

Merging CaseMix and clinical data The next level of “insight”?

PCSI Conference 2024

Workshop „From CaseMix to clinics“

Tuesday, May 28th 2024

Prof. Dr. med. Michael Wilke

Agenda

- Clinical insights from CaseMix data
- Typical clinical questions
- Merging clinical & CaseMix data
- Example
- Take home

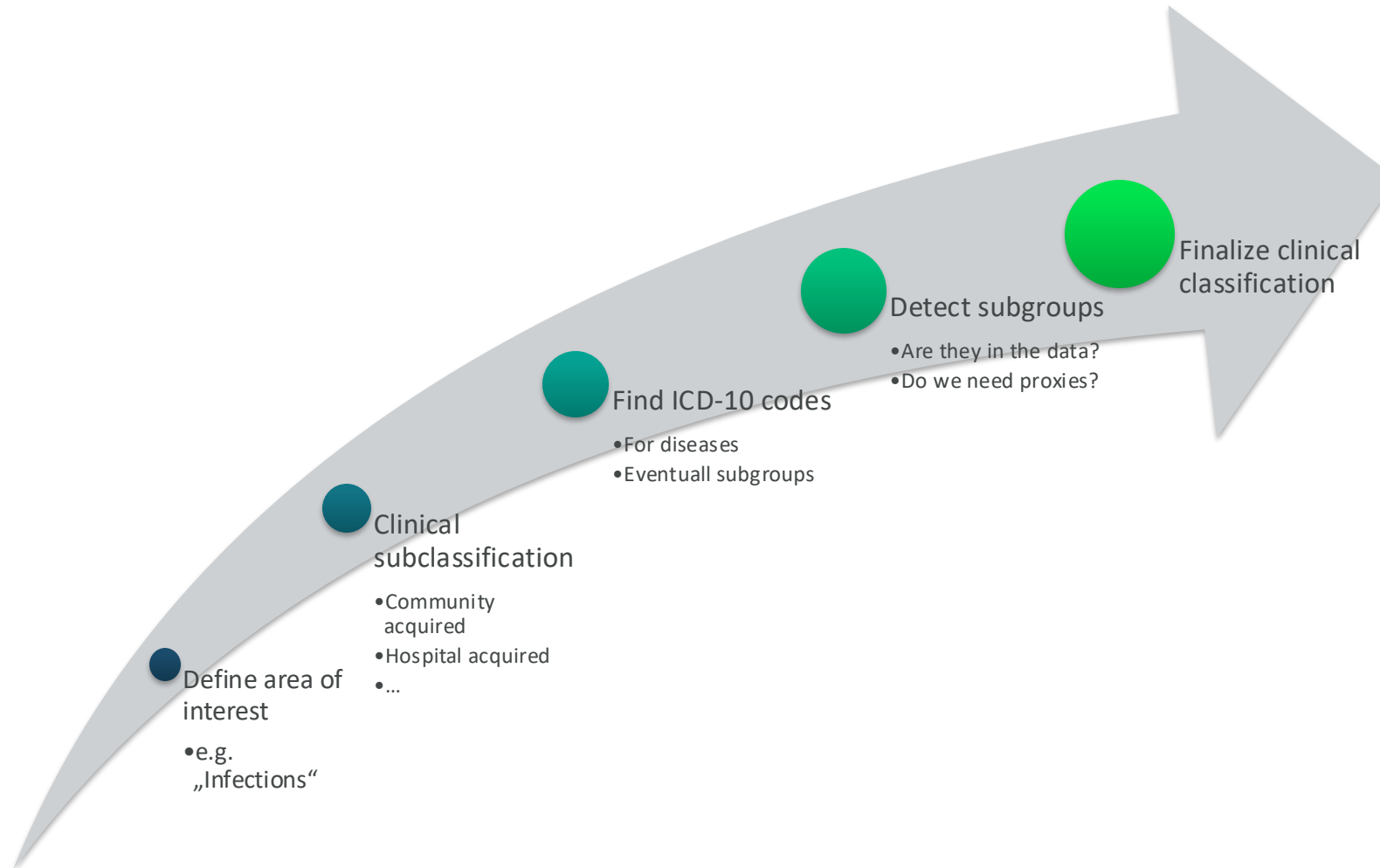
CaseMix data contains lots of clinical information

- ICD-10 Diagnoses
 - Principal (PDX)
 - Secondary (SDX)
- Procedures
 - ICH, ACHI, OPCS, OPS, KTDP
- ICU stay
- Length of stay
- ...



