

Accesso ai test diagnostici per SARS-CoV-2: sono barriere per gli immigrati in Italia?

Accesso ai test diagnostici per SARS-CoV-2: esistono barriere per gli immigrati in Italia?

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ABSTRACT

OBJECTIVES: to describe the epidemiology of SARS-CoV-2 infection in relation with the use of nasal swabs in the immigrant population in Italy, using data from the COVID-19 national surveillance system and to verify if a difference is present comparing natives and immigrant.

DESIGN: descriptive study based on longitudinal health-administrative data.

SETTING AND PARTICIPANTS: general population of six Italian Regions (Piedmont, Lombardy, Veneto, Emilia-Romagna, Tuscany, Lazio) covering about 55% of the resident population and 72% of foreigners' population.

MAIN OUTCOME MEASURES: regional rates of access to at least a nasal swab, separately by country of origin.

RESULTS: across all the periods, a lower rate in the foreigners' group was observed, with the only exception of the period May-June 2021. Considering separately High Migratory Pressure Countries (HMPCs) and Highly Developed Countries (HDCs), a higher proportion of nasal swabs performed in people coming from HDC with respect to HMPCs and natives was noticed. This observation is consistent in males and females.

CONCLUSIONS: during the first wave of the pandemic, Italians have had a higher proportion of nasal swabs compared to migrants across all Regions. This difference disappeared in the following periods, probably due to a major availability of diagnostic tests.

Keywords: SARS-CoV-2, nasal swabs, immigrants

RIASSUNTO

OBIETTIVI: descrivere l'epidemiologia dell'infezione di SARS-CoV-2, in particolare considerando l'accesso ai tamponi nasali nella popolazione immigrata in Italia, usando i dati del sistema di sorveglianza nazionale COVID-19 e di valutare se esiste una differenza tra popolazione nativa e immigrata.

DISEGNO: studio descrittivo basato su dati amministrativo-sanitari longitudinali.

WHAT IS ALREADY KNOWN?

- The impact of SARS-CoV-2 pandemic is different comparing natives and immigrants.
- A socioeconomic inequality was observed in the access to SARS-CoV-2 diagnostic tests.

WHAT THIS STUDY ADDS?

- In Italy, foreigners had a slightly lower access to nasal swabs than their Italian counterpart.
- This lower access regarded in particular subject belonging to High Migration Pressure Countries.
- On the contrary, subjects from High Developed Countries have a higher access to nasal swabs, in particular in Lazio and Lombardy Regions, probably due to the COVID-19 rules of governments that requested a negative test to countries during the pandemic period.

SETTING E PARTECIPANTI: popolazione generale di sei Regioni italiane (Piemonte, Lombardia, Veneto, Emilia-Romagna, Toscana, Lazio) che coprono circa il 55% della popolazione residente e il 72% della popolazione straniera

PRINCIPALI MISURE DI OUTCOME: tassi regionali di accesso ad almeno un tampone nasale, separate per Paese di origine.

RISULTATI: è stato osservato un minor tasso di accesso ai tamponi nella popolazione straniera in tutti i periodi, con l'unica eccezione del periodo maggio-giugno 2021. Considerando separatamente chi proviene dai Paesi ad alta pressione migratoria (PAPM) e chi proviene dai Paesi a sviluppo avanzato (PSA), si è osservata una più alta proporzione di tamponi nasali in coloro che vengono da PSA rispetto sia ai PAPM sia agli italiani. Questa osservazione è consistente sia nei maschi sia nelle femmine.

CONCLUSIONI: durante la prima ondata della pandemia, la popolazione italiana residente ha avuto un maggiore accesso ai tamponi nasali rispetto alla popolazione immigrata, uniformemente per tutte le Regioni. Questa differenza si è annullata nei periodi successivi, probabilmente grazie a una maggior disponibilità dei test nasali.

Parole chiave: SARS-CoV-2, tamponi nasali, popolazione immigrata

INTRODUCTION

Migration to and within the European Union (EU) has increased and diversified in recent years, with migrants (defined as individuals living in a country outside their country of origin) accounting for approximately 10% of the total population of the EU. In 2019, there were an estimated 2.7 million immigrants to the EU from non-EU countries, and 1.4 million people previously residing in one EU Member State migrated to another Member State.¹ Based on data from the Global Migration Data Analysis Centre of the International Organization for Migration, that uses data from the United Nations Department of Economic and Social Affairs, the total number of migrants in Italy increased by 60% between 2005 and 2020, from 4 to 6.4 million.²

Immigrants, in the first period of stay, generally present a better health condition than the natives. This is known as the 'healthy migrant effect'. Despite this, the literature shows that this effect is short-lived, and that regular immigrants tend to have worst health outcomes to that of the autochthonous population.^{3,4} In certain contexts, the relationship between immigration status and self-perceived poor health has also been shown.⁵ The reason for this is that migration is a social determinant of health.⁶ Migrants tend to have a lower socioeconomic position (SEP) in terms of income, occupation, and social class, than non-migrants in the same country, and factors like unfavourable working conditions, degraded housing, linguistic and legal problems, limited access, and use of health and social services are more prevalent in migrants' population.

There are concerns that the Coronavirus disease (COVID-19) pandemic has exacerbated these inequalities; emerging data highlights the differential impact of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection on migrants' groups.⁷⁻⁹ Specifically, incidence and mortality due to COVID-19 were found to be higher in migrants' groups. Whilst some of this can be explained by worse general health status (existing morbidities) in these groups, one of the reasons advanced is the lack of access to health care.¹⁰ The main barriers to healthcare access that migrants face are:

- absence of linguistic and cultural;
- digital exclusions;
- housing and proximity to healthcare services;
- fear of contracting Coronavirus while accessing health care (exacerbated by fears of discriminatory treatment).

During the pandemic, many services were closed and others moved online, highlighting these existing barriers.^{11,12} Although various quantitative studies have been carried out on the health impact of COVID-19 in migrants in various countries across the globe, the information about access to diagnostic tests is much scarser. The main approach has been performing interviews using qualitative analysis.¹³⁻¹⁵ The objective of this study is to describe the epidemiology of SARS-CoV-2 infection in relation with the use of nasal swabs in the immigrant population in Italy, using data from the COVID-19 national surveillance system and to verify if a

difference is present comparing natives and immigrant. The six Regions participating in the project are Piedmont, Lombardy, Veneto, Emilia-Romagna (Northern Italy), Tuscany and Lazio (Central Italy), which cover 55.7% of the resident population, including 72.3% of foreigners' population.

MATERIAL AND METHODS

The data about the access to nasal swabs were collected in the context of an interregional project supported by the National Institute for Health, Migration and Poverty (INMP). Details of the project could be found elsewhere.¹⁶ Briefly, six Italian Regions from the North and the Centre participated into the project and collected information about several SARS-CoV-2 outcomes (number of nasal swabs, SARS-CoV-2 infections, COVID-19 hospitalizations, COVID-19 mortality), separately for native Italians and resident foreigners.

