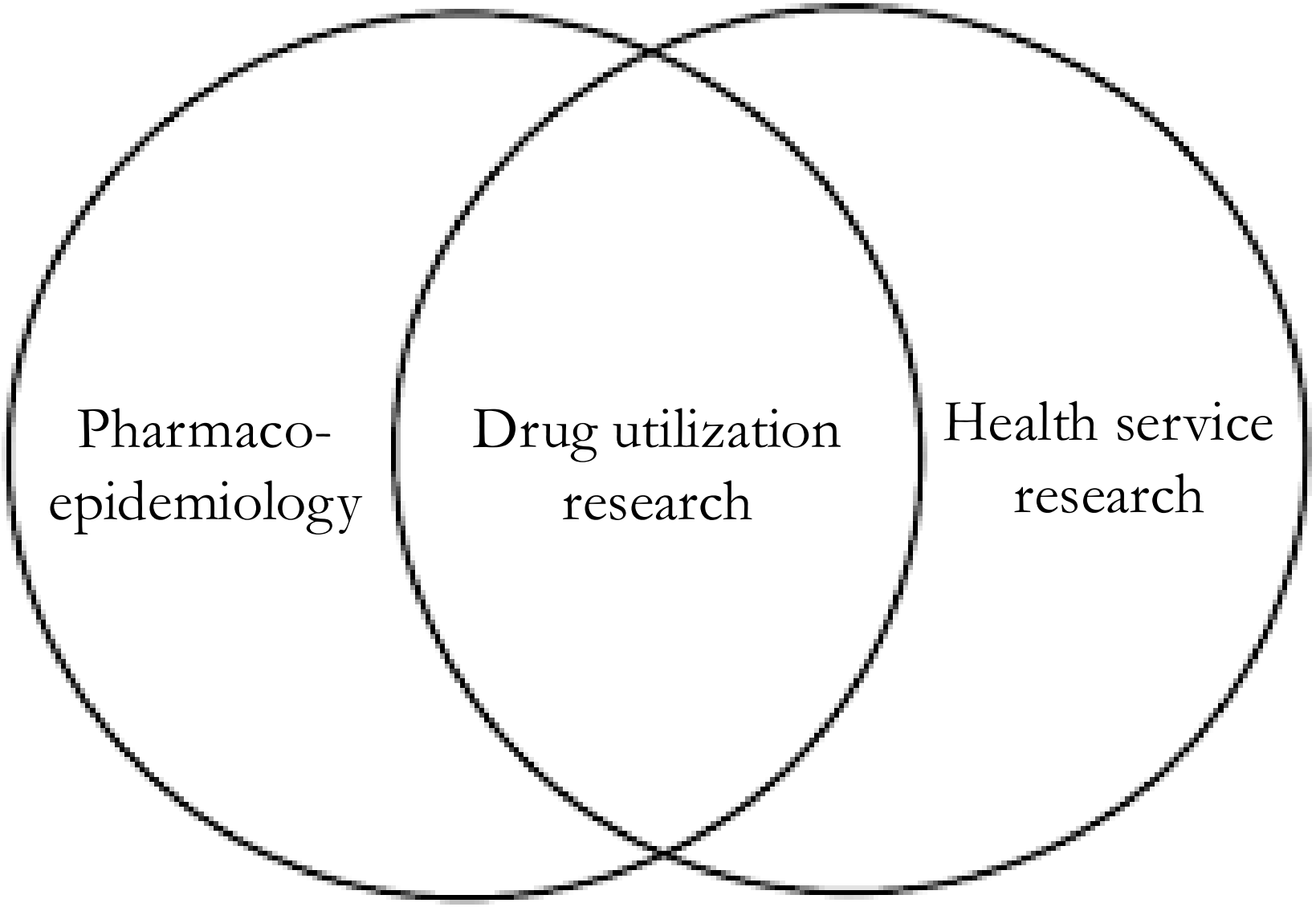
Drug utilization

Credit: Lotte Rasmussen

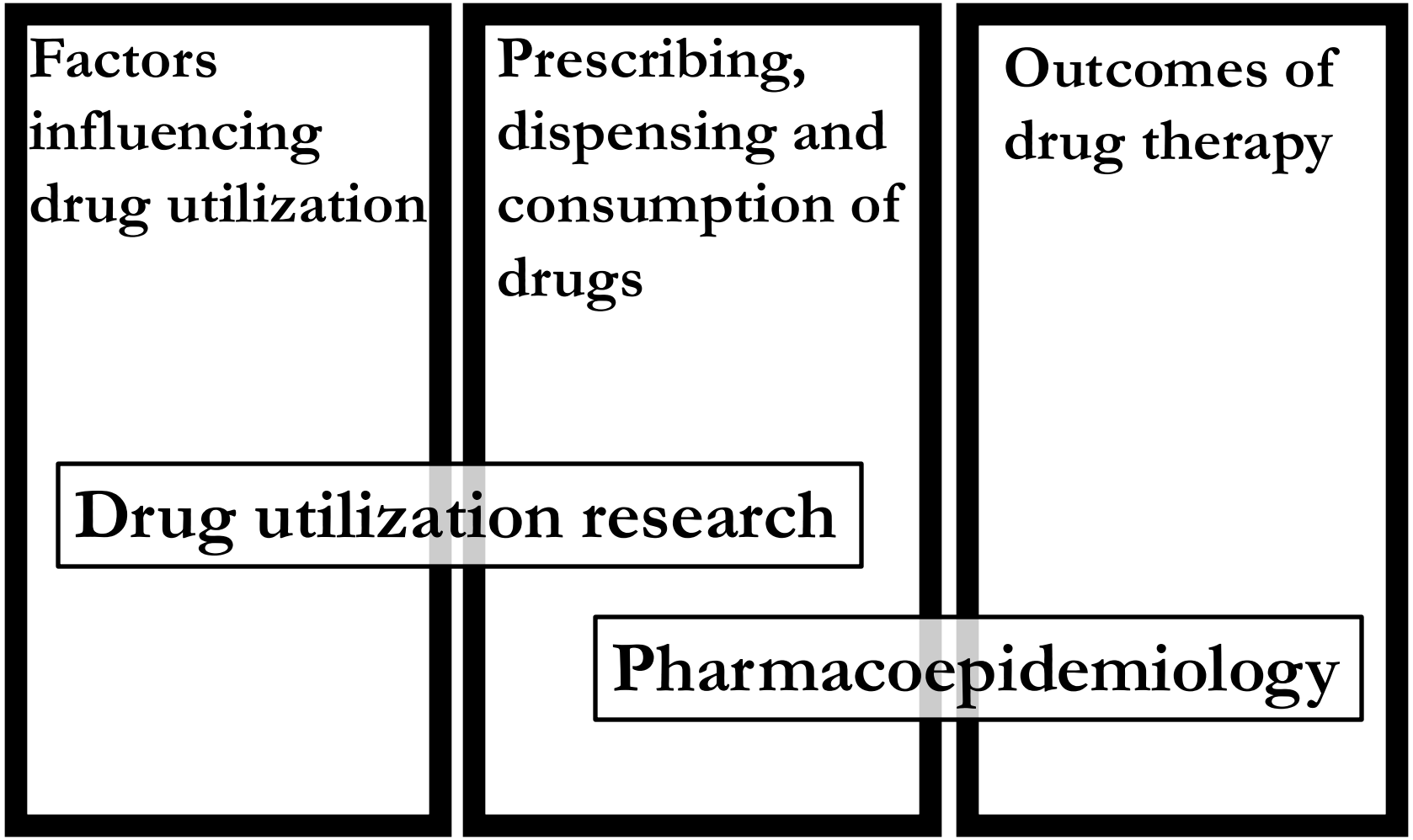
Pharmacoepidemiology

”Pharmacoepidemiology is the study of use and effects of medications on a population basis.”

Strom, Kimmel, and Hennessy
Textbook of Pharmacoepidemiology 3rd ed



Adapted from Elseviers et al. 2016



Adapted from Elseviers et al. 2016

To facilitate rational use of drugs!

WHO on rational use of drugs:

"...patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community"

News
ATC/DDD Index
Updates included in the ATC/DDD Index
ATC/DDD methodology
ATC
DDD
Lists of temporary ATC/DDDs and alterations
ATC/DDD alterations, cumulative lists
ATC/DDD Index and Guidelines
Use of ATC/DDD
Courses
Meetings/open session
Deadlines
Links

Postal address:
WHO Collaborating Centre for Drug Statistics Methodology
Norwegian Institute of Public Health
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0213 Oslo
Norway

Visiting/delivery address:
Sandakerveien 24C
Bygg C
0473 Oslo
Norway

Tel: +47 21 07 81 60
E-mail: whocc@fhi.no

ATC/DDD Index 2022

A searchable version of the complete ATC index with DDDs is available below. The search options enable you to find ATC codes and DDDs for substance name and/or ATC levels. In your search result you may choose to show or hide the text from the Guidelines for ATC classification and DDD assignment linked to the ATC level. The text in the Guidelines will give information related to the background for the ATC and DDD assignment.

