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BELGIAN HOSPITALS – SURVEILLANCE OF ANTIMICROBIAL CONSUMPTION (BEH-SAC)

Eline Vandael, Boudewijn Catry

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BAPCOC workshop – 02/10/2019

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- Methodology
- National results
- Reports on Healthstat.be: demo
- Strengths and weaknesses
- Future plans
- Experiences from hospitals: Caroline Briquet (St. Luc Brussels) and Franky Buyle (UZ Gent)

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Introduction

Anatomical Therapeutic Chemical (ATC) classification

- Active substances are divided into different groups according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties
- Five different levels

J	Anti-infectives for systemic use	1st level, anatomical main group
J01	Antibacterials for systemic use	2nd level, therapeutic subgroup
J01C	Beta-lactam antibacterials, penicillins	3rd level, pharmacological subgroup
J01CA	Penicillins with extended spectrum	4th level, chemical subgroup
J01CA04	Amoxicillin	5th level, chemical substance

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https://www.whocc.no/atc_ddd_index/

Introduction

Defined Daily Dose (DDD) =
the assumed average maintenance dose per day for a drug used for its main indication in adults (70 kg)

- Numerator for drug consumption
- International unit
- To assess trends in drug consumption and to perform comparisons between population groups
- Normally one DDD for each drug (per administration route)
- Systematic update by experts
- Disadvantages: not appropriate for children and patients with reduced drug excretion, not always in line with the actual doses in the hospitals

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https://www.whocc.no/atc_ddd_index/

Introduction

ESAC-Net

- Europe-wide network
- Reporting for Belgium: 1x/year (July-August)
- Reimbursement data
- Overall AM consumption
- Hospitals vs community
- DDDs/1000 inhabitants/day
- Results publically available

Belgian Hospitals • Surveillance of Antimicrobial Consumption

- Belgian hospitals
- Reimbursement data
- Individual reports for each hospital + benchmarking
- DDDs/1000 patient days + DDDs/1000 admissions

AM = antimicrobial; ECDC = European Center for Disease Prevention and Control; ESAC-Net = European Surveillance of Antimicrobial Consumption Network, https://ecdc.europa.eu/en/antimicrobial-consumption/surveillance-and-disease-data/database

Objectives

- To develop and offer a scientifically standardized methodology to Belgian hospital (acute and chronic care hospitals), to follow-up their antimicrobial consumption in a quantitative way through time.
- To give Belgian hospitals the opportunity to benchmark, based on their antimicrobial consumption, with similar hospitals.
- To provide recent national and regional data (with an acceptable delay in time) to be able to evaluate the antimicrobial consumption in Belgian hospitals.

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Methodology

	ABUH (2007) → BeH-SAC (2018)	
Source of the data	Hospitals	RIZIV-INAMI Reimbursement data
Data collection	1x/year	2x/year
Feedback reports	NSIH-web	Healthdata

- ↓ workload for hospitals
- ↓ variation in data collection
- more detailed data
- improved reporting

ABUH = Antibiotic use in Hospitals; BeH-SAC = Belgian Hospitals – Surveillance of Antimicrobial Consumption;
RIZIV = Rijksinstituut voor ziekte- en invaliditeitsverzekering; INAMI = Institut National d'Assurance Maladie-Invalidité

Methodology

Year + trimester	2003-2017 (→ year data 2018 expected in Jan 2020)
Numerator	Consumed units per drug, translated in DDDs
ATC-codes	A07A = Intestinal anti-infectives J01 = Antibacterials for systemic use J02 + D01BA = Antimycotics and antifungals for systemic use P01AB = Nitroimidazole derivatives J04A = Drugs for treatment of tuberculosis J05 = Antivirals for systemic use (only starting from 2015)
Denominators	Patient days + admissions
Hospitals	Acute care, chronic care and psychiatric hospitals Identified based on the RIZIV/INAMI-number Benchmarking per: - Kind (acute, chronic, psychiatric) - Type (primary, secondary, tertiary, specialised) - Size (large, medium, small) - Region (Brussels, Flanders, Wallonia)
Hospital units	Including internal medicine, surgery, pediatrics, neonatology, maternity, ICU, infectious diseases, burn unit, geriatrics, specialised/chronic care, (neuro)psychiatry, surgical day hospitalisations

DDDs/1000 patient days

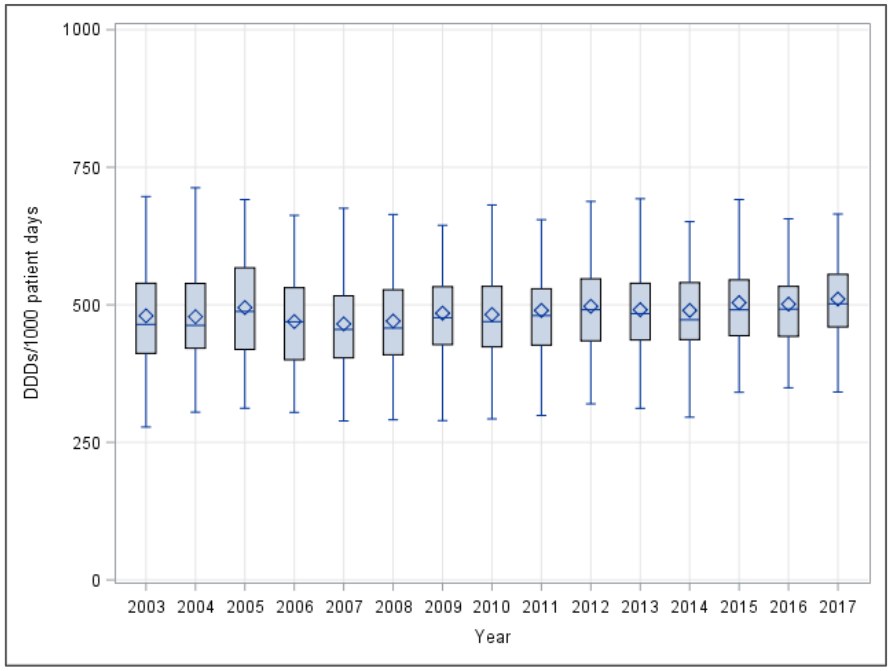
DDDs/1000 admissions

ATC = Anatomical Therapeutic Chemical classification; DDD = defined daily dose; ICU = intensive care unit