For the objective of this research, the first time in which a subject performed a nasal swab regardless the result of the swab was considered. Three Regions (Piedmont, Lombardy, and Lazio) were also able to provide foreigners' data separately for High Migratory Pressure Countries (HMPCs)¹⁷ and Highly Development Countries (HDCs). For the period 22.02.2020-16.07.2021 the age-standardized rates and 95% confidence interval (95%CI) of access to nasal swabs were calculated separated by Region, gender, and nationality (Italians or foreigners). To take into account a possible residual bias, due to the different age-distribution in the older ages, the same analyses have been performed on subjects less than 65 years old only. Additionally, in the three Regions for which data are available, the rates in the same period were computed separating HMPCs and HDCs.

RESULTS

Table 1 presents the age-standardized rates and 95% CI about the access to nasal swabs separately by Italians and foreigners, by the six Regions, and by gender. Across all the periods, it can be seen a lower rate in the foreigners' group, with the only exception of the period May-June 2021 in Piedmont, Lombardy, Emilia-Romagna, and Lazio, particularly among women. Similar results have been obtained considering subjects less than 65 years old (Table S1, online Supplementary materials).

These data hide the fact that immigrants' epidemiological profiles vary depending on the country of origin, with enormous differences depending on whether it is an advantaged or disadvantaged country. These differences could affect the access to the healthcare system.

The data in Piedmont, Lombardy, and Lazio were deeply analysed from the start of the pandemic to July 2021, where the possibility to distinguish between immigrants from HMPCs and HDCs is possible. These 3 Regions covered approximately 20 million people, one third of the Italian population: 48.6% men and 51.4% women. Out of this 20 million, 2.260.574 were migrants.

