



International trends in head and neck cancer incidence rates: Differences by country, sex and anatomic site



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SUMMARY

Objective: To describe trends in country and sex-specific incidence rates of head and neck cancer (HNC), focusing on changes across calendar periods.

Materials and Methods: Sex and country specific rates of HNC were calculated for 1998–2002 and

1983–1987 using population-based registry data assembled by the Cancer Incidence in Five Continents (CI5) data system for 83 registries representing 35 countries. HNCs were categorized into three groups: oral cavity (including tongue and mouth), oropharynx (including tonsil and oropharynx) and other HNC (including larynx and poorly-specified tumors of the lip/oral cavity/pharynx). Age-standardized rates per 100,000 persons were calculated using the 1960 world standard population. Changes in rates between 1998–2002 and 1993–1987 were assessed.

Results: During these periods there was substantial global variation in HNC incidence trends by cancer site, country/registry and sex. Rates of oral cavity cancer increased among men and women in some European and Asian countries (Czech Republic, Slovak Republic, Denmark, Estonia, Finland, the United Kingdom and Japan). In France and Italy, rates declined among men but increased among women. Oral cavity incidence rates declined among men and women in many Asian registries as well as in Canada and the United States. Oropharyngeal cancer rates increased among both men and women in a number of European countries (Belarus, Czech Republic, Denmark, Finland, Iceland, Latvia, Norway and the United Kingdom) whereas they declined in some Asian countries. The largest increase in oropharyngeal rates was among Brazilian men. Rates of other HNCs varied substantially by country and sex.

Conclusion: From 1983–1987 to 1998–2002, trends in HNC rates differed by subtype, country and sex. Oral cavity cancer incidence rates increased in many countries with tobacco epidemics that are currently peaking and declined in areas where tobacco use peaked some time ago. In contrast, rates of oropharyngeal cancer increased in a number of countries where tobacco use has declined, perhaps due to the emerging importance of human papillomavirus infection. Continued monitoring of trends in incidence rates is needed to inform global cancer prevention strategies.

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Introduction

Cancers of the head and neck comprise a heterogeneous grouping of tumors at various anatomic sites with different etiologic factors. Tobacco exposure (either via active or passive smoking as well as consumption of smokeless tobacco) is the most important risk factor for head and neck cancers (HNCs) [1]. The fraction of HNC cases due to tobacco exposure likely varies across the globe. One recent pooled analysis of data from North America, Latin America and Europe found that tobacco exposure accounted for approximately 33% of HNC cases [2]. Alcohol exposure is also important

in HNC etiology, and in the same study it accounted for approximately 4% of cases while the interaction between tobacco and alcohol accounted for almost three-fourths of HNCs [2]. Another recent study found differences in the joint hazard of smoking and alcohol consumption in relation to HNC (mouth and oropharyngeal cancer) deaths. Specifically, 42% of HNC deaths in low-income countries versus 80% in high-income countries were due to tobacco and alcohol use, likely reflecting different exposure patterns in relation to economic development status [3]. In addition, a series of recent studies in economically-developed nations have described the role of persistent infection with human papillomavirus (HPV) as an etiologic factor in the development of HNC (mainly restricted to the oropharynx, tonsils and base of the tongue) [4,5]. In some regions (i.e., North America, Australia, and Northern

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Table 1
Age-standardized oral cavity cancer (tongue & mouth; C01-06) incidence rates and rate ratios by sex among adults ≥ 15 years, select registries.

