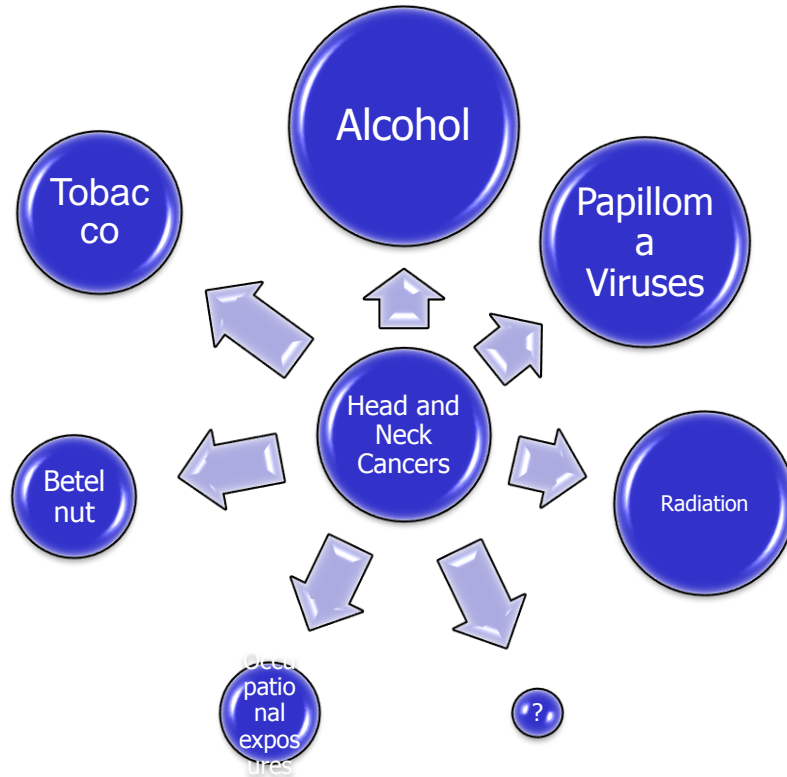


The role of oral hygiene in cancers of the Head and Neck

Results from International Head and Neck Cancer Epidemiology (INHANCE) Consortium

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Attributable cases of oral and pharyngeal cancer (%) - France, 2000

Risk factor	♂	♀
Tobacco smoking	71	29
Alcohol drinking	71	25
Infectious agents	7	7
Total	92	50

A role of oral hygiene/health has been proposed in studies with small sample size and limited exposure assessment

Aim

To investigate the association between oral hygiene and health indicators and risk of H&N cancer in the INHANCE Consortium

Study	Years	Oral hygiene variables					N ca/co	Controls Source
		Missing teeth	Denture wear	Gum disease	Dental visits	Tooth brushing		
Central Europe	1998-03	■	■	■	■	■	762/907	Hosp
Los Angeles	1999-04	■	■	■	■	■	428/1040	Neigh
Seattle 1 (Leo)	1983-87	■	■	■	■	■	435/547	RDD
Seattle 2 (WA)	1985-95	■	■	■	■	■	412/615	RDD
MSKCC (NY)	1992-94	■	■	■	■	■	165/169	Hosp
US multicenter	1981-90	■	■	■	■	■	1114/1268	RDD
Baltimore	2000-05	■	■	■	■	■	209/200	Hosp
HOTSPOT	2009-12	■	■	■	■	■	71/71	Hosp
North Carolina	2002-06	■	■	■	■	■	1368/1396	DMV
Puerto Rico	1992-95	■	■	■	■	■	351/521	Resid
Latin America	2000-03	■	■	■	■	■	2200/1706	Hosp
Japan	2001-05	■	■	■	■	■	526/3102	Hosp
IARC International	1992-97	■	■	■	■	■	884/985	Resid/Hosp
Total		■	■	■	■	■	8,925/12,527	

Methods

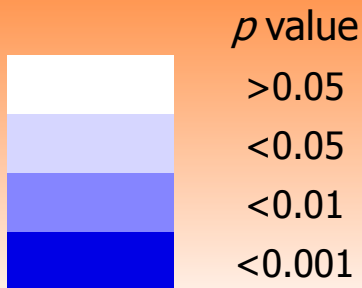
- Data harmonization
- Multivariable logistic regression
 - OR and 95% CI of H&N cancers
 - adjusted for study, center, sex, age, education, alcohol drinking/day, cumulative tobacco smoking

