

ECONOMIC BURDEN OF HPV-RELATED HEAD & NECK AND ANAL CANCERS IN GERMANY

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BACKGROUND

- Literature on the economic burden of head & neck (H&N) and anal cancers in Germany is scarce.
- Human papillomavirus (HPV) infection is a necessary cause of cervical cancer and is also associated with a subset of H&N cancers (5% to 72%)^{a,b} and the majority of anal cancers (84%)^c.
- HPV is likely to be responsible for a substantial burden of disease in both women and men.

OBJECTIVE

- This study aimed to assess the medical and economic burden associated with H&N and anal cancers in Germany in 2008.
- Then, the annual overall costs of HPV-related H&N and anal cancers was estimated by considering the assumed proportion of cancers attributable to HPV infection.

METHODS

- The cost-of-illness study was a secondary analysis of five German public databases covering hospitalisations, inpatient rehabilitations, and sick leaves.
- The reference period of the cross-sectional analysis was the year 2008.

Data sources

- Hospitalisations** | German Federal Statistical Office (Destatis) for the annual number of hospitalisations, and the Institute for the Hospital Remuneration System (InEK) for the type and frequency of main treatment categories (surgery, radiotherapy, medical) during the hospital stays.
- Inpatient rehabilitations** | German Public Pension Insurance (DRV) for the annual number and duration of inpatient rehabilitations.
- Sick leaves** | Local Statutory Health Insurance (SHI) funds extrapolated to the total German compulsory SHI member population for the number and duration of sick leaves.

Data extraction

- The data extraction was based on **14 ICD-10 codes** related to H&N (C01-C06, C09-C14; C32) and anal (C21) cancers. Specifically, H&N cancers were grouped into five categories:
 - Oral cavity (C02-C06): tongue other, gum, floor of mouth, palate, mouth other;
 - Oropharynx (C01, C09-C10): base of tongue, tonsil, oropharynx;
 - Pharynx (C11-C13): nasopharynx, piriform sinus, hypopharynx;
 - Larynx (C32): larynx;
 - Other H&N sites (C14): other/ill-defined sites in lip, oral cavity, pharynx.

- Numbers refer to resource consumption units and not to patients.

Cost valuation

- All costs were considered from the **societal perspective**.
- Direct costs** incurred by **hospitalisation** were based on German Diagnosis-related Groups (G-DRG) system, used to assess cost per hospital stay.
- Direct costs** incurred by **inpatient rehabilitation** were based on DRV.
- Indirect costs** incurred by **sick leave** were estimated by using the human capital approach.

RESULTS

Resource use of H&N and anal cancers

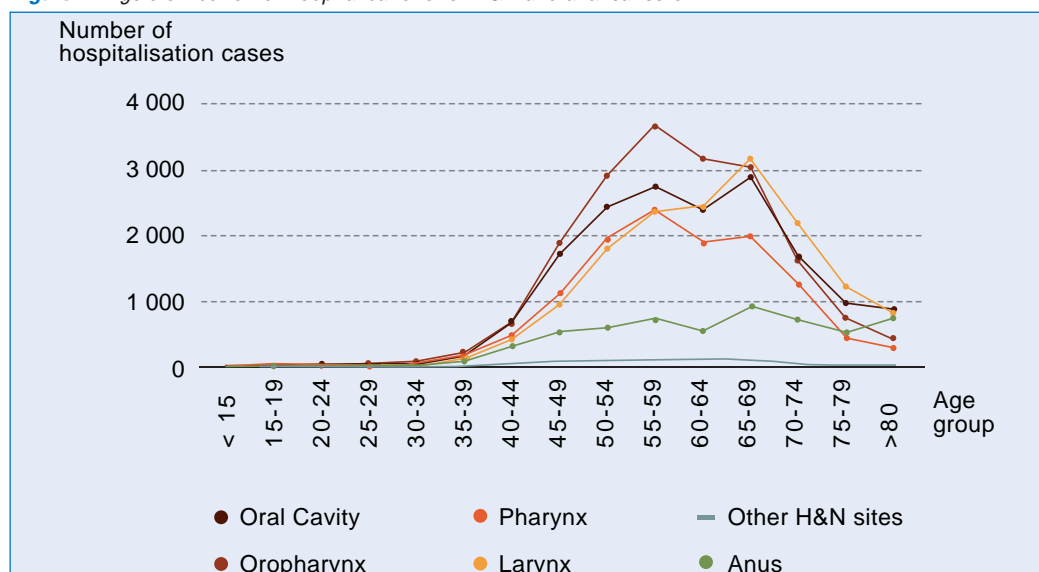
- In Germany, 69,631 hospitalisations are due to H&N and anal cancers annually, with more than 75% of cases associated with men.