- Which disease?
- How did we treat the patient?
- How severely ill was the person?
- Have been successful?

Extracting clinical information from CaseMix data



Example: „Pneumonia“

ICD - coding

- Many, many codes:
- J11 – J19
- Viral pneumonia
- Bacterial pneumonia
- Other bugs (chlamydia, etc.)
- Sometimes combinations with „bacteria“ codes (B95.*!)

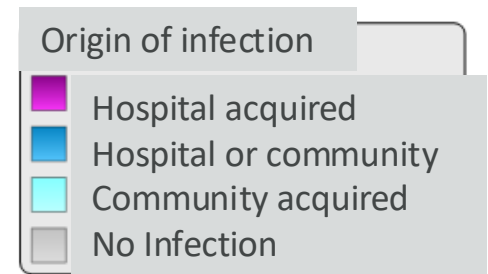
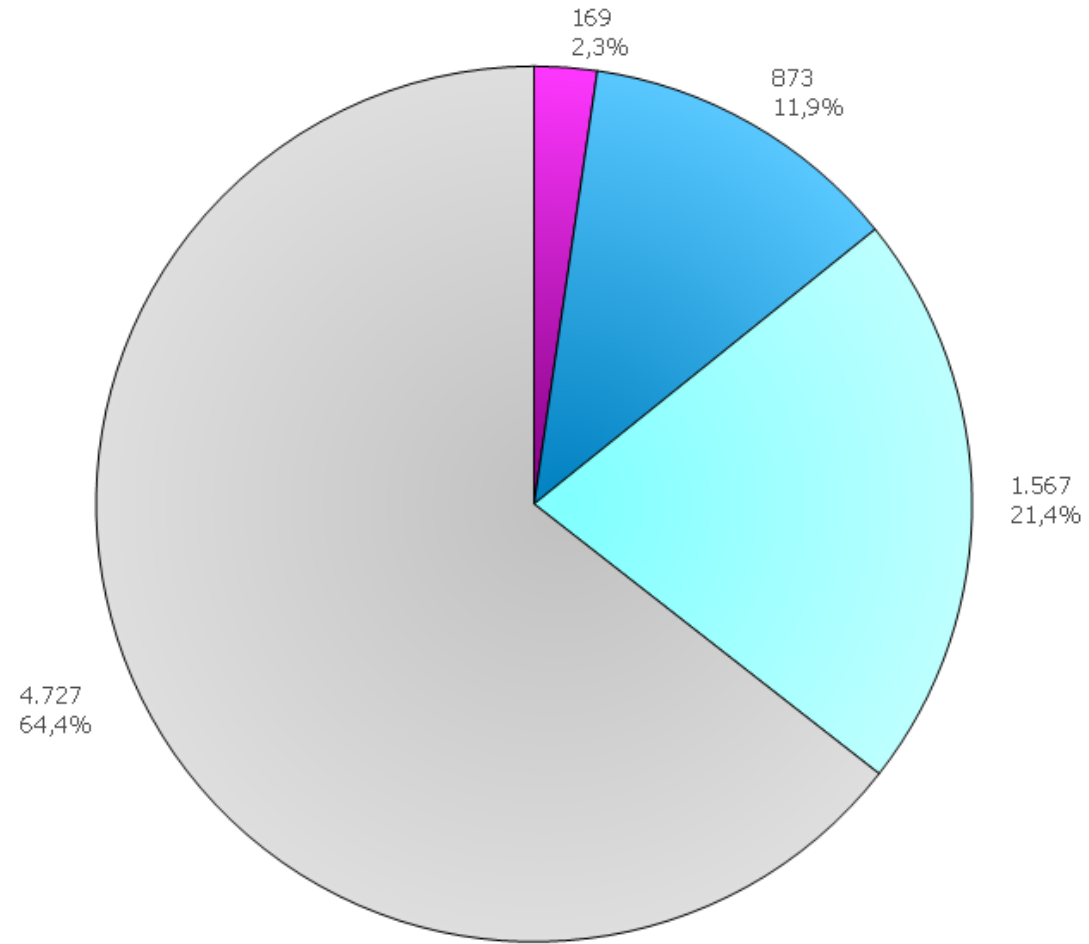
Subclassifications / Severity

- Origin (community / hospital) via PDX / SDX or „POA“
- „Index“-SDX (sepsis, kidney failure, etc.)
- Ventilation needed?