National results

Overall antibiotic consumption (J01) – All units without psychiatry and day hospitalizations

All Belgian acute-care hospitals (n=101)



Median antibiotic use in 2017:

503.2 DDDs/1000 patient days
→ 2003-2017: +9.4%

3271.7 DDDs/1000 admissions
→ 2008-2017: -8.5%

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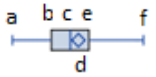
Legend boxplot: a. maximum (without outliers, 1.5x interquartile range), b. 75 percentile (P75), c. median, d. mean, e. 25 percentile (P25), f. minimum (without outliers, 1.5x interquartile range).



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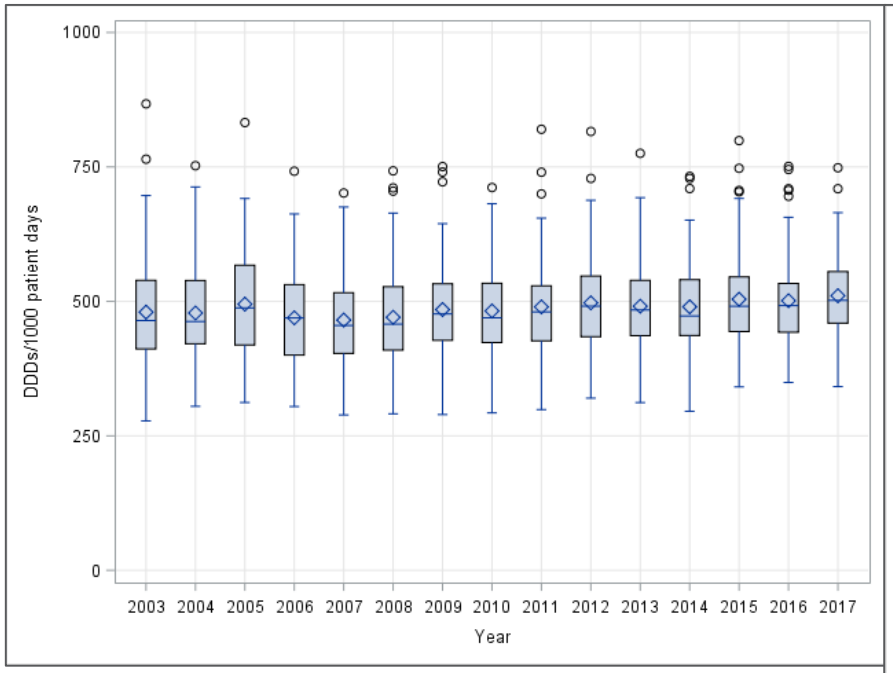
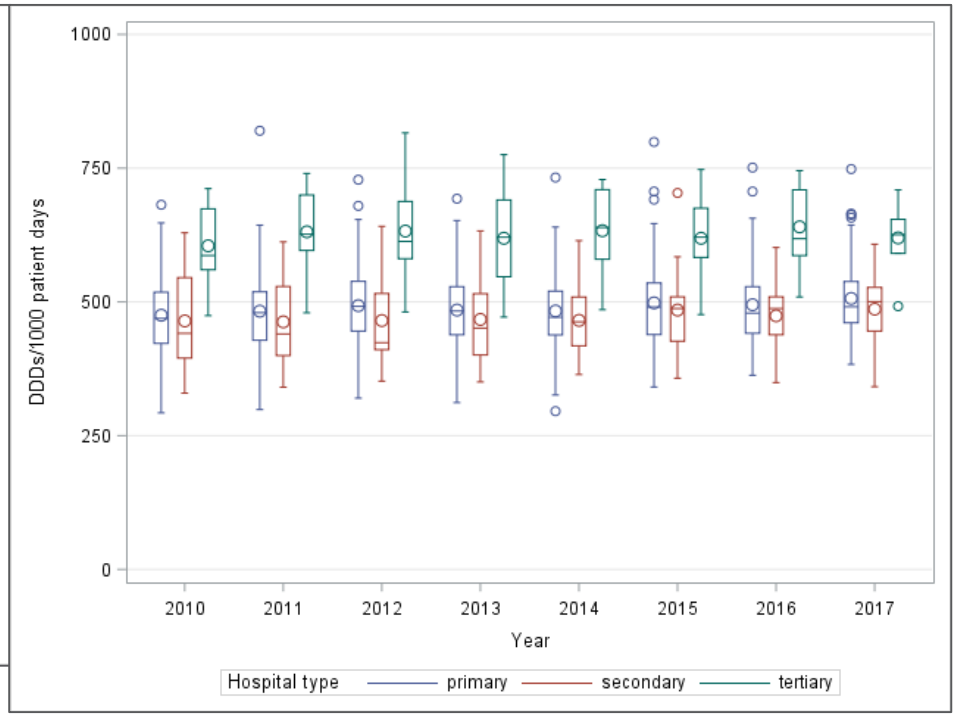