PANDEMIC PERIODS	MALES AND FEMALES				MALES				FEMALES			
	ITALIANS		FOREIGNERS		ITALIANS		FOREIGNERS		ITALIANS		FOREIGNERS	
	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)
PIEDMONT												
22.02.2020-20.03.2020	255.27	(250.28-260.26)	140.39	(123.27-157.51)	237.48	(230.70-244.25)	139.86	(115.13-164.60)	272.64	(265.32-279.96)	148.08	(121.49-174.68)
21.03.2020-17.04.2020	1,215.89	(1,205.07-1,226.71)	832.10	(787.26-876.95)	887.93	(874.81-901.04)	580.98	(522.74-639.21)	1,533.54	(1,516.45-1,550.64)	1,047.12	(978.29-1,115.96)
18.04.2020-15.05.2020	1,928.69	(1,915.17-1,942.21)	1,710.52	(1,648.65-1,772.39)	1,348.15	(1,331.97-1,364.33)	1,079.55	(1,009.82-1,149.29)	2,488.47	(2,466.97-2,509.97)	2,219.63	(2,118.79-2,320.47)
16.05.2020-12.06.2020	1,207.95	(1,197.21-1,218.69)	984.09	(935.14-1,033.05)	1,047.14	(1,032.88-1,061.39)	789.18	(727.44-850.92)	1,363.02	(1,347.01-1,379.04)	1,164.30	(1,086.79-1,241.81)
13.06.2020-10.07.2020	892.74	(883.48-902)	809.02	(764.13-853.91)	842.40	(829.67-855.12)	704.91	(641.16-768.67)	941.66	(928.22-955.09)	925.23	(858.73-991.73)
11.07.2020-07.08.2020	822.86	(813.97-831.75)	988.54	(942.47-1,034.61)	789.65	(777.30-802.00)	934.97	(866.73-1,003.22)	855.08	(842.29-867.87)	1,050.11	(984.91-1,115.31)
08.08.2020-04.09.2020	1,200.55	(1,189.52-1,211.58)	1,671.13	(1,615.21-1,727.05)	1,208.54	(1,192.75-1,224.32)	1,548.34	(1,471.18-1,625.49)	1,193.34	(1,177.90-1,208.77)	1,786.24	(1,703.59-1,868.89)
05.09.2020-02.10.2020	1,622.71	(1,609.86-1,635.56)	1,971.19	(1,912.93-2,029.44)	1,608.08	(1,589.82-1,626.33)	1,827.73	(1,746.84-1,908.61)	1,638.83	(1,620.73-1,656.94)	2,101.92	(2,015.79-2,188.05)
03.10.2020-30.10.2020	5,457.03	(5,433.52-5,480.55)	4,536.64	(4,445.86-4,627.41)	4,734.54	(4,703.17-4,765.91)	3,915.96	(3,791.96-4,039.96)	6,161.71	(6,126.74-6,196.67)	5,075.25	(4,939.05-5,211.45)
31.10.2020-27.11.2020	5,716.57	(5,692.56-5,740.59)	3,865.07	(3,776.12-3,954.03)	5,295.65	(5,262.59-5,328.70)	3,697.15	(3,566.89-3,827.42)	6,124.93	(6,090.13-6,159.72)	4,056.93	(3,930.88-4,182.97)
28.11.2020-01.01.2021	3,517.38	(3,498.52-3,536.23)	2,891.99	(2,820.3-2,963.68)	3,424.42	(3,397.85-3,450.99)	2,985.51	(2,877.26-3,093.77)	3,608.28	(3,581.52-3,635.05)	2,865.75	(2,765.67-2,965.82)
02.01.2021-29.01.2021	5,566.47	(5,542.93-5,590.01)	4,573.10	(4,476.42-4,669.77)	4,521.50	(4,491.15-4,551.85)	3,896.15	(3,765.55-4,026.75)	6,580.05	(6,544.22-6,615.89)	5,191.08	(5,044.76-5,337.40)
30.01.2021-26.02.2021	4,201.37	(4,180.68-4,222.07)	3,542.50	(3,458.73-3,626.28)	4,029.31	(4,000.36-4,058.26)	3,531.83	(3,408.54-3,655.11)	4,370.97	(4,341.39-4,400.54)	3,606.47	(3,487.70-3,725.23)
27.02.2021-26.03.2021	5,695.00	(5,670.84-5,719.16)	4,038.07	(3,957.18-4,118.97)	5,716.05	(5,681.43-5,750.66)	4,036.56	(3,916.58-4,156.54)	5,677.23	(5,643.46-5,711.00)	4,074.59	(3,960.53-4,188.64)
27.03.2021-23.04.2021	7,339.16	(7,312.00-7,366.32)	6,000.72	(5,897.48-6,103.97)	6,586.00	(6,549.11-6,622.89)	5,283.20	(5,139.53-5,426.86)	8,070.46	(8,030.67-8,110.25)	6,630.74	(6,477.13-6,784.35)
24.04.2021-21.05.2021	4,383.28	(4,362.05-4,404.52)	3,912.18	(3,831.99-3,992.37)	4,263.63	(4,233.70-4,293.56)	3,781.21	(3,662.58-3,899.84)	4,501.91	(4,471.76-4,532.05)	4,041.70	(3,929.44-4,153.97)
22.05.2021-18.06.2021	3,006.50	(2,988.99-3,024.01)	3,151.47	(3,075.98-3,226.95)	3,038.09	(3,012.92-3,063.26)	2,972.70	(2,863.03-3,082.37)	2,976.81	(2,952.43-3,001.19)	3,319.43	(3,211.84-3,427.01)
19.06.2021-16.07.2021	2,748.05	(2,731.21-2,764.90)	3,855.97	(3,770.76-3,941.18)	2,780.02	(2,755.80-2,804.24)	3,680.60	(3,555.43-3,805.77)	2,717.41	(2,693.95-2,740.86)	4,058.89	(3,937.99-4,179.79)
LOMBARDY												
22.02.2020-20.03.2020	505.60	(500.97-510.22)	262.56	(246.36-278.77)	537.98	(531.21-544.75)	269.26	(243.38-295.14)	476.20	(469.86-482.54)	262.66	(241.28-284.04)
