UNIKLINIK KÖLN
Institut für Gesundheitsökonomie und Klinische Epidemiologie

CoRe-Net / ZVFK Methodenforum

Gesundheitsökonomische Evaluation komplexer Interventionen

8.5.2018

Dr. rer. pol. Dirk Müller

Agenda

- Nutzung von Routinedaten für die Gesundheitsökonomie in Deutschland (Übersicht)
- 2 Fall-Beispiele einer gesundheitsökonomischen Evaluation
- Eignung von Routinedaten für die gesundheitsökonomische Evaluation komplexer Interventionen

Nutzung von Routinedaten für die Gesundheitsökonomie

- GKV-Versorgungsstrukturgesetz (2012): Stamm- und Leistungsdaten GKV-Versicherter sollten zugänglich werden
- Gesetzliche Grundlage ist die Datentransparenzverordnung (DaTraV)
- über das DIMDI: aggregierte Datensätze der gesetzlichen Krankenkassen für wissenschaftliche Analysen verfügbar
  - Repräsentativität ↑
  - i.d.R. weniger Variablen als bei den Kassen
    (demographische Infos, mediz. Prozeduren)
  - Keine kommerzielle Nutzung
  - Zeitverzug (Jahre), Abrechnungscharakter
- bisher überwiegt wohl weiter die Nutzung von GKV-Daten

Health economic evaluations based on routine data in Germany: a systematic review

Abstract

Background: Improved data access and funding for health services research have promoted the application of routine data to measure costs and effects of interventions within the German health care system. Following the trend towards real world evidence, this review aims to evaluate the status and quality of health economic evaluations based on routine data in Germany.

Methods: To identify relevant economic evaluations, a systematic literature search in the databases PubMed and EMBASE was complemented by a manual search. The included studies had to be full economic evaluations using German routine data to measure either costs, effects, or both. Study characteristics were assessed with a structured template. Additionally, the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) were used to measure quality of reporting.

Results: In total, 912 records were identified and 35 studies were included in the further analysis. The majority of these studies was published in the past 5 years ($n = 27$, 77.1%) and used insurance claims data as a source of routine data ($n = 30$, 85.7%). The most common method used for handling selection bias was propensity score matching. With regard to the reporting quality, 42.9% ($n = 15$) of the studies satisfied at least 80% of the criteria on the CHEERS checklist.

Conclusions: This review confirms that routine data has become an increasingly common data source for health economic evaluations in Germany. While most studies addressed the application of routine data, this analysis reveals deficits in considering methodological particularities and in reporting quality of economic evaluations based on routine data. Nevertheless, this review demonstrates the overall potential of routine data for economic evaluations.

Keywords: Economic evaluation, Cost-consequences analysis, Cost-effectiveness analysis, Routine data, Administrative data, Germany

Nutzung von GKV-Routinedaten in der gesundheits-ökonomischen Evaluation

- Studien, die die ökonomischen Konsequenzen (ganz oder teilweise) über GKV-Routinedaten betrachten:
  - Köster I, Huppertz E, Hauner H, Schubert I (2011) Direct costs of diabetes mellitus in Germany – CoDiM 2000–2007. Exp Clin Endocrinol Diabetes 119(6):377–85
- Studien, die sowohl die Kosten- als auch die Outcomeseite über GKV-Routinedaten betrachten
  - Stargardt T, Mavrogiorgou P, Gericke CA, Juckel G (2011) Effectiveness and costs of flupentixol compared to other first and second generation antipsychotics in the treatment of schizophrenia. Psychopharmacology
  - Drabik A, Büscher G, Sawicki PT et al (2011) Life prolonging of disease management programs in patients with type 2 diabetes is cost-effective. Diabetes Res Clin Pract
  - Bäumler M, Stargardt T, Schreyögg J, Busse R (2011) Cost-effectiveness of drug-eluting stents in AMI patients in Germany. Appl Health Econ Health Policy

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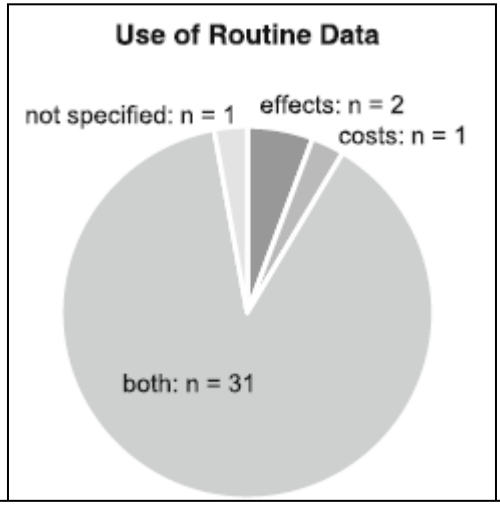