Per type of hospital



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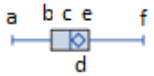
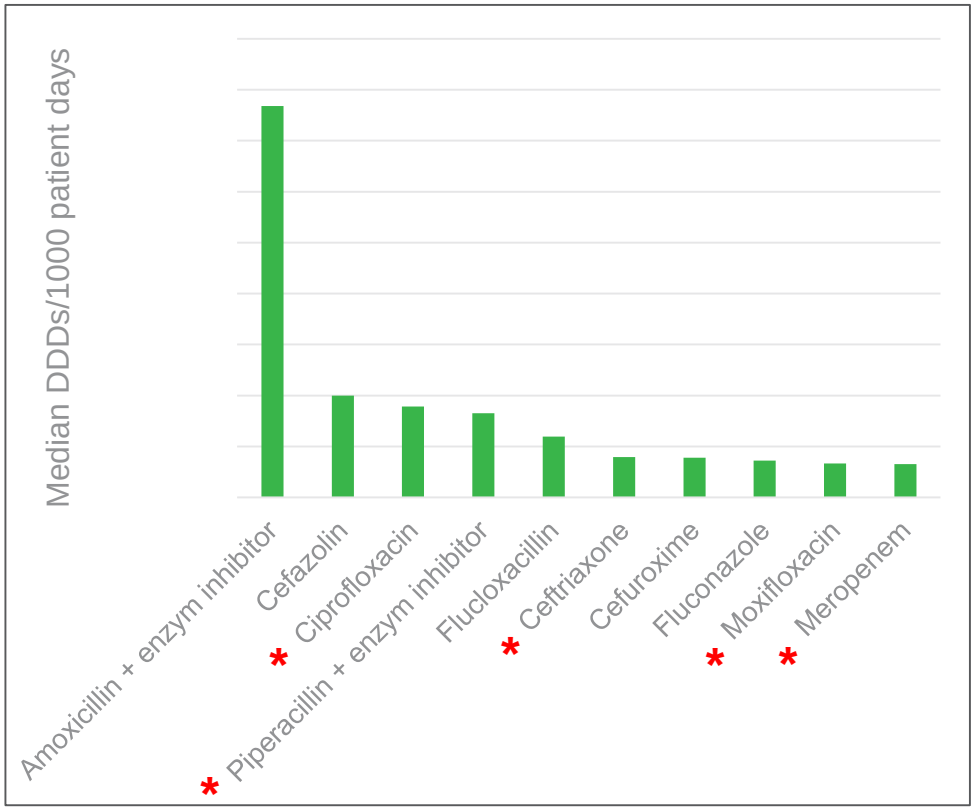
Legend boxplot: a. maximum (without outliers, 1.5x interquartile range), b. 75 percentile (P75), c. median, d. mean, e. 25 percentile (P25), f. minimum (without outliers, 1.5x interquartile range). Outliers included in the graph



National results

Top 10 most used products in 2017



Parenteral antibiotic use: 64.0%

Broad-spectrum antibiotic use: 31.7%

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Broad-spectrum: piperacillin in combination with a beta-lactamase inhibitor (J01CR05), third- and fourth-generation cephalosporins (J01DD and J01DE), monobactams (J01DF), carbapenems (J01DH), fluoroquinolones (J01MA), glycopeptides (J01XA), polymyxins (J01XB), daptomycin (J01XX09) and oxazolidinones: linezolid (J01XX08) and tedizolid (J01XX11)

DEMO
BEH-SAC REPORTS ON HEALTHSTAT

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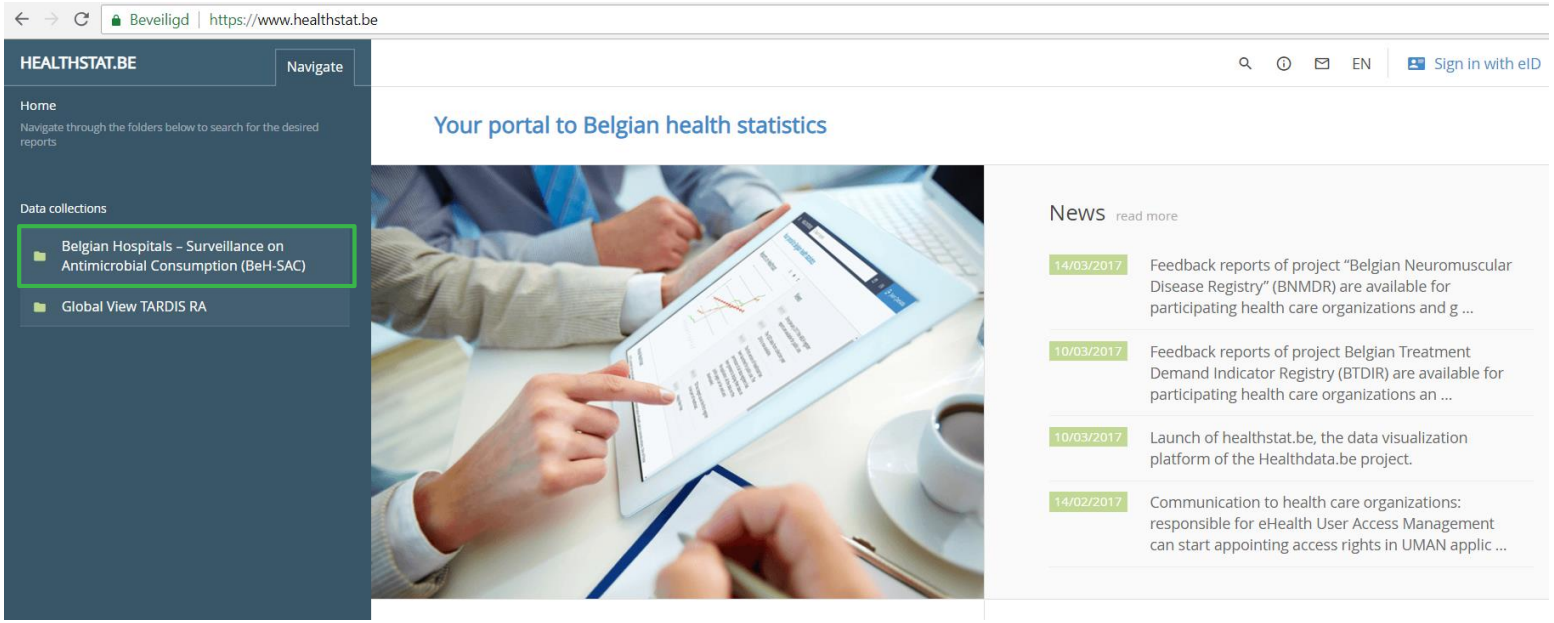
Demo BeH-SAC reports on Healthstat.be