21.03.2020-17.04.2020	856.88	(850.87-862.89)	643.05	(617.06-669.03)	711.07	(703.27-718.88)	560.43	(522.80-598.06)	998.57	(989.45-1,007.70)	739.79	(701.38-778.19)
18.04.2020-15.05.2020	1,446.93	(1,439.07-1,454.80)	1,012.57	(984.97-1,040.16)	1,112.00	(1,102.17-1,121.83)	700.96	(666.39-735.53)	1,770.50	(1,758.28-1,782.71)	1,300.91	(1,257.58-1,344.24)
16.05.2020-12.06.2020	1,748.40	(1,739.72-1,757.09)	1,103.44	(1,073.16-1,133.72)	1,570.85	(1,559.13-1,582.57)	901.56	(859.11-944.02)	1,922.12	(1,909.32-1,934.92)	1,301.41	(1,256.20-1,346.62)
13.06.2020-10.07.2020	1,408.48	(1,400.72-1,416.25)	1,115.18	(1,084.01-1,146.36)	1,325.10	(1,314.38-1,335.82)	1,034.27	(989.44-1,079.10)	1,490.92	(1,479.69-1,502.16)	1,211.91	(1,165.65-1,258.17)
11.07.2020-07.08.2020	1,188.89	(1,181.77-1,196.01)	1,479.33	(1,440.52-1,518.14)	1,137.41	(1,127.50-1,147.33)	1,449.08	(1,393.60-1,504.55)	1,239.54	(1,229.32-1,249.76)	1,533.36	(1,476.36-1,590.35)
08.08.2020-04.09.2020	2,403.74	(2,393.44-2,414.05)	2,069.92	(2,032.15-2,107.68)	2,429.11	(2,414.34-2,443.89)	2,063.15	(2,005.00-2,121.31)	2,381.54	(2,367.15-2,395.93)	2,105.73	(2,054.41-2,157.05)
05.09.2020-02.10.2020	2,944.07	(2,932.72-2,955.42)	2,832.69	(2,788.65-2,876.73)	2,959.17	(2,942.94-2,975.41)	2,839.62	(2,773.31-2,905.93)	2,932.95	(2,917.05-2,948.86)	2,861.40	(2,800.15-2,922.65)
03.10.2020-30.10.2020	4,723.14	(4,708.71-4,737.58)	3,837.66	(3,789.54-3,885.77)	4,792.20	(4,771.45-4,812.95)	3,934.24	(3,861.76-4,006.73)	4,663.17	(4,643.05-4,683.29)	3,806.05	(3,738.04-3,874.06)
31.10.2020-27.11.2020	5,011.68	(4,996.84-5,026.51)	4,115.37	(4,065.22-4,165.52)	4,958.52	(4,937.48-4,979.56)	4,389.74	(4,311.80-4,467.68)	5,068.23	(5,047.28-5,089.19)	3,917.58	(3,850.48-3,984.68)
28.11.2020-01.01.2021	3,017.23	(3,005.72-3,028.74)	3,137.47	(3,093.05-3,181.89)	3,005.22	(2,988.84-3,021.60)	3,655.68	(3,584.50-3,726.86)	3,031.29	(3,015.09-3,047.48)	2,723.83	(2,666.28-2,781.39)
02.01.2021-29.01.2021	4,682.56	(4,668.27-4,696.85)	4,035.03	(3,980.03-4,090.03)	4,356.07	(4,336.41-4,375.73)	4,143.59	(4,061.32-4,225.86)	5,003.25	(4,982.52-5,023.97)	4,014.01	(3,936.69-4,091.32)
30.01.2021-26.02.2021	4,721.93	(4,707.53-4,736.34)	3,992.72	(3,939.83-4,045.6)	4,708.80	(4,688.28-4,729.31)	4,181.00	(4,101.10-4,260.89)	4,739.35	(4,719.09-4,759.61)	3,887.67	(3,814.39-3,960.94)
27.02.2021-26.03.2021	6,291.88	(6,275.24-6,308.52)	4,855.23	(4,800.59-4,909.88)	6,353.75	(6,329.91-6,377.60)	5,119.70	(5,035.99-5,203.40)	6,236.14	(6,212.89-6,259.39)	4,669.77	(4,595.52-4,744.01)
27.03.2021-23.04.2021	3,774.91	(3,762.04-3,787.78)	3,714.44	(3,664.69-3,764.18)	3,813.62	(3,795.17-3,832.08)	3,837.69	(3,763.14-3,912.23)	3,739.32	(3,721.34-3,757.29)	3,623.29	(3,554.26-3,692.31)
24.04.2021-21.05.2021	3,762.42	(3,749.55-3,775.29)	3,664.94	(3,616.60-3,713.28)	3,773.16	(3,754.77-3,791.55)	3,640.22	(3,568.52-3,711.91)	3,755.63	(3,737.59-3,773.67)	3,699.88	(3,633.05-3,766.70)
22.05.2021-18.06.2021	2,637.42	(2,626.65-2,648.19)	3,041.55	(2,996.28-3,086.82)	2,670.61	(2,655.14-2,686.07)	2,791.08	(2,726.44-2,855.72)	2,607.15	(2,592.12-2,622.18)	3,259.00	(3,194.79-3,323.22)
19.06.2021-16.07.2021	2,370.84	(2,360.60-2,381.07)	3,313.41	(3,265.43-3,361.39)	2,396.90	(2,382.21-2,411.60)	3,127.39	(3,058.90-3,195.88)	2,346.51	(2,332.24-2,360.78)	3,492.22	(3,423.18-3,561.25)

Follows →

Table 1. Age-standardized rates (per 100,000 residents) and 95% confidence interval of access to nasal swab in Piedmont, Lombardy, Veneto, Emilia-Romagna, Tuscany, and Lazio Regions, separated by gender and migrant status.
Tabella 1. Tassi standardizzati per età (per 100.000 abitanti) e intervalli di confidenza al 95% dell'accesso ai tamponi nasali in Piemonte, Lombardia, Veneto, Emilia-Romagna, Toscana e Lazio, per genere e origine.