Gansen BMC Health Services Research (2018)

Nachteile von Outcome-Messungen über GKV-Routinedaten von GKV-Routinedaten in der gesundheitsökonomischen Evaluation

	GKV-Routinedaten	Primärdaten
Wirksamkeit und Nutzen	poststationäre Mortalität, Wiedereinweisungen, poststationäre Infektionen; klinische Outcomeparameter, Nutzwerte und Nutzen müssen aus anderen Quellen hinzugefügt werden	Keine Einschränkung
Selektionseffekte	Auftreten von Selektionseffekten; kann durch Matching-Methoden minimiert (aber nicht eliminiert) werden	Gering bei RCT-Daten
Homogenität des Settings sowie der Interventions- und Kontrollgruppe	Tendenziell geringe Homogenität, kann aber durch Matching-Methoden oder andere Verfahren verbessert werden, das heißt Ex-post-Bildung von Personen mit gleichen Merkmalsausprägungen	hoch

⬇

→ i.d.R. retrospektiv vergleichende Studien (LoE III)

Auszug aus: Schreyögg und Stargardt. Bundesgesundheitsbl 2012

Health economic evaluations based on routine data in Germany: a systematic review

- 31 vergleichende Analysen für den deutschen Kontext bis 2016
- Selektionsbias nicht berücksichtigt: 14%
- Teilweise methodische und/oder Berichtsdefizite:
  - Keine Angabe der Software
  - Fehlendes Linkage divergenter Daten
  - Fehlende Angaben zum Matching-Algorhytmus
  - Zu wenig Details zu Adjustierung von Daten
- Ø Unsicherheit / Heterogenität: 2/3 der Studien
- Ø Angabe der Perspektive: 28%

Defizite in der Outcomemessung

Nur geringe Anzahl gesundheitsökonomischer Modellierungen

Gansen BMC Health Services Research (2018)

Methodische Qualität

Health economic evaluations based on routine data in Germany: a systematic review

"With regard to the reporting quality of the included studies, the CHEERS based analysis revealed that more than half of the studies did not reach the benchmark of meeting 80% of the checklist's criteria. This is a clear indicator that a minimum of reporting standards for economic evaluations was frequently not met."

(Gansen, BMC Health Services Research 2018)

Status and perspectives of claims data analyses in Germany—A systematic review

"A weakness of many of the publications identified through this research was that their reporting of methods and results was neither transparent nor standardised"

(Kreis et al, Health Policy 2016)

Cost-effectiveness of a multifactorial fall prevention program in nursing homes

Routinedaten-basierte Kosten-Effektivitäts-Studie

Abstract

Introduction Despite their increased risk of falls and fractures, nursing home residents have been neglected in economic evaluations of fall prevention programs so far. The purpose of this study was to analyze, for the first time, the cost-effectiveness of a multifactorial fall prevention program in nursing home residents.

Methods This study is part of a prospective, unblinded, cluster, nonrandomized, controlled study focusing on the transfer of an efficacious fall prevention program into a real-world setting. The analyzed subsample was derived from claims data and consisted of data on intervention (n=256, residents n=10,178) and control homes (n=893, residents n=22,974), representing all insurants of a sickness fund (AOK Bavaria, Germany) who were 65 years or older, residing in a nursing home on the 31st of March 2007 and had a level of care of ≥1 according to the classification of the statutory long-term care insurance. Time free of femoral fracture (ICD-10, S72) was used as measure of health effects. Femoral fracture-related costs and intervention costs were measured from a payer perspective. Multivariate regression models were applied. Sensitivity analyses were performed and cost-effectiveness acceptability curves computed.

Results Within the first year of the intervention, femoral fracture rate was significantly reduced, resulting in a nonsignificant incremental mean time of 1.41 days free of femoral fracture. Incremental mean total direct costs were 29 EUR per resident, which was not significant. The incremental cost-effectiveness ratio (ICER) was 7,481 EUR per year free of femoral fracture. The probability of an ICER<50,000 EUR per year free of femoral fracture was 83 %.

