

Burden of HPV-associated Cancers in Mexico From 2011-2019

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Introduction

- Human papillomavirus (HPV) is a leading cause of anogenital, cervical, and head and neck cancers, affecting both genders significantly¹
- In Mexico, during the period 2017-2020, a population-based cancer registry network was created, covering less than 15% of total population. The Ministry of Health's hospital discharge data, which covers about 32% of the population, supplements the registry by offering a broader view of hospital discharges for cancer cases²
- In Mexico, the HPV vaccine was introduced in the National Immunization Program in 2008 for 9-year-old girls. In 2022, the target age changed to 11 years, with a catch-up campaign for girls aged 12 to 14 years. The program also expanded to include cisgender and transgender girls and women aged 11 to 49 living with HIV³

Objective

- To describe the hospitalizations of HPV-associated cancers in Mexico from 2011 to 2019

Methods

- A retrospective, observational, time-trend analysis was conducted using the inpatient database from the Mexican public healthcare system (IMSS)
- HPV-associated cancers were defined as cancers occurring at anatomic sites where HPV-DNA is frequently detected; HPV-attributable cancer was defined as a cancer probably caused by HPV. The attributable fraction was estimated using PCR studies for HPV-DNA detection, except for head and neck cancers, which also considered p16 positivity⁴⁻⁵
- Hospitalizations were identified using International Classification of Diseases (ICD-10) codes. Average annual hospitalization rates per 100,000 people were calculated using age-specific population
- Trends in hospitalization rates for each HPV-associated cancer were analyzed using joinpoint regression from 2011-2019 (average annual percent change [AAPC]); *P*<0.05 was considered statistically significant for identifying trends

Results

HPV-associated cancers

- From 2011 to 2019, 116,632 hospitalizations due to HPV-associated cancers were reported in both genders. Cervical cancer accounted for 76.2% of these hospitalizations (**Figure 1A**). For non-cervical cancers, laryngeal cancer (29.8%) and oral cancer (28.1%) were the most frequent in men (**Figure 1B**).
- On average, there were 12,960 annual hospitalizations: (10.6/100,000), including 10,950 for women (17.6/100,000) and 2,010 for men (3.4/100,000) (**Table 1**)
- Cervical cancer was the primary cause of hospitalizations among women, accounting for 90.1% (88,836) of cases (**Figure 1C**), while specific head and neck cancer sites (oral cavity, oropharynx, and larynx) were the predominant reason for hospitalizations among men, comprising 73.8% (13,352) of hospitalizations (**Figure 1D**)

Estimates of attributable fraction of HPV-associated cancers

- Every year, an average of 10,809 hospitalizations occurred, including 10,222 among women and 587 among men (**Table 1**). The most common causes of HPV-attributable cancers were cervical and head and neck cancers, constituting 91.3% and 3.2%, respectively
- From 2011 to 2019, we observed significant increases in hospitalization rates for women due to cervical and oropharyngeal cancers, with annual increases of 4.0% and 8.4%, respectively. Among men, rising hospitalization rates were noted for penile cancer (4.8% per year), anal cancer (13% per year), and oropharyngeal cancer (13% per year) (**Table 1**)

Figure 1. Percentage of HPV-associated and attributable cancers (A) All HPV-associated cancers, (B) Non-cervical HPV-associated cancers, (C) All HPV-associated cancers - females, (D) HPV-associated cancers - males