PANDEMIC PERIODS	MALES AND FEMALES				MALES				FEMALES			
	ITALIANS		FOREIGNERS		ITALIANS		FOREIGNERS		ITALIANS		FOREIGNERS	
	Std rate	(95% CI)	Std rate	(95% CI)	Std rate	(95% CI)	Std rate	(95% CI)	Std rate	(95% CI)	Std rate	(95% CI)
VENETO												
22.02.2020-20.03.2020	1,167.21	(1,157.04-1,177.38)	470.94	(438.99-502.90)	946.53	(933.53-959.52)	461.24	(410.62-511.86)	1,384.65	(1,369.03-1,400.27)	497.04	(452.46-541.63)
21.03.2020-17.04.2020	3,483.54	(3,466.02-3,501.07)	1,656.58	(1,597.65-1,715.51)	2,457.79	(2,436.88-2,478.70)	1,216.58	(1,143.13-1,290.02)	4,487.94	(4,459.94-4,515.93)	2,058.49	(1,964.02-2,152.95)
18.04.2020-15.05.2020	4,941.74	(4,920.95-4,962.52)	2,499.17	(2,421.47-2,576.86)	3,503.10	(3,478.21-3,527.99)	1,831.29	(1,734.82-1,927.75)	6,342.99	(6,309.88-6,376.11)	3,096.18	(2,971.85-3,220.51)
16.05.2020-12.06.2020	5,379.49	(5,357.82-5,401.17)	2,892.55	(2,802.56-2,982.53)	3,716.69	(3,691.09-3,742.29)	1,980.22	(1,872.92-2,087.51)	6,997.85	(6,963.08-7,032.62)	3,726.47	(3,578.74-3,874.20)
13.06.2020-10.07.2020	4,834.98	(4,814.48-4,855.48)	2,999.99	(2,910.48-3,089.50)	3,323.02	(3,298.86-3,347.18)	2,106.38	(1,995.07-2,217.68)	6,303.62	(6,270.70-6,336.54)	3,805.35	(3,661.09-3,949.61)
11.07.2020-07.08.2020	4,406.60	(4,387.01-4,426.19)	3,811.45	(3,709.55-3,913.35)	3,186.69	(3,162.99-3,210.40)	3,125.72	(2,997.06-3,254.38)	5,589.28	(5,558.30-5,620.27)	4,434.90	(4,274.39-4,595.42)
08.08.2020-04.09.2020	5,939.72	(5,916.83-5,962.61)	5,305.47	(5,197.55-5,413.39)	4,854.88	(4,825.34-4,884.42)	4,800.90	(4,654.17-4,947.62)	6,993.85	(6,959.02-7,028.69)	5,798.08	(5,634.94-5,961.23)
05.09.2020-02.10.2020	6,184.53	(6,161.15-6,207.90)	5,197.01	(5,086.05-5,307.98)	5,067.13	(5,036.92-5,097.34)	4,691.43	(4,541.09-4,841.76)	7,272.05	(7,236.51-7,307.59)	5,694.62	(5,524.08-5,865.17)
03.10.2020-30.10.2020	10,941.34	(10,910.19-10,972.50)	7,150.65	(7,040.99-7,260.31)	9,547.35	(9,505.75-9,588.94)	6,828.14	(6,673.73-6,982.54)	12,306.88	(12,260.57-12,353.19)	7,475.71	(7,312.28-7,639.14)
31.10.2020-27.11.2020	17,441.08	(17,401.70-17,480.46)	10,147.51	(10,023.72-10,271.31)	14,860.01	(14,808.09-14,911.93)	9,140.90	(8,964.04-9,317.75)	19,968.09	(19,909.00-20,027.18)	11,072.14	(10,891.99-11,252.29)
28.11.2020-01.01.2021	22,514.71	(22,469.94-22,559.48)	13,174.93	(13,030.63-13,319.23)	19,266.84	(19,207.71-19,325.97)	11,637.67	(11,438.72-11,836.63)	25,700.82	(25,633.72-25,767.92)	14,564.72	(14,349.73-14,779.70)
02.01.2021-29.01.2021	13,738.09	(13,703.13-13,773.06)	8,330.35	(8,214.21-8,446.49)	11,306.61	(11,261.37-11,351.85)	7,429.47	(7,262.33-7,596.60)	16,125.15	(16,071.97-16,178.34)	9,174.03	(9,005.12-9,342.93)
30.01.2021-26.02.2021	12,642.60	(12,609.02-12,676.18)	8,151.23	(8,036.53-8,265.93)	10,542.49	(10,498.76-10,586.21)	7,349.63	(7,179.27-7,519.99)	14,710.38	(14,659.51-14,761.25)	8,910.30	(8,749.06-9,071.54)
27.02.2021-26.03.2021	15,591.41	(15,554.11-15,628.71)	9,847.06	(9,725.11-9,969.02)	13,611.43	(13,561.73-13,661.14)	9,176.19	(8,994.90-9,357.48)	17,543.20	(17,487.65-17,598.76)	10,510.35	(10,338.95-10,681.74)
27.03.2021-23.04.2021	12,214.61	(12,181.65-12,247.56)	10,301.58	(10,126.39-10,476.77)	10,439.52	(10,396.08-10,482.96)	9,402.11	(9,166.72-9,637.51)	13,959.97	(13,910.49-14,009.45)	11,230.99	(10,963.91-11,498.07)
24.04.2021-21.05.2021	12,143.19	(12,110.29-12,176.08)	10,858.18	(10,678.96-11,037.41)	10,464.48	(10,420.91-10,508.05)	10,163.78	(9,918.02-10,409.53)	13,792.87	(13,743.65-13,842.08)	11,647.52	(11,377.62-11,917.43)
22.05.2021-18.06.2021	9,607.95	(9,578.68-9,637.23)	8,849.90	(8,667.94-9,031.86)	8,103.15	(8,064.81-8,141.50)	7,592.23	(7,356.20-7,828.26)	11,085.16	(11,041.03-11,129.30)	10,093.41	(9,809.80-10,377.03)
19.06.2021-16.07.2021	10,122.75	(10,092.66-10,152.85)	9,618.33	(9,423.12-9,813.53)	8,995.73	(8,955.23-9,036.24)	8,684.56	(8,424.79-8,944.33)	11,226.43	(11,182.00-11,270.87)	10,584.03	(10,287.20-10,880.87)
EMILIA-ROMAGNA												
22.02.2020-20.03.2020	182.12	(169.93-194.32)	167.69	(79.86-255.52)	195.25	(177.40-213.11)	89.87	(30.93-148.82)	168.54	(151.96-185.12)	250.80	(82.03-419.57)
21.03.2020-17.04.2020	875.55	(848.72-902.38)	385.00	(326.55-443.46)	778.68	(742.68-814.69)	560.44	(427.61-693.28)	969.02	(929.35-1,008.68)	298.61	(241.57-355.65)
18.04.2020-15.05.2020	1,319.65	(1,286.60-1,352.70)	659.76	(585.75-733.77)	1,214.15	(1,169.06-1,259.23)	1,076.10	(901.40-1,250.81)	1,421.45	(1,373.22-1,469.68)	446.39	(368.06-524.71)
16.05.2020-12.06.2020	1,176.66	(1,145.49-1,207.82)	671.27	(574.00-768.54)	1,038.55	(996.88-1,080.21)	962.10	(771.44-1,152.75)	1,310.19	(1,263.97-1,356.40)	543.07	(423.84-662.31)
13.06.2020-10.07.2020	1,102.36	(1,072.08-1,132.63)	736.15	(603.13-869.17)	986.88	(946.24-1,027.53)	1,130.74	(861.09-1,400.39)	1,214.02	(1,169.28-1,258.77)	469.12	(396.81-541.42)
11.07.2020-07.08.2020	1,427.96	(1,393.43-1,462.5)	2,347.07	(2,195.45-2,498.69)	1,566.40	(1,514.88-1,617.91)	2,028.86	(1,778.38-2,279.34)	1,290.41	(1,244.32-1,336.49)	2,835.28	(2,609.46-3,061.10)
08.08.2020-04.09.2020	2,067.88	(2,026.15-2,109.61)	2,179.32	(2,017.30-2,341.34)	2,164.29	(2,103.38-2,225.20)	2,908.64	(2,587.82-3,229.46)	1,974.98	(1,917.78-2,032.18)	1,858.01	(1,677.09-2,038.94)
05.09.2020-02.10.2020	2,457.64	(2,412.28-2,503.00)	2,920.19	(2,720.27-3,120.11)	2,296.00	(2,233.54-2,358.46)	4,743.42	(4,325.11-5,161.74)	2,618.52	(2,552.72-2,684.32)	1,988.12	(1,769.58-2,206.65)
03.10.2020-30.10.2020	3,297.91	(3,245.53-3,350.29)	2,732.46	(2,555.94-2,908.98)	3,311.49	(3,236.68-3,386.31)	3,742.06	(3,385.96-4,098.16)	3,289.64	(3,216.14-3,363.14)	2,330.43	(2,120.88-2,539.98)
31.10.2020-27.11.2020	4,733.29	(4,670.57-4,796.02)	2,968.80	(2,789.59-3,148.02)	4,510.80	(4,423.56-4,598.03)	4,214.83	(3,832.59-4,597.06)	4,954.17	(4,864.00-5,044.34)	2,330.70	(2,148.48-2,512.93)
28.11.2020-01.01.2021	5,715.33	(5,646.74-5,783.91)	4,111.19	(3,917.41-4,304.97)	5,385.55	(5,290.76-5,480.35)	5,654.97	(5,256.98-6,052.95)	6,040.67	(5,941.56-6,139.78)	3,287.64	(3,078.81-3,496.47)
02.01.2021-29.01.2021	3,637.57	(3,582.80-3,692.34)	2,622.82	(2,458.57-2,787.07)	3,552.50	(3,475.42-3,629.59)	2,841.34	(2,571.23-3,111.45)	3,722.47	(3,644.61-3,800.33)	2,510.53	(2,286.08-2,734.99)
30.01.2021-26.02.2021	4,809.39	(4,746.51-4,872.28)	3,215.64	(3,036.11-3,395.18)	4,775.36	(4,686.11-4,864.61)	3,306.34	(3,023.01-3,589.67)	4,847.08	(4,758.35-4,935.81)	3,188.18	(2,939.56-3,436.81)
27.02.2021-26.03.2021	5,896.01	(5,826.10-5,965.92)	3,819.67	(3,628.40-4,010.94)	5,874.68	(5,775.25-5,974.11)	3,982.01	(3,673.98-4,290.04)	5,919.89	(5,821.50-6,018.29)	3,742.34	(3,480.87-4,003.81)
27.03.2021-23.04.2021	4,146.90	(4,088.32-4,205.49)	3,985.03	(3,775.80-4,194.27)	4,069.94	(3,987.31-4,152.57)	4,317.80	(3,971.74-4,663.86)	4,223.32	(4,140.22-4,306.43)	3,859.28	(3,562.94-4,155.61)
24.04.2021-21.05.2021	3,465.74	(3,412.52-3,518.97)	3,142.83	(2,960.66-3,325.00)	3,408.19	(3,332.95-3,483.44)	3,085.12	(2,824.54-3,345.70)	3,526.16	(3,450.75-3,601.56)	3,222.32	(2,951.30-3,493.34)
22.05.2021-18.06.2021	1,506.44	(1,471.17-1,541.72)	1,571.73	(1,416.83-1,726.64)	1,477.15	(1,427.47-1,526.83)	1,506.56	(1,275.13-1,738.00)	1,534.43	(1,484.36-1,584.49)	1,654.45	(1,433.10-1,875.80)
19.06.2021-16.07.2021	1,082.01	(1,052.03-1,111.98)	1,377.26	(1,232.00-1,522.52)	1,068.85	(1,026.49-1,111.20)	1,304.07	(1,103.06-1,505.07)	1,093.35	(1,050.97-1,135.73)	1,444.68	(1,226.62-1,662.74)

