

Oral Cavity

1. Introduction

1.1 General Information and Aetiology

The oral cavity extends from the lips to the palatoglossal folds and consists of the anterior two thirds of the tongue, floor of the mouth, buccal mucosa, lower and upper alveolar ridge, hard palate and retromolar gingiva (Figure 1) [1].

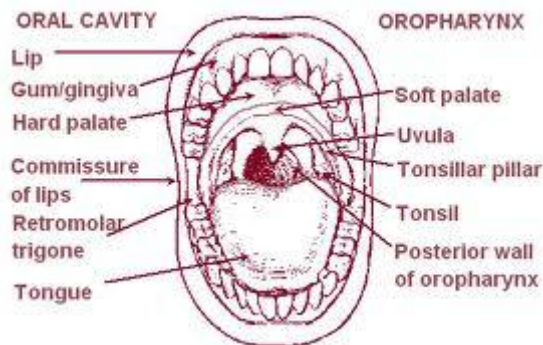


Figure 1. Anatomy of the Oral Cavity

In Belgium for incidence year 2008, 612 patients are diagnosed with a carcinoma of the oral cavity. Men are more than twice as frequently affected than women [2]. Besides excess in smoking and alcohol consumption, other etiological risk factors are known such as poor mouth hygiene, chronic irritation, food or vitamin deficiencies and genetic factors. Nevertheless, especially older women sometimes develop cancer of the oral cavity without any known risk factor [1,3].

At early stage, these cancers often stay asymptomatic or cause non-specific problems such as gum bleeding or difficulties with false teeth. Later onwards, local pain, chewing, swallowing or speaking problems, cranial neuropathies or trismus may occur [3].

1.2 Diagnosis and Treatment

The clinical diagnosis of malignancy can be preceded by a history of premalignant lesions such as leukoplakia or erythroplakia. Patients presenting with suspicious symptoms should be carefully examined, both concerning the oral cavity itself as the regional (neck) lymph nodes. Definitive histological confirmation is as always necessary [3].

The information obtained from clinical examination should be supplemented with imaging by CT and MRI in order to judge on the extent of the tumor and invasion of regional lymph nodes. Dental radiographs or an orthopantomogram may help in identifying involvement of the underlying bone. The importance of distant metastasis is increasing as locoregional control improves. These distant metastases most often occur in lung, liver or bone [3,4].

As for head and neck cancer sublocalisations, active screening for second primary tumors is often performed, with an X-ray of the thorax and an oesophagoscopy [3,4].

Treatment modalities are chosen in function of the clinical staging, the patients' comorbidities and the expertise of the oncologic center. For small primary tumours, surgery and radiotherapy generally yield equal results. For larger tumours or in case of invaded lymph nodes, a combination treatment of surgery plus radio(chemo)therapy is indicated. Inoperable patients may be treated with chemoradiotherapy. In the majority of the patients, the bilateral neck lymph nodes are also treated [3,4].

Relative survival rates at 5 years after diagnosis situate around 50%, but differences in sex, age and stage are noted [5].

2. Data Selection

All cancers of oral cavity diagnosed between 2004 and 2007 for patients with an official residence in the Flemish Region are selected, resulting in 1,211 cases (for detailed information on selected topography and morphology codes, see Appendix A). As described in Figure 2, 144 of them are excluded resulting in 1,077 patients for which results are presented in this chapter.