Search query

ATC code or name Search

containing query

ATC code

- All ATC levels are searchable.
- A search will result in showing the exact substance/level and all ATC levels above (up to 1st ATC level).

Name

- "Name" is defined as the name of the substance (normally the INN name) or the name of the ATC level. Note that trademarks are not searchable.
- A minimum of three letters must be entered in the name box. Select a query that contain part of or a query that start with the letter entered.
- For ATC combination levels, please note that all active ingredients would normally not be searchable.

DDD

The DDDs, which will be reviewed in 2022 (3 year revision), are listed here and in the annex I in the printed ATC Index. See also Guidelines: Part III; D Principles for reviewing and changing DDD and Part V; D Requests for changes to DDDs.

To express the DDD several abbreviations are used for units and routes of administration.

Core questions

Why is the medication prescribed?

Who prescribes the medication?

Who is the medication prescribed to?

Are patients taking the medication correctly?

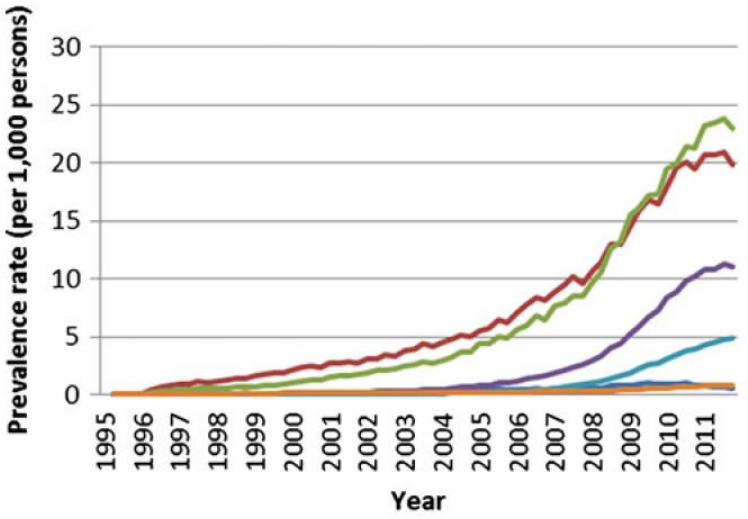
Is the medication used in accordance with guidelines?

Does the consumption of the medication
vary across regions, age, or sex?

What is the effect of regulatory initiatives on
the consumption of the medication?