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Table 1. Age-standardized rates (per 100,000 residents) and 95% confidence interval of access to nasal swab in Piedmont, Lombardy, Veneto, Emilia-Romagna, Tuscany, and Lazio Regions, separated by gender and migrant status.
Tabella 1. Tassi standardizzati per età (per 100.000 abitanti) e intervalli di confidenza al 95% dell'accesso ai tamponi nasali in Piemonte, Lombardia, Veneto, Emilia-Romagna, Toscana e Lazio, per genere e origine.

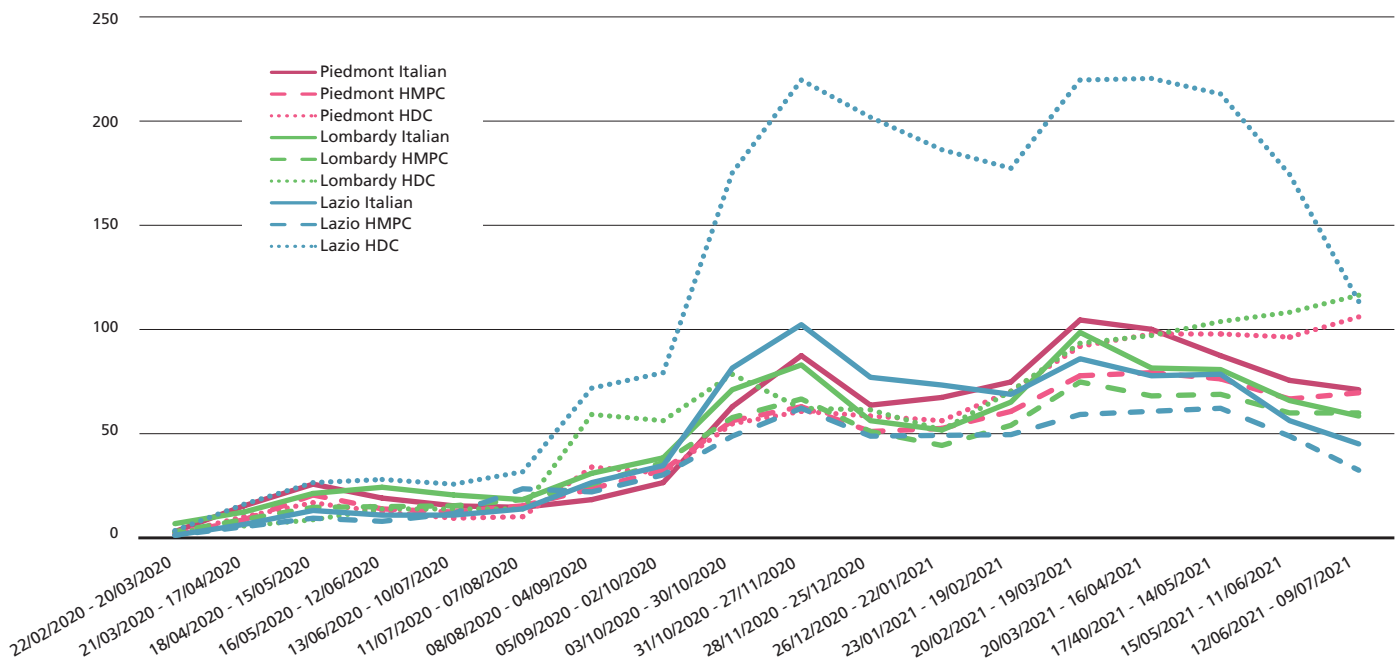
PANDEMIC PERIODS	MALES AND FEMALES				MALES				FEMALES			
	ITALIANS		FOREIGNERS		ITALIANS		FOREIGNERS		ITALIANS		FOREIGNERS	
	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)	Std rate	(95%CI)
TUSCANY												
22.02.2020-20.03.2020	248.23	(242.85-253.61)	140.19	(119.82-160.56)	236.81	(229.35-244.27)	150.55	(122.17-178.94)	258.71	(250.99-266.44)	136.89	(107.16-166.62)
21.03.2020-17.04.2020	1,799.28	(1,784.84-1,813.72)	915.21	(869.71-960.71)	1,414.69	(1,396.53-1,432.85)	736.43	(673.54-799.33)	2,164.55	(2,142.30-2,186.80)	1,100.55	(1,031.33-1,169.77)
18.04.2020-15.05.2020	2,135.53	(2,119.81-2,151.24)	1,290.36	(1,236.67-1,344.05)	1,791.91	(1,771.49-1,812.33)	1,035.14	(966.27-1,104.02)	2,460.83	(2,437.11-2,484.55)	1,556.43	(1,470.75-1,642.11)
16.05.2020-12.06.2020	2,046.01	(2,030.72-2,061.29)	1,413.11	(1,354.42-1,471.80)	1,860.37	(1,839.68-1,881.07)	1,194.86	(1,117.55-1,272.16)	2,220.30	(2,197.91-2,242.69)	1,659.45	(1,568.58-1,750.33)
13.06.2020-10.07.2020	1,821.30	(1,807.02-1,835.58)	1,455.90	(1,392.06-1,519.75)	1,715.27	(1,695.56-1,734.97)	1,219.37	(1,138.88-1,299.86)	1,919.89	(1,899.30-1,940.49)	1,726.06	(1,623.60-1,828.53)
11.07.2020-07.08.2020	1,740.34	(1,726.34-1,754.34)	1,915.94	(1,844.82-1,987.07)	1,681.14	(1,661.55-1,700.72)	1,893.67	(1,795.52-1,991.81)	1,793.99	(1,774.03-1,813.94)	2,017.65	(1,909.94-2,125.37)
08.08.2020-04.09.2020	3,028.89	(3,009.88-3,047.90)	2,842.53	(2,765.05-2,920.01)	3,034.21	(3,006.95-3,061.46)	2,869.70	(2,758.70-2,980.71)	3,021.76	(2,995.24-3,048.28)	2,901.98	(2,787.87-3,016.08)
05.09.2020-02.10.2020	4,339.95	(4,317.20-4,362.70)	4,410.31	(4,322.22-4,498.40)	4,321.59	(4,289.08-4,354.10)	4,752.76	(4,619.28-4,886.24)	4,354.68	(4,322.84-4,386.52)	4,253.41	(4,129.46-4,377.36)
03.10.2020-30.10.2020	8,551.98	(8,519.67-8,584.29)	6,123.16	(6,024.72-6,221.60)	8,450.44	(8,404.41-8,496.47)	6,778.90	(6,627.38-6,930.43)	8,646.55	(8,601.21-8,691.90)	5,799.29	(5,661.20-5,937.38)
31.10.2020-27.11.2020	10,556.55	(10,520.68-10,592.42)	6,631.55	(6,528.64-6,734.46)	9,911.57	(9,861.74-9,961.39)	6,956.45	(6,802.49-7,110.40)	11,168.38	(11,116.89-11,219.88)	6,527.42	(6,381.71-6,673.14)
28.11.2020-01.01.2021	8,703.67	(8,671.27-8,736.07)	5,984.63	(5,883.42-6,085.85)	7,633.73	(7,590.27-7,677.18)	5,858.47	(5,716.87-6,000.07)	9,721.02	(9,673.19-9,768.85)	6,269.25	(6,115.42-6,423.07)
02.01.2021-29.01.2021	7,825.27	(7,794.64-7,855.90)	5,401.36	(5,303.39-5,499.33)	6,893.53	(6,852.35-6,934.71)	5,190.47	(5,055.51-5,325.43)	8,712.15	(8,667.01-8,757.30)	5,761.60	(5,609.75-5,913.45)
30.01.2021-26.02.2021	11,303.82	(11,266.83-11,340.81)	7,121.51	(7,009.84-7,233.18)	10,410.86	(10,359.99-10,461.74)	7,078.80	(6,919.18-7,238.42)	12,154.41	(12,100.86-12,207.96)	7,341.10	(7,175.36-7,506.84)
27.02.2021-26.03.2021	14,376.84	(14,335.01-14,418.67)	8,441.98	(8,322.78-8,561.18)	13,518.80	(13,460.63-13,576.97)	8,320.36	(8,151.21-8,489.51)	15,192.94	(15,132.92-15,252.95)	8,741.00	(8,564.51-8,917.49)
27.03.2021-23.04.2021	13,741.96	(13,701.03-13,782.88)	8,788.51	(8,668.68-8,908.35)	12,903.73	(12,846.86-12,960.59)	8,656.62	(8,483.01-8,830.22)	14,538.72	(14,479.98-14,597.46)	9,066.07	(8,893.70-9,238.43)
24.04.2021-21.05.2021	13,239.47	(13,199.22-13,279.72)	8,964.08	(8,846.88-9,081.28)	12,393.07	(12,337.24-12,448.89)	8,833.50	(8,662.24-9,004.76)	14,043.01	(13,985.14-14,100.88)	9,302.95	(9,133.19-9,472.70)
