

Iatrogenic Ureteral Injury Rate in Abdominopelvic Surgeries in Germany: Feasibility Assessment Results

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EP.0191

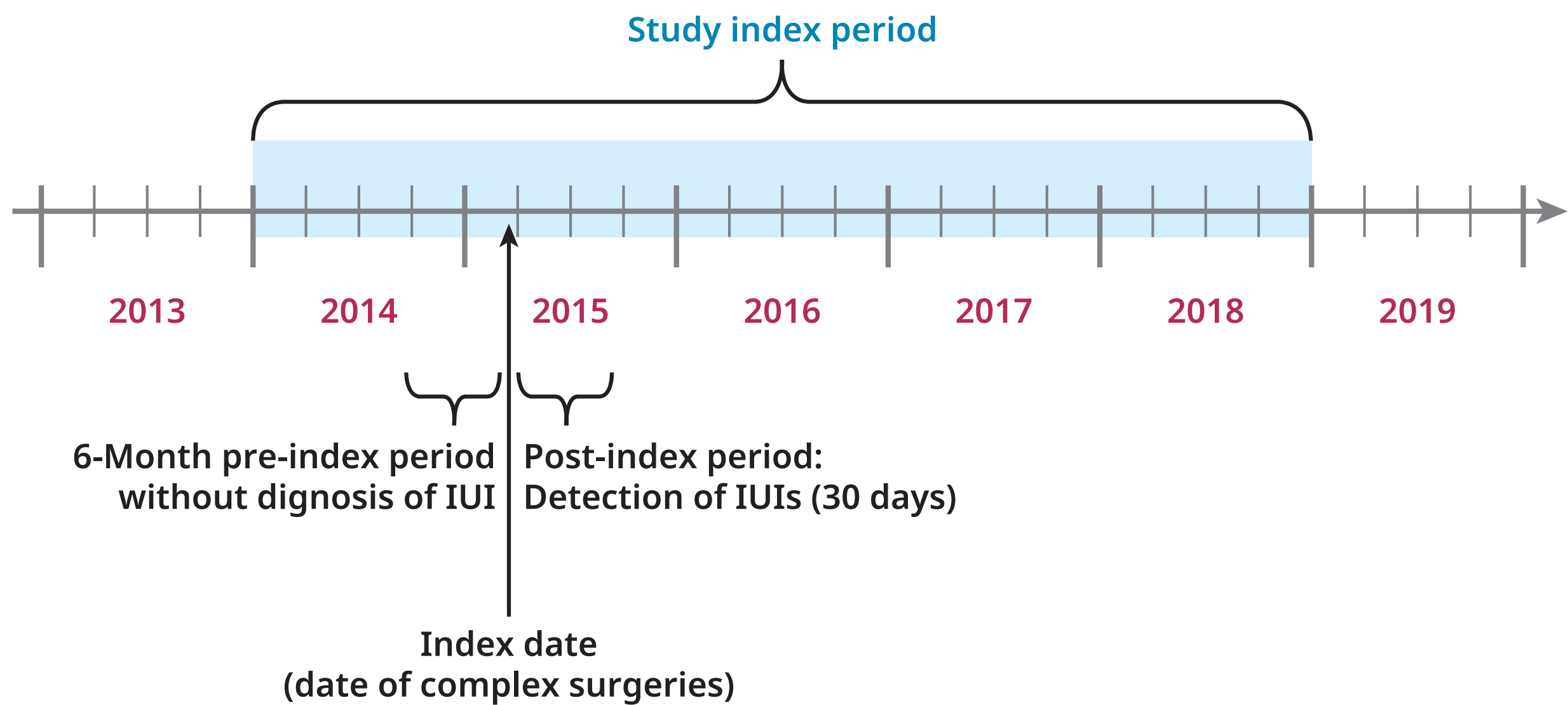
INTRODUCTION AND OBJECTIVE

- Iatrogenic ureteral injuries (IUIs) are rare but serious surgical complications that are associated with increased morbidity¹ and short- and long-term complications, including urinary leak, fistula, sepsis, acute and permanent renal failure, and death^{2–4}
- Ureters may be at high risk of IUIs during complex abdominopelvic surgeries that may lead to potential damage to the ureters^{3,5}
- Most IUIs occur during gynaecological (GYN) procedures, while the remainder occur in colorectal, vascular, pelvic, and urologic surgeries^{6,7}
- Incidences of ureteral trauma in GYN surgeries have been reported to range between 0.3% to 2.5% for hysterectomies and standard pelvic operations, up to 5% for radical hysterectomy,⁷ and between 0.25% to 0.65% for gastrointestinal (GI) procedures⁸
- This study assessed the feasibility of using claims data to estimate the incidence of IUIs in complex abdominopelvic surgeries in Germany
- This is the first study to identify IUI prevalence in complex surgeries using German claims data

STUDY DESIGN AND METHODS

- This retrospective, longitudinal, observational study determined complex surgeries, and the IUI rate in those surgeries, using the Wissenschaftliches Institut für Gesundheitsökonomie und Gesundheitssystemforschung (WIG2) Benchmark dataset (**Figure 1**)
 - GI and GYN surgeries were identified using Operation and Procedure Classification System (OPS) codes (**Table 1**)
 - Confirmed IUI diagnosis was captured using the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (German Modification) (ICD-10-GM) code S37.1 (injury of ureter)

Figure 1. Study design.



