Regional variations in German head and neck, laryngeal and esophageal cancer: mortality rates and incidence patterns.

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Squamous cell carcinoma (SCC) of the head and neck, larynx and esophagus (HNC) are mainly preventable diseases. Namely **tobacco use in combination with alcohol consumption, and viral infections** are accessible to **preventive means**. It is well known that **area context effects alcohol and tobacco consumption** (Blomgren 2004). A large **East-West-gap** in the **alcohol-related burden of mortality, and a North-South-gap in tobacco-related burden of mortality** have been identified in Germany (Nolte 2003; Mons 2011), However it is unclear how regional variation in SCC-incidence of the head and neck and HNC mortality is patterned in Germany.

Nationwide population based cancer registration

Identification of incident HNC cases**:**

1) Data from registries with estimated completeness of ≥80% for incident head & neck tumors in 2011 (reference-pool and method: Kraywinkel 2014)
2) ICD-O-10 topography codes C01-06, C09-15, C32 and ICD-O-3 morphology codes (8050-8084), men and women aged 35-79years, year of diagnosis 2010-2012

Mortality data is provided by the Federal Statistical Office Germany

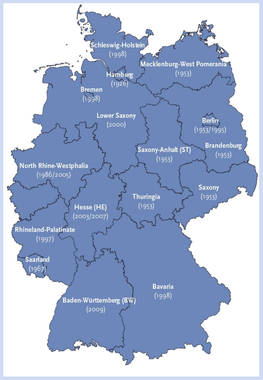
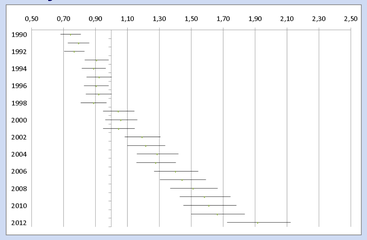


Figure 1. Population based cancer registration is federally organized and was implemented between 1926 and 2009

Regional variation largest among younger men

Figure 2. Standardized HNC **mortality rate ratios** (East to West Germany) for **men**, by age group, 1990-2012

<60 years



≥60 years

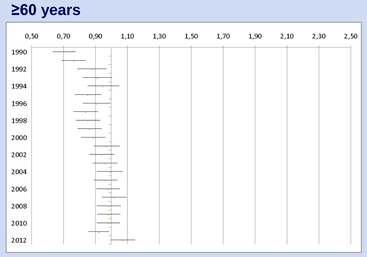


Figure 3. A red (high) – green (low) color scale depicts regional variation, standardized **HN-SCC incidence rates for men** (provided, per 100.000) on federal state basis, by age group

<60 years

	HN&E	Esophagus	Oropharynx	Oral cavity	Hypopharynx	Histology not further specified
Schleswig-Holstein	23,56	2,66	8,11	5,63	6,79	2%
Hamburg	26,87	3,33	10,39	6,63	5,88	5%
Lower Saxony	24,53	3,82	7,00	6,10	7,12	2%
Bremen	35,12	2,99	10,49	12,13	9,50	2%
North Rhine-Westfalia	23,41	3,03	7,40	5,35	7,15	6%
Rhineland-Palatinate	20,17	2,48	6,17	5,36	5,82	4%
Bavaria	25,56	3,56	7,68	6,18	7,65	4%
Saarland	32,97	4,16	9,06	9,02	10,00	1%
Berlin	26,50	2,76	9,09	6,94	7,32	3%
Brandenburg	38,43	5,13	12,29	10,38	10,53	1%
Mecklenburg-W. P.	52,42	7,31	16,40	13,05	14,77	2%
Saxony	42,11	4,90	13,38	12,48	10,78	2%
Thuringia	34,18	4,44	10,98	10,08	8,33	3%

≥60 years

	HN&E	Esophagus	Oropharynx	Oral cavity	Hypopharynx	Histology not further specified
Schleswig-Holstein	85,48	17,38	25,58	12,53	28,12	2%
Hamburg	119,04	22,90	37,10	22,04	33,72	8%
Lower Saxony	86,89	19,46	20,03	16,19	30,07	2%
Bremen	130,49	22,71	29,85	24,48	51,68	2%
North Rhine-Westfalia	95,22	19,47	22,87	16,79	34,75	6%
Rhineland-Palatinate	81,31	16,15	21,77	13,78	28,89	3%
Bavaria	86,50	18,53	21,69	14,11	30,96	4%
Saarland	122,60	23,96	26,30	23,74	46,62	3%
Berlin	91,83	15,83	29,80	16,61	27,99	4%
Brandenburg	93,00	22,95	23,28	14,12	31,88	3%
Mecklenburg-W. P.	109,38	23,23	29,23	19,47	35,83	3%
Saxony	87,22	18,12	20,74	17,62	29,53	3%
Thuringia	75,70	15,73	20,40	17,43	20,86	3%

Increasing regional disparities

- Existing **health inequalities** continue to increase in Germany
- East-West-HNC **mortality gap** among men below 60 years of age widens
- Large **within-country variance** of HN-SCC is not substantiated by sufficient data on regional variation of HPV burden in head and neck in Germany (for summary statistics see ICO Information Centre on HPV and Cancer)
- **Multiplicative effects** from alcohol consumption in combination with smoking might explain the observed regional clustering across all subsites of HN-SCC in areas of high alcohol-related mortality
- Timely **transfer of results** on gender, age and geographic variance to regional health authorities is needed to promote local cancer control strategies

References: Blomgren J et al. Social Science & Medicine 58 (2004) 2523–2535; Nolte E et al. Social Science & Medicine 56 (2003) 1385–1395; Mons U Gesundheitswesen 73 (2011) 238 – 246; Kraywinkel K et al. Bundesgesundheitsbl 57 (2014) 13-21; ICO http://www.hpvcentre.net

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