- National reports → publically available
- Hospital reports → login with e-ID

Google Chrome
Webbrowser

www.healthstat.be



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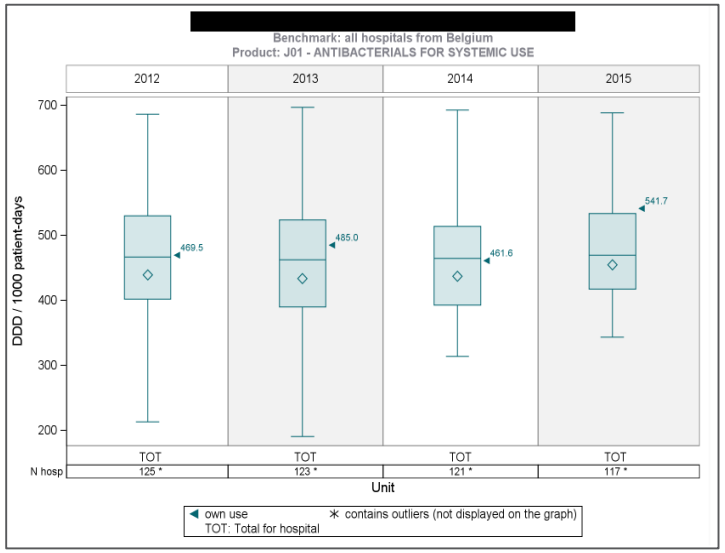
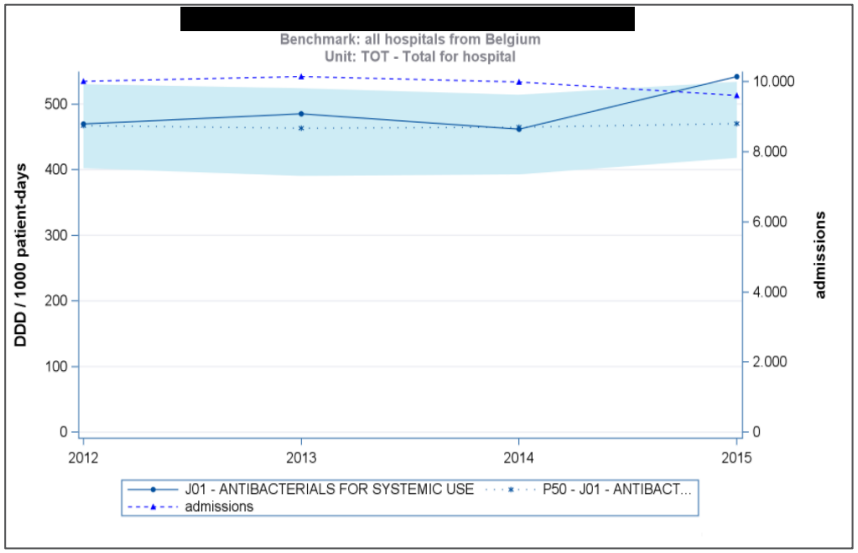
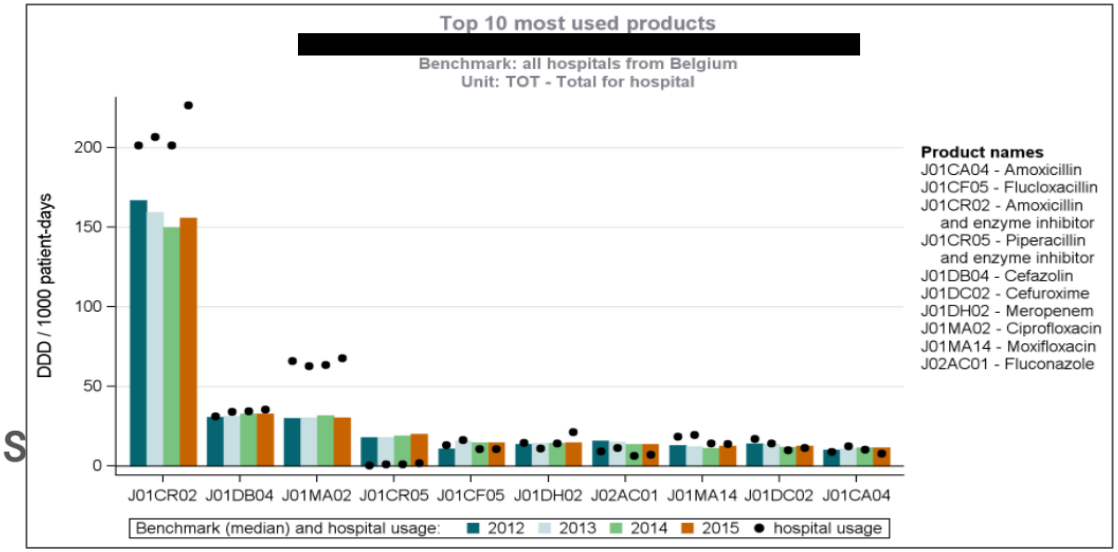
BeH-SAC: Belgian Hospitals - Surveillance of Antimicrobial Consumption; e-ID = electronic identification card

BeH-SAC reports on Healthstat.be







Access to the hospital reports

Step 1: Contact the RAE (Responsible Access Entity) of your hospital to activate your access to the BeH-SAC reports
→ Link to step by step instructions for the RAE on www.nsih.be

Step 2: login on www.healthstat.be with your electronic identity card to open the reports
→ user manual to getting started on Healthstat on www.nsih.be

In case of technical problems, please contact the support of Healthdata: **support.healthdata@sciensano.be or 02 793 01 42**.

If this is the first time that your hospital participates in this surveillance, contact Eline Vandael of Sciensano for further instructions (eline.vandael@sciensano.be or 02 642 50 26).