Incidence rates

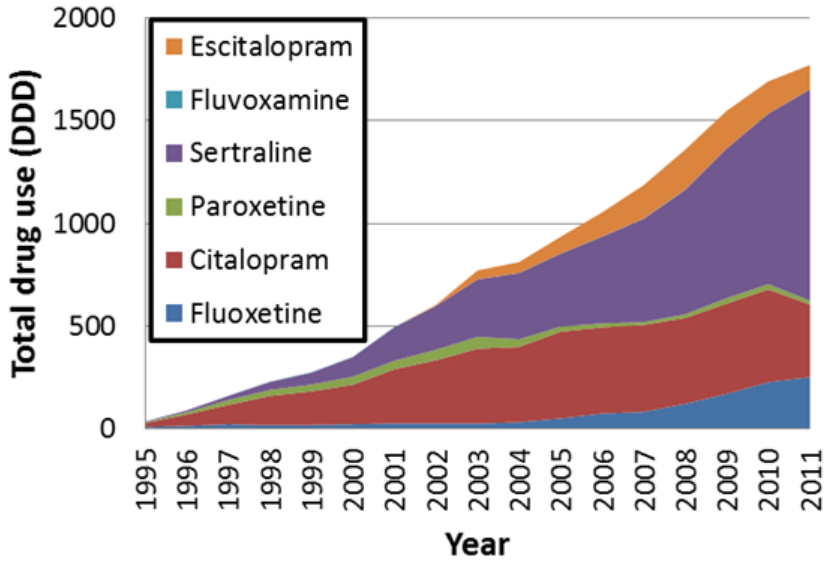
Prevalence proportions



Incidence rates

Prevalence proportions

Use of single substances

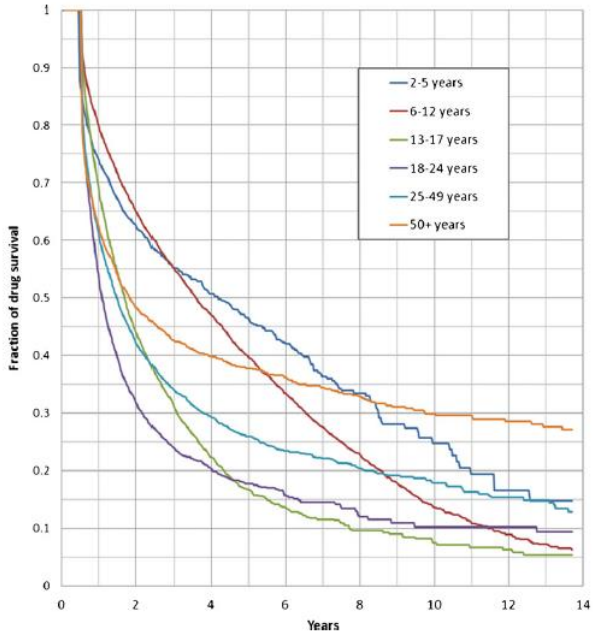


Incidence rates

Prevalence proportions

Use of single substances

Persistence (‘drug survival’)



Incidence rates

Prevalence proportions

Use of single substances

Persistence ('drug survival')

Co-medication

Table 5 Sub-analysis of ACT group N

ATC category	ATC description	<18 years (n=15,660)	
		%	SMR[a]
N01B	Anesthetics, local	0.1	1.3 [0.8–2.0]
N02A	Opioids	0.3	1.1 [0.8–1.4]
N02B	Other analgesics and antipyretics	0.8	2.9 [2.4–3.4]
N02C	Antimigraine preparations	0.6	1.9 [1.5–2.3]
N03A	Antiepileptics	1.9	4.0 [3.6–4.5]
N04A	Anticholinergic agents	0.1	9.3 [4.4–17.0]
N04B	Dopaminergic agents	0.0	9.2 [3.3–19.9]
N05A	Antipsychotics	7.1	19.5 [18.4–20.7]
N05B	Anxiolytics	0.7	3.3 [2.7–4.0]
N05C[b]	Hypnotics and sedatives[b]	0.3	5.3 [3.9–7.0]
N06A	Antidepressants	4.9	7.9 [7.3–8.4]
N07B	Drugs used in addictive disorders	0.1	4.9 [2.6–8.4]
N07X	Other nervous system drugs	0.1	15.5 [6.7–30.5]

Incidence rates

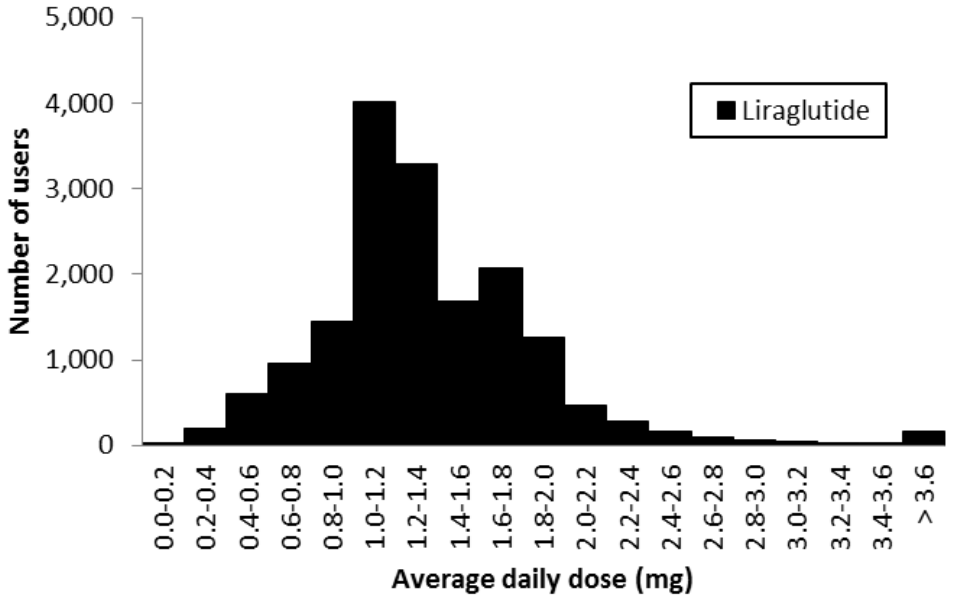
Prevalence proportions

Use of single substances

Persistence (‘drug survival’)