Final classification

- Community acquired pneumonia (CAP)
- Hospital acquired pneumonia (HAP)
- Ventilation associated pneumonia (VAP)

Infection „Map“



Infection groups

Infektionsverteilung nach Ursprung - Ebene Infektionsgruppen

Infektionszahlen nach Gruppen

Lower respiratory Tract Infections

Urinary Tract Infections

Skin and Soft Tissue Infections

Intra-abdominal Infections

Carrier

Others

Surgical Site Infections

Sepsis

Mykosen

Virusinfektionen

Infektionen obere Atemwege

Infektionen an Muskel, Knochen u. Ge...

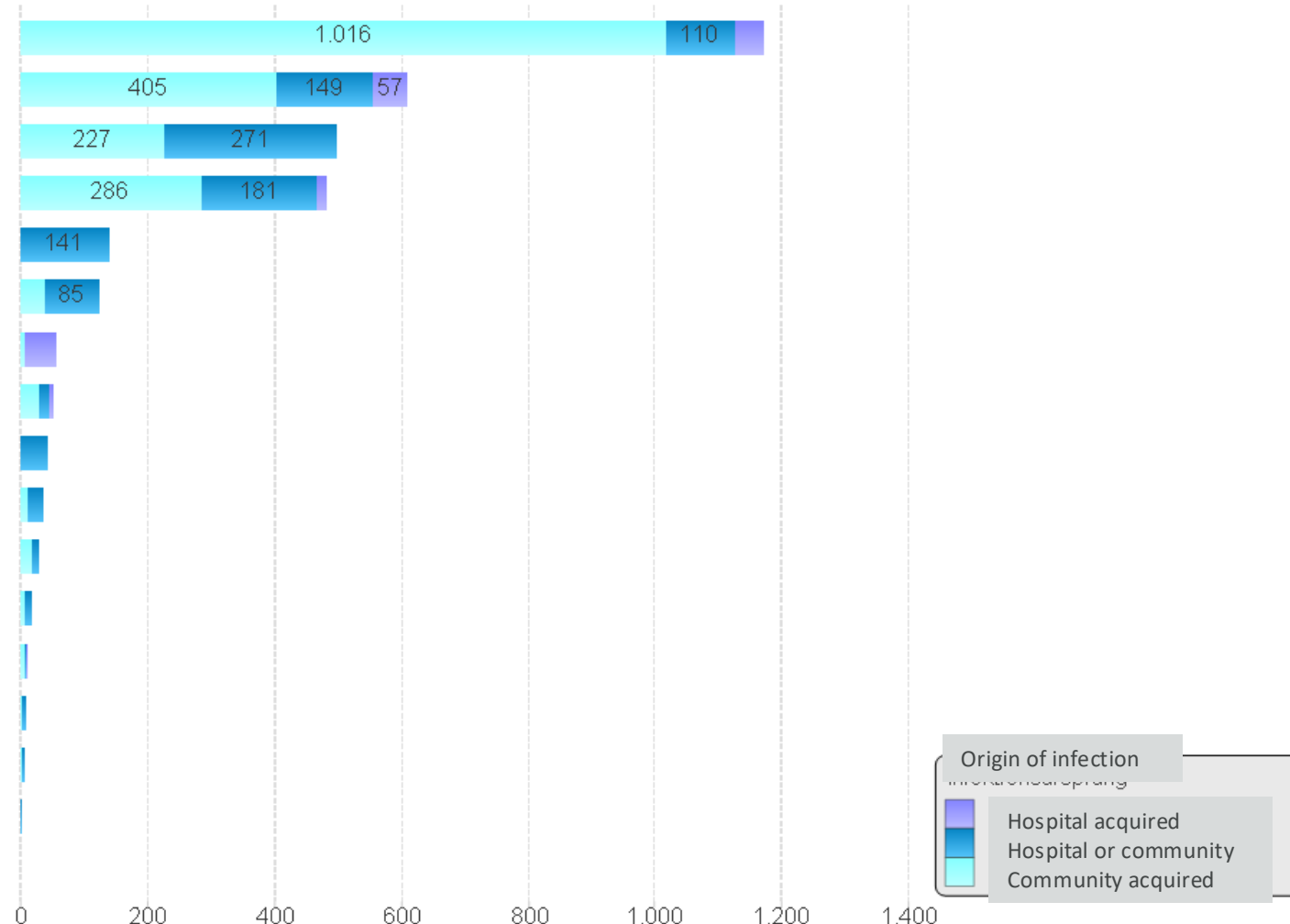
Infektionen Herz und Gefäße

