

Preliminary results of the BROADEN study: Burden of human papillomavirus-related head and neck cancers

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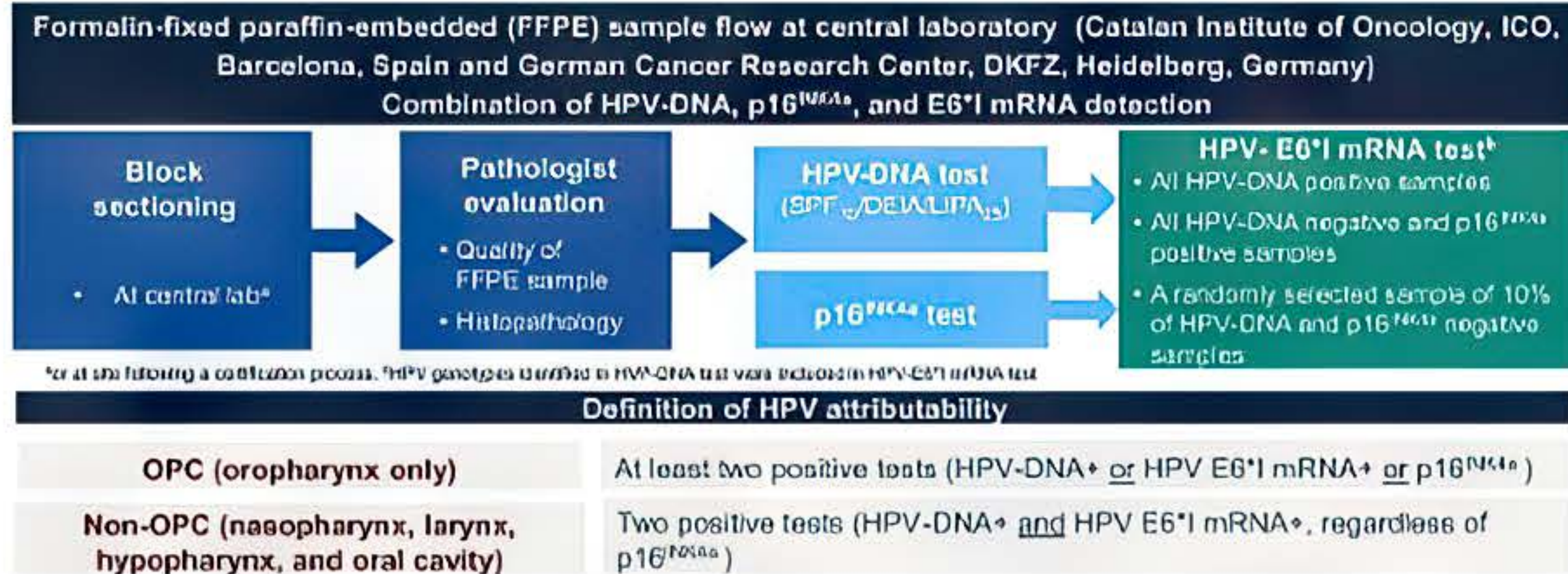
Introduction

- Head and Neck Cancer (HNC) is a major public health concern and represents the seventh most common cancer worldwide with an annual incidence of 892,128 new diagnoses and 458,486 deaths in 2022 with higher incidence in men¹.
- Human Papillomavirus (HPV) has emerged as an etiological factor in some HNC².
- There is limited understanding of epidemiology and time trends of HPV-driven HNC.
- The study objectives are:
 - Primary objective:** Estimate the HPV attributable fraction in oropharynx, nasopharynx, larynx, hypopharynx, and oral cavity cancers in the two study time periods (2008-2009 and 2018-2019).
 - Secondary Objectives:** Assess HPV genotype, per anatomic location, and histopathology of HPV-driven HNC and Describe HNC patient characteristics by HPV status

Study design

- The BROADEN (Observational study to assess the absolute Burden Of hpv-related heAd and nEck caNcers) study is a noninterventional, cross-sectional, multicenter study of HNC patients diagnosed in 2008-2009 and 2018-2019 in 6 EU countries (France, Germany, Italy, Portugal and Spain) as well as China and Japan³
- Patient Inclusion criteria:** Adults with a first HNC diagnosis at any anatomic site in the study time periods
- Location and sublocation of head and neck primary tumour as per International Classification of Diseases, 10th Revision (ICD-10) classification.
- Patient Exclusion criteria:** Only fine-needle aspiration samples from metastatic lymph nodes available; Diagnosis of unspecified pharyngeal cancer (ICD-10: C14)

Methods



- In order to calculate the annual percent change (APC) of HPV-AF between time periods, a least squares regression line will be fitted between the logarithm of the AF calculated in each time period, using the calendar year of each period as a regressor variable. That is: $y = \text{AF}$; $x = \text{calendar year}$; $y = mx + b$; $\text{APC} = 100(m-1)^4$

Results

Results presented include five EU countries and Japan. A total of 4,833 patients were screened, 4,010 had valid samples and were included from 73 hospitals in France, Germany, Italy, Spain, Portugal and Japan.