Conclusion Depending on the amount the decision-maker is willing to pay for the incremental effect, the fall prevention program might be cost-effective within the first year. Future studies should expand the range of costs and effects measured.

Keywords Cost-effectiveness · Elderly · Multifactorial fall prevention · Nursing homes

Cost-effectiveness of a multifactorial fracture prevention program for elderly people admitted to nursing homes

Literatur-basierte Kosten-Nutzwert Studie

Abstract

Background Fractures are one of the most costly consequences of falls in elderly patients in nursing homes.

Objectives To compare the cost-effectiveness of a 'multifactorial fracture prevention program' provided by a multidisciplinary team with 'no prevention' in newly admitted nursing home residents.

Methods We performed a cost-utility analysis using a Markov-based simulation model to establish the effectiveness of a multifaceted fall prevention program from the perspective of statutory health insurance (SHI) and long-term care insurance (LCI). The rate of falls was used to estimate the clinical and economic consequences resulting from hip and upper limb fractures. Robustness of the results was assessed using deterministic and probabilistic sensitivity analyses.

Results Compared to no prevention a multifactorial prevention program for nursing home residents resulted in a cost-effectiveness ratio of €21,353 per quality-adjusted life-year. The total costs for SHI/LCI would result in €1.7 million per year. Results proved to be robust following deterministic and probabilistic sensitivity analyses.

Conclusion Multifactorial fracture prevention appears to be cost-effective in preventing fractures in nursing home