22.05.2021-18.06.2021	9,499.18	(9,465.20-9,533.16)	7,028.48	(6,918.67-7,138.28)	8,968.44	(8,921.09-9,015.79)	6,583.66	(6,428.72-6,738.61)	10,002.49	(9,953.86-10,051.13)	7,586.78	(7,422.88-7,750.69)
19.06.2021-16.07.2021	7,259.21	(7,229.50-7,288.92)	5,586.48	(5,486.27-5,686.69)	6,735.07	(6,694.03-6,776.11)	5,111.05	(4,971.14-5,250.96)	7,755.35	(7,712.51-7,798.19)	6,119.66	(5,970.07-6,269.25)
LAZIO												
22.02.2020-20.03.2020	97.50	(94.76-100.24)	74.13	(65.30-82.95)	106.25	(102.16-110.34)	82.30	(67.31-97.30)	89.05	(85.39-92.71)	71.52	(60.10-82.94)
21.03.2020-17.04.2020	642.60	(635.54-649.65)	422.85	(403.45-442.26)	575.87	(566.30-585.44)	417.04	(385.77-448.31)	704.90	(694.59-715.21)	439.46	(413.06-465.86)
18.04.2020-15.05.2020	1,313.99	(1,303.90-1,324.07)	846.96	(818.92-875.00)	1,138.48	(1,125.03-1,151.93)	793.59	(749.71-837.47)	1,478.86	(1,463.93-1,493.78)	901.23	(862.76-939.70)
16.05.2020-12.06.2020	1,099.65	(1,090.46-1,108.84)	950.99	(917.49-984.48)	1,044.28	(1,031.46-1,057.09)	988.44	(934.96-1,041.92)	1,150.71	(1,137.59-1,163.83)	947.66	(902.58-992.73)
13.06.2020-10.07.2020	1,096.63	(1,087.48-1,105.78)	1,359.86	(1,320.09-1,399.64)	1,077.68	(1,064.70-1,090.66)	1,637.22	(1,572.41-1,702.02)	1,113.15	(1,100.27-1,126.02)	1,167.19	(1,115.34-1,219.04)
11.07.2020-07.08.2020	1,346.55	(1,336.42-1,356.68)	2,482.96	(2,429.59-2,536.33)	1,343.48	(1,329.01-1,357.96)	3,169.01	(3,081.79-3,256.22)	1,347.27	(1,333.11-1,361.43)	1,969.75	(1,901.30-2,038.21)
08.08.2020-04.09.2020	2,722.02	(2,707.42-2,736.62)	2,726.81	(2,671.36-2,782.25)	2,774.66	(2,753.50-2,795.82)	2,949.52	(2,859.40-3,039.64)	2,670.13	(2,649.99-2,690.27)	2,597.43	(2,525.31-2,669.54)
05.09.2020-02.10.2020	3,459.43	(3,443.09-3,475.77)	3,597.04	(3,533.62-3,660.45)	3,429.73	(3,406.42-3,453.05)	3,877.33	(3,774.82-3,979.84)	3,483.89	(3,461.01-3,506.77)	3,458.69	(3,375.36-3,542.03)
03.10.2020-30.10.2020	8,281.68	(8,256.32-8,307.04)	5,989.86	(5,909.26-6,070.46)	8,237.29	(8,201.00-8,273.58)	6,461.31	(6,332.99-6,589.63)	8,317.01	(8,281.58-8,352.43)	5,684.71	(5,578.96-5,790.47)
31.10.2020-27.11.2020	10,420.43	(10,391.98-10,448.89)	7,136.19	(7,052.41-7,219.96)	10,165.13	(10,124.79-10,205.46)	7,510.43	(7,377.19-7,643.67)	10,654.88	(10,614.78-10,694.98)	6,900.34	(6,789.81-7,010.86)
28.11.2020-01.01.2021	9,440.31	(9,413.19-9,467.43)	7,053.18	(6,970.00-7,136.35)	8,979.64	(8,941.69-9,017.58)	7,343.08	(7,209.38-7,476.77)	9,867.10	(9,828.45-9,905.75)	6,908.46	(6,799.34-7,017.58)
02.01.2021-29.01.2021	7,609.65	(7,585.30-7,633.99)	6,047.66	(5,971.78-6,123.53)	7,310.99	(7,276.75-7,345.22)	6,578.29	(6,454.37-6,702.21)	7,885.46	(7,850.91-7,920.01)	5,687.07	(5,589.34-5,784.80)
30.01.2021-26.02.2021	7,174.43	(7,150.84-7,198.02)	5,945.73	(5,869.72-6,021.74)	6,980.18	(6,946.82-7,013.55)	6,523.21	(6,398.71-6,647.71)	7,351.99	(7,318.69-7,385.29)	5,579.29	(5,481.15-5,677.43)
27.02.2021-26.03.2021	8,805.53	(8,779.38-8,831.68)	7,089.17	(7,005.89-7,172.45)	8,725.47	(8,688.11-8,762.83)	7,630.00	(7,495.60-7,764.40)	8,875.26	(8,838.66-8,911.85)	6,746.12	(6,637.77-6,854.47)
27.03.2021-23.04.2021	7,848.30	(7,823.56-7,873.03)	6,829.72	(6,749.37-6,910.08)	7,738.31	(7,703.07-7,773.56)	7,296.50	(7,166.76-7,426.24)	7,946.00	(7,911.31-7,980.68)	6,537.43	(6,432.73-6,642.14)
24.04.2021-21.05.2021	7,670.29	(7,645.90-7,694.68)	7,233.01	(7,147.79-7,318.24)	7,490.49	(7,455.92-7,525.06)	7,743.01	(7,606.18-7,879.84)	7,833.72	(7,799.35-7,868.09)	6,921.10	(6,809.40-7,032.80)
22.05.2021-18.06.2021	5,310.68	(5,290.34-5,331.02)	5,839.21	(5,763.56-5,914.86)	5,257.74	(5,228.70-5,286.77)	6,188.74	(6,066.64-6,310.83)	5,356.09	(5,327.61-5,384.57)	5,661.52	(5,562.04-5,761.00)
19.06.2021-16.07.2021	4,536.75	(4,517.93-4,555.58)	5,255.12	(5,182.43-5,327.81)	4,472.72	(4,445.90-4,499.54)	5,475.64	(5,358.95-5,592.34)	4,592.58	(4,566.18-4,618.98)	5,159.24	(5,063.71-5,254.76)