Table 1. Description of demographic and behavior characteristics of patients included

Patient characteristics		HNC diagnosis period 2008-2009 (N=1800)	HNC diagnosis period 2018-2019 (N=2630)
Gender *	Male	1805 (81.1%)	2022 (76.9%)
	Female	375 (16.9%)	608 (23.1%)
Age at diagnosis, mean (SD) *		62.2 (11.6)	64.5 (11.4)
Smoking status *	Current smoker	698 (56.4%)	1036 (50.6%)
	Ex-smoker (quit ≥12 months prior to diagnosis)	281 (23.6%)	568 (27.8%)
	Non-smoker	248 (20.0%)	442 (21.6%)
Alcohol consumption *	Heavy drinker (Male >4 and female >3 drinks per day)	379 (34.3%)	501 (28.1%)
	Occasional drinker (Male ≤4 and female ≤3 drinks per day)	401 (36.3%)	672 (37.7%)
	Non-drinker	324 (29.3%)	610 (34.2%)

*Differences are statistically significant across time periods for these characteristics (p<0.05).

Results continuation

Figure 1. HPV attributable fraction in OPC stratified by country and by time period

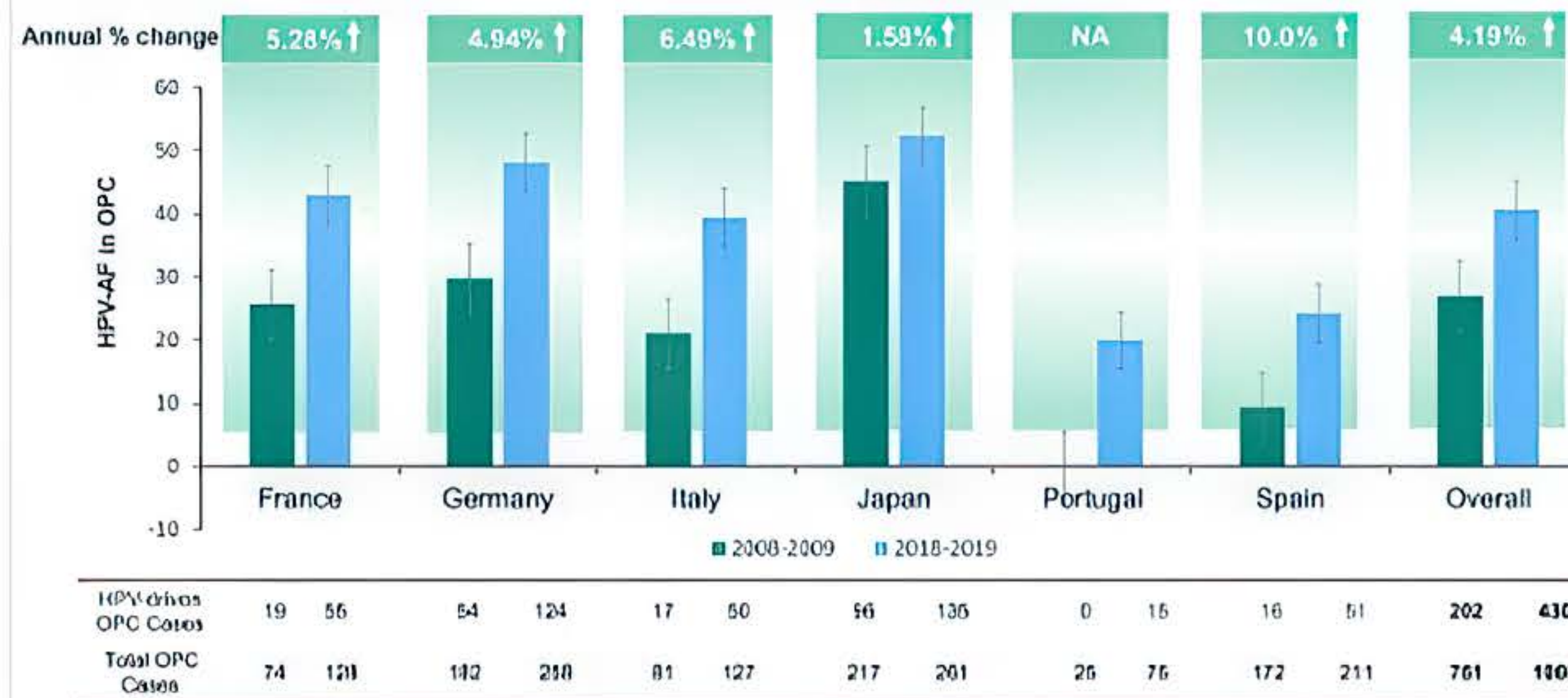


Figure 2. HPV attributable fraction stratified by anatomic location and time period (excluding OPC)