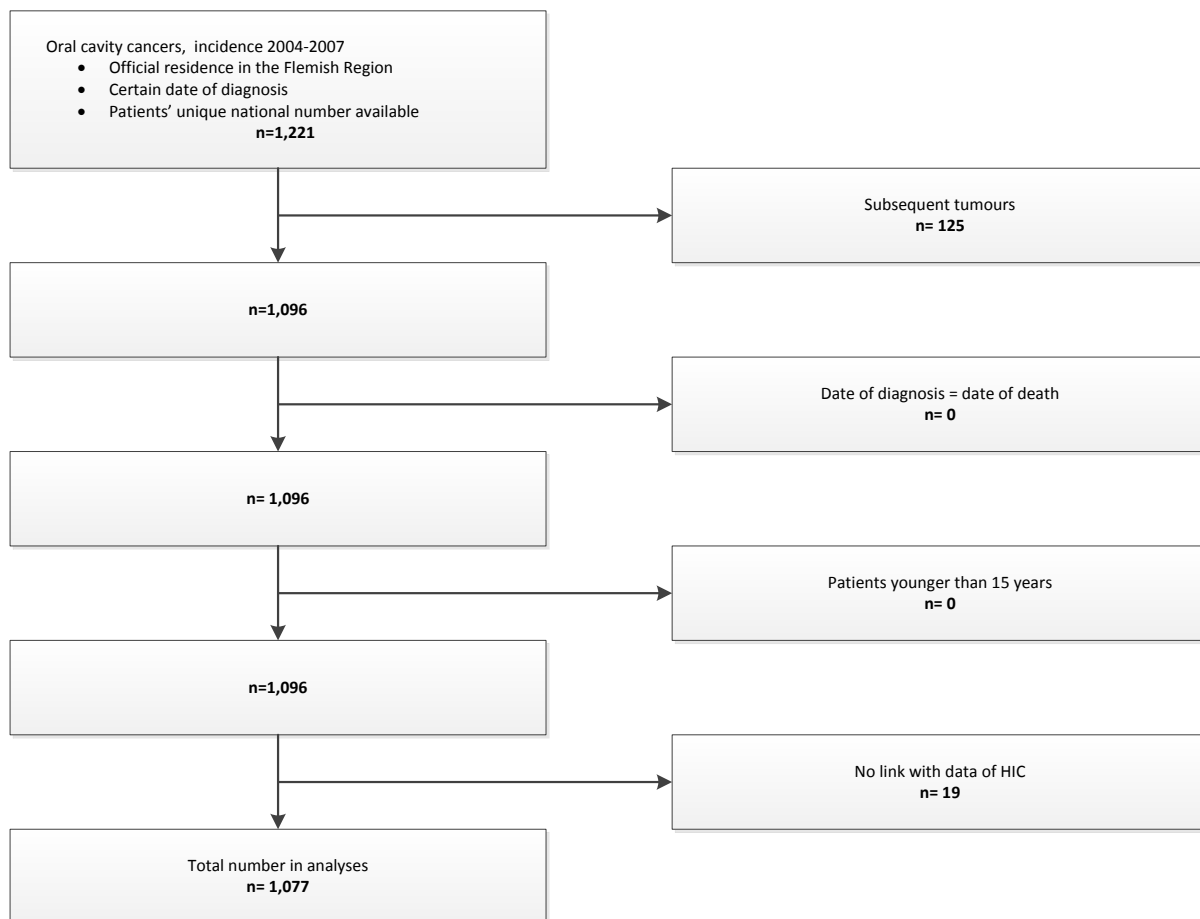


Figure 2. Selection of Oral Cavity Tumours (Flemish Region, 2004-2007)

3. Patient Characteristics

Males are more frequently diagnosed with a tumour of the oral cavity than females (male/female ratio = 2.76) during the observed period (Table 1).

No clear trend in age-standardised rates can be observed over the years 2004-2007 (EAPC: -0,1104 p: 0.10)

The median age is 58 years for males and 62.5 years for females. For further analyses, the patients are divided in three age categories: 15 -54 years, 55-64 years and 65 years and older (Table 2).

Table 1. Oral Cavity Cancer: Incidence (Flemish Region, 2004-2007)

Incidence year	Males		Females		Total	
	n	ESR	n	ESR	n	ESR
2004	212	6.37	76	2.00	288	4.15
2005	201	5.89	101	2.61	302	4.25
2006	196	5.67	71	1.80	267	3.71
2007	152	4.29	68	1.61	220	2.94
2004-2007	761	5.55	316	2.01	1077	3.76

ESR: age-standardised rate, using the European Standard Population (n/100,000 person years)

Table 2. Oral Cavity Cancer: Age Distribution (Flemish Region, 2004-2007)

	Males	Females	Total
15-54 years	258	85	343
55-64 years	279	85	364
65+ years	224	146	370

4. Tumour Characteristics

Sublocalisation, morphology, differentiation grade and stage (clinical, pathological and combined stage) of the selected oral cavity cancers are described in Table 3. Six-hundred-fifteen tumours (57.1%) are staged as “Other and unspecified parts” of respectively the tongue (C02.0-C02.3, C02.9) and mouth (C06).