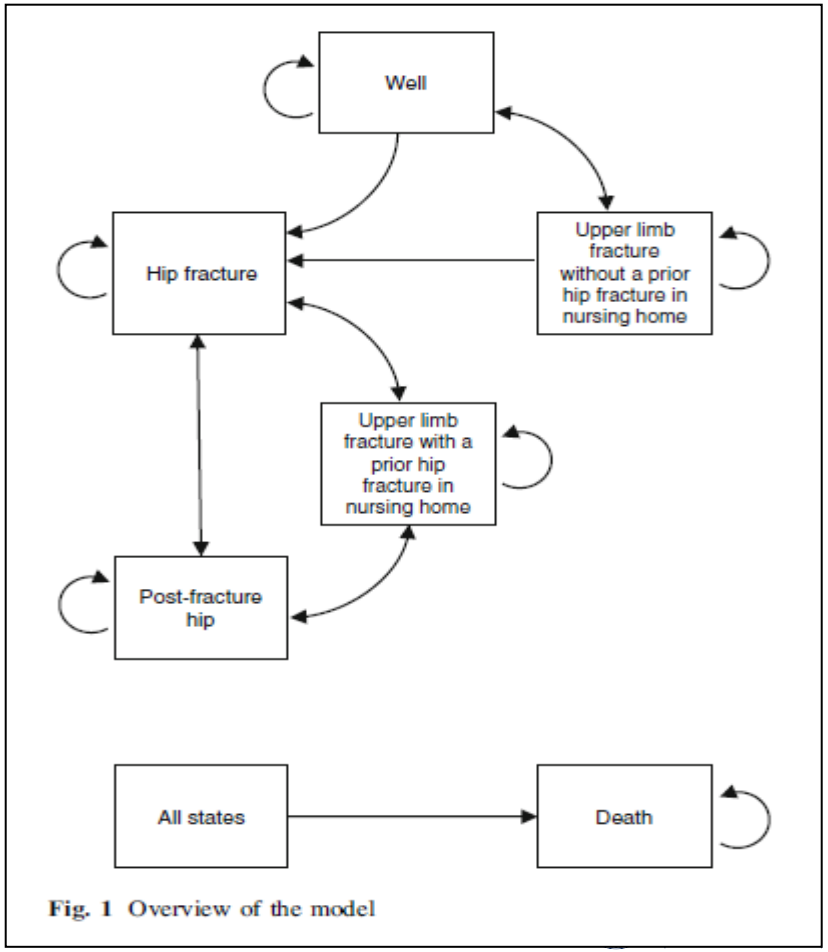


Fig. 1 Overview of the model

Müller, Borsi, Stracke, Stock, Stollenwerk. Eur J Health Econ 2014

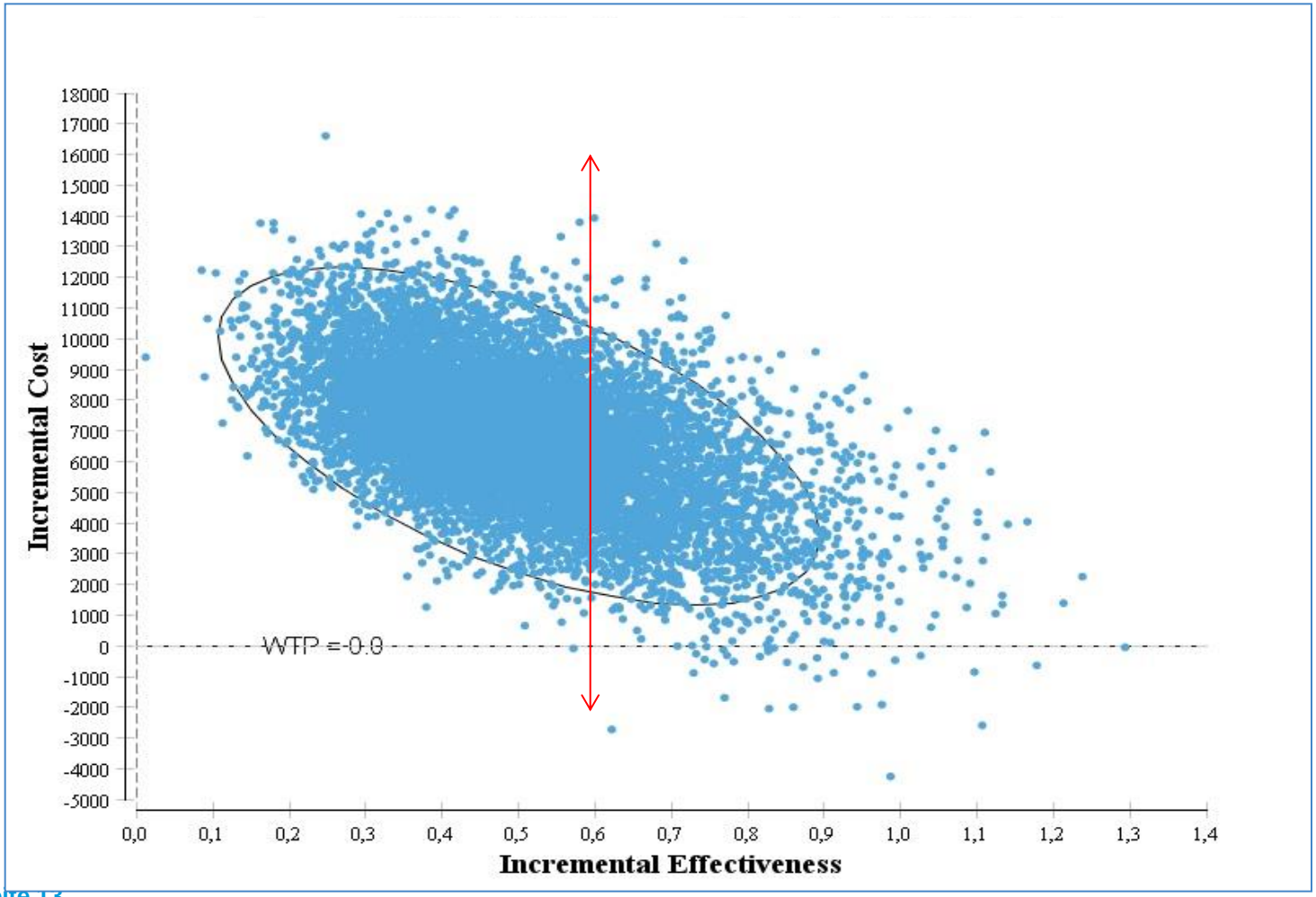
Cost-effectiveness of a multifactorial fracture prevention program for elderly people admitted to nursing homes

Intervention	Total costs in € per person
Hip protector ("Safehip" by Tytex)	207
Group education and written information on hip protectors	6
Labour costs for education	7
Environmental check	21
Group exercise (two 30-min sessions per week over 6 months)	195
Geriatric assessment by general practitioner	13
Total	449 (314; 584)
Treatment of fractures	**Total costs in € per fracture**
Hip fracture year 1	7,186 (5,749; 8,624)
Hip fracture year 2	335 (268; 402)
Hip fracture year 3+	155 (124; 186)
Upper limb fracture	
Medical treatment	2,740
Physiotherapy	270
Ergotherapy	378
Total	3,388 (2,710; 4,065)

