

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

Nina Buttmann-Schweiger <sup>a</sup>, Burkhard Frigel <sup>b</sup>, Klaus Kraywinkel <sup>a</sup>

a. German Centre for Cancer Registry Data (ZfKD), Dept. of Epidemiology and Health Monitoring, Robert Koch Institute, Berlin, Germany; b. Department of Head and Neck Surgery, St.Gertrauden Hospital, Berlin, Germany

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  $\geq 80\%$  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

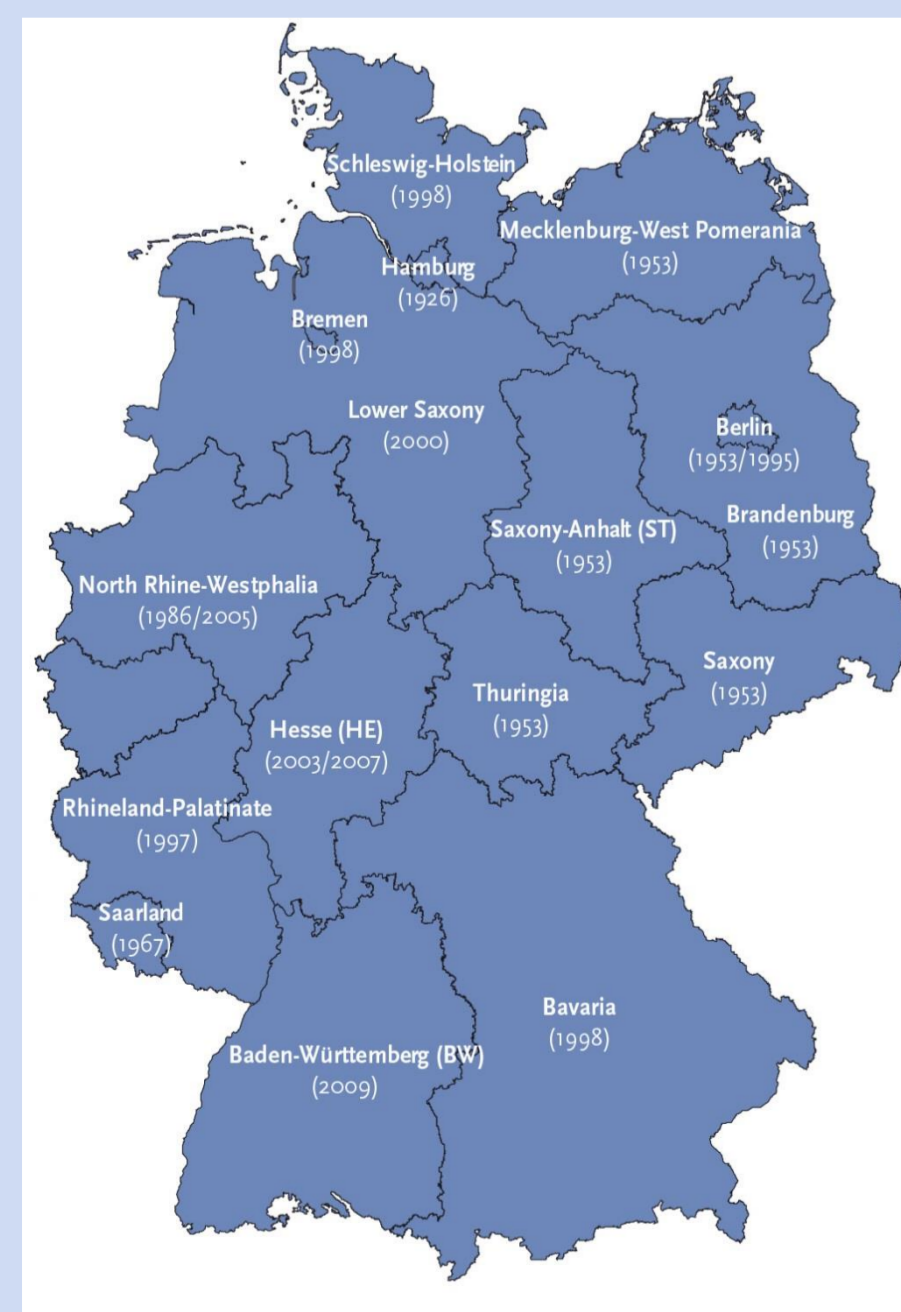


Figure 1. Population based cancer registration is federally organized and was implemented between 1926 and 2009