Table 3. Oral Cavity Cancer: Tumour Characteristics (Flemish Region, 2004-2007)

	N	% of total	% of known
Localisation			
Other and unspecified parts of tongue (C02.0-C02.3, C02.9)	399	37.0	46.3
Gum (C03)	66	6.1	7.7
Floor of mouth (C04)	381	35.4	44.3
Hard palate (C05.0)	15	1.4	1.7
Other and unspecified parts of mouth (C06)	216	20.1	/
Morphology			
Squamous cell carcinoma	1,077	100.0	/

Differentiation grade			
Well differentiated	243	22.6	26.0
Moderately differentiated	448	41.6	47.9
Poorly differentiated	236	21.9	25.2
Undifferentiated	9	0.8	1.0
Unknown	141	13.1	/
Clinical stage			
0	1	0.1	0.1
I	151	14.0	19.3
II	174	16.2	22.3
III	118	11.0	15.1
IV	338	31.4	43.2
Unknown	295	27.4	/
Pathological stage			
I	177	16.4	29.1
II	130	12.1	21.4
III	87	8.1	14.3
IV	214	19.9	35.2
Unknown	469	43.5	/
Combined stage			
I	214	19.9	23.6
II	178	16.5	19.6
III	124	11.5	13.7
IV	390	36.2	43.0
Unknown	171	15.9	/

All oral cavity cancers have a squamous cell carcinoma histology. The majority of the cases originate from the tongue and the floor of mouth. Moderate differentiation is the most commonly and undifferentiated the least commonly diagnosed differentiation grade. As shown in Figure 3 and Figure 4, no major differences in stage distribution are seen between both sexes or amongst different age categories. Nevertheless, the youngest age group (15-54 years) has a slightly more

favorable stage distribution and the oldest age group has a higher proportion of missing data concerning the stage of the disease.

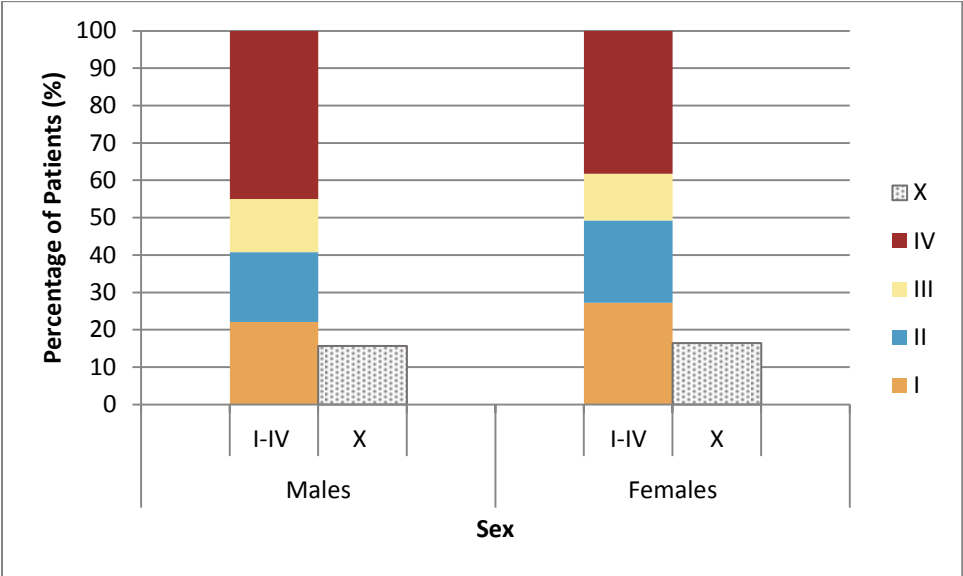


Figure 3. Oral Cavity Cancer: Stage Distribution by Sex (Flemish Region, 2004-2007)