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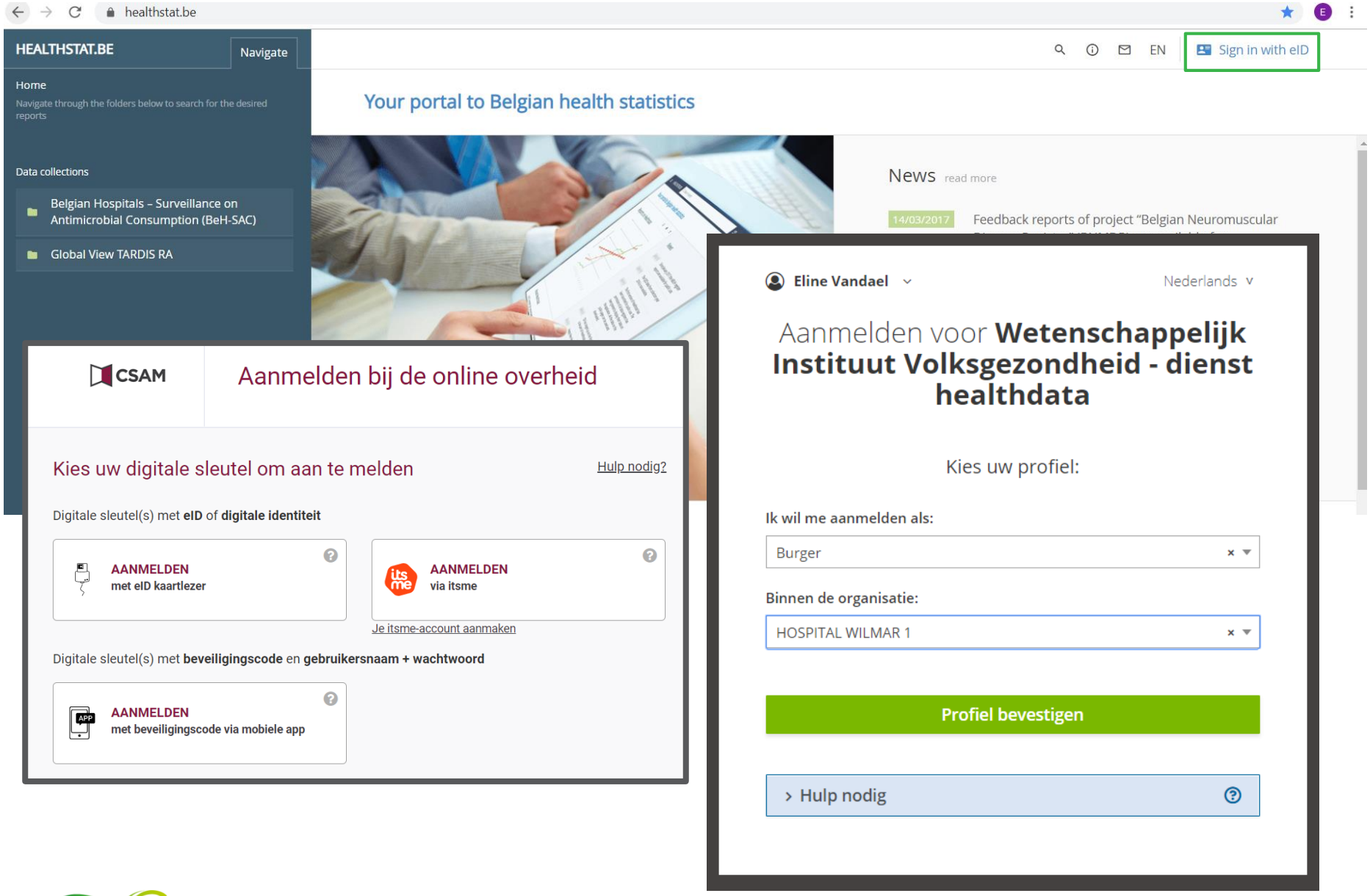
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HEALTHSTAT.BE
Navigate
Home
Navigate through the folders below to search for the desired reports
Data collections
Belgian Hospitals – Surveillance on Antimicrobial Consumption (BeH-SAC)
Global View TARDIS RA
EN
Sign in with eID
Your portal to Belgian health statistics
News read more
14/03/2017
Feedback reports of project "Belgian Neuromuscular
CSAM
Aanmelden bij de online overheid
Kies uw digitale sleutel om aan te melden
Hulp nodig?
Digitale sleutel(s) met eID of digitale identiteit
AANMELDEN
met eID kaartlezer
AANMELDEN
via itsme
Je itsme-account aanmaken
Digitale sleutel(s) met beveiligingscode en gebruikersnaam + wachtwoord
AANMELDEN
met beveiligingscode via mobiele app
Eline Vandael
Nederlands
Aanmelden voor Wetenschappelijk Instituut Volksgezondheid - dienst healthdata
Kies uw profiel:
Ik wil me aanmelden als:
Burger
Binnen de organisatie:
HOSPITAL WILMAR 1
Profiel bevestigen
Hulp nodig
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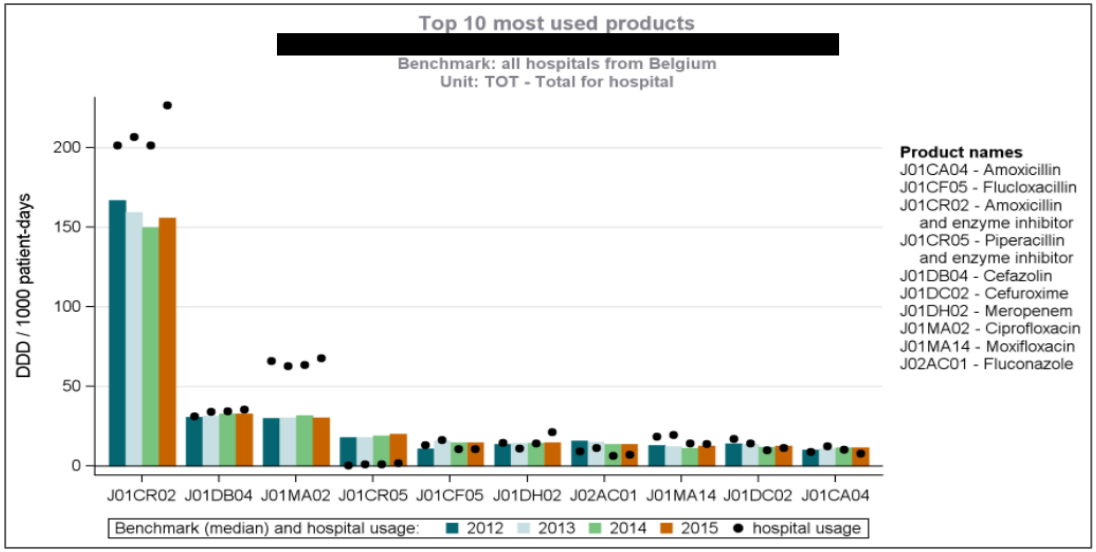
BeH-SAC reports on Healthstat.be