Co-medication

Daily dose (≈)



Incidence rates

Prevalence proportions

Use of single substances

Persistence (‘drug survival’)

Co-medication

Daily dose (≈)

Prescriber profile

	6–12 years	25–49 years
MPH	GP/SP/HP 7/27/66 (6,338)	GP/SP/HP 20/49/31 (9,767)

Incidence rates

Prevalence proportions

Use of single substances

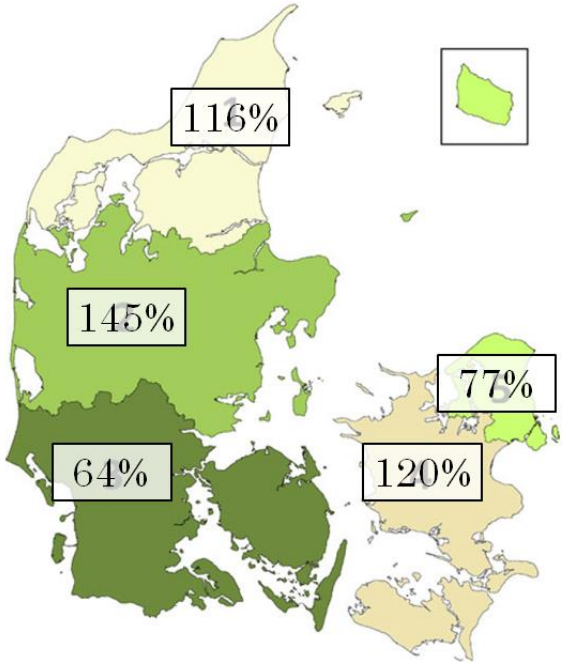
Persistence (‘drug survival’)

Co-medication

Daily dose (≈)

Prescriber profile

Regional differences



Incidence rates

Prevalence proportions

Use of single substances

Persistence (‘drug survival’)

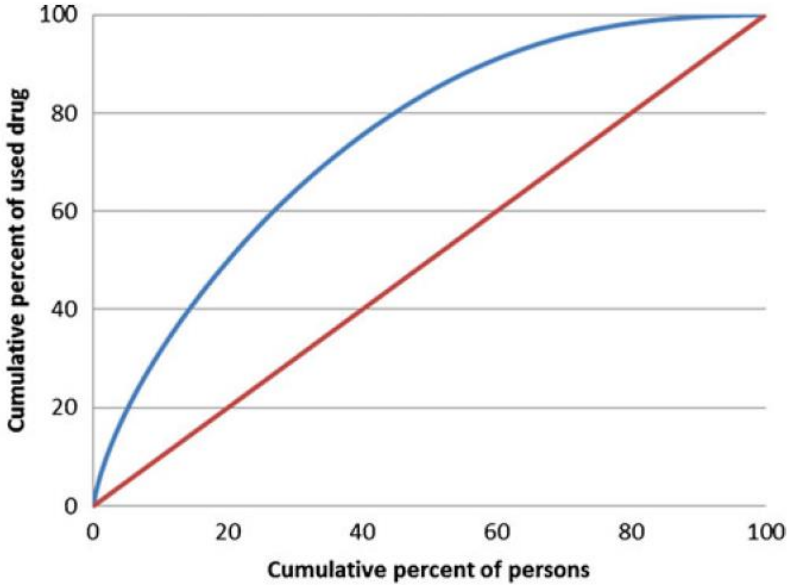
Co-medication

Daily dose (≈)

Prescriber profile

Regional differences

Skewness



MEDSTAT.DK

Forside | Lægemiddelgrupper | ATC kode | Produktnavn

Datagrundlag og beskrivelse

ATC kode

Indtast specifik ATC kode og tryk ENTER

- Alle lægemidler
- A (Fordøjelsesorganer og stofskifte)
- B (Blod og bloddannende organer)
- C (Kardiovaskulære system)
- D (Dermatologiske midler)
- G (Urogenitalsystem og kønshormoner)
- H (Systemiske hormonpræparater, excl. kønshormoner)
- J (Midler mod infektionssygdomme til systemisk brug)
- L (Antineoplastiske og immunomodulerende midler)
- M (Muskulo-skeletal system)
- N (Nervesystemet)
- P (Antiparasitære midler, insekticider og repellanter)
- R (Respirationssystemet)
- S (Sanseorganer)
- V (Diverse)

År

2021
2020
2019
2018
2017
2016

Region

Hele landet
Hovedstaden
Nordjylland
Midtjylland
Sjælland
Syddanmark

Køn

Køn, samlet
Mænd
Kvinder

Aldersgruppe (skift)