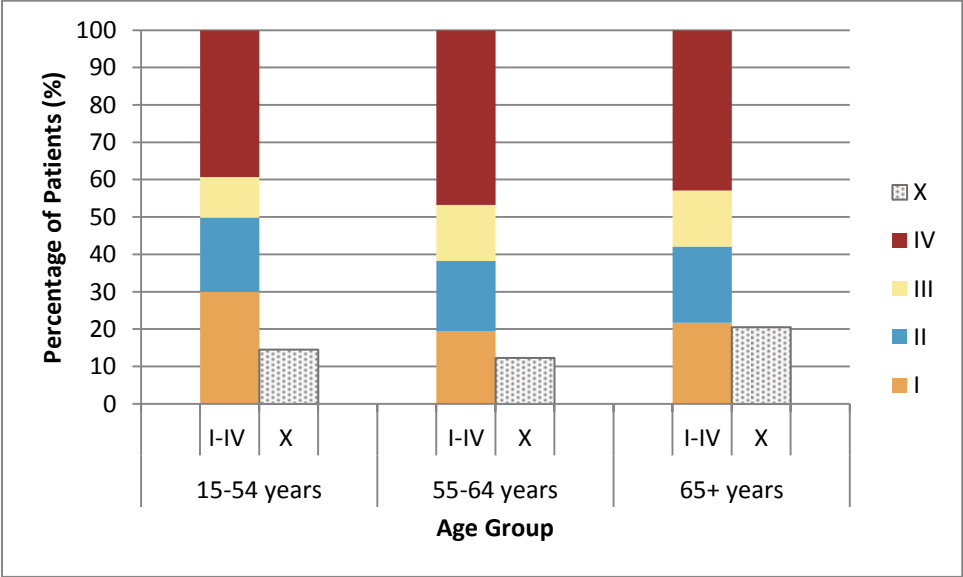


Figure 4. Oral Cavity Cancer: Stage Distribution by Age Group (Flemish Region, 2004-2007)

5. Diagnostic and Therapeutic Procedures

5.1 Diagnosis and Staging

All procedures regarding diagnosis and staging of the oral cavity cancers occurring within three months around incidence date are described in Table 4.

The diagnosis of cancer is confirmed by pathology tissue examination in almost all cases (97.4%). Very rare, cytology is found to be the sole specimen that serves as the basis for diagnosis.

To evaluate tumour extent, imaging techniques are frequently used (94.2%). CT is performed in almost nine patients on ten. An X-ray of the chest is done in more than 85% of the patients. MRI and PET are used in about one patient on three.

As indicated, more than half of the patients undergo screening for second primary cancers in the upper aerodigestive tract (63.6%).

Biopsies of suspected neck lymph nodes are uncommonly performed (2.7%).

Table 4. Oral Cavity Cancer: Overview of Diagnostic and Staging Procedures (Flemish Region, 2004-2007)

Diagnostic Procedure (-3m<inc<+3m)	Total (N=1,077)		2004 (N=288)		2005 (N=302)		2006 (N=267)		2007 (N=220)	
	n	%	n	%	n	%	n	%	n	%
Tissue Examination	1,049	97.4	282	97.9	291	96.4	259	97.0	217	98.6
Histological Diagnosis	1,048	97.3	282	97.9	291	96.4	259	97.0	216	98.2
Cytology	147	13.6	34	11.8	42	13.9	41	15.4	30	13.6
Imaging	1,014	94.2	275	95.5	276	91.4	256	95.9	207	94.1
CT	955	88.7	254	88.2	259	85.8	250	93.6	192	87.3
MRI	389	36.1	96	33.3	118	39.1	94	35.2	81	36.8
Ultrasound Neck	121	11.2	28	9.7	41	13.6	32	12.0	20	9.1
PET Scan	347	32.2	83	28.8	88	29.1	91	34.1	85	38.6
Chest X-ray	920	85.4	259	89.9	240	79.5	233	87.3	188	85.5
Ultrasound Abdomen	499	46.3	132	45.8	129	42.7	133	49.8	105	47.7
Screening for Second Primary Malignancies	685	63.6	191	66.3	181	59.9	176	65.9	137	62.3
Respiratory Tract	549	51.0	155	53.8	147	48.7	146	54.7	101	45.9
Digestive Tract	462	42.9	123	42.7	117	38.7	124	46.4	98	44.5
Other Procedures										
Lymph Node Biopsy	29	2.7	6	2.1	11	3.6	7	2.6	5	2.3

5.2 Multidisciplinary Oncological Consult

Overall, about 60% of all oral cavity cancer patients are discussed at a multidisciplinary oncological consult (MOC) within 1 month before till three months after incidence date (Table 5). An increase of the proportion of patients discussed at a MOC is observed during the observation period, ranging from 52.4 % in 2004 to 62.7% in 2007 (Table 5).