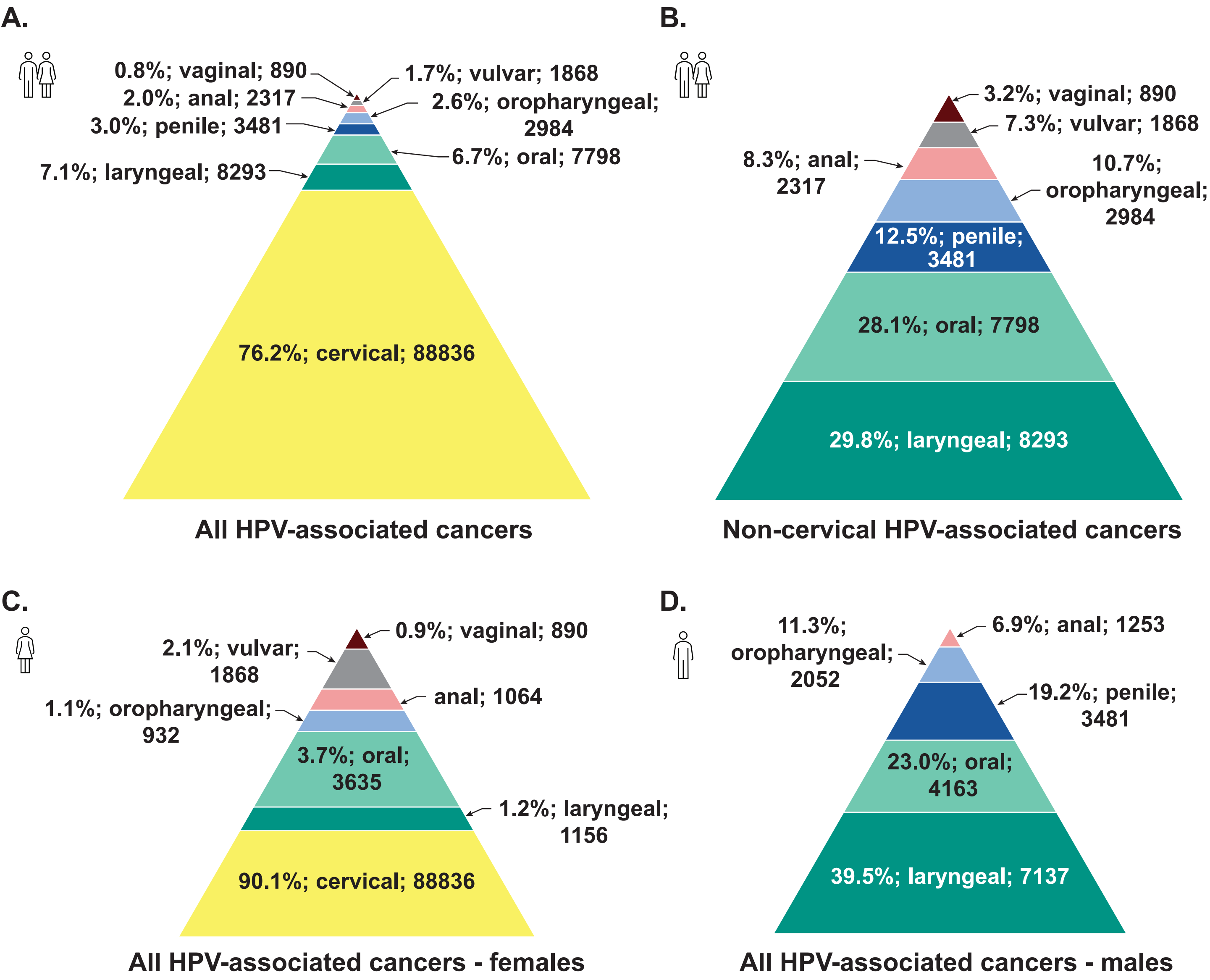


Table 1. Average annual number and hospitalization rate of HPV-associated and HPV-attributable cancers by anatomic site in Mexico, 2011-2019

Anatomic site	HPV-associated cancers		HPV-attributable cancers	
	Average no. of hospitalizations (rate ^a) 2011-2019	Trends AAPC 2011-2019	Attributable fraction	Average no. of hospitalizations (rate ^a) 2011-2019
Cervix	9871 (15.8)	4.0* (1.2;7.3)	100%	9871 (15.8)
Vagina	99 (0.2)	8.8 (-0.7;19.2)	78%	77 (0.1)
Vulva	226 (0.4)	1.5 (-3.6;7.3)	48% (<60 years)	58 (0.1)
			15% (≥60 years)	
Penis	387 (0.6)	4.8* (0.1;10.4)	51%	197 (0.3)
Anus, males	139 (0.2)	13.0* (4.8;24.6)	100%	139 (0.2)
Anus, females	118 (0.2)	7.8 (-12.1;33)	100%	118 (0.2)
Larynx, males	793 (1.3)	4.2 (-0.7;11.3)	14.7%	117 (0.2)
Larynx, females	128 (0.2)	-4.5 (-18;11)	14.7%	19 (<0.1)
Oropharynx, males	228 (0.4)	13.0* (5.7;23.3)	39.2%	89 (0.1)
Oropharynx, females	104 (0.2)	8.4* (2.1;18.1)	39.2%	41 (0.1)
Oral cavity, males	463 (0.8)	6.9* (0;15.2)	9.6%	44 (0.1)
Oral cavity, females	404 (0.6)	5 (-3.5;18.3)	9.6%	39 (0.1)
All HPV-cancers, females	10950 (17.6)	4.1* (1.2;7.3)		10222 (16.4)
All HPV-cancers, males	2010 (3.4)	7.2* (3.8;11.3)		587 (1.0)
All HPV-cancers, both sex	12960 (10.6)	4.7* (1.9;7.9)		10809 (8.9)

^aExpressed as 100,000 population.

Limitations

- The number of HPV-attributable hospitalizations derived from PCR studies for HPV DNA detection may not be sufficient to establish a causal association, leading to inaccuracies in estimating the burden of HPV-attributable cancers.
- Using the total population as the population at risk may result in underestimated rates, but it serves as a proxy for understanding hospitalizations related to HPV-associated cancers
- Another limitation is that HPV-related cancers may be hospitalized under other codes, such as sepsis, leading to potential misclassification

Conclusions

- The study highlights the substantial burden of HPV-associated cancers in Mexico, with cervical cancer being the primary cause of hospitalizations in women and head and neck cancers being prominent in men
- The increasing trends in HPV-associated cancer hospitalization underscore the importance of ongoing monitoring and comprehensive public health interventions. Prioritizing HPV vaccination programs for females and males is crucial in preventing these potentially avoidable diseases and reducing their impact on both genders

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