Alle
0 - 17 år
18 - 24 år
25 - 44 år
45 - 64 år
65 - 79 år

Sektor

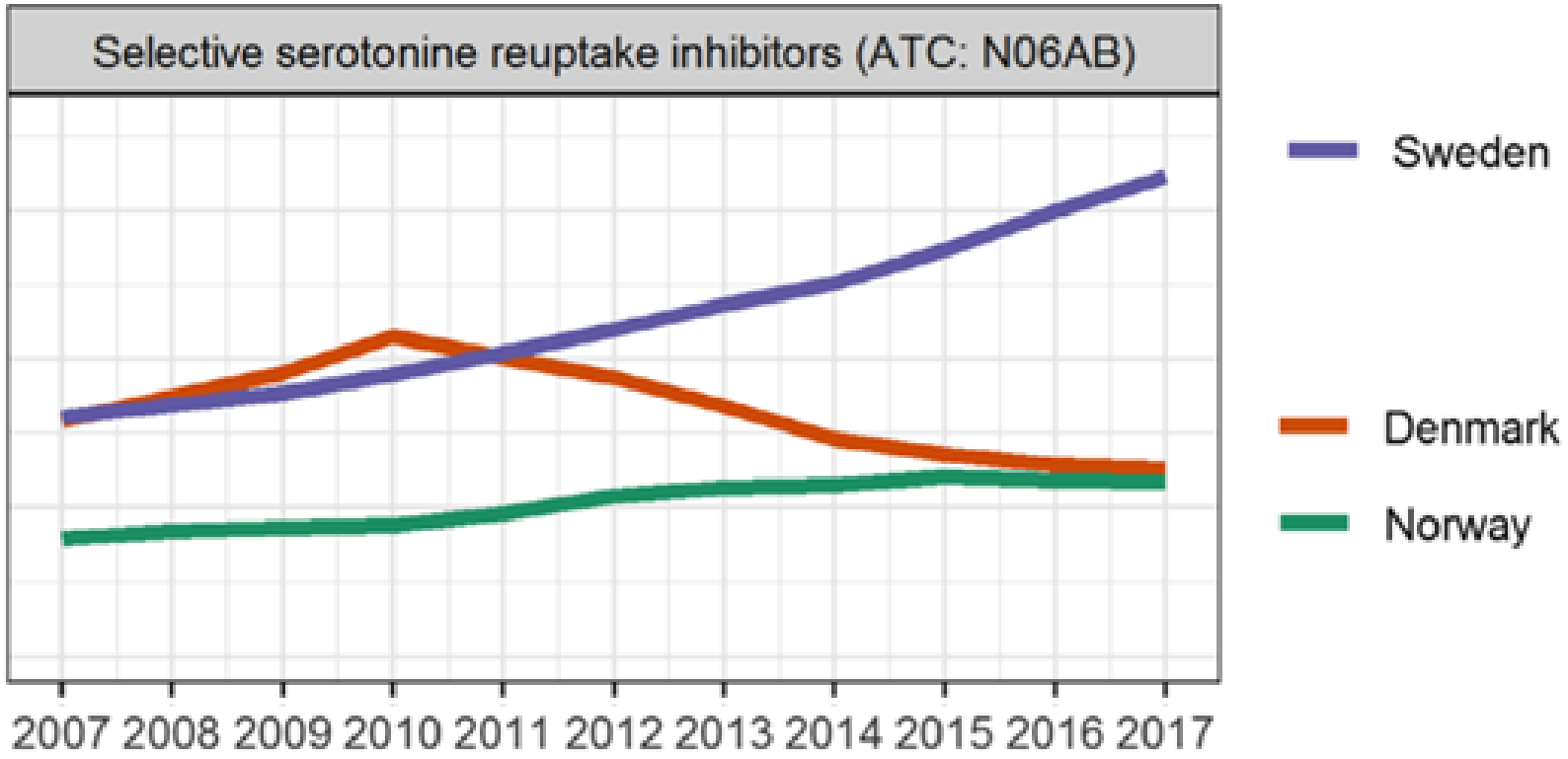
Primærsektor
Sygehussektor
Total

Søgevariabel

Omsætning
Udbetalt regionalt tilskud
Solgt mængde
Solgt mængde pr. 1.000 indbygger pr. døgn
Antal personer
Antal personer pr. 1.000 indbyggere

Vis resultat | Vis resultat i Excel

Sidst opdateret 27.4.2022



Wesselhoeft et al. Acta Psychiatr Scand. 2019

Received: 1 September 2022 | Revised: 30 November 2022 | Accepted: 9 December 2022

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ORIGINAL ARTICLE

WILEY

Changes in the use of glucose-lowering drugs: A Danish nationwide study

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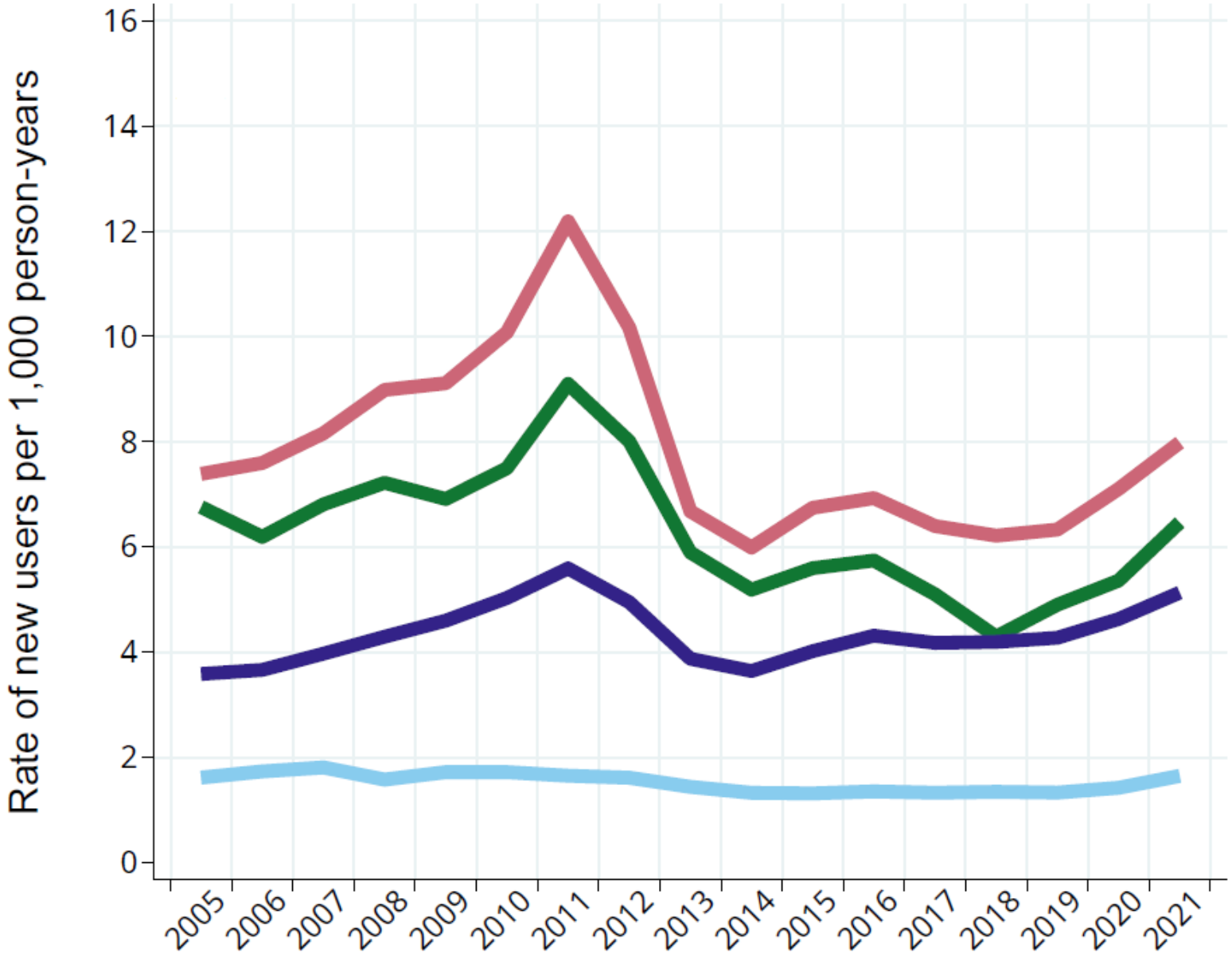
Correspondence
Anton Pottegård, PhD, Clinical Pharmacology, Pharmacy, and Environmental Medicine

