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Acknowledgements—This research was supported by the Auckland Division of the Cancer Society of New Zealand, the Medical Research Council of New Zealand and a Warner–Lambert Laboratory Fellowship.
We thank Dr Robert Wiltrout for sending us material before publication, and Lynden Wallis for secretarial help.

Eur J Cancer, Vol. 27, No. 1, pp. 83–85, 1991.
Printed in Great Britain
0277-5379/91 $3.00 + 0.00
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Incidence of Cancer of the Respiratory and Upper Digestive Tract in Urban and Rural Eastern Austria

Herwig Swoboda and Hans-P. Friedl

The incidence of head and neck, oesophagus and lung cancer between 1981 and 1985 was studied in Eastern Austria for an urban–rural division. In males, rural rates of oral cavity, oropharynx and oesophagus tumours were higher than urban rates. For lung tumours, urban rates slightly exceeded rural rates. In females, the incidence of oral cavity, oropharynx, larynx, hypopharynx, oesophagus and lung cancer showed an urban predominance, steepest for head and neck and oesophagus cancers. Cancer of the oral cavity, pharynx, larynx, oesophagus and lung had a high male preponderance.
Eur J Cancer, Vol. 27, No. 1, pp. 83–85, 1991.

INTRODUCTION

NEOPLASMS IN the ear, nose and throat represent a minor part of all malignant tumours. Because of exogenous risk factors acting on some sites, such neoplasms deserve epidemiological analysis. We report regional patterns of incidence of cancer of the respiratory and digestive tract above the diaphragm in Eastern Austria (Vienna, Lower Austria and Burgenland, about 3.2 million inhabitants) for 1981–1985.

METHODS

Incidence values were calculated from data collected by the Austrian Cancer Registry [1–3]. The Austrian census of 1981 served for regional allocation, classifying communities with more than 2000 inhabitants as "urban" [1]. Although the mortality/incidence ratios [M/I] are high—because it was not possible to include death certificate only cases in the registry until 1985—the differences between the subparts of Eastern Austria are insignificant. This means that the coverage can be estimated as uniform for the whole region (Table 1).

Oral cavity and oropharynx (ICD/9 141, 143–146, 149), and larynx and hypopharynx (ICD 161, 148) were grouped into two major sites. The other sites analysed were oesophagus (ICD 150) and trachea, bronchi and lungs (ICD 162).

Incidences were calculated as crude, age-standardised and truncated standardised rates with the standard population

Table 1. Regional comparison of population data (1981 *census*) *and indices of cancer registry quality. New cases* 1981–1985 (*ICD*/9 140–149, 150, 161, 162)

	Austrian Eastern Region (1+2+3)	Provinces		
		Burgenland (1)	Lower Austria (2)	Vienna (3)
Population				
Absolute	3228 966	269 771	1427 849	1531 346
% of urban	74.3	32.6	54.6	100.0
New cases				
Absolute	8944	709	3283	4952
HV (%)	88.3	85.2	86.2	90.2
M/I (%)	110.9	108.7	111.3	110.9

HV = histologically verified and M/I = mortality/incidence ratio.

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Revised and accepted 22 Oct. 1990.

Table 2. Incidence of cancer of oral cavity and oropharynx, larynx and hypopharynx, oesophagus and lungs, bronchi and trachea by sex

Site (ICD)	Sex	No.	New cases per 100 000 and year: World	Truncated	Crude	Sex ratio (crude)
Oral cavity/ oropharynx (141, 143–6, 149)						
Urban	M	493	6.8	18	9	3.7
	F	161	1.3	2.8	2.5	
Rural	M	192	8.3	23.2	9.6	10.3
	F	20	0.5	1	0.9	
Larynx/hypopharynx (161, 148)						
Urban	M	551	7.2	16.9	10.1	8.1
	F	81	0.7	1.4	1.2	
Rural	M	181	7.4	18.3	9	27.6
	F	7	0.2*	0.4*	0.3*	
Oesophagus (150)						
Urban	M	233	2.9	6.2	4.3	4
	F	69	0.4	0.6	1.1	
Rural	M	99	4	9.7	4.9	17.6
	F	6	0.1*	0.1*	0.3*	
Trachea, bronchi and lungs (162)						
Urban	M	3939	44.3	75.2	72	3.4
	F	1367	9.1	16.3	23.9	
Rural	M	1029	37.9	70.3	51.3	5.4
	F	202	4.8	8.3	9.4	

World = age-standardised rates "world" and truncated = age-standardised rates for age 35–64 years.
*$n < 10$.

Table 3. Urban/rural ratios (age-standardised rates) by sex

	Urban/rural
Males	
Oesophagus	0.72
Oral cavity/oropharynx	0.83
Lung	1.17
Larynx/hypopharynx	0.97*
Females	
Oesophagus	4.3†
Larynx/hypopharynx	3.5†
Oral cavity/oropharynx	2.4
Lung	1.9

*Not significant, all other ratios $P < 0.01$.
†Age-standardised rates below 1.

Table 4. Ratios of buccopharyngeal tumours (O) and of cancer of the pathway of deglutition (O+L+E) by bronchopulmonary tumours (B) (age-standardised rates) by sex

Ratios by lung	Sex	O/B	(O+L+E)/B
Rural	M	0.22	0.52
	F	0.11	0.17
Urban	M	0.15	0.38
	F	0.14	0.26

L = larynx and hypopharynx, E = oesophagus.