Table 5. Oral Cavity Cancer: Frequency of Multidisciplinary Oncological Consult (Flemish Region, 2004-2007)

Incidence year	MOC	
	n	%
2004 (n=288)	151	52.4
2005 (n=302)	179	59.3
2006 (n=267)	171	64.0
2007 (n=220)	138	62.7
Total (n=1,077)	639	59.3

5.3 Therapeutic Procedures

Three different surgery types are taken into account for the treatment analyses: major surgery for larger oral cavity tumours (e.g. resection uvular cancer), minor surgery (e.g. cryo-surgery), and lymphadenectomies. Major surgeries always receive priority when performed within the studied timeframe. Otherwise, minor surgery or lymphadenectomy is taken into account, with preference for the surgical procedure that is closest to incidence date.

Within one month before and six months after incidence date, more than 70% of the patients has been operated, of which the majority (80.2%) at least major surgery (Table 6).

Table 6. Oral Cavity Cancer: Overview of the Selected Surgeries (Flemish Region, 2004-2007)

Type of Surgery	n	%
Major Surgery	647	80.2
Minor Surgery	116	13.4
Lymphadenectomy	44	5.5

For 13 patients, the surgical procedure is carried out after radiotherapy (within the timeframe of six months after incidence) and therefore considered as salvage surgery. For the remaining 794 operated patients, the surgical procedure is considered to be the cornerstone of the treatment. More than half of these are postoperatively irradiated either with or without concomitant chemotherapy. The number of patients who undergo surgery without adjuvant radio- or chemotherapy is more than 40%.

More than 15% of the patients are mainly treated with radiotherapy. This irradiation is sometimes performed alone but more frequently in combination with chemotherapy. Chemotherapy as only treatment is given in a very small proportion of the patients (1.6%).

No indications on any oncological treatment (surgery, radiotherapy or chemotherapy) within the studied timeframe are found for only about 8% of the patients.

Table 7. Oral Cavity Cancer: Overview of Treatment Schemes (Flemish Region, 2004-2007)

Treatment Scheme	n	%
Surgery	794	73.7
Adjuvant radiotherapy	314	29.2
Adjuvant chemoradiotherapy	111	10.3
No other therapy	346	32.1
Other therapy		
Surgery < chemotherapy	14	1.3
Chemotherapy < surgery < radiotherapy	1	0.1
Chemotherapy < surgery < chemotherapy	1	0.1
Chemotherapy < surgery < chemoradiotherapy	7	0.6
Radiotherapy	77	7.1
Chemoradiotherapy	102	9.5
Chemotherapy only	17	1.6
No primary treatment registered	87	8.1

6. Survival

6.1 Observed and Relative Survival

Survival of oral cavity cancer patients is rather poor, with less than half of the patients surviving more than five years (Table 8).

Table 8. Oral Cavity Cancer: Observed and Relative Survival (Flemish Region, 2004-2007)

N at risk	Observed Survival (%)					Relative Survival (%)				
	1 year	2 year	3 year	4 year	5 year	1 year	2 year	3 year	4 year	5 year
1,075	74.7	61.1	55.0	49.9	45.5	76.2	63.3	58.0	53.4	49.5

6.2 Relative Survival by Sex

Survival is comparable between males and females, there is only a slightly difference in favour of females noted during the follow-up.

Table 9. Oral Cavity Cancer: Relative Survival by Sex (Flemish Region, 2004-2007)

	N at risk	%	Relative Survival (%)				
			1 year	2 year	3 year	4 year	5 year
Males	759	70.6	76.7	63.4	57.8	52.6	48.6
Females	316	29.4	75.1	63.2	58.5	55.2	51.6

6.3 Relative Survival by Age Group

The youngest patients have the best prognosis, the oldest the worst. The middle age group (55-64 years) has a 5-year relative survival of almost 50%. The difference between the youngest and the middle group is comparable to the difference between the middle and the oldest group.