	Males					Females						
	1983–1987	1998–2002	Rate ratio	(95% CI)	p Value	1983–1987	1998–2002	Rate ratio	(95% CI)	p Value		
<i>Europe</i>												
<i>Eastern Europe</i>												
Belarus	6.10	8.93	1.46	1.36	1.58	0.00	0.69	0.73	1.06	0.86	1.31	0.56
Czech Republic	5.77	7.19	1.25	1.16	1.34	0.00	0.87	1.35	1.54	1.31	1.82	0.00
Poland												
Cracow	6.01	5.40	0.90	0.64	1.25	0.52	†	1.26				
Warsaw City	5.68	4.99	0.88	0.71	1.08	0.21	1.35	1.59	1.18	0.85	1.64	0.34
Russia (St Petersburg)	10.16	9.43	0.93	0.84	1.02	0.12	1.11	1.39	1.25	1.01	1.55	0.04
Slovak Republic	12.21	14.22	1.16	1.08	1.26	0.00	0.83	1.37	1.64	1.28	2.10	0.00
<i>Northern Europe</i>												
Denmark	4.51	7.12	1.58	1.42	1.76	0.00	2.33	3.08	1.32	1.15	1.53	0.00
Estonia	6.03	8.47	1.40	1.15	1.71	0.00	0.81	1.62	2.00	1.34	3.00	0.00
Finland	2.54	4.09	1.61	1.39	1.86	0.00	1.56	2.18	1.40	1.18	1.67	0.00
Iceland	†	3.56					2.99	2.65	0.89	0.45	1.75	0.72
Latvia	4.46	6.85	1.54	1.30	1.82	0.00	0.68	0.89	1.29	0.89	1.87	0.18
Norway	4.50	4.32	0.96	0.84	1.10	0.55	2.07	2.18	1.05	0.88	1.26	0.57
Sweden	3.78	3.50	0.92	0.84	1.02	0.12	1.75	2.20	1.26	1.10	1.43	0.00
United Kingdom (4 registries)	4.00	5.18	1.30	1.20	1.40	0.00	1.75	2.75	1.57	1.42	1.74	0.00
UK, Scotland	5.62	8.65	1.54	1.39	1.70	0.00	2.34	3.80	1.62	1.41	1.86	0.00
<i>Western Europe</i>												
France (6 registries)	21.93	15.25	0.70	0.65	0.75	0.00	2.13	3.12	1.46	1.22	1.76	0.00
Germany (Saarland)	13.15	13.11	1.00	0.85	1.16	0.96	1.77	3.35	1.89	1.35	2.64	0.00
Switzerland (4 registries)	10.57	10.17	0.96	0.83	1.11	0.61	2.33	3.96	1.70	1.33	2.18	0.00
The Netherlands												
Eindhoven	3.95	4.90	1.24	0.92	1.67	0.17	2.05	3.11	1.51	1.04	2.20	0.04
Maastricht	4.24	6.13	1.45	1.06	1.98	0.03	1.74	2.76	1.59	0.99	2.54	0.07
<i>Southern Europe</i>												
Italy (6 registries)	6.97	6.08	0.87	0.78	0.98	0.02	1.66	2.41	1.45	1.20	1.76	0.00
Slovenia	13.68	11.02	0.81	0.72	0.91	0.00	1.22	1.97	1.62	1.19	2.20	0.00
Spain (5 registries)	7.85	8.66	1.10	0.98	1.24	0.11	0.97	2.17	2.23	1.73	2.88	0.00
<i>Asia</i>												
<i>Eastern Asia</i>												
China												
Hong Kong	6.99	4.72	0.68	0.60	0.76	0.00	3.02	2.38	0.79	0.67	0.92	0.00
Shanghai	1.96	1.97	1.01	0.85	1.19	0.95	1.51	1.71	1.13	0.94	1.35	0.19
Japan (5 registries)	3.98	4.43	1.11	1.03	1.20	0.01	1.61	1.98	1.23	1.11	1.37	0.00
<i>Southern Asia</i>												
India												
Mumbai (Bombay)	19.14	15.49	0.81	0.76	0.87	0.00	9.83	8.12	0.83	0.75	0.91	0.00
Chennai (Madras)	16.65	15.96	0.96	0.87	1.06	0.41	14.10	9.83	0.70	0.62	0.79	0.00
<i>South-Eastern Asia</i>												
Philippines (Manila)	7.99	5.30	0.66	0.54	0.81	0.00	9.19	3.97	0.43	0.36	0.53	0.00
Singapore												
Chinese	5.35	4.64	0.87	0.69	1.09	0.21	1.42	1.78	1.26	0.89	1.78	0.22
Indian	14.73	6.43	0.44	0.27	0.71	0.00	†	6.08				
Malay	†	2.83					†	†				
Thailand (Chiang Mai)	11.33	5.95	0.53	0.40	0.68	0.00	5.44	3.59	0.66	0.48	0.90	0.01
<i>Western Asia</i>												
Israel												
Jews	2.18	2.64	1.21	0.98	1.49	0.07	1.77	1.59	0.89	0.71	1.13	0.34
Non-Jews	†	2.49		†	†							
Kuwait												
Kuwaitis	†	†					†	†				
Non-Kuwaitis	2.83	2.13	0.75	0.37	1.55	0.44	†	†				
<i>North America</i>												
Canada (9 registries)												
United States	7.08	5.70	0.80	0.76	0.85	0.00	3.22	2.92	0.91	0.84	0.97	0.01
SEER (9 Registries): Black	14.61	9.65	0.66	0.58	0.76	0.00	4.49	3.31	0.74	0.60	0.91	0.00
SEER (9 Registries): White	8.92	7.16	0.80	0.76	0.84	0.00	4.32	3.41	0.79	0.74	0.84	0.00
<i>South America</i>												
<i>Caribbean</i>												
Martinique (France)	14.10	9.93	0.70	0.50	0.98	0.04	†	1.67				
<i>Central America</i>												
Costa Rica	3.56	2.69	0.76	0.56	1.02	0.06	1.74	1.27	0.73	0.48	1.10	0.11
<i>South America</i>												
Brazil (Goiania)	9.72	12.73	1.31	0.88	1.96	0.22	†	2.66				
Colombia (Cali)	3.67	2.57	0.70	0.47	1.05	0.07	2.42	2.81	1.16	0.80	1.69	0.45
Ecuador (Quito)	†	1.01					†	1.35				
Peru (Trujillo)	†	3.44					†	2.54				
<i>Oceania</i>												
Australia (6 registries)	7.01	6.32	0.90	0.85	0.96	0.00	2.82	3.01	1.07	0.98	1.17	0.16

Source: Cancer Incidence in Five Continents.

Incidence rates per 100,000 population, age-standardized to the 1960 standard world population.

Abbreviation: 95% CI, 95% confidence interval.

Rate ratio comparing 1998–2002 to 1983–1987. Significant rate ratios in bold.

† Rates not reported if the numerator included fewer than 16 cases.

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