→ Starting point

- Focus on the most used products

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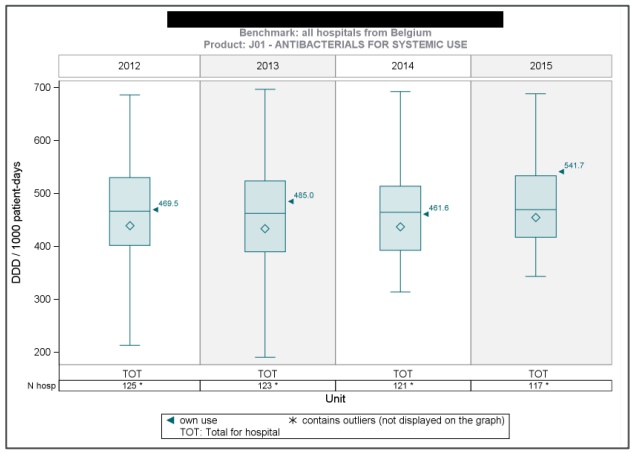
BeH-SAC reports on Healthstat.be



- Boxplot with range other hospitals
- Table: % parenteral use

→ Focus on different AM groups

- Overall antibiotic (J01) and antimycotic use (J02)
- Fluoroquinolones (J01MA)
- Third-generation cephalosporines (J01DD)
- Carbapenems (J01DH)
- Penicillins in combination with enzym inhibitors (J01CR)
- Glycopeptides (J01XA) and polymyxins (J01XB)
- Broad-spectrum antibiotics (J01CR05, J01DD, J01DE, J01DF, J01DH, J01MA, J01XA, J01XB, J01XX08/09/11)

→ Focus on different hospital units

- ICU (490)
- Geriatrics (300)
- Surgery (210)
- Internal medicine (220)

CAVE: denominator = patient days for analyses per unit

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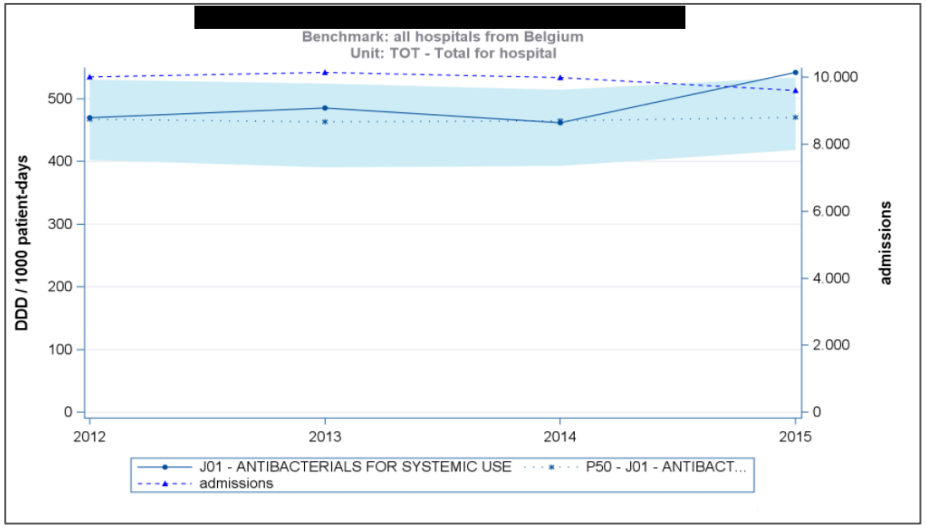
AM = antimicrobial; ICU = intensive care unit