Table 10. Oral Cavity Cancer: Relative Survival by Age Group (Flemish Region, 2004-2007)

	N at risk	%	Relative Survival (%)				
			1 year	2 year	3 year	4 year	5 year
15-54 years	341	31.7	86.2	74.4	67.8	64.5	61.4
55-64 years	364	33.9	78.6	63.6	59.4	54.2	48.1
65+ years	370	34.4	64.1	52.3	46.9	41.4	38.9

6.4 Relative Survival by Stage

Survival is better for patients diagnosed with a stage I tumour (5-year relative survival: 74.3%) compared with the other stages (Figure 5). Survival is worst for patients diagnosed with a stage IV tumour (5-year relative survival: 33.1%). However, it should be noted that, in line with other head and neck cancers, some locally or regionally advanced diseases are also categorised as stage IV (stage IVA or IVB, more precisely). Oral cavity tumours with distant metastases are labelled as Stage IVC, but

are rare in this study (only 21 patients in this selection of patients). Consequently, survival for stage IV cancers is rather high compared to other types of cancers.

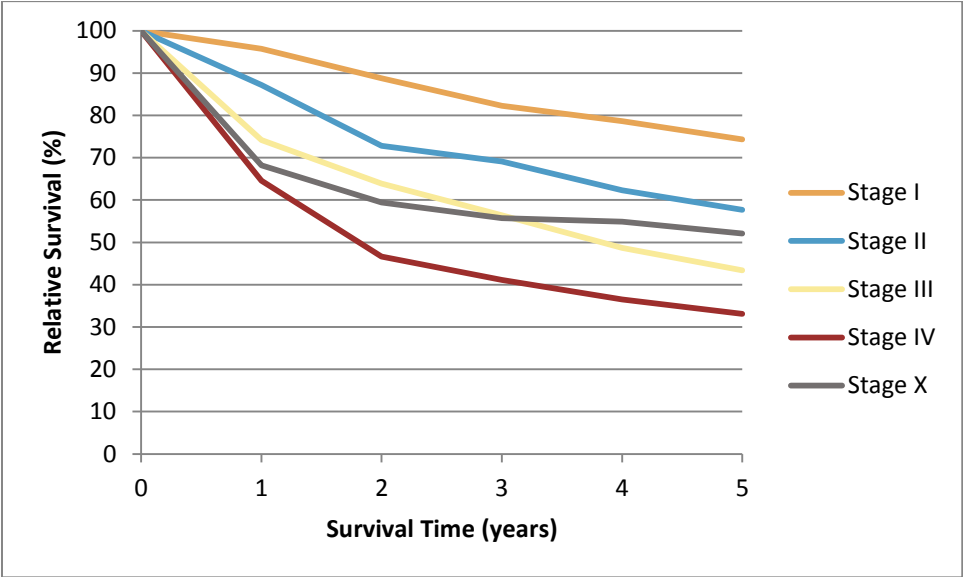


Figure 5. Oral Cavity Cancer: Relative Survival by Stage (Flemish Region, 2004-2007)

6.5 Relative Survival by Sublocalisation

Survival is comparable between the different sublocalisations during the first 5 years of follow-up.

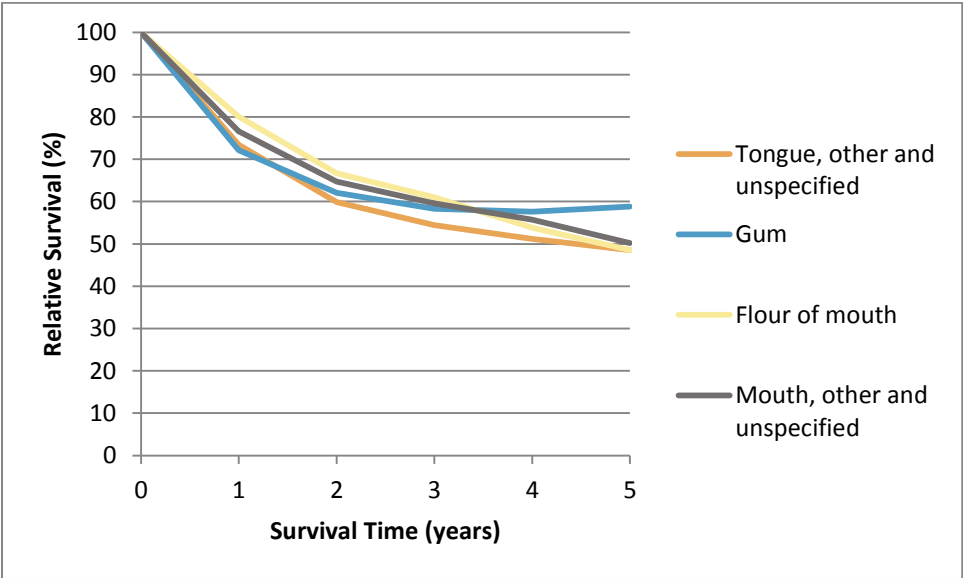


Figure 6. Oral Cavity Cancer: Relative Survival by Sublocalisation (Flemish Region, 2004-2007)