"world" [4]. Statistical significance was assessed following Doll and Smith [4]. Sex ratios were derived from crude rates; all other ratios (urban/rural; buccopharynx by lung, "pathway of deglutition" [oral cavity, oropharynx, larynx, hypopharynx and oesophagus] by lung) from age-standardised rates.

RESULTS

Incidence rates are shown in Tables 2–4. In men urban–rural differences were generally small. Oesophageal and buccopharyngeal tumours showed some rural excess ($P < 0.01$), mainly due to lower rates in Vienna. Bronchopulmonary tumours were more frequent in urban areas ($P < 0.01$), but this difference was small (1.17:1). In women all analysed sites had an urban predominance of incidence, especially for the head and neck and oesophagus ($P < 0.01$). The highly sex-specific regional differences in the head and neck and oesophagus can be seen by urban–rural and sex ratios (Tables 2 and 3) and emphasised by comparison with lung tumour incidence (Table 4).

DISCUSSION

The main risk factors acting upon oral cavity, oropharynx, hypopharynx, larynx and oesophagus are tobacco and alcohol, especially when associated [5–11], whereas for the lung tobacco smoke alone is the major risk factor [11]. The scant urban excess in lung cancer in men parallels regional cigarette consumption [12–14]. However, the slight rural accentuation of cancer incidence in the pathway of deglutition coincides better with regional alcohol consumption, which is higher in Lower Austria and Burgenland than in Vienna [2, 15]. The high rural incidence of tobacco-related cancer in men possibly corresponds to an urbanisation of lifestyle in rural areas, which predominatly concerns men shifting from agricultural to industrial professions [1].

The steep urban–rural gradient in women accords with female tobacco and alcohol consumption, which is still higher in urban areas [12–15]. By contrast to the tobacco-related cancer sites studied here, other sites of the respiratory and upper digestive tract, such as salivary glands, nasopharynx, nasal, paranasal and tubotympanic cavities, had low and evenly distributed cancer incidences [2, 16]. The uneven regional distributions, which to a great extent are opposite by sex, should be further investigated for the underlying social and sociocultural patterns and their relation to the main risk increasing conditions [1, 2, 11].

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Eur J Cancer, Vol. 27, No. 1, pp. 85–88, 1991.
Printed in Great Britain
0277–5379/91 $3.00 + 0.00
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Previous Thyroid Disease and Risk of Thyroid Cancer in Switzerland

Fabio Levi, Silvia Franceschi, Carlo La Vecchia, Eva Negri, Cristina Gulie, Germaine Duruz and Bianca Scazziga

A hospital-based case-control study of 86 cases of thyroid cancer and 317 controls was done in the Swiss Canton of Vaud. Patients with thyroid cancer tended to be better educated (odds ratio [OR] 2.1 for ≥ 14 vs. ≤ 8 years of education 95% CI 1.1–4.1) and of higher social class than controls. Cases more often had a history of benign thyroid nodules (OR 25.2, 95% CI 7.6–83.6) and non-toxic goitre (OR 5.3, 95% CI 2.5–11.2). Furthermore, patients with thyroid cancer were more likely to have resided in endemic goitre areas (OR 1.7, 95% CI 1.0–3.0) and to have had first-degree relatives affected by benign thyroid disease (OR 3.9, 95% CI 2.1–7.1). Therefore, this study offers quantitative evidence of the association between various thyroid diseases and the risk of thyroid cancer which, despite difficulties in the classification of benign and malignant thyroid diseases, is remarkably consistent in studies from different countries.
Eur J Cancer, Vol. 27, No. 1, pp. 85–88, 1991.

INTRODUCTION

THYROID CANCER is rare, causing less than 1% of cancer deaths [1], yet its epidemiology is of interest for several reasons. Upward incidence trends of thyroid cancer have been reported, in recent decades, in various registration areas (e.g. Nordic countries, Israel, USA) [2–3], although lack of increases in mortality rates [4] and changes in the definition of several areas of thyroid pathology [5–6] limit interpretation of temporal changes. Thyroid cancer is highly curable [7–8], but present treatment (e.g. thyroidectomy, lifelong high-dose thyroid hormone therapy) of small, clinically silent carcinomas, especially in young women, is a considerable burden to many countries [9].

Except ionising radiation [1], only history of thyroid conditions (benign nodules/goitre) has been consistently associated with risk of thyroid cancer [10–18]. In aetiopathogenic terms, influence of iodine deficiency as a possible link between benign and malignant thyroid disease [10] is not established. Only few case-control studies [11–17] and two prospective investigations [18–20] have been reported on this cancer site. Switzerland offers a privileged opportunity to study thyroid cancers. First, historically it ranks among the highest mortality and incidence rates from thyroid cancer in the world [2, 21]; secondly, it has improved living standards and introduced prophylaxis against iodine deficiency (once very common in mountainous areas), therefore substantially reducing thyroid cancer deaths [22].

To explore and quantify the role of personal and family history of benign thyroid disease, sociodemographic factors and residence in endemic goitre areas in the development of thyroid cancer, we present data from our case-control study in the Canton of Vaud, Switzerland.

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Revised 24 Aug. 1990; accepted 17 Oct. 1990.