Table 1. Resource use for H&N and anal cancers

Resource consumption units	Hospitalisations	Inpatient rehabilitations	Sick leaves
- H&N cancers	63 857 [♂ 80%]	4 898 [♂ 76%]	17 494 [♂ 85%]
- Anal cancer	5 774 [♀ 61%]	517 [♀ 67%]	897 [♀ 52%]
Overall resources	69 631	5 415	18 391

- Of the hospitalisations due to H&N and anal cancers, 38% and 50% took place for patients older than 65%, respectively.

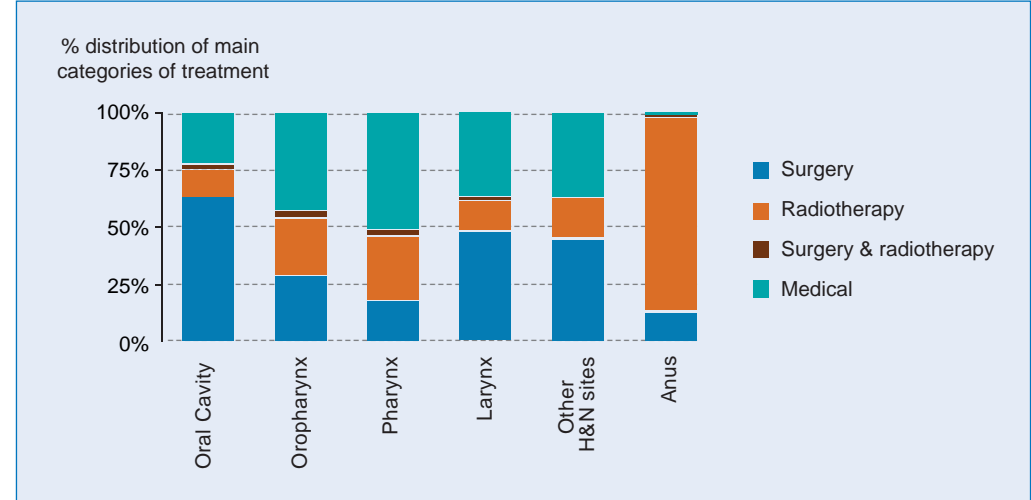
Figure 1. Age distribution of hospitalisations for H&N and anal cancers



RESULTS (CONT'D)

- Most of the hospitalisations were linked to surgical procedures exclusively (41%) for H&N cancer and to radiotherapy exclusively (84%) for anal cancer.

Figure 2. Distribution of main categories of treatment during hospitalisation for H&N and anal cancers



Costs of H&N and anal cancers

- In Germany, annual overall cost of H&N and anal cancers was estimated at €399.9 million, with more than 75% of this cost (€302.5 million) resulting from men.
- Hospitalisations, inpatient rehabilitations, and sick leaves accounted for 82%, 4%, and 15% of overall cost, respectively.

Table 2. Annual overall costs for H&N and anal cancers

€ Million	Hospitalisations	Inpatient rehabilitations	Sick leaves
- H&N cancers	293.7 [♂ 78%]	13.1 [♂ 77%]	59.0 [♂ 86%]
- Anal cancer	29.5 [♀ 61%]	1.3 [♀ 69%]	3.3 [♀ 64%]
Overall costs	323.2	14.4	62.3

Burden of HPV-related H&N and anal cancers

- Considering the HPV attributable fraction for each cancer (no gender specific), the annual overall cost associated with HPV-related H&N and anal cancers was approximately €78.2 and €28.7 million, respectively.

Table 3. HPV prevalence in H&N and anal cancers and estimated annual overall HPV-related cost

Cancer type	Cancer cases attributable to HPV all types (%)	Estimated overall HPV-related costs (€ million)		
		Men	Women	Both genders
H&N cancer	-	62.4	15.8	78.2
- Oral cavity	16.0 ^a	15.0	5.9	21.0
- Oropharynx	28.2 ^a	22.1	5.9	28.0
- Pharynx	21.3 ^a	10.3	1.9	12.2
- Larynx	21.3 ^a	13.6	1.8	15.4
- Other H&N sites	28.2 ^a	1.3	0.3	1.6
Anal cancer	84.2 ^c	10.9	17.7	28.7
Total	-	73.4	33.5	106.9

- Overall cost due to HPV-related H&N and anal cancers was estimated at €73.4 million in men and €34.1 million in women, annually.

CONCLUSIONS

- The annual overall cost of HPV-related H&N and anal cancers contributes to a substantial economic burden in Germany, €106.9 million, appearing significant compared to the cost of HPV-related cervical cancer (€143 million)^d.
- The annual overall cost of HPV-related H&N and anal cancers incurred by men was important (69%). While cost in anal cancer was higher in women (62%), the main cost in H&N cancers was driven by men (80%).
- Overall cost is likely to be underestimated since several cost components are not included (e.g., outpatient management, expensive chemotherapy, premature retirement, or long-term care costs).
- Results are the first estimation for HPV-related H&N and anal cancer cost in Germany, and could be helpful for decision-makers when assessing health and economic benefits of HPV vaccination programmes in both genders.

References

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