Variable	Value
Probabilities of fracture in year 1 of nursing home stay	
Hip	0.0387 (0.0361–0.0413)
Upper	0.0118 (0.0104–0.0133)
Probabilities of fracture from year 2 of nursing home stay	
Hip	0.0060 (0.0057–0.0062)
Upper limb	0.0018 (0.0017–0.0019)
Hip or upper limb fracture in year 1 after a hip fracture	0.0634 (0.0281–0.0987)
Hip or upper limb fracture in year 2+ after a hip fracture	0.0138 (0.0000–0.0306)
Relative risk	0.60 (0.51–0.72)
Mortality	
In year 1 after a hip fracture	0.4670 (0.4295–0.5085)
In year 1 of nursing home stay	0.4239 (0.3391–0.5087)
In year 2+ of nursing home stay	0.2764 (0.2211–0.3317)
Utilities (QALYs)	
No fracture (nursing home)	0.5222 (0.4178–0.6266)
Hip fracture	0.2942 (0.2354–0.3530)
Upper limb fracture without a prior hip fracture	0.4822 (0.3858–0.5786)
Post hip fracture year	0.3692 (0.2954–0.4430)

Müller, Borsi, Stracke, Stock, Stollenwerk. Eur J Health Econ 2014

Darstellung der Unsicherheit: probabilistische Sensitivitätsanalyse



Komplexe Interventionen

- Mehrere interdependente Komponenten (z.B. Module, zeitlich gestaffelte Elemente)
- Einzelkomponenten können sich wechselseitig bedingen
- Beitrag der Einzelkomponenten und der Einfluss ihrer Interaktion mit dem Setting auf das Gesamtergebnis häufig unklar (z.B. Stroke Units, DMP)
- Häufig: vielfältige Kosten- und Nutzenkomponenten für unterschiedliche Stakeholder (zahlreiche Public Health-Maßnahmen)
- „Indikationen und Ingredienzien sind variabel, häufig unzureichend definiert und nicht systematisch deklariert“ (Mühlhauser 2012)
- Gesundheitsökonomisch Evaluation komplexer Interventionen:

→ Besondere Standards erforderlich ?

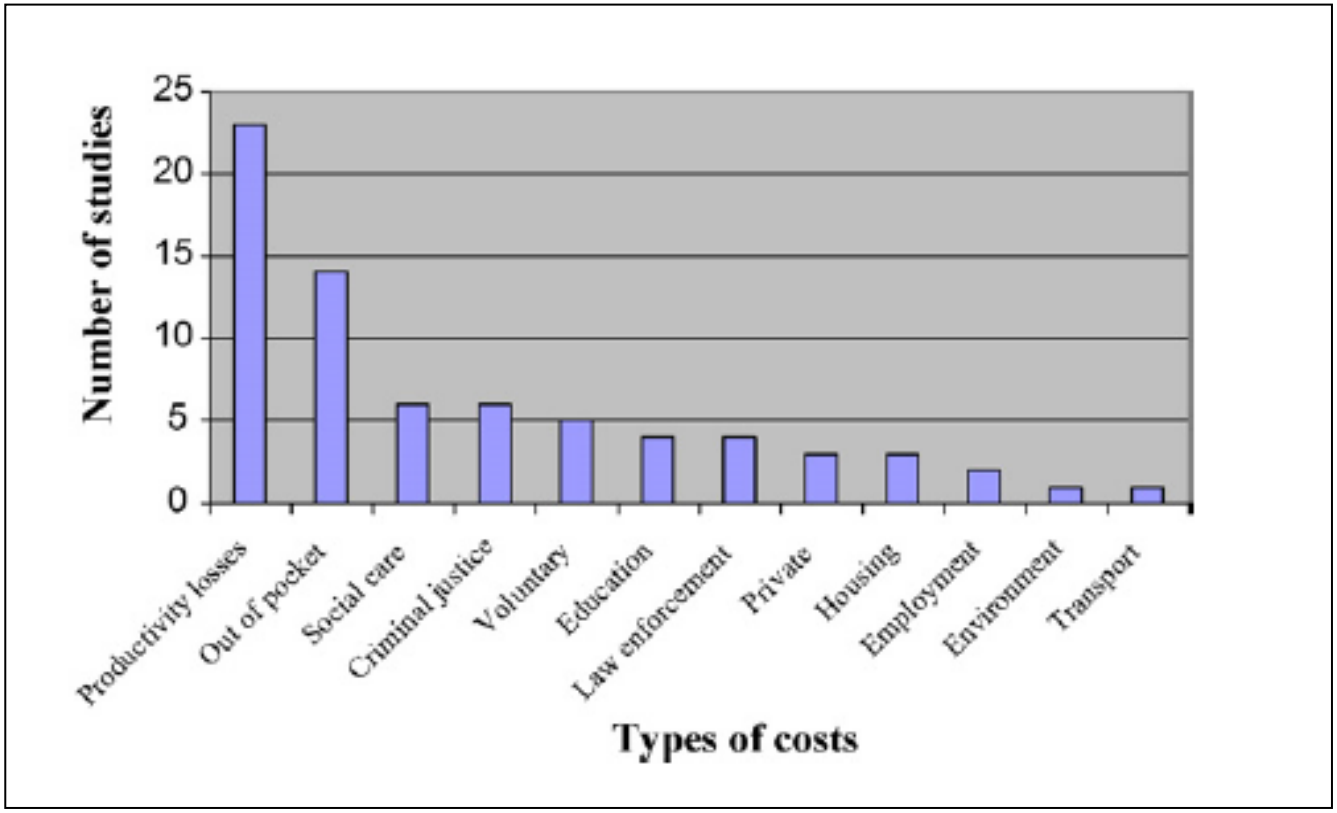
Nutzung von Routinedaten für gesundheitsökonomische Evaluationen bei komplexen Interventionen (Outcome)?