Patients with IUIs that occurred within 30 days of the end of the study index period were included in the analysis. IUI, iatrogenic ureteral injury.

Table 1. Types of complex surgeries assessed.

OPS Code	English Description	German Description
5-384	Resection and replacement (interposition) on the aorta	Resektion und Ersatz (Interposition) an der Aorta
5-456	(Total) colectomy and proctocolectomy	(Totale) Kolektomie und Proktokolektomie
5-484	Rectum resection while preserving the sphincter	Rektumresektion unter Sphinktererhaltung
5-485	Rectal resection without sphincter preservation	Rektumresektion ohne Sphinktererhaltung
5-541	Laparotomy and opening of the retroperitoneum	Laparotomie und Eröffnung des Retroperitoneums
5-683	Hysterectomy	Uterusexstirpation [Hysterektomie]
5-685	Radical hysterectomy	Radikale Uterusexstirpation
5-686	Radical cervical stump extirpation	Radikale Zervixstumpfexstirpation
5-684	Cervical stump extirpation	Zervixstumpfexstirpation

OPS, Operation and Procedure Classification System.

- Patient selection criteria:
 - Patients with ≥ 1 complex surgery occurring between 1 January 2014 and 31 December 2018, and who were continuously insured for ≥ 30 days (or deceased) after the index date (the date of the complex surgery) were included; those surviving surgeries were followed for 30 days post-index date
 - Patients with an IUI in the 6 months pre-index date were excluded
- The overall incidence of IUIs was calculated as the number of cases with ≥ 1 diagnosis for an IUI within 30 days after any complex surgery divided by the total number of the surgeries
 - For a broader understanding of the frequency of IUI, we combined GI (codes 5-456, 5-484, 5-485) and GYN (codes 5-683, 5-684, 5-685, 5-686) surgeries and evaluated the frequencies of IUIs within these groups
 - Additionally, we investigated elective surgeries for colectomies and hysterectomies, distinguished by an open versus laparoscopic approach

RESULTS

- A total of 26 392 complex surgeries were identified, including 6967 GI surgeries and 19 425 GYN surgeries (**Table 2**)
- The rates for confirmed IUI as diagnosed by “injury of ureter” (code S37.1) within 30 days of complex GI and GYN surgeries were 0.7% (n / N = 52 / 6967) and 0.4% (69 / 19 425), respectively
 - IUI incidence as diagnosed by “injury of ureter” (code S37.1) was 0.5% (1 / 216) for open colectomies; no IUIs were reported (0 / 65) for laparoscopic colectomies
 - For laparoscopic and open hysterectomies, IUI incidence as diagnosed by “injury of ureter” (code S37.1) was 0.4% (24 / 5779), and 0.4% (14 / 3293), respectively