6.6 Relative Survival by Primary Treatment

In the evaluation of survival by primary treatment, we only mention stage III to IVb disease, because a large part of all stage I and II tumours are only treated with surgery (84.1%) and only a small part with radiotherapy (6.9%) or chemoradiotherapy (1.8%). In 7.2% no charged treatments have been registered.

For stage III-IVb diseases, 5-year relative survival is better for patients who are primarily treated with surgery (42.9%) than for patients primarily treated with chemoradiotherapy (29.6%) or radiotherapy (16.2%).

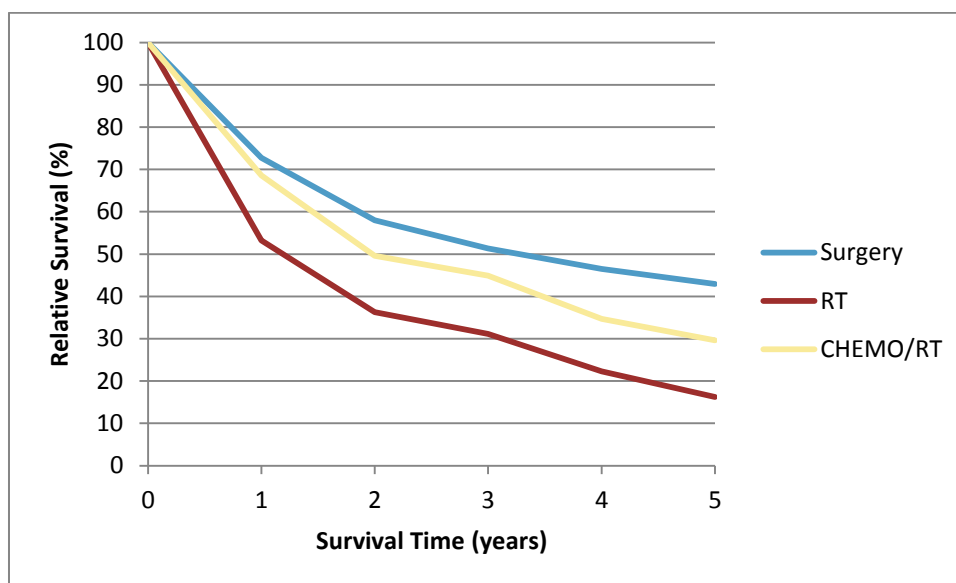


Figure 7. Oral Cavity Cancer: Relative Survival by Primary Treatment - Stage III- IVb (Flemish Region, 2004-2007)

7. Analyses by Volume

During the period 2004-2007, Belgian patients with oral cavity cancer are treated in 54 different Flemish hospitals. The mean number of patients (during the period 2004-2007) by hospital is 18.8, with a range between 1 and 135. The distribution of the number of patients (=volume) per hospital is displayed in Figure 8.