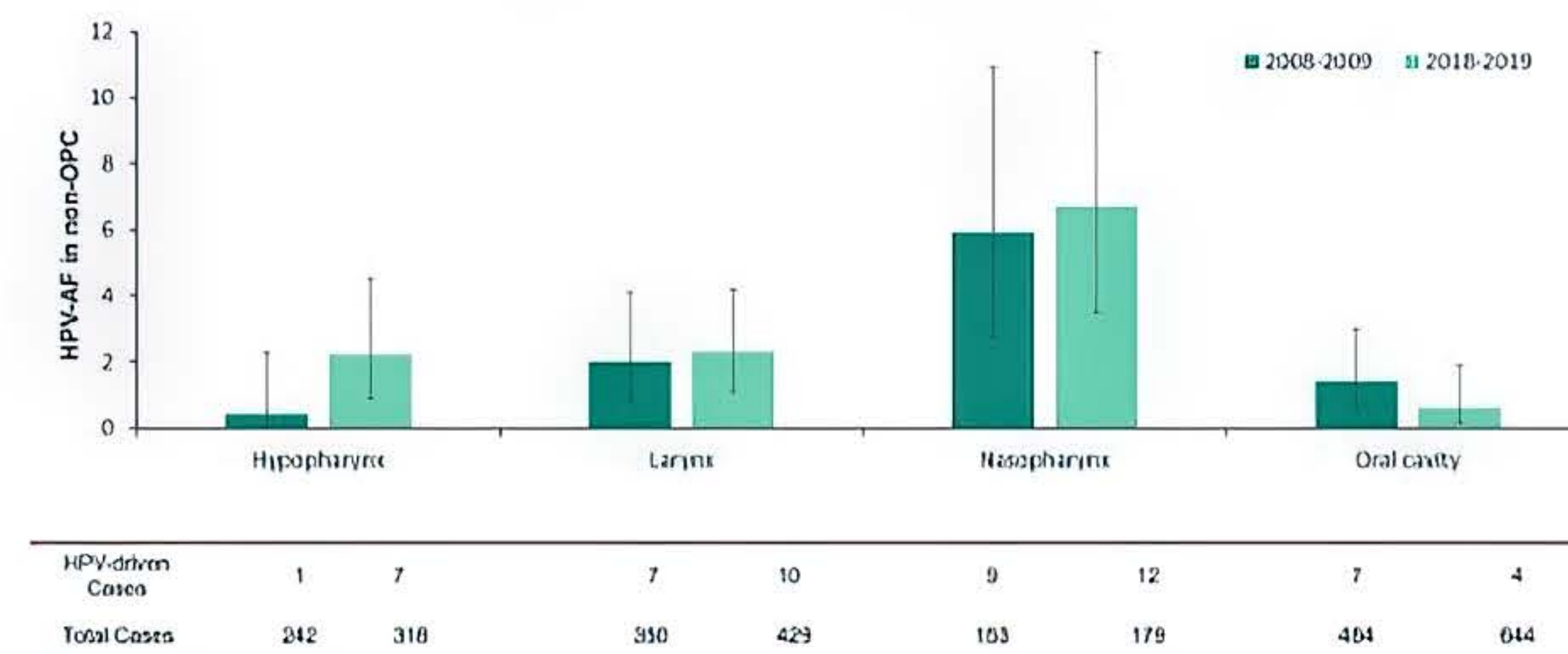
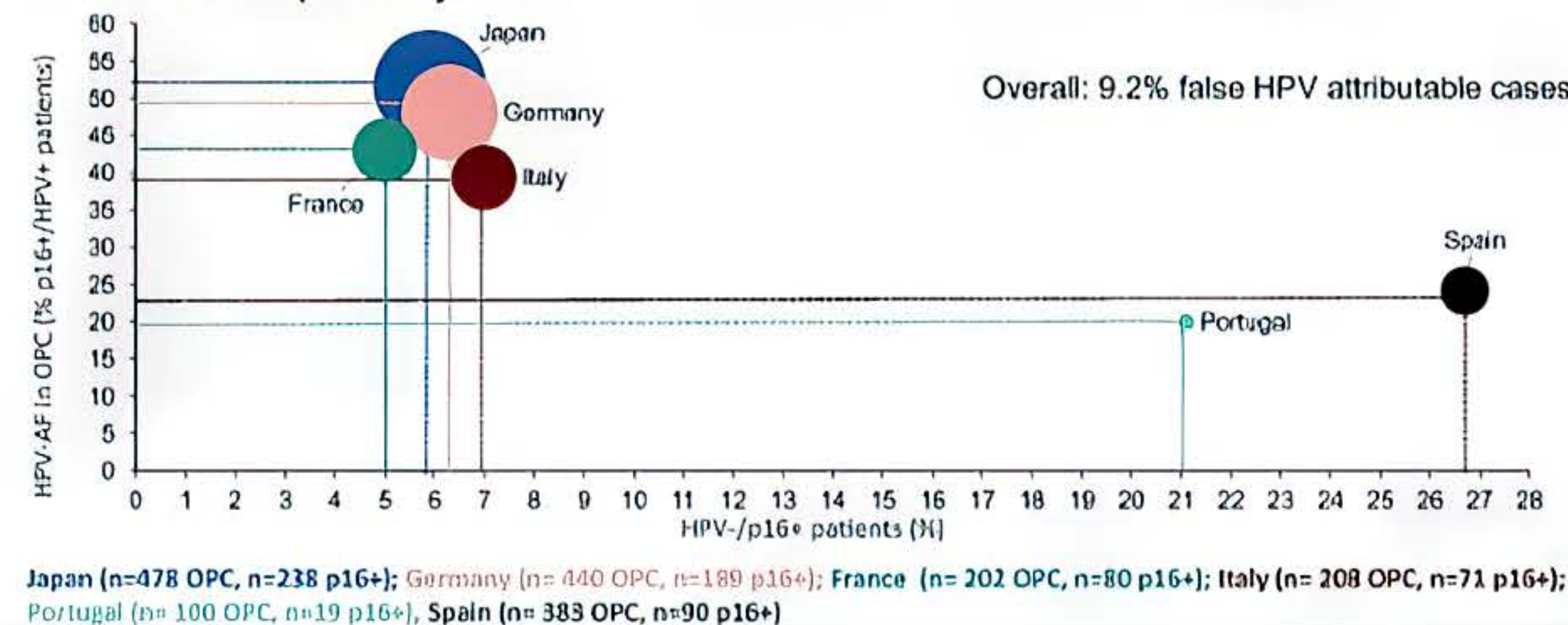


