


# Non-attendance in cervical cancer screening among migrant women in Portugal: A cross-sectional study

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## Abstract

**Objectives:** Cervical cancer has a high mortality rate among women worldwide. Although cervical cancer screening (CCS) is an effective strategy in reducing mortality of the disease, inequalities in accessing screening exist, particularly among migrant women. This study aims to characterize migrant women's participation in CCS and determine factors associated with non-attendance to CCS.

**Methods:** A cross-sectional study based on a web-based survey targeting adult migrant women living in Portugal was conducted. Prevalence of non-attendance to CCS was examined, and its associations with socioeconomic, migration-related, and health-related factors were determined using adjusted logistic regression models.

**Results:** A total of 1100 migrant women were included in the study. Prevalence of CCS non-attendance was 24.5%. CCS non-attendance was associated with younger age, being born in Africa or Asia, being single/divorced/widowed, never having had a GP appointment in Portugal and not having regular gynecology appointments. Being born in South and Central America, shorter length of stay in Portugal, having had HPV vaccination, and not having children are associated with CCS attendance.

**Conclusion:** These findings point out that an important percentage of migrant women do not attend CCS. Strategies to increase participation should be developed, considering the inequalities identified and designed to target the specific needs of migrant women to improve their CCS attendance and increase cervical cancer prevention.

## Keywords

early detection of cancer, emigrants and immigrants, reproductive health, transients and migrants, uterine cervical neoplasms, women's health

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## Introduction

Cervical cancer has the second highest cancer incidence and mortality among women of reproductive age worldwide.<sup>1</sup> This disease originates from a persistent HPV infection.<sup>2,3</sup> Its geographic distribution is uneven, with prevalence and mortality being higher in low and middle income countries (LMIC) compared with high income countries.<sup>4</sup>

Evidence suggests that the cervical cancer screening (CCS) is an effective strategy to reduce mortality from cervical cancer.<sup>3,5–7</sup> CCS is a program that consists in collecting a sample from the cervix for early identification of HPV infection or abnormal cells and referring women with

positive screening tests to secondary care, allowing for a timely and adequate diagnosis and treatment. CCS is performed by a health professional in an opportunistic

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manner or in organized screening programs.<sup>3,5,7</sup> However, inequities in CCS exist, particularly among migrant women. When compared to native women, migrant women have lower CCS uptake,<sup>5,8</sup> increasing their risk of developing serious disease and, ultimately, the mortality from cervical cancer.

In the past few decades, the number of international migrants in Europe has been increasing,<sup>9,10</sup> and in 2020, 51.6% of the migrant population in the region was female.<sup>9</sup> In Portugal, in 2019, the foreign population represented 10.8% of the total population residing in the country, among which approximately 50% were women. Migrants in Portugal are mainly from Brazil, Eastern Europe, Portuguese-speaking African countries and China,<sup>11,12</sup> where incidence and mortality rates for cervical cancer are high.<sup>4</sup>

Portugal has a population-based CCS program implemented that covers all the regions of the country, except for Madeira Autonomous Region. There are variations in the CCS program specificities across regions in terms of primary screening test (HPV test, liquid-based cytology, or conventional cytology), periodicity (every 3 or every 5 years), and target age groups (women aged 25–60, 25–64 or 30–65 years old).<sup>13</sup> Non-attendance in CCS programs is around 22%<sup>14</sup> in Portugal; on the other hand, according to a study that included both organized as well as opportunistic screening showed that non-attendance is around 13.2%.<sup>15</sup> However, data on migrant women's attendance to CCS is scarce.

Studies have been conducted to identify facilitating factors and barriers faced by migrant women when accessing CCS.<sup>16–19</sup> Factors that have been consistently associated with a lower CCS attendance among migrant women include lack of knowledge about CCS, difficulties in accessing healthcare services, legal issues, and language barriers. However, other factors such as education, marital status, socioeconomic conditions, or cultural and religious background have not been consensual in the literature.<sup>16,17</sup> Further research is important to clarify how these factors influence migrant women's CCS attendance.

This study aims to characterize migrant women CCS non-attendance in Portugal and identify its associated factors.

## Methods

This cross-sectional study consisted of a web-based survey conducted between February and July of 2021.

### Study population and recruitment

The inclusion criteria for the study were being a migrant woman, being > 20 years old and residing in Portugal. The exclusion criteria were not residing in Portugal at the time of the survey, being younger than 20 years of age, did not

provide information on the country of birth, age, or cervical cancer screening participation.

For the purpose of sample size calculation, it was considered the total number of migrants residing in Portugal in 2020 with legal resident status, which according to the data available was 662,095.<sup>20</sup> We added an estimate of 10% of migrants in irregular status (i.e. undocumented), which is a conservative value to ensure the robustness of the sample size given that there is no official data available on the size of this subgroup in the country, and our study population included both documented and undocumented migrants. Sample size was calculated considering the existence of 50% of the characteristics under study (i.e. the worst-case scenario, as the prevalence of the characteristics to be studied is not known), at a 95% confidence level and with a margin error rate of 3%. It was estimated a minimum of 1066 migrants to be surveyed.

Migrant women were recruited exclusively through online campaigns through Facebook groups and official pages of associations that collaborate with migrant communities. Administrators of the selected groups and pages were contacted for permission to disseminate the link of the survey in their online communities.

### Data collection

The online survey was available through Google Forms platform in Portuguese and in English.

Visitors interested in participating, accessed the survey by clicking in the link, which lead them to an informative page in Google Forms, providing information about the objective of the study, the anonymity and confidentiality of the data collected, and contacts of the researchers responsible for the study. Each visitor had to fill in an informed consent form to access the questionnaire. The survey was anonymous and voluntary. No mandatory answers were required, and participants could skip questions or leave the webpage without completing the survey. No incentives were given to the participants for their participation in the study.

### Instrument and variables

The questionnaire was developed based on the results of a previous literature review<sup>17</sup> and can be found in Supplementary Material 1. A pretest was conducted with a sample of 10 migrant women—five Portuguese-speaking women and five English-speaking women—to ensure the questions were clear and the survey platform was working correctly.

Participants were asked about if they have ever participated in CCS (with “yes” or “no” response options). In case they did, participants were also asked when was their last CCS performed (<1 year, 1–5 years, >5 years ago).

Socioeconomic variables included age ( $\leq 34$ , 35–54, or  $\geq 55$  years), continent of birth (Europe, Africa, Asia, North

America or