Table 1. Age-standardized rates (per 100,000 residents) and 95% confidence interval of access to nasal swab in Piedmont, Lombardy, Veneto, Emilia-Romagna, Tuscany, and Lazio Regions, separated by gender and migrant status.
Tabella 1. Tassi standardizzati per età (per 100.000 abitanti) e intervalli di confidenza al 95% dell'accesso ai tamponi nasali in Piemonte, Lombardia, Veneto, Emilia-Romagna, Toscana e Lazio, per genere e origine.

PERIOD	LAZIO			LOMBARDY			PIEDMONT		
	ITALIAN	HMPC	HDC	ITALIAN	HMPC	HDC	ITALIAN	HMPC	HDC
ALL									
February-May 2020	25.9	18.3	58.1	52.6	32.7	22.7	54.2	37.8	34.2
June-September 2020	91.1	90.0	220.5	117.6	101.4	147.9	81.7	87.1	88.3
October 2020-January 2021	352.7	218.8	818.7	274.6	229.4	264.3	296.6	235.1	243.2
February-April 2021	256.8	185.6	674.9	268.4	216.0	295.2	301.5	237.3	288.8
May-June 2021	151.2	110.3	387.8	148.4	137.1	246.6	171.5	155.7	225.9
MALES									
February-May 2020	23.5	14.6	59.7	44.4	21.8	17.8	40.5	23.2	24.9
June-September 2020	91.3	89.4	233.1	114.2	89.7	132.0	74.9	68.2	67.9
October 2020-January 2021	343.3	195.1	841.8	254.7	213.0	260.4	240.6	173.8	194.8
February-April 2021	253.2	167.6	714.9	257.6	200.8	295.1	258.7	183.0	250.0
May-June 2021	149.3	98.1	391.6	142.2	117.4	234.1	146.0	115.6	192.4
FEMALES									
February-May 2020	28.2	22.2	57.1	60.6	43.4	26.3	67.2	51.7	40.8
June-September 2020	90.9	90.6	212.1	120.9	112.8	159.4	88.2	104.9	103.1
October 2020-January 2021	361.5	241.5	803.4	293.7	245.5	267.1	349.7	292.9	278.2
February-April 2021	260.2	202.9	648.4	278.8	230.8	295.1	342.2	288.5	316.8
May-June 2021	152.9	122.0	385.3	154.3	156.5	255.5	195.7	193.5	250.1

HMPC: foreigners from High Migratory Pressure Countries / stranieri provenienti da Paesi a forte pressione migratoria
 HDC: foreigners from Highly Developed Countries / stranieri provenienti da Paesi a sviluppo avanzato

Table 2. Proportion of subjects who have performed at least one nasal swab (per 1,000 residents), per Region and per origin, stratified by gender.
Tabella 2. Proporzioe di soggetti che hanno fatto almeno un tampone nasale (per 1000 abitanti), per Regione e per origine stratificata per genere.



HMPC: foreigners from High Migratory Pressure Countries / stranieri provenienti da Paesi a forte pressione migratoria
 HDC: foreigners from Highly Developed Countries / stranieri provenienti da Paesi a sviluppo avanzato

Figure 1. Proportion of subjects who have performed at least one nasal swab (per 1,000 residents), per Region and origin.
Figura 1. Proporzioe di soggetti che hanno ricevuto almeno un tampone nasale (per 1.000 residenti), separati per Regione e origine.

In Table 2, the proportion of nasal swabs was analysed dividing the foreign population in two different categories according to the country of origin (HMPCs and HDCs). Several interesting results could be observed: subjects coming from HMPCs have equal or less probability to access to a nasal swab across all the period and in all Regions. However, especially in Lazio and Lombardy, those coming from HDC are the group with the higher proportion of nasal swabs performed. It could be visualized better in Figure 1, where the results by 4-week periods were presented. This result is consistent when stratifying by gender; in fact, both men and women from HDC have higher rates of nasal swabs than their counterparts from HMPC and Italy (Table 2).

DISCUSSION

In this study, the main characteristics of the distribution of access to nasal swabs in six Italian Regions were described, focusing on the migration status and the gender of the participants. This enables the collaboration of epidemiological teams from six different Italian Regions, allowing us to cover more than 55% of the Italian population. Data used came from the national COVID-19 surveillance system, which was established very early in the pandemic, on 27.02.2020.

During the first wave, the availability of tests to detect COVID-19 was much scarcer than in the rest of the periods, which is why most tests were prioritized and therefore carried out on health personnel, or workers and residents of nursing homes. This could be the reason why during this period it was observed a higher number of nasal swabs performed on natives, compared with the second wave, as Italians are more represented within these professions.¹⁸ From most Regions and nationalities, a higher rate of performed tests was observed on women. This difference coincides with the literature, in most studies women had higher rates of infection.^{19,20} This fact could be explained by the greater exposure to the virus in highly feminized groups, such as personnel of the nursing homes.

In the following periods, it seems that migrants and natives have similar access to nasal swabs, consistently in any Region or period, and the period differences in migrants follows the pandemic trend. However, considering the results in subjects belonging to HPMCs, it was observed that foreigners from these countries had in almost all period a slightly lower access to nasal swabs than Italians. This result may be explained by socioeconomic reasons. In fact, those subjects more frequently belonged to lower socioeconomic positions in the society and several studies observed a socioeconomic disparity in access to SARS-CoV-2 diagnostic tests.^{21,22}

Nonetheless, the most interesting results is that people coming from HDCs had a strong higher chance of getting a nasal swab, consistent during all the analysed periods. This result is particularly evident in Lazio and Lom-

bardy. This phenomenon could be explained considering that the regional platforms registered the nasal swabs without considering if the subject is resident in Italy or not. The COVID-19 rules of all governments asked for a molecular test to those that moved among different countries. People from HDCs tend to travel much more, both for work and for pleasure, explaining in a great part the positive difference in testing rates, that is more evident in those Regions where the two main Italian business cities (Rome and Milan) are located.

STRENGTHS AND LIMITATIONS

It was used reliable data over a long period of time, which allowed to analyse the different waves of the pandemic. The data were reported weekly, but collected daily.

The national COVID-19 surveillance system does not provide information on socioeconomic position, but to overcome this limitation the analysis of the country of origin was performed in a deeper way. This is fundamental when studying migrant populations.^{23,24}

The main limitation was that the age-standardized rates for the HDCs and HMPCs analysis could not be provided; this type of analysis could bring a better understanding of the differences shown in these groups.

Another limitation of the study is that the data regarding the country of origin were aggregated. There are 195 different nationalities in Italy²⁵ and, due to sparse number, only three categories could be considered: natives, immigrants from countries with high migratory pressure, and from highly developed countries. This limitation prevents from studying individual countries situation, which would be interesting to perform in other studies. Also the difference between natives and second or third generation of migrants – that could have different social and health related characteristics – could not be made. Moreover, it would be interesting to observe differences by socioeconomic position, information that is not available in the database used for this study.

CONCLUSIONS

During the first wave of the pandemic, Italians have had a higher proportion of nasal swabs compared to migrants across all Regions. This difference disappeared in the following periods, probably due to a major availability of diagnostic tests. When the countries of origin were broken down into highly developed countries and countries with strong migratory pressure, these differences were not seen for the former, which in fact have a higher proportion of tests than the natives. This is consistent when stratifying by gender.

These data show that, in order to understand the differences between local and migrant populations, it is important to deepen analyses that take into account disaggregated data and as many socioeconomic variables as possible.

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