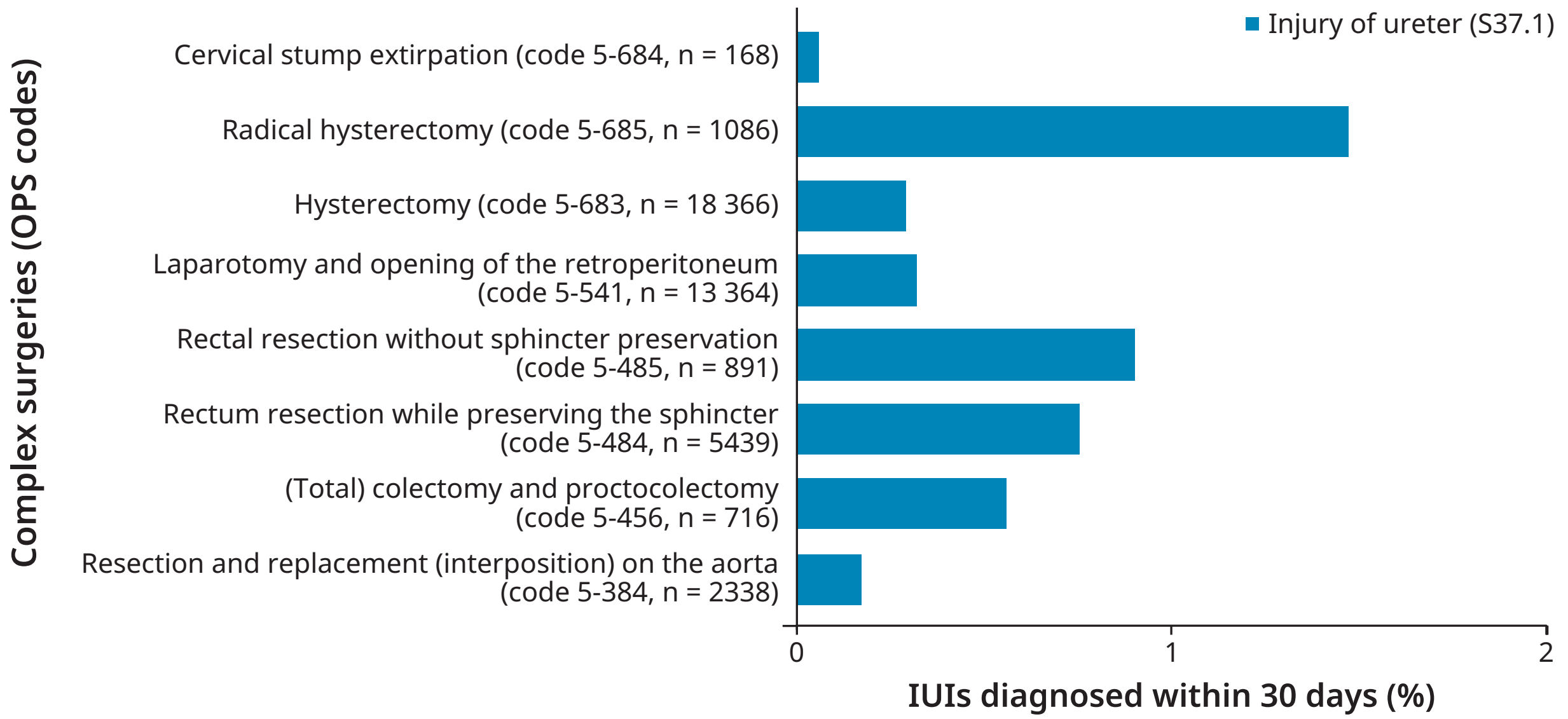
Table 2. IUI in GI and GYN subgroups within 30 days after complex surgeries.

Patient setting	n	IUI diagnosed by ICD-10-GM S37.1 only	
		n (%)	95% CI
All complex surgeries			
GI	6967	52 (0.7)	0.6–1.0
GYN	19 425	69 (0.4)	0.3–0.4
Inpatient complex surgeries, nonemergent			
Laparoscopic colectomy	65	0 (0)	0.0–5.5
Open colectomy	216	1 (0.5)	0.0–2.6
Laparoscopic hysterectomy	5779	24 (0.4)	0.3–0.6
Open hysterectomy	3293	14 (0.4)	0.2–0.7

CI, confidence interval; GI, gastrointestinal; GYN, gynaecological; ICD-10-GM, International Statistical Classification of Diseases and Related Health Problems, 10th Revision (German Modification); IUI, iatrogenic ureteral injury.

- Radical hysterectomy had the most common diagnoses of IUI, followed by rectal resection without sphincter preservation (**Figure 2**)

Figure 2. IUI diagnosed within 30 days by complex surgery type and ICD-10-GM code.



No IUIs were reported within 30 days of radical cervical stump extirpation (code 5-686). GI, gastrointestinal; GYN, gynaecological; ICD-10-GM, International Statistical Classification of Diseases and Related Health Problems, 10th Revision (German Modification); IUI, iatrogenic ureteral injury; OPS, Operation and Procedure Classification System.

LIMITATIONS

- There are some limitations to this study, which identified the IUI prevalence using administrative claims data:
 - Inpatient treatments are billed as lump sums; thus, some procedures and diagnoses may not have been reported if they were not relevant for reimbursement of the inpatient stay
 - IUI diagnoses during outpatient visits could not be traced to an exact date

CONCLUSIONS

- This is the first study that identified IUI prevalence in complex surgeries using administrative claims of WIG2, demonstrating that it is feasible to provide recent real-world data on IUI incidence rates in GI and GYN surgeries in Germany from 2014 to 2018
 - IUI is a rare event, with less than 1% of the complex surgeries having a documented IUI
 - For this analysis, a conservative approach was taken, as other potential codes (N13.1, K65.8, T81.2, and R39.0) also need to be considered to assess the IUI rate, and a follow-up period of 180 days or longer may be needed to have a clear understanding of the patient’s situation and to avoid overestimating the results
- Further research is needed to determine the impact of IUI on hospital costs and resources

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ACKNOWLEDGEMENTS

This study was funded by Astellas Pharma Inc. Medical writing support was provided by Jing Xu, PhD, of Oxford PharmaGenesis Inc., Newtown, PA, USA, and was funded by Astellas Pharma Global Development, Northbrook, IL, USA.

DISCLOSURES

A.F.A and J.S are employees of Astellas Pharma, Inc. M.D and M.P are employees of Zentrum f. Epidemiologie u. Gesundheitsforschung Berlin GmbH. A.S reported grants, consulting fees and payment for expert testimony from Zentrum f. Epidemiologie u. Gesundheitsforschung Berlin GmbH. N.K is an employee of Wissenschaftliches Institut für Gesundheitsökonomie und Gesundheitssystemforschung