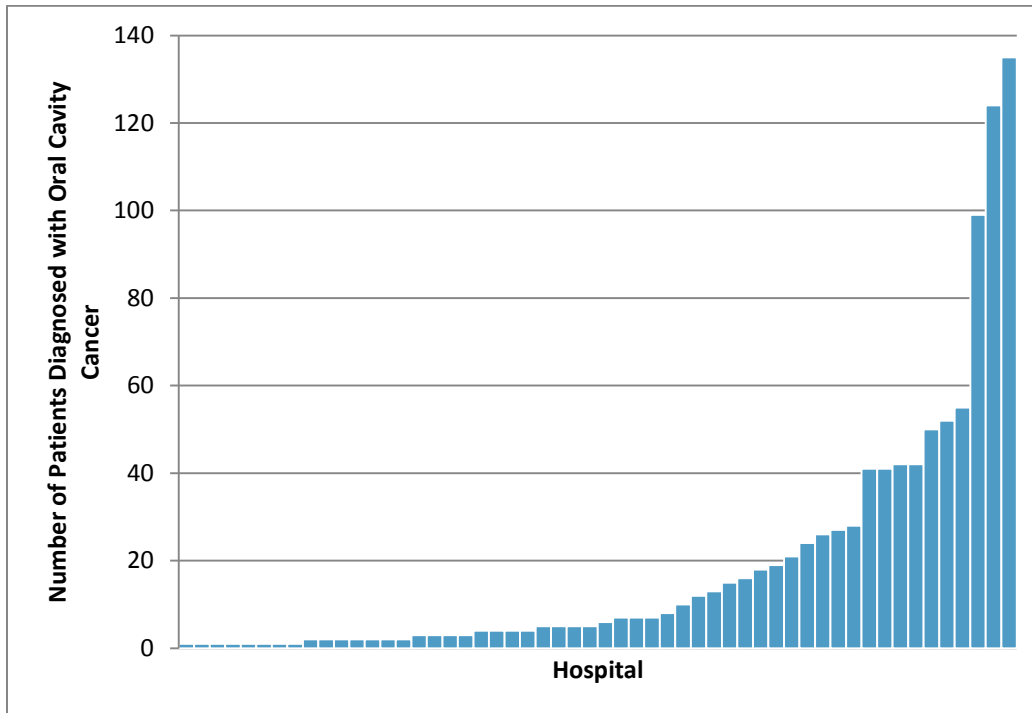


Figure 8. Oral Cavity Cancer: Distribution of Patients by Hospital (Flemish Hospitals, 2004-2007)

1,015 of the Flemish patients (94.2%) can be assigned to a hospital (see Methodology for the rules applied to assign a patient to one hospital). Considering hospitals having taken care of 60 or more patients diagnosed during the period 2004-2007 as high-volume hospitals, 363 patients are assigned to high-volume hospitals and 652 are assigned to low-volume hospitals. Treatment schemes are similar for low-volume and high-volume hospitals (Figure 9). In low-volume hospitals, 78.1% of the patients is primarily treated with surgery, 9.5% is primarily treated with chemo/RT and 7.4% is primarily treated with RT only. For high-volume hospitals these percentages are 76.3%, 11.0% and 8.0%, respectively.

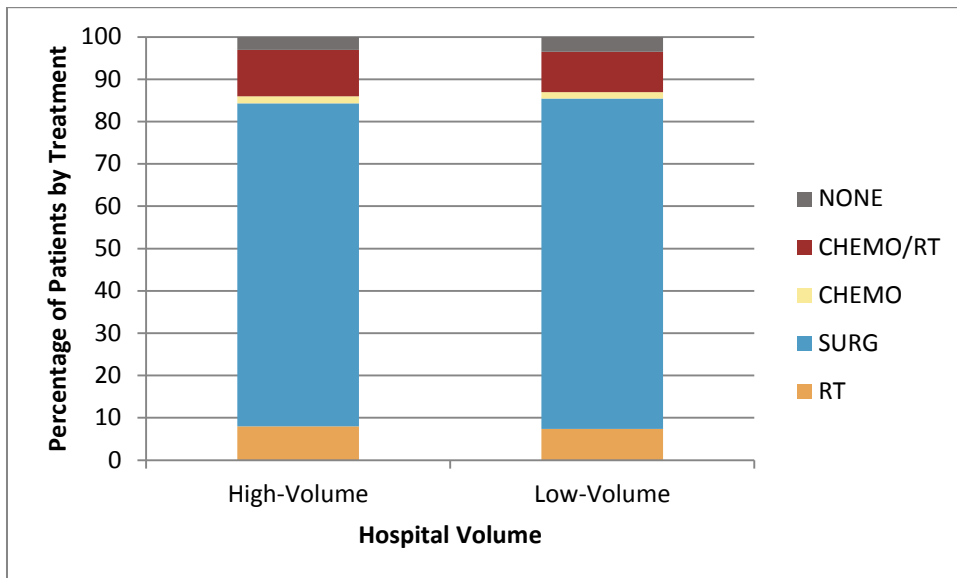


Figure 9. Oral Cavity Cancer: Primary Treatment by Hospital Volume (Low-Volume versus High-Volume Hospitals, Flemish Region, 2004-2007)

8. References

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