Tuberkulose

Infektionen durch Parasiten

HNO-Infektionen

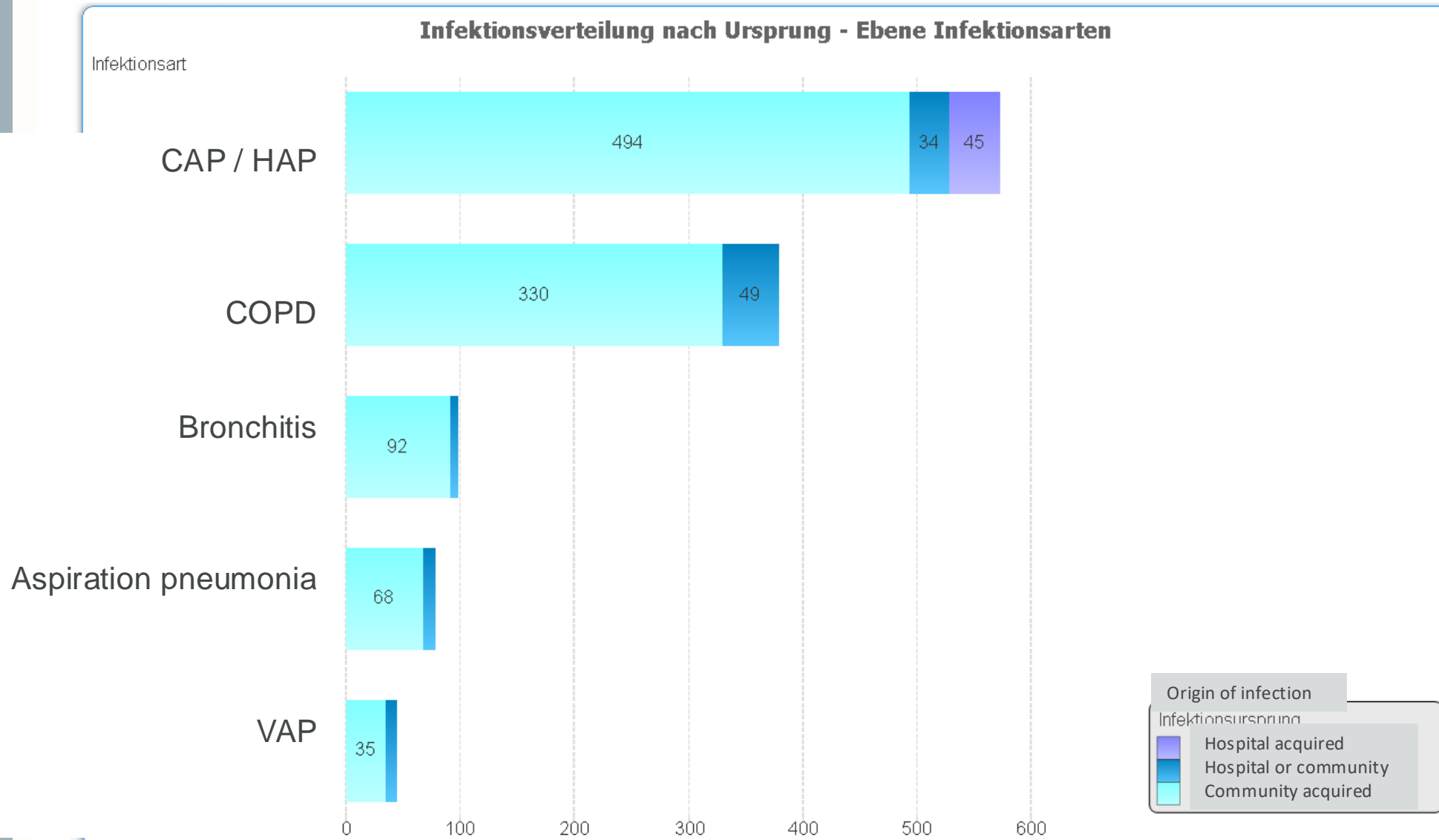
Infektionen des Zentralnervensystems



Origin of infection

- Community acquired
- Hospital or community
- Hospital acquired

Infections (Lower respiratory tract)



Outcome measures

No. Of cases	CaseMix	CMI	Age	PCCL	ICU cases	ICU%	Cases ventilation	Hour of mechanical ventilation	Deceased	Deceased %
792	606,126	0,765	75,8	1,1	89	11,2%	46	109,5	125	15,8%

So far – so good 😊

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Clinical questions (requirements for data insights?)