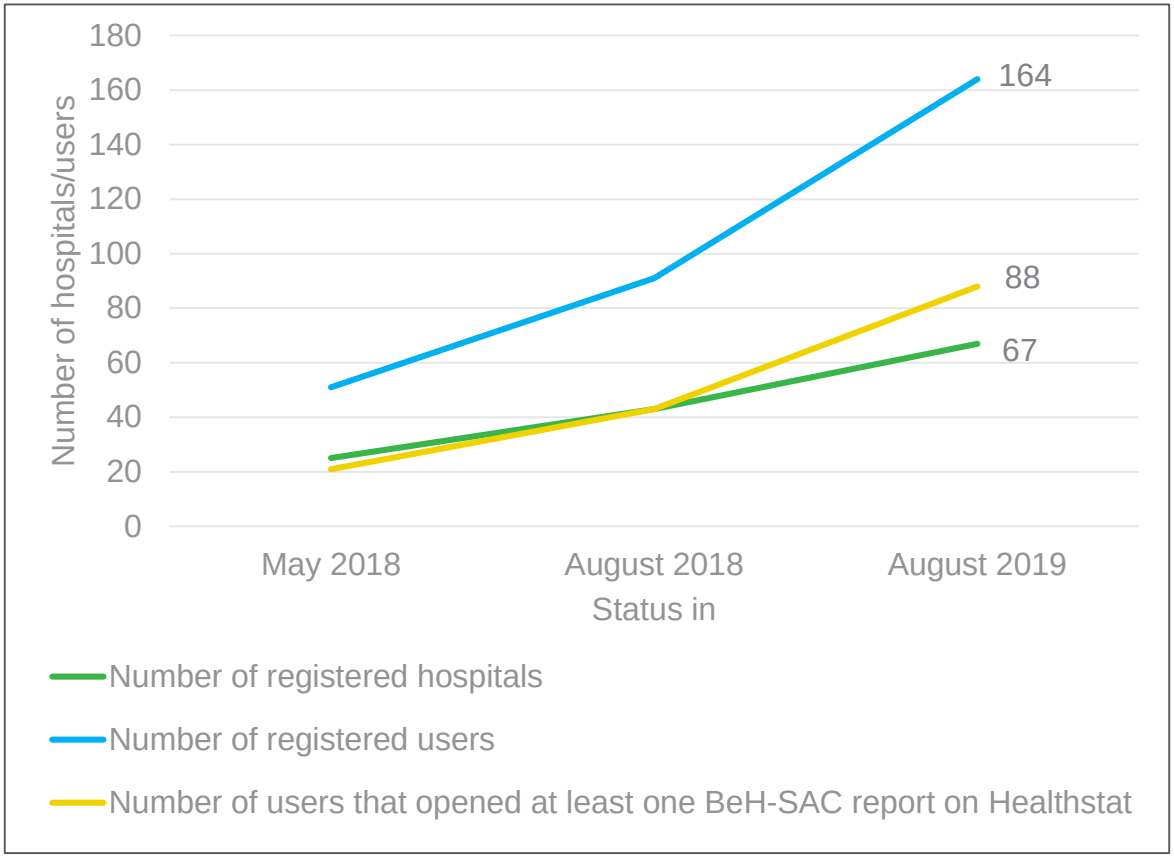
BeH-SAC reports on Healthstat.be

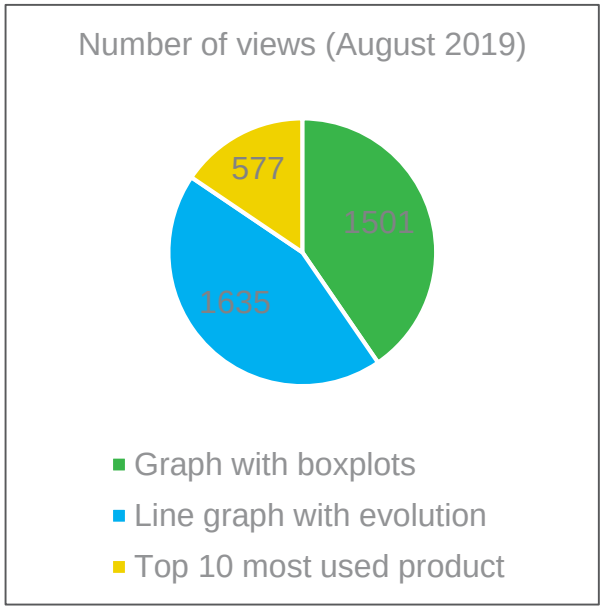


→ Check denominators

- Evolution with a line
- Evolution of denominators (second y-axis)

Current use of the reports





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Strengths and weaknesses

+	−
Reuse of existing data	Delay in data (± 1 year), adjustments possible
No registration load for hospitals	Non-reimbursed use not included
Uniformity data collection	DDDs ↔ actual doses used
Extended database	DDDs not appropriate for children
Detailed data on different levels (national, regional, hospital, unit)	No duration of treatment available
Interactive reporting (Healthstat.be) with benchmarking	Units not detailed enough for feedback to specific prescribers
Hospital-specific indicators (DDDs/1000 patient days and DDDs/1000 admissions)	No link with indication

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! Own surveillance on AM consumption in your hospital

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Future plans

- New indicator:
  DDA = DDD adjusted for the Belgian setting
- Validation of high/low consumers - outliers
  or other hospitals voluntering…
- Extra reports on Healthstat to identify outliers/high consumption
- New project AM-DIA (Antimicrobial Consumption data of Belgian Hospitals linked with Diagnoses)
  → minimal hospital data linked with facturation data

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DDA = daily dose administration; DDD = defined daily dose

Validation

Possible differences between databases:

- DDD calculation (version WHO), ATC codes
- Denominator
- Which units are included (classification RIZIV/INAMI)
- Which hospital sites are included
- BeH-SAC: only reimbursed consumption

ATC = Anatomical Therapeutic Chemical classification; DDD = defined daily dose; WHO = World Health Organisation
RIZIV = Rijksinstituut voor ziekte- en invaliditeitsverzekering; INAMI = Institut National d'Assurance Maladie-Invalidité

Future plans

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DDA = daily dose administration; DDD = defined daily dose

Help/support/feedback

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Satisfaction survey NSIH surveillances

French: https://surveys.wiv-isp.be/index.php/179586?lang=fr
Dutch: https://surveys.wiv-isp.be/index.php/179586?lang=nl

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www.nsih.be

Sciensano
Volksgezondheid & Surveillance
Zorginfecties & Antimicrobiële Resistentie (NSIH)

Waakprogramma voor het systemisch en gastro-intestinaal gebruik van anti-infectieuze geneesmiddelen

BeH-SAC: Belgian Hospitals - Surveillance of Antimicrobial Consumption

Inleiding

Antimicrobiële resistentie leidt tot hogere morbiditeit en bijkomende gezondheidszorguitgaven.

Bijgevolg beval de Europese Ministerraad de Lidstaten in 2001 aan om het voorzichtig gebruik van antimicrobiële geneesmiddelen aan te moedigen. Dit werd in juni 2017 ook bevestigd in het nieuwe 'One Health Action Plan against Antimicrobial Resistance' van de Europese commissie. Het is in dit kader dat vanaf 01/07/2007 een antibioticabeleidsgroep wettelijk verplicht is in alle Belgische acute zorg ziekenhuizen en in de chronische ziekenhuizen met minstens 150 bedden.

De werkgroep ziekenhuisgeneeskunde van de Commissie voor de Coördinatie van het Antibioticabeleid (BAPCOC) volgt deze maatregel op en zorgt ervoor dat elk Belgisch ziekenhuis feedbackrapporten over zijn gebruik van antimicrobiële middelen kan ontvangen.