Head and Neck Cancers & Good Oral Hygiene

<i>Variable</i>	<i>Contrast</i>	<i>p co. (%)</i>	<i>OR</i>	<i>95% CI</i>
Missing teeth	0-4 vs. 5+	57	0.78	0.74-0.82
Visit to dentist	1+/yr vs. < 1/yr	59	0.82	0.78-0.87
Tooth brushing	1+/day vs. <1/day	83	0.83	0.79-0.88
Gum disease	No vs. Yes	75	0.94	0.89-0.99
Wear denture	Yes vs. No	56	1.00	0.95-1.05

Results by HNC cancer sub-site

Variable	Oral cavity	Oropharynx	Hypopharynx	Pharynx NOS*	Larynx
Missing teeth	0.69 (0.64-0.76)	0.87 (0.80-0.94)	0.93 (0.79-1.09)	0.88 (0.81-0.94)	0.75 (0.68-0.84)
Visit to dentist	0.82 (0.76-0.89)	0.78 (0.72-0.86)	0.74 (0.64-0.87)	0.78 (0.72-0.84)	0.83 (0.76-0.91)
Tooth brushing	0.81 (0.75-0.88)	0.87 (0.80-0.95)	0.80 (0.70-0.92)	0.86 (0.80-0.93)	0.78 (0.72-0.85)
Gum disease	0.83 (0.77-0.89)	1.04 (0.96-1.11)	1.12 (0.96-1.30)	1.04 (0.96-1.11)	0.92 (0.83-1.02)
Wear denture	0.96 (0.90-1.03)	0.98 (0.91-1.06)	0.95 (0.84-1.09)	0.98 (0.91-1.06)	1.10 (1.01-1.21)



*NOS-not otherwise specified

Oral hygiene score

	Good oral health			Poor oral health		
Missing teeth	0-4 missing	=	1	≥ 5 missing	=	0
Dental visit	Annually +	=	1	< annually	=	0
Tooth brushing	Once/day +	=	1	< once/day	=	0
Gum disease	No	=	1	Yes	=	0
Wear denture	Yes	=	1	No	=	0
Total score			5			0

- Population Attributable Fraction (PAF) for a suboptimal oral health score ≤ 2
 - Oral cancer: 8.9% (95%CI: 3.3, 14%)

Conclusions

- Clear associations between indicators of oral hygiene and risk of H&N cancer
- Good oral hygiene is associated with a lower risk of HNC, independent of smoking and alcohol drinking
- Improvements in oral hygiene represent an opportunity for primary prevention of HNCs.

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<http://www.inhance.utah.edu>

Reciprocal adjustment of oral hygiene variables

Exposure	Head and neck cancer	Oral cancer
	OR (95% CI)	OR (95% CI)
Wear denture	0.65	0.58
(yes vs. no)	(0.57, 0.75)	(0.48, 0.72)
Gum disease	0.48	0.32
(no vs. yes)	(0.37, 0.63)	(0.23, 0.44)
Number of missing teeth	0.38	0.28
(< 5 vs. ≥ 5)	(0.32, 0.46)	(0.21, 0.36)
Tooth brushing	0.83	0.79
(≥ once/day vs. < once/day)	(0.68, 1.00)	(0.60, 1.04)
Visit dentist	0.86	0.91
(≥ once/year vs. < once/year)	(0.73, 1.01)	(0.72, 1.16)

Analysis restricted to three studies with all five oral hygiene variables
(Puerto Rico, Latin America, International)

Oral hygiene score

Oral Hygiene Score	Head and neck cancer		Oral cancer	
	Ca/Co	OR (95%CI)	Ca/Co	OR (95%CI)
≤ 1	184/127	1.98 (1.68, 2.35)	57/127	3.12 (2.08, 4.68)
2	951/823	1.79 (1.50, 2.13)	287/823	2.42 (1.87, 3.15)
3	1171/940	1.98 (1.48, 2.65)	496/940	2.45 (1.93, 3.12)
≥ 4	366/744	1.0 (referent)	118/744	1.0 (referent)
<i>P</i> for trend		<0.001		<0.001

Analysis restricted to three studies with all five oral hygiene variables
(Puerto Rico, Latin America, International Multicenter)