

# A retrospective analysis of the healthcare pathway of head & neck cancer patients in the Netherlands: from first visit to a general practitioner to diagnosis

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## Background

Head and neck cancer (HNC) is diagnosed in over 3,000 patients annually in the Netherlands<sup>1</sup>. Nearly half of HNCs are diagnosed at an advanced stage, partly attributed to prolonged time-to-diagnosis (TTD)<sup>2</sup>. There are currently no data available on the referral landscape from first visit to the general practitioner (GP) to diagnosis of HNC patients in the Netherlands. Data generation and analysis of the patient journey and diagnostic procedures in HNC patients will contribute to the identification of areas for improvement in the referral and diagnostic process as well as improvement of patient access to care.

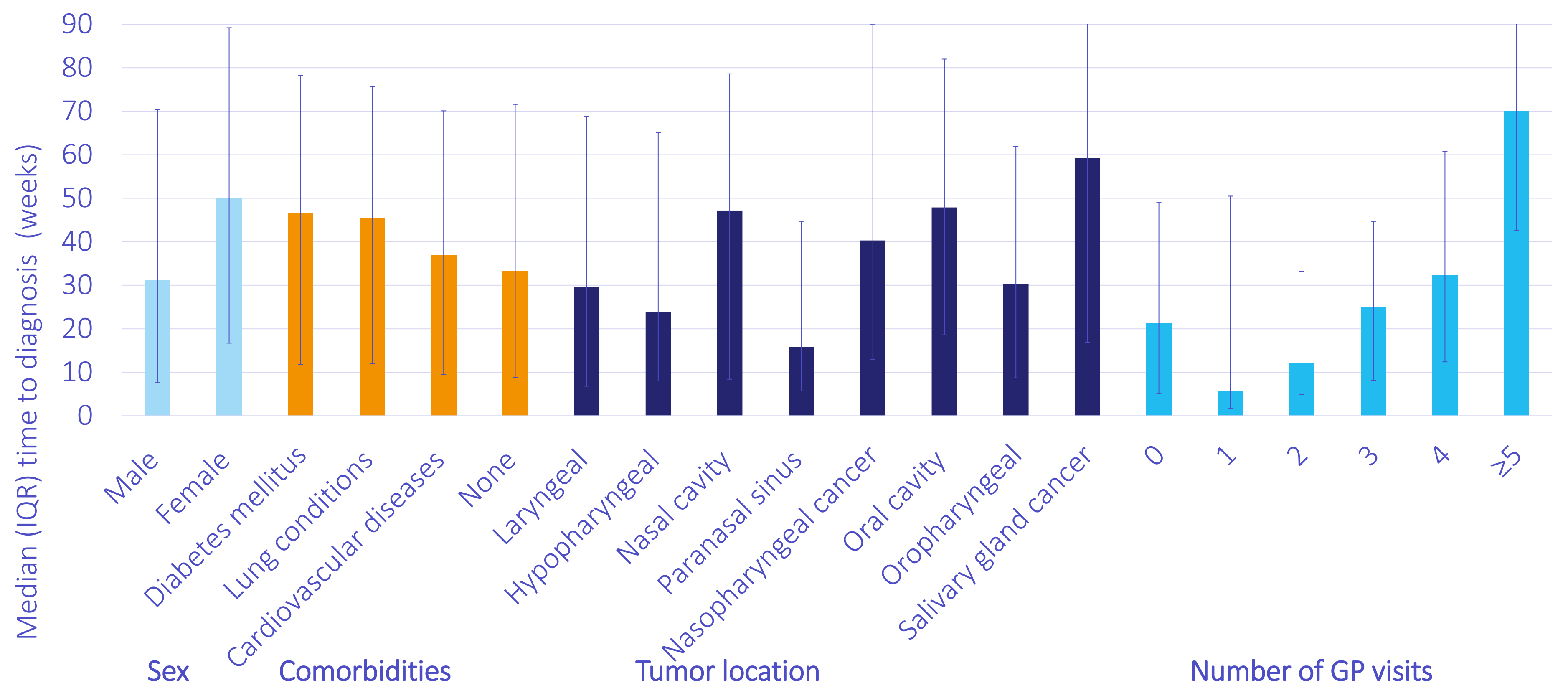
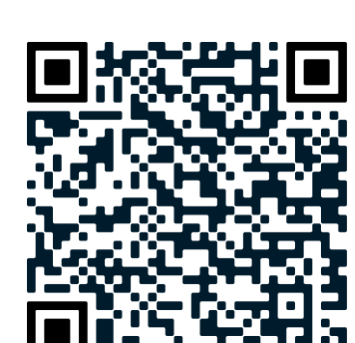
## Objective