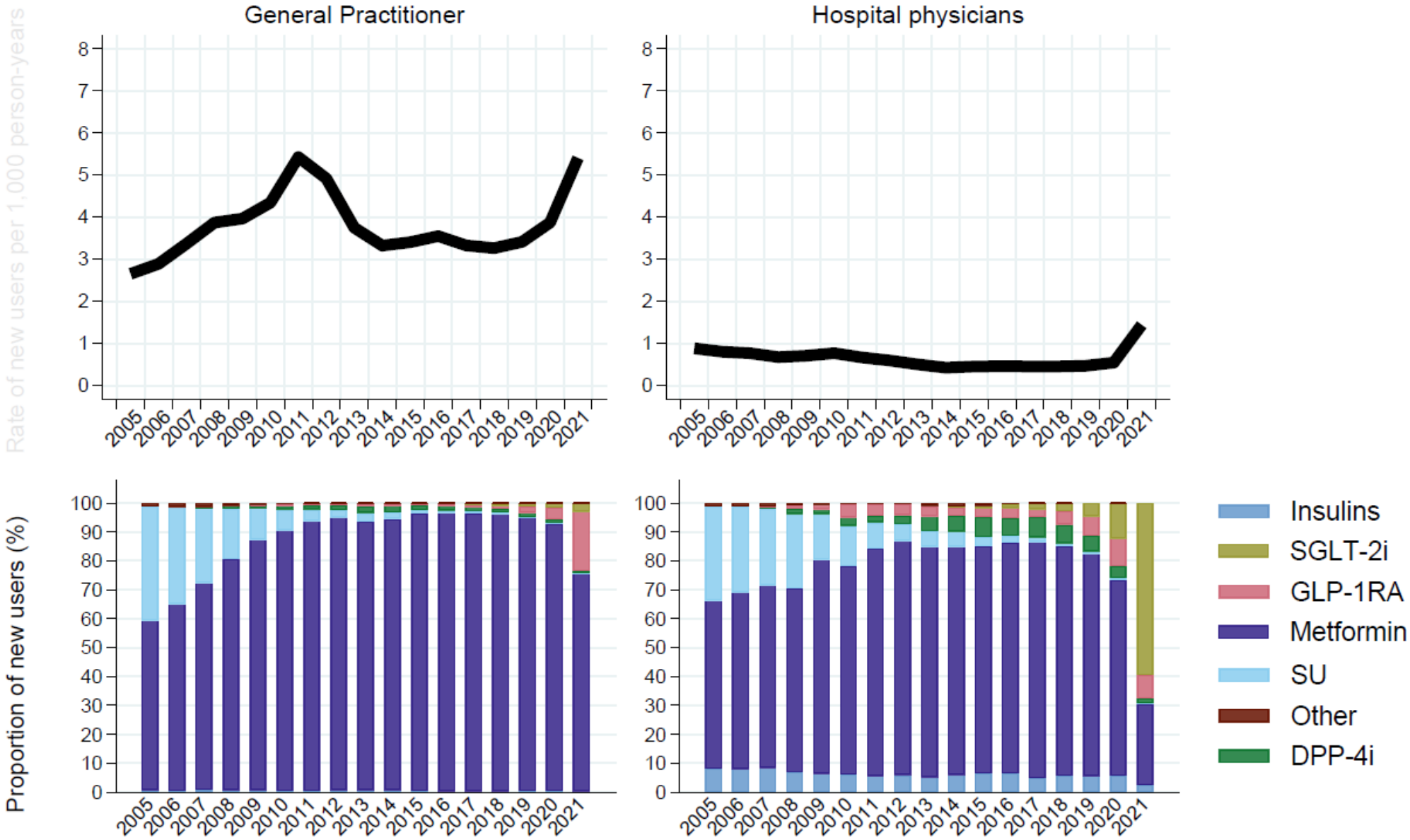
Abstract

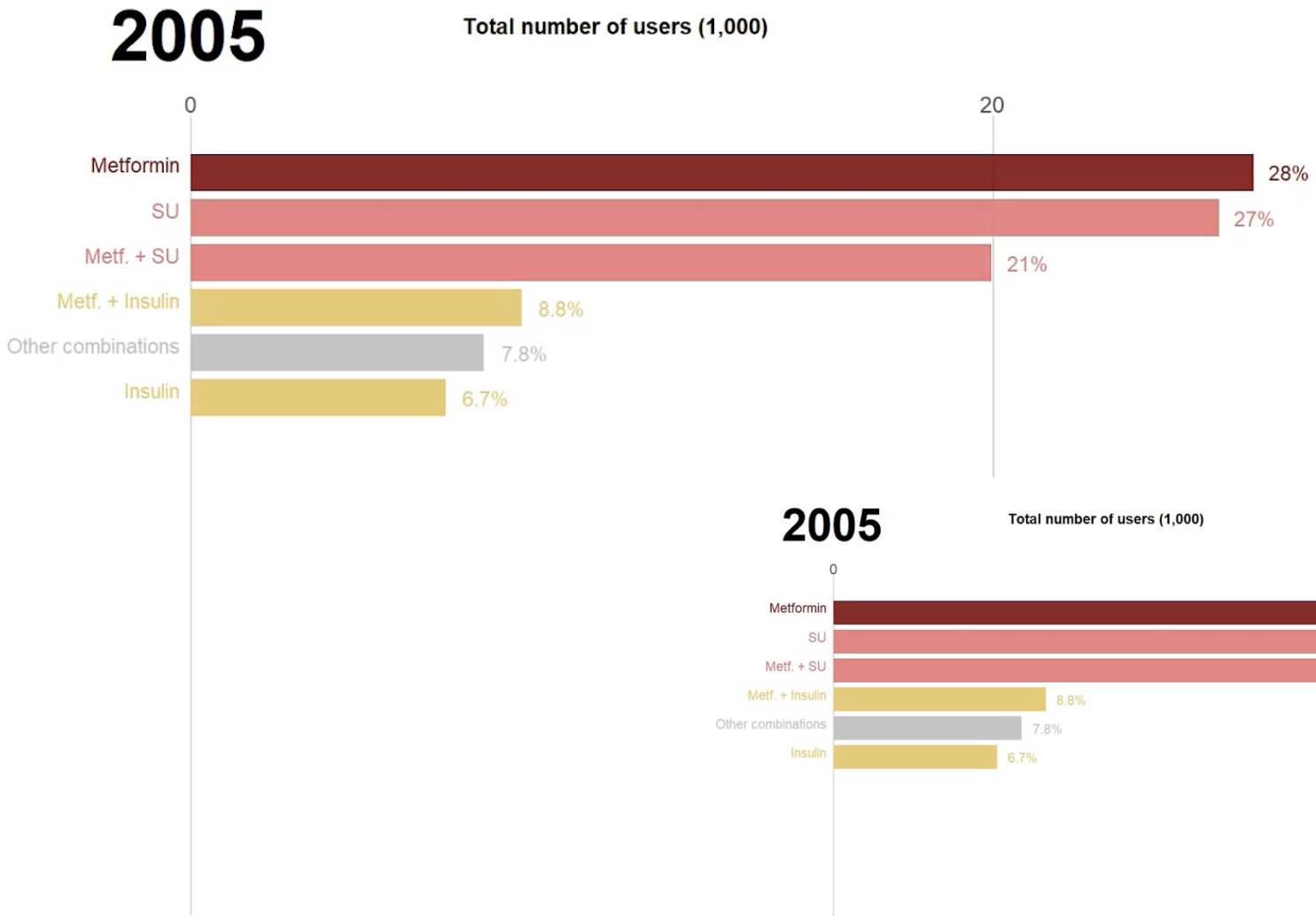
Aim: To investigate changes in the pattern of drugs used to treat type 2 diabetes in Denmark from 2005 to 2021.

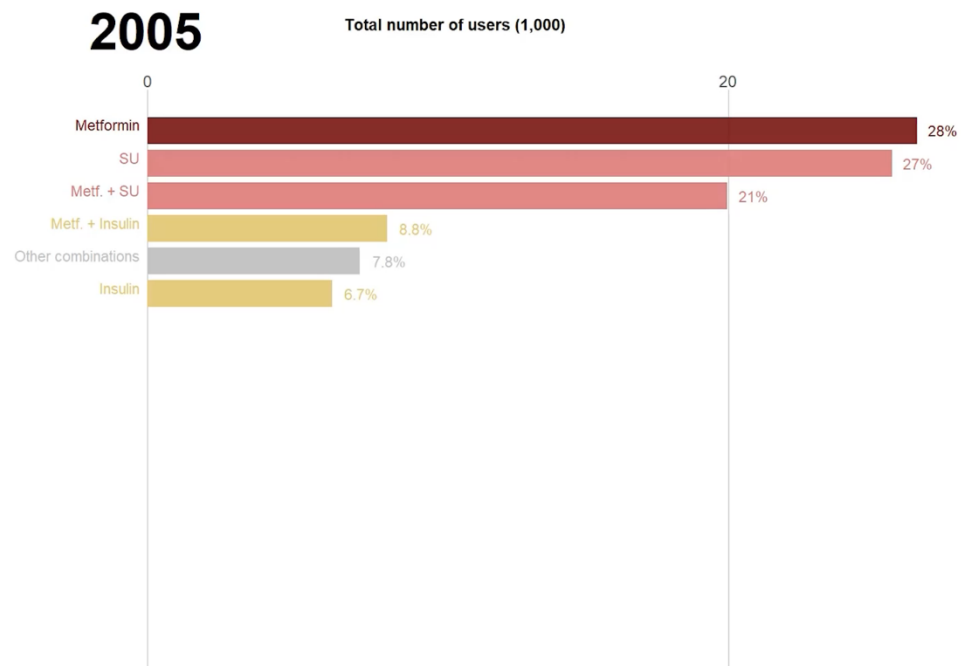
Materials and Methods: A nationwide, population-based drug utilization study based on medical databases covering the Danish population was conducted. We assessed incident and prevalent use patterns among all 441 205 individuals initiating at least one non-insulin, glucose-lowering drug.