- How many pneumonia patients do we have?
- How many CAP / HAP / VAP?
- How is the outcome?
- Do we treat them according to guidelines?
- Which antibiotics do we use?
- Do we monitor the infections properly?
- Which lab tests do we perform how often?

Clinical Questions

Answered from (enriched) CaseMix data

- How many pneumonia patients do we have?
- How many CAP / HAP / VAP?
- How is the outcome?



More (clinical) data needed

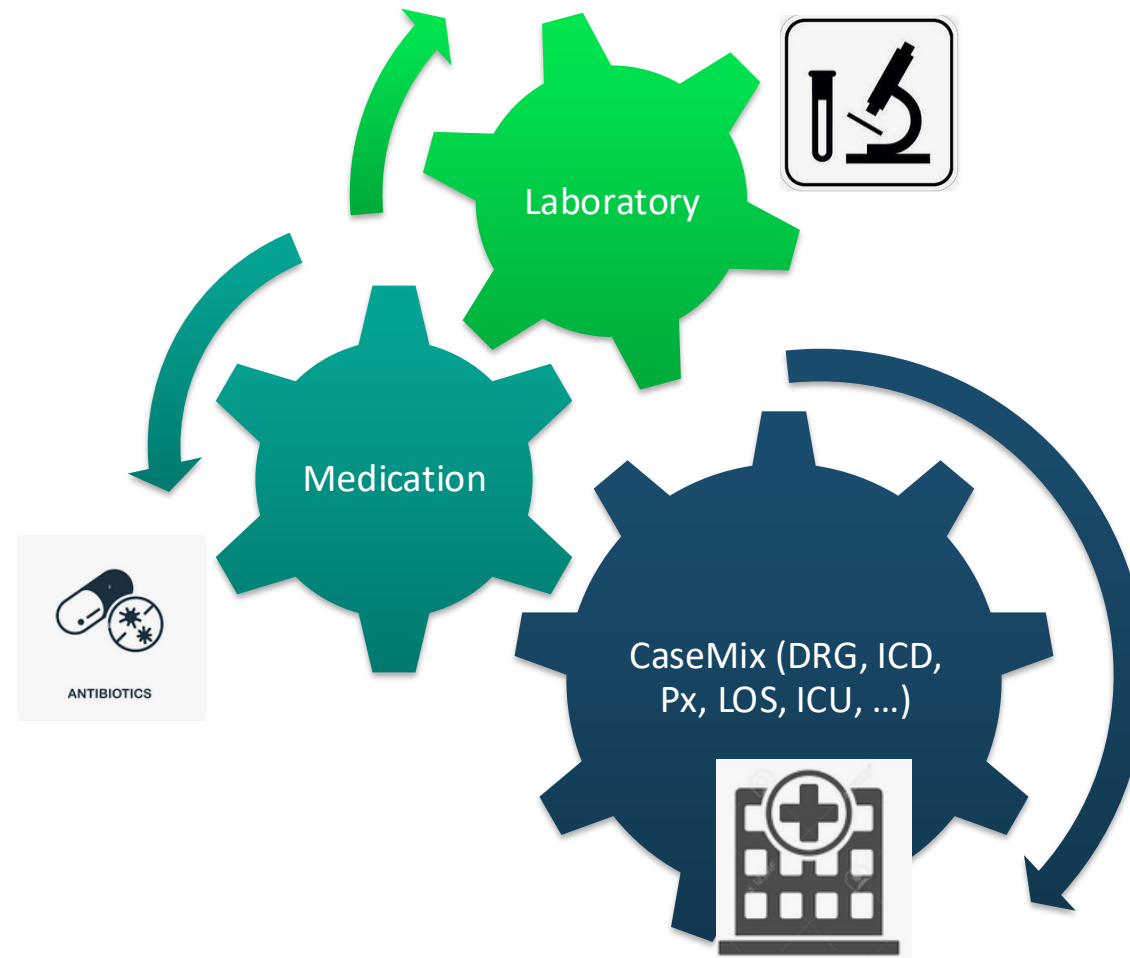
- Do we treat them according to guidelines?
- Which antibiotics do we use?
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Data sources