## Regional variation largest among younger men

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

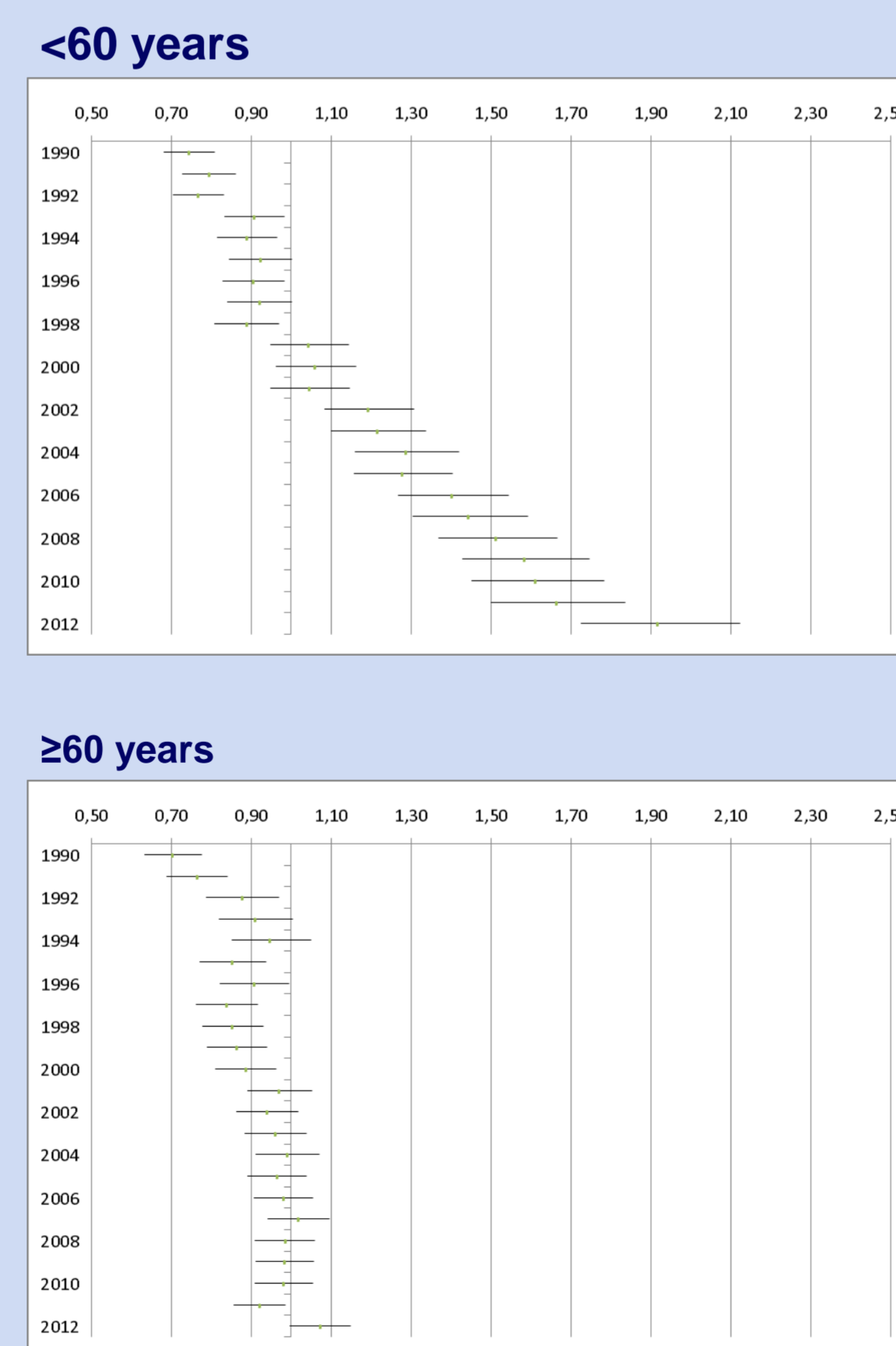


Figure 3. A red (high) – green (low) color scale depicts regional variation, standardized HN-SCC incidence rates for men (provided, per 100.000) on federal state basis, by age group

Age Group	Standardized HN-SCC incidence rates (per 100,000)					Histology not further specified
	HN&E	Esophagus	Oropharynx	Oral cavity	Hypopharynx	
<b>&lt;60 years</b>						
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-Westphalia	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%
<b>≥60 years</b>						
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-Westphalia	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	15,53	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

