Variations in preference-sensitive care and controversial medical procedures in Switzerland

Collaborators

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Goals, challenges, and hypothesis

Figure 1: Patient flow across Swiss MedStat regions
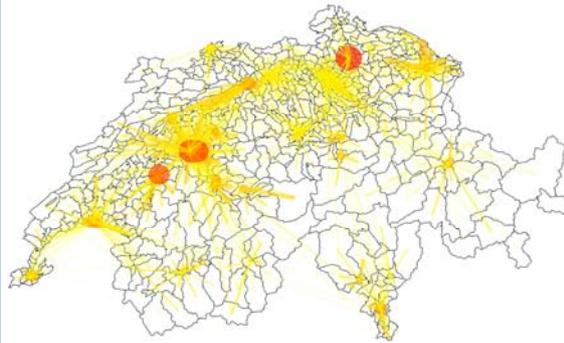
- Preference-sensitive interventions are elective interventions for which there is more than one option and where the outcome depends on the chosen treatment option.
- The goal is to investigate and explain spatiotemporal variation in intervention rates of 15 preference-sensitive interventions in Switzerland.
- Expected challenges are to combine the different routinely collected data files, the definition of determinants, and the definition of the "right" procedure rate for a specific intervention / procedure (Figure 1).
- We hypothesize that we will find a >3-fold variation in age- and sex-standardized rates of 15 preference-sensitive interventions across Swiss Health Services Areas (HSAs) / Swiss cantons and that this variation will persist over time.
- A more than 3-fold variation usually cannot be plausibly explained by differences in patient need or preferences.[1]
- Our secondary hypothesis is that several demographic, socioeconomic, health-related, regional, and supply-related determinants will substantially account for regional practice variation.[2]

Methods

Design	Population-based small area variation analysis[3,4]
Data	Routinely collected, person-level, patient discharge data of all hospitals in Switzerland (Medizinische Statistik der Krankenhäuser, Swiss Federal Statistical Office (SFSO))
Study period	Calendar years 2014 - 2018
Inclusion	Procedure codes for 15 procedures - Spine surgery - Vertebroplasty / kyphoplasty - Hip and knee arthroplasty - Percutaneous closure of the left atrial appendage - Cholecystectomy - Patent foramen ovale closure - Cardiac bypass surgery, - Implantable cardioverter defibrillator placement - Hysterectomy - Cardiac pacemaker placement - Prostatectomy - Prophylactic coiling/clipping cerebral aneurysms - Carotid endarterectomy and stenting - Bariatric surgery
Exclusion	- Patients younger than 18 years - Patients living outside Switzerland at the time of treatment

Statistics	- Unadjusted and age- /sex-standardized procedure rates per 100,000 for each HSA
	- Measures of variation:
	    - Extremal Quotient (EQ, ratio of highest to lowest intervention rate)
	    - Coefficient of Variation (CV, ratio of standard deviation of intervention rates to the mean rate)
	    - Systematic Component of Variation (SCV) and the Empirical Bayes (EB) statistic
	- Determinants of variation: are explored by using progressively adjusted multilevel negative binomial regression models to analyze in a stepwise process potential determinants of variation: sex/age, socioeconomic status, and physician density
	- Time trends from 2014 to 2018
	    - age- / sex-standardized intervention rates: non-parametric extension of the Wilcoxon rank-sum test
	    - SCVs: joint point trend analysis, assuming linear evolution and constant variance

Results

- We will extend previous analyses on the variation in classical surgical interventions to relatively novel, understudied technologies (e.g. vertebroplasty, closure of a patent foramen ovale).
- The results will be helpful to understand the uptake of novel interventions and inform the design of future health technology assessment projects.
- Results will set the basis for a Swiss Health Atlas to study Swiss health care utilization and variation and allow for international comparison.

References

[1]The King's Fund. Variations in health care. The good, the bad and the inexplicable. http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/Variations-in-health-care-good-bad-inexplicable-report-The-Kings-Fund-April-2011.pdf
[2]Birkmeyer JD, et al. . Understanding of regional variation in the use of surgery. Lancet. 2013;382:1121-9.
[3]McPherson K et al. Small-area variations in the use of common surgical procedures: an international comparison of New England, England, and Norway. N Engl J Med. 1982;307:1310-4.
[4]Wennberg J et al. Small area analysis and the Challenge of practice variation. Available from http://www.ices.on.ca/~/media/Files/Atlases-Reports/2016/Medical-Practice-Variations/Wennberg-Small-Area-Analysis-and-the-Challenge-of-Practice-Variation.ashx.