Challenges

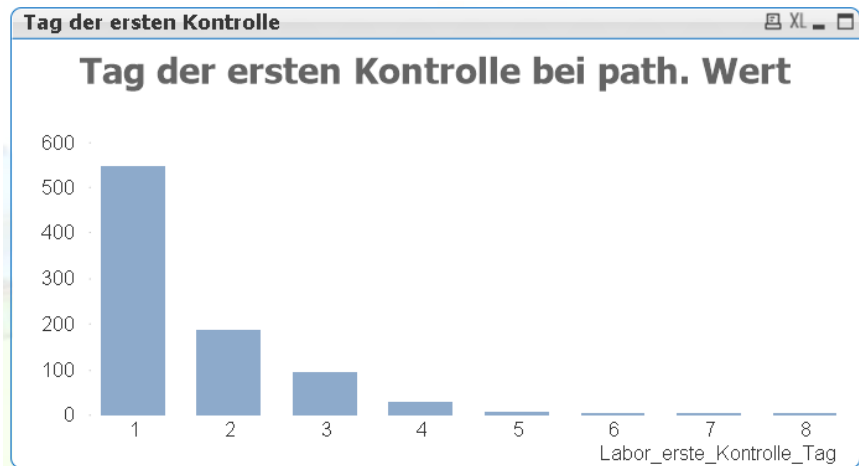
- Connecting the data sources
 - Usually possible by Case-ID / Patient-ID
- Building a timeline
 - When did we start treating?
 - How did lab values develop?
- „Add (artificial) intelligence“
 - Was our choice of antibiotics in line with the current guidelines?
 - Are there infection patients w/o treatment?
 - Do we treat patients w/o infections?

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Current project: „Support the Antimicrobial Stewardship Team (AMS)“ with data-based insights

- Diagnostic and Treatment for certain infections



Labor: PCT / CRP

CRP / PCT	Anzahl ...
CRP high, PCT high	122
CRP high, PCT low	311
Nur CRP gemessen	482
Gesamt	915

AB Verordnungen

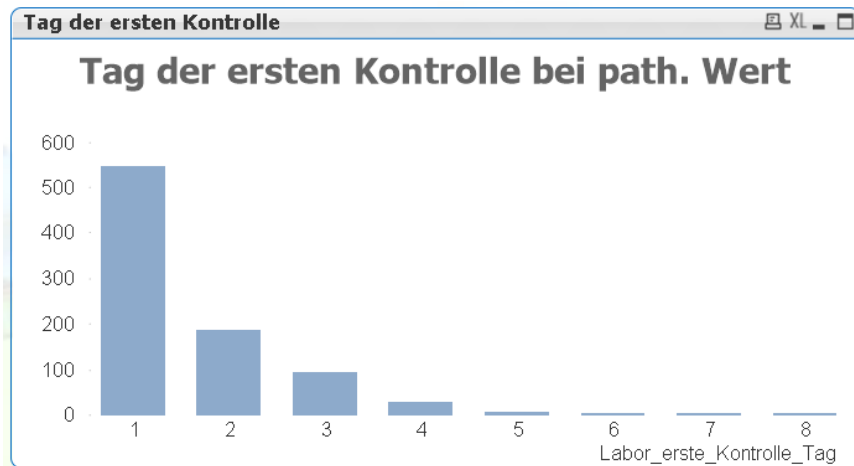
Pharmakolog. Gruppe	Chemische Gruppe	ATC / Substanz	Anzahl Fälle	Anzahl Ve...
		J01DD02 Ceftazidim	1	2
		J01DD04 Ceftriaxon	62	126
		J01DD13 Cefpodoxim	5	7
BETALACTAM-ANTIBIOTIKA, PENICILLINE			328	597
	Beta-Lactamase-sensitive Penicilline		3	7
		J01CE01 Benzylpenicillin	3	7
	Kombinationen von Penicillinen, inkl. Beta-Lactamase-...		326	582
		J01CR01 Ampicillin und Bet...	326	582
	Penicilline mit erweitertem Wirkungsspektrum		5	8
		J01CA04 Amoxicillin	5	8
MAKROLIDE, LINCOSAMIDE UND STREPTOGRAMINE			23	50
	Makrolide		23	50
		J01FA10 Azithromycin	23	50