Results: The rate of new users of non-insulin, glucose-lowering drugs increased from 2005, peaked in 2011, decreased to stable levels during 2013 to 2019, then increased dramatically during 2020-2021. The prevalence of use increased from 2.1% (in 2005) to 5.0% (in 2021) of the entire adult population. In 2021, metformin comprised 39% of all glucose-lowering drug consumption, followed by insulin (17%), sodium-glucose co-transporter-2 inhibitors (SGLT-2is) (17%), glucagon-like peptide-1 receptor agonists (GLP-1RAs) (16%) and dipeptidyl peptidase-4 inhibitors (7.5%)


Rate of new users per 1,000 person-years
16
14
12
10
8
6
4
2
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021


General Practitioner
Hospital physicians
Rate of new users per 1,000 person-years
Proportion of new users (%)
0
1
2
3
4
5
6
7
8
10
20
30
40
50
60
70
80
90
100
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Insulins
SGLT-2i
GLP-1RA
Metformin
SU
Other
DPP-4i


2005
Total number of users (1,000)
0
20
Metformin
SU
Metf. + SU
Metf. + Insulin
Other combinations
Insulin
28%
27%
21%
8.8%
7.8%
6.7%


2005
Total number of users (1,000)
0
20
Metformin
SU
Metf. + SU
Metf. + Insulin
Other combinations
Insulin
28%
27%
21%
8.8%
7.8%
6.7%

So what…!?

Remember to bridge the gap
between your DUS and
the clinical reality.

(Include a clinician!)

How do we get from
the research question to
the rational use of medicines?

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WILEY

Core concepts in pharmacoepidemiology: Measures of drug utilization based on individual-level drug dispensing data

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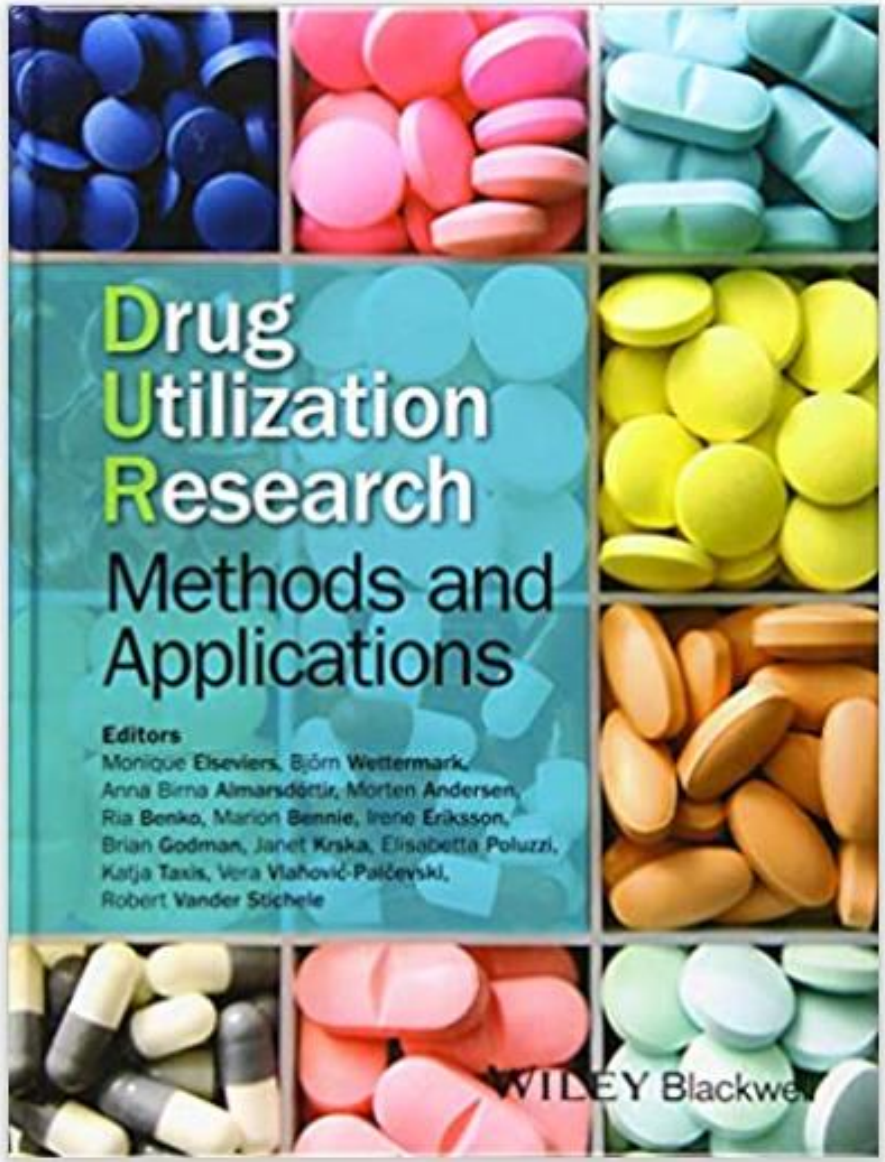
Abstract

Background: Drug utilization studies are essential to facilitate rational drug use in the society.

Aim: In this review, we provide an overview of drug utilization measures that can be used with individual-level drug dispensing data, referencing additional reading on the individual analysis. This is intended to serve as a primer for those new to drug utilization research and a shortlist from which researchers can identify useful analytical approaches when designing their drug utilization study.

Results and Discussion: We provide an overview of: (1) basic measures of drug utilization which are used to describe changes in drug use over time or compare drug use in different populations; (2) treatment adherence measures with specific focus on persistence and implementation; (3) how to measure drug combinations which is useful when assessing drug–drug interactions, concomitant treatment, and polypharmacy; (4) prescribing quality indicators and measures to assess variations in drug use which are useful tools to assess appropriate use of drugs; (5) proxies of prescription drug misuse and skewness in drug use; and (6) considerations when describing the characteristics of drug users or prescribers.


Drug
Utilization
Research
Methods and
Applications
Editors
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Anna Birna Almarsdóttir, Morten Andersen,
Ria Benko, Marion Bennie, Irene Eriksson,
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