(EV_25072017)

- Protocol
- DDD/DDA list
- National report
- Instructions Healthstat

Acknowledgements

Participating hospitals

BAPCOC working group Hospital Medicine

BAPCOC
Belgian Antibiotic Policy Coordination Committee

INAMI-RIZIV

NSIH-team, Nathalie Verhocht, Tadek Kryzwania

Healthdata: Thaddé Mahmourian, Juan Quesada, Kris Vranken, Gaëtan Muyldermans

Contact: eline.vandael@sciensano.be

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National results

Hospitals with high total antibiotic consumption over time

Hospital	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	■	■	■	■	■	■	■		■	■	■	■	■	■	■
2	■	■	■	■	■	■	■	■	■	■	■	■		■	
3				■			■	■	■	■	■	■	■	■	■
4	■						■			■	■	■	■	■	■
5							■	■	■	■	■		■		■
6						■		■		■	■	■	■	■	■
7	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
8			■				■	■	■	■		■	■	■	
9	■	■	■		■		■	■	■	■	■	■		■	■
10		■		■		■			■	■	■	■	■	■	■
11				■	■		■	■				■	■	■	

■ ≥ 90 percentile
per type of hospital
DDDs/1000 patient days

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⇨ Further validation

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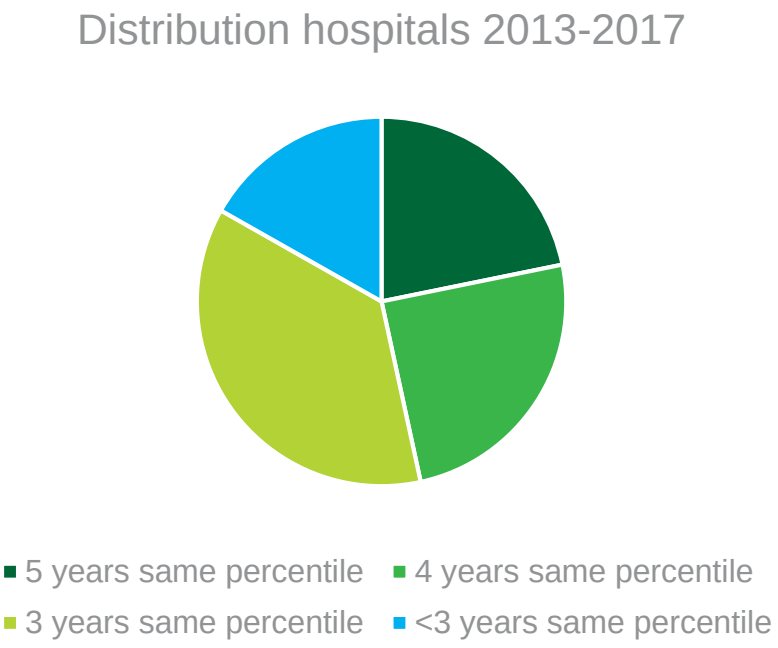
National results

Percentiles total antibiotic consumption (DDDs/1000 patient days) per type of hospital:

≤10	>10 - ≤25	>25 - ≤50	>50 - ≤75	>75 - <90	≥90



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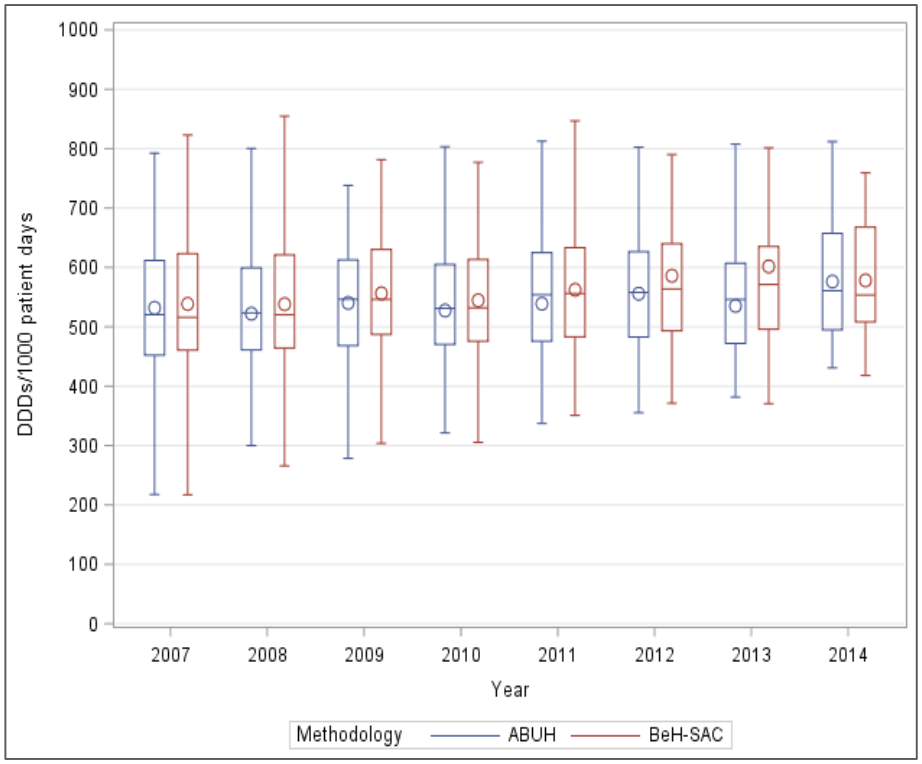
National results

Overall antibiotic consumption (J01) – All units without psychiatry and day hospitalizations
ABUH versus BeH-SAC (database 2018)
Overlapping hospitals and years (2007-2014)



Legend boxplot: a. maximum (without outliers, 1.5x interquartile range), b. 75 percentile (P75), c. median, d. mean, e. 25 percentile (P25), f. minimum (without outliers, 1.5x interquartile range). Outliers included in the graph