Auswertungen

Basis-DRG	Anzahl Fälle	Fälle mit Antibiose	Fälle mit kodierter Infektion	Fälle mit Infektion lt. Labor	Fälle mit Laborkont rolle 48h	Fälle mit Laborkont rolle 72h	Fälle mit Antibiose ohne Inf...
	2081	387	387	380	285	156	7
G24	1	0	0	0	0	0	0
E79	1519	293	293	287	216	107	6
H08	1	0	0	0	0	0	0

Analyses on patient level

- Diagnostic and Treatment for certain infections



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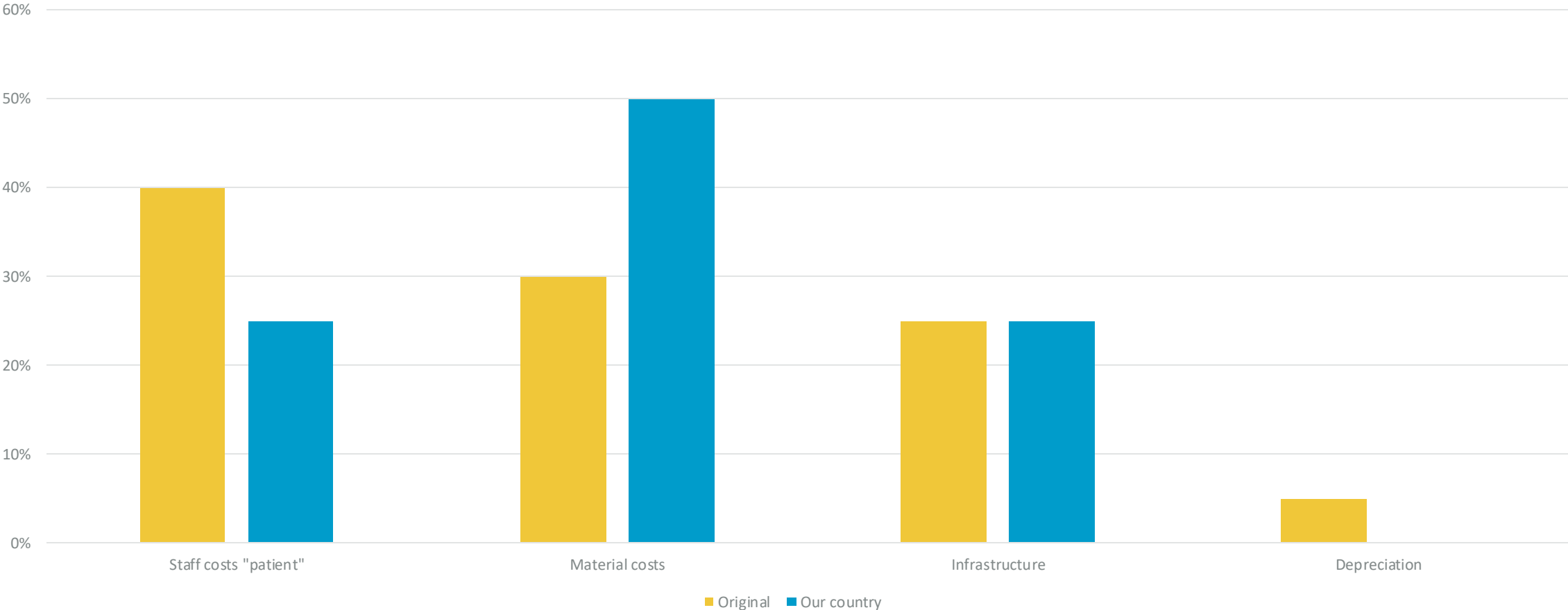
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Common findings

DRG Cost distribution in different countries



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Analyses on patient level

Fall							
Geschl.	Alter	Auf.- Datum	Auf.- Grund	Ent.- Datum	Ent.- Grund	Beat.- h	
w	78	08.05.2023 23:56	0107	16.05.2023 10:32	012	0	

DRG											
DRG	Text	VWD	uGVD	MVD	oGVD	PCCL	eff. KG	Kat. KG	Eff. Erlös	Kat. Erlös	LK
E79C	Infektionen und Entzündungen der Atmungsorgane ohne komplexe Diagnose, ohne äußerst schwere CC oder ein B...	8	1	6,6	14	0	0,605	0,605	2.420,43 €	2.420,43 €	OM