- The majority of key commentators see the need and importance to go beyond measures such as life-years gained, cases averted, or utility (Edwards 2013).
- Interessierende Outcomes:
  intermediäre Parameter, klinische Parameter, Lebensqualität, sogenannte nicht unmittelbar gesundheitsbezogene Parameter bzw. non-health-outcomes (NHOs)
  - Cost-utility analysis?
  - Sen's Capability Approach (Sen, 1985)
  - 'Subjective Wellbeing' Approach (Diener, 1984)
  - Andere Instrumente?

Nutzung von Routinedaten für Gesundheitsökonomische Evaluationen bei komplexen Interventionen (Kosten)?

- bei Public Health-Maßnahmen gesellschaftliche Perspektive erwünscht
  → Kosten in anderen sozialen Sektoren, zusätzliche durch Routinedaten nicht erfasste Kosten

Erweiterte Kostenkomponenten gesundheitsökonomischer Evaluationen komplexer Interventionen



Intersektorale Kosten und Effekte können bei Public Health-Maßnahmen durchaus auch außerhalb des Gesundheitssystems anfallen

Weatherly et al. Health Policy 2009

Nutzung von Routinedaten für Gesundheitsökonomische Evaluationen bei komplexen Interventionen (Kosten)?

- bei Public Health-Maßnahmen gesellschaftliche Perspektive erwünscht
  → Kosten in anderen sozialen Sektoren, zusätzliche durch Routinedaten nicht erfasste Kosten
- Vollständigkeit und Konsistenz (“costs in each behavior change area”)
- Abbildung komplexer Ursache-Wirkungsbeziehungen: langfristige Veränderungen auf multiplen Ebenen (Individuum, Familie, Institution, Nachbarschaft, Policy Level)
- Berücksichtigung verhaltensökonomischer Aspekte

Zweckmäßigkeit von GKV-Daten?

Zusammenfassung

- Input: GKV-Routinedaten wichtiger Bestandteil zur Beschreibung der Inanspruchnahme von Gesundheitsleistungen und direkter Outcomes (bedeutsam für Kostenträger-Perspektive)
- Wird künftig oftmals Ergänzungen bedürfen (Kosten in andere Sektoren, erweiterter Begriff von Outcome)
- Evaluation von Public Health-Maßnahmen: Synthese relevanter Daten aus verschiedenen Quellen (exp. und nicht exp., Mixed methods inklusive GKV-Daten)
- Beachtung von methodischen- und Berichtsstandards (Unsicherheit, Perspektive) → STandardised Reporting Of Secondary dataAnalyses (STROSA) checklist (Swart 2014)

Vielen Dank für die Aufmerksamkeit

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