This study aimed to analyze the healthcare pathway of HNC patients from their initial visit to the general practitioner to diagnosis.

**Table 1: Baseline characteristics of HNC patients and non-HNC controls at index date**

	HNC patients N = 1,913 n (%)	Non-HNC controls N = 7,652 n (%)	p-value
Sex, male	1,274 (67)	5,096 (67)	1.0000
Age (years), median (IQR)	66 (59-74)	66 (58-74)	0.0913
Alcohol history*			<.0001
Non-drinker	50 (7)	203 (8)	
Low to moderate intake (1-6 units/week)	335 (49)	1,507 (61)	
Heavy or very heavy intake (7+ units/week)	292 (43)	752 (31)	
Drinker, unknown quantity	16 (1)	89 (1)	
Unknown	1,220 (64)	5,101 (67)	
Smoking history*			<.0001
Current	461 (24)	724 (9)	
Former	367 (19)	1,539 (20)	
Never	185 (10)	1,222 (16)	
Unknown	900 (47)	4,167 (54)	
Comorbidities			
Diabetes mellitus	324 (17)	1,259 (16)	0.6108
Lung conditions	653 (34)	1,720 (22)	<.0001
Cardiovascular diseases	1,157 (60)	3,960 (52)	<.0001
None of the assessed comorbidities	487 (25)	2,792 (36)	<.0001

\*Unknowns are displayed as a separate percentage; rest adds up to 100%.