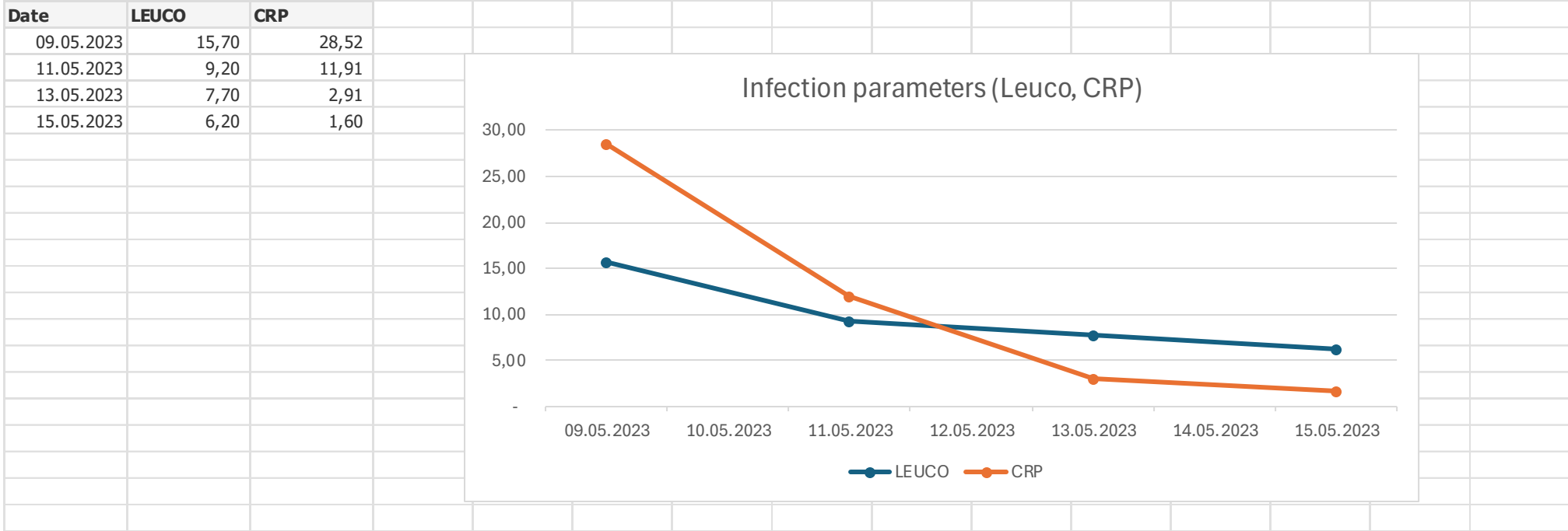
Diagnosen				
HD/ND	ICD	Text	Sek.- Kode	Text
HD	J18.1	Lobärpneumonie, nicht näher bezeichnet	U69.04	Anderenorts klassifizierte, im Krankenhaus erworbene...
ND	I10.90	Essentielle Hypertonie, nicht näher bezeichnet. Ohne Angabe ei...		
	L93.2	Sonstiger lokalisierter Lupus erythematodes		
	Z11	Spezielle Verfahren zur Untersuchung auf infektiöse und parasit...	U99.0	Spezielle Verfahren zur Untersuchung auf SARS-CoV-2
	Z88.0	Allergie gegenüber Penicillin in der Eigenanamnese		

Operationen und Prozeduren			
OPS	Datum	Lok.	Text

Infektionen				
ICD	Infektion	U	Erreger	MRE
J18.1	Pneumonie ohne Beatmung	A		

Antibiose						
Start	Ende	Applikati...	Bezeichnung	Verordnungstext	ATC Code	Medikament
12.05.2023 14:03:00	12.05.2023 14:03:00	intravenös	Ceftriaxon Eberth 2 g Pulver und Lö...	Einmalig 1 Stk. am 12.05...	J01DD04	Ceftriaxon
12.05.2023 18:13:00	16.05.2023 18:00:00	intravenös	Ceftriaxon Eberth 2 g Pulver und Lö...	Anwendung: 0-1-0-0 Stk....	J01DD04	Ceftriaxon

Analyses on patient level (work in progress)



TAKE HOME

A close-up photograph of a compass rose on a map. The compass is mounted on a wooden surface. The map shows various geographical features and labels like 'NW', 'W', 'SW', 'S', 'SE'. A yellow semi-transparent rectangle is overlaid on the top-left portion of the compass, containing the text 'TAKE HOME'.

- Analyzing the suitability of cost weights is a crucial step in DRG introduction
- If foreign weights do not fit
 - Check options
 - Take decisions
 - Implement
- Evaluate regularly

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