Improving planning for cross-sectoral health care provision Initial results using a needs-based population classification system (PopGrouper)

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Problem & Background

- German healthcare system is characterized by a distinct separation between different sectors of care (e.g. ambulatory and hospital care)

- In recent years, several reports have called for cross-sectoral healthcare delivery planning that is <u>based on morbidity-related needs</u>
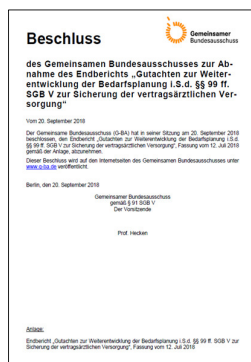
Research objective

1. To develop a German population-based classification system (PopGrouper) to measure morbidity-related care needs (presented yesterday)

2. To evaluate the PopGrouper's suitability for planning cross-sectoral healthcare provision

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Development of the PopGrouper (V0.4)

The PopGrouper is a **population-based classification system** that assigns individuals with similar medical needs and costs to **mutually exclusive PopGroups** based on their diagnoses and characteristics.

The PopGrouper development drew inspiration from other international classification systems, such as the Clinical Risk Groups (CRGs)[1], Adjusted Clinical Groups (ACGs)[2], and Canadian POP Grouper[3].

Macro PopGroup (MPG)	No. of Base PopGroups (N = 640)	No. of PopGroups (N = 781)
1 Newborns	16	18
2 Pregnancy, childbirth and puerperium	15	15
3 Severe, high-cost cases	72	95
4 Actively treated malignant neoplasms	84	101
5 At least one severe disease	208	263
6 At least one moderate disease	117	148
7 At least one minor disease	96	108
8 At least one very mild disease	30	31
9 Healthy users	1	1
10 Non-users	1	1

PopGroup example (from MPG 5):
Cerebral hemorrhage or cerebral infarction with number of severe comorbidities from other MDGs ≤ 2 and mechanical ventilation ≤ 48h

1: (3M 2022)
2: (Johns Hopkins University 2015)
3: (CIHI 2023)

MDG: Macro Disease Group

Methods

- **Data source**: pseudonymized claims data from BARMER sickness fund (2019) → approx. 9 million insured persons, assigned to PopGroups

- **Regional unit of analysis**: 400 administrative districts in Germany

Administrative districts in Germany ("Kreise")

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Methods II

Measurement of observed and expected utilization in a region

1. Determination of the average per capita utilization for each PopGroup in the <u>total population</u>

2. Multiplication of the average nationwide utilization by the number of people per PopGroup in the <u>region</u>, summed across PopGroups
   ⇨ **expected** utilization

3. Determination of the actual utilization in the <u>region</u>
   ⇨ **observed** utilization

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Determination of the average utilization per PopGroup

	Average utilization per person and year to approximate the average demand*							
Pop Group	Ambulatory care (number of contacts, reimbursement points) by physician group				Outpatient hospital care (number of cases) by category		Inpatient hospital care (number of cases, bed days) by department		
	Primary care (GPs)	Secondary care (specialists)			Outpatient surgery	…	Internal medicine	Interventional cardiology	…
		Internal medicine	Pediatrics and adolescent medicine	…					
P0101A	2.546	0.440	0.384		0.082		0.037	0.009	
P0101B	2.412	0.593	0.326		0.081		0.043	0.008	
P0101C	4.123	0.967	0.767		0.101		0.175	0.018	
P0101D	2.601	0.532	0.224		0.079		0.037	0.009	
P0102A	2.810	0.345	0.272		0.073		0.026	0.008	
P0102B	2.565	0.488	0.369		0.084		0.023	0.010	
P0102C	2.403	0.434	0.194		0.078		0.017	0.009	
…									

*fictional numbers

Regional analysis of health care provision

- Ratio of observed and expected utilization

- Derivation of required care capacities

  - i.e. number of hospital beds, number of primary/specialist care physicians

- Reference points for healthcare planning activities:

  - Discrepancies between observed and expected utilization

  - Discrepancies between available and required care capacities

Results

- Example region:

    - Rural area (several sparsely populated administrative districts combined)

    - Approx. 63,000 insured individuals
      (extrapolated to the total population in the region, approx. 393,000 people)

- Data year: 2019

- Selected care area:

    - Pediatrics and adolescent medicine

Results for an example region: Pediatrics and adolescent medicine

Ambulatory care utilization	Number of contacts			Reimbursement points		
	Observed contacts	Expected contacts	O/E	Observed points	Expected points	O/E
Pediatrics and adolescent medicine	116,448	143,749	0.8	67 million	77 million	0.9

Hospital utilization	Number of cases			Bed days		
	Observed cases	Expected cases	O/E	Observed days	Expected days	O/E
Inpatient care						
General pediatrics and adolescent medicine	5,282	3,744	1.4	18,402	12,727	1.4

Discussion

- The morbidity of the population is taken into account using more than 700 PopGroups
  - ⇨ Discrepancies between observed and expected utilization are not due to the morbidity-related composition of the population

- Limitations
  - Extrapolation
  - Retrospective analysis
  - Use of average utilization to determine the expected values

Thank you for your attention!

Questions & Discussion

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