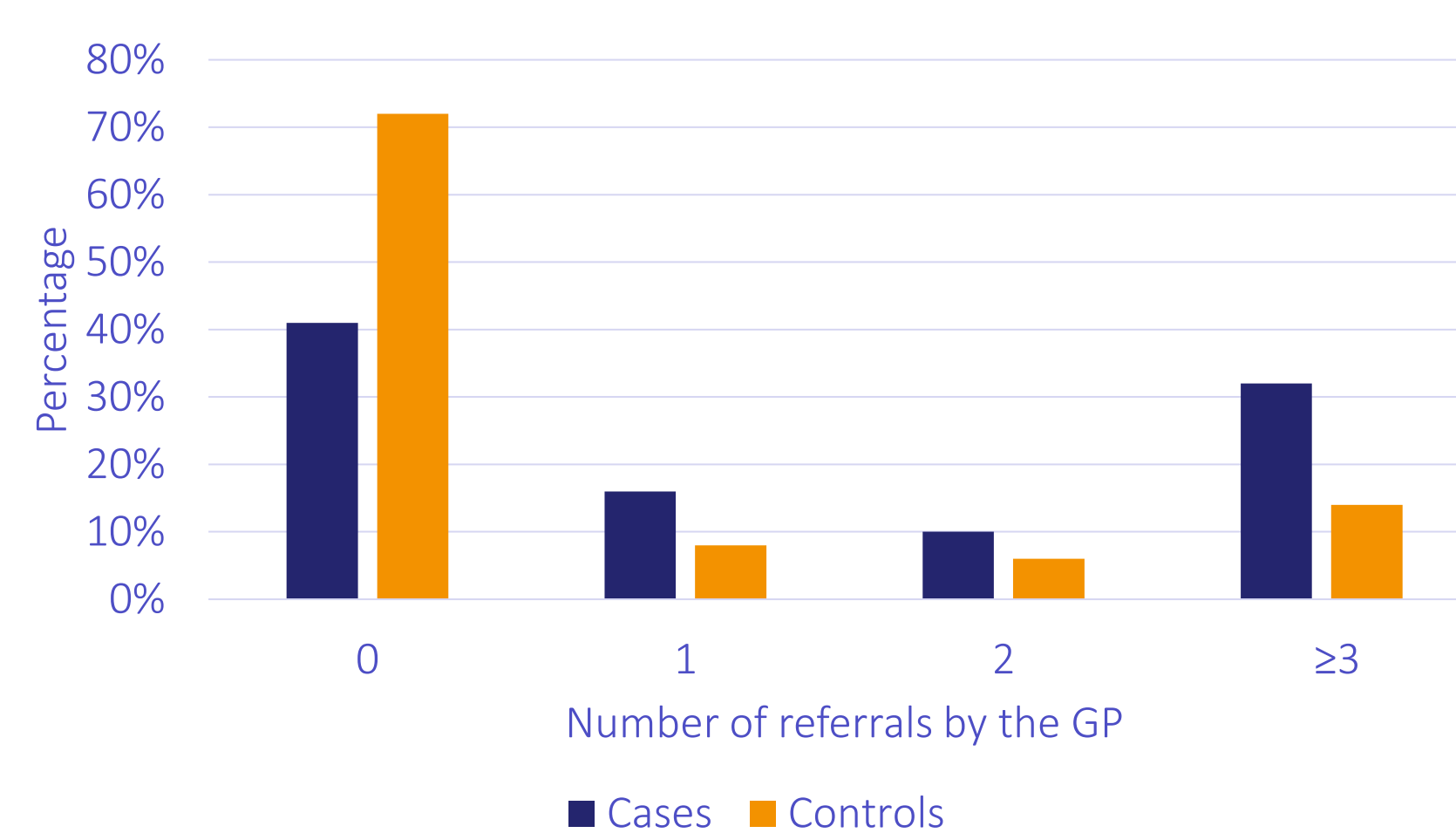
**Figure 1. Time to diagnosis of HNC stratified by baseline and tumor characteristics**

## Methods

- A cohort of primary care and cancer data (using linked data from the PHARMO Data Network and the NKR (Nederlandse Kankerregistratie)) from the Netherlands was utilized to select HNC patients (cases) between 2013 and 2020.
- Date of first HNC diagnosis was defined as the index date. Cases were matched 1:4 to non-HNC patients (controls) on age, sex, and GP-practice number.
- Cases and controls needed to have at least 24 months of primary care data available before index date and no previous cancer diagnosis.
- Cases were additionally required to have one of fourteen predefined symptoms<sup>3</sup>.
- Baseline characteristics were compared between cases and controls using Chi2-tests. Time to diagnosis (TTD) was stratified by baseline and tumor characteristics and tested using Kruskal-Wallis tests.

## Results

- The study included 9,565 individuals: 1,913 cases and 7,652 controls. Among cases, 67% were male, and median age was 66 years (Table 1).
- Apart from bleedings in the mouth cavity, all symptoms occurred more often in cases than controls ( $p < 0.0001$ ), with otalgia being the most reported symptom.
- Compared to controls, cases had a higher alcohol intake, were more often current smokers, and had more comorbidities, e.g. cardiovascular and lung diseases (all  $p < 0.0001$ ).
- Overall median TTD (IQR) was 36 weeks (10 – 75).
- TTD was affected by sex, comorbidities (compared to no comorbidities), tumor location and number of GP visits (all  $p < 0.05$ ) (Figure 1).
- Additionally, cases had more GP visits, received more medication, were ordered more lab tests and had more referrals to a specialist (most often to an otolaryngologist) (Figure 2), compared to controls (all  $p < 0.05$ ).



**Figure 2. Number of referrals of HNC patients and non-HNC controls between start and index date**

## Conclusion

This study provides insights into characteristics and healthcare utilization of HNC-patients in the Netherlands, with differences observed in their patient journey compared to non-HNC controls. Future research should focus on identifying opportunities for earlier diagnosis.