

Background

Cancer epidemiology is frequently reported using registry data. A growing trend of reporting and utilizing real-world administrative data opens an opportunity for epidemiological studies based on such data. In this study, we assessed the prevalence and incidence of different cancer types in Germany using a large claims dataset and attempted to infer comparability of the parameters against other reports.

Conclusion

Based on the claims data analyzed in this study, we identified higher cancer incidence rates for Germany than those previously reported based on registry data. On one hand, this may suggest a higher real-world healthcare burden than the current official estimate. On the other hand, to explain these differences, an investigation is necessary to further characterize the specific cancer patient cohorts, and calibrate the diagnosis definitions which are used to identify these patients in the claims data.

Methods

We conducted a retrospective analysis utilizing an anonymized claims database based on a German statutory health insurance fund (AOK PLUS) covering the federal states of Saxonia and Thuringia. Approximately 2.9 million individuals were covered in the database in the years of 2010 to 2016.

Cancer patients were identified by confirmed cancer diagnoses (at least 1 inpatient and/or 2 confirmed outpatient diagnoses) based on ICD-10 codes (C00.x-C75.x/C76.x-C80.x/C81.x-C97.x) documented by specialists.

Prevalent cases were defined as all patients with the record of confirmed diagnoses of at least one type of cancer between 01/01/2016 and 12/31/2016.

Incident cases were defined as those who received confirmed diagnoses in 2016 (excluding those who only received ICD-10 codes for secondary neoplasm or unspecified malignancies, C76.x-C80.x). A patient was excluded as incident case if cancer diagnosis of a proximate or related site was recorded in the pre-index period (2010-2015). For incident patients the main baseline characteristics available in the claims dataset were reported at time of first diagnosis.

The reported prevalence and cumulative incidence were standardized according to the German standard population in the corresponding year (age and gender distribution published as forecast by the German Federal Office of Statistics in 2015).

Results

Age and gender standardized prevalence of any cancer in 2016 was 34.5 cases per thousand (31.7 per thousand women, 37.5 per thousand men). The standardized cumulative incidence (CI) in the same period was 8.6 cases per thousand (7.4 per thousand women and 9.9 per thousand men).

Non-melanoma skin cancer (NMSC) was the most common type of malignancy with a prevalence of 5.9 per 1000 and incidence of 1.6 per thousand (Table 1). The median age of NMSC patients was 74.5 years with an even gender distribution (51.3% females, 48.7% males) and a mean Charlson Comorbidity Index (CCI) of 2.8 (Table 2).

Following NMSC, prostate cancer was the most common type of cancer in men (Figure 1), with prevalence and incidence of 12.0 and 1.4 per thousand men, respectively, and lung and bronchus cancer with a prevalence of 2.1 and incidence of 0.9 per thousand men. In women, breast cancer was the most common type of cancer after NMSC, with prevalence and incidence of 11.9 and 1.4 per thousand women followed by colon cancer with a prevalence of 1.4 and incidence of 0.4 per thousand women.

Table 1 Ten most common cancers by overall incidence in Germany, 2016.

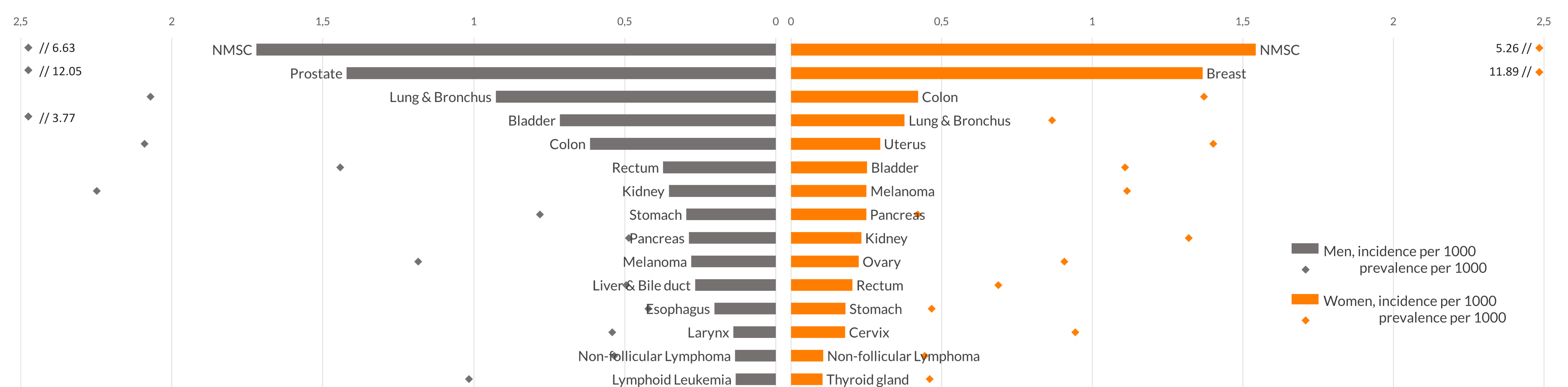
Rank	Cancer site	ICD-10-GM	Incidence per 1000	Prevalence per 1000
1	NMSC	C44	1.63	5.9
2	Breast	C50	0.71	6.1
3	Prostate	C61	0.70	5.9
4	Lung & Bronchus	C33,34	0.65	1.5
5	Colon	C18	0.52	1.7
6	Bladder	C67	0.48	2.4
7	Kidney	C64	0.29	1.8
8	Rectum	C20	0.29	1.1
9	Pancreas	C25	0.27	0.5
10	Melanoma	C43	0.27	1.1

Table 2 Baseline characteristics of incident NMSC, breast and prostate cancer patients in 2016.

	NMSC	Breast Cancer	Prostate Cancer
N	5928	2418	2281
Age mean (SD)	74.5 (12.3)	67.6 (15.4)	73.0 (9.2)
Sex			
Female N (%)	3039 (51.3)	2375 (98.2)	0 (0.0)
Male N (%)	2889 (48.7)	43 (1.8)	2281 (100.0)
CCI mean (SD)	2.8 (2.6)	2.1 (2.5)	2.7 (2.7)
# of hospitalisations in 2015 mean (SD)	1.8 (1.4)	1.6 (1.1)	1.9 (1.5)
# of chronic medications in 2015 mean (SD)	5.1 (3.3)	4.6 (3.2)	4.7 (3.0)

SD: Standard deviation, CCI: Charlson Comorbidity Index

Figure 1 Most frequent cancer sites by gender, calculated as cumulative incidence and period prevalence in Germany, 2016.



Key words

Claims data | Cancer Incidence | Cancer Prevalence

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