Figure 3. Proportions of p-16-positive and HPV-negative patients (false HPV attributable cases) according to the HPV-attributable fraction per country for OPC



Regarding HPV genotyping distribution, HPV16 was the most common genotype for HPV-driven OPC cases (89.9%), followed by HPV33 (2.8%) and HPV35 (2.5%). For HPV-driven non-OPC, HPV16 was also the most common genotype (64.9%) followed by HPV18 (10.5%), HPV35 (7.0%). Overall, 94.6% of HPV-driven HNC are due to high-risk genotypes included in the 9-valent vaccine (95.3% of HPV-driven OPC and 87.7% of HPV-driven non-OPC).

Table 2. Multivariable logistic regression model to assess differences in HPV-AF for OPC between time-periods, adjusting for potential cofounders

	OR	95% CI	P-value
Period (ref: 2008-2009)	1.85	1.36, 2.52	<0.001
Gender (ref: male)	1.00	0.70, 1.43	0.986
Age	0.98	0.97, 0.99	0.008
Smoking status (ref: non-smoker)	0.19	0.13, 0.27	<0.001
	0.32	0.22, 0.48	<0.001
Alcohol consumption (ref: non-drinker)	0.36	0.24, 0.54	<0.001
	0.98	0.70, 1.39	0.926
	1.11	0.63, 1.96	0.713
Country (ref: Germany)	1.30	0.76, 2.21	0.342
	0.52	0.32, 0.85	0.010
	0.32	0.15, 0.68	0.003
	2.36	1.52, 3.68	<0.001

Conclusions

- BROADEN is the largest observational study of its kind assessing the HPV attributability in HNC of various anatomic locations and allowing direct comparison of HPV-AF across countries over a 10-year period.
- Overall, HPV-driven OPC significantly increased over time (26.9% to 40.6%) with an annual percent change of 4.19% (Figure 1)
- The results demonstrate an increase over time for HPV-driven cancers in the hypopharynx (0.4% to 2.2%), larynx (2.0% to 2.3%) and nasopharynx (5.9% to 6.7%) though this increase was not statistically significant. Oral cavity cancers showed no increase from the first to second study period. (Figure 2)
- Overall, 94.6% of HPV-driven HNC are due to high-risk genotypes targeted in the 9-valent vaccine, highlighting the value of the HPV vaccination prevention in men and women.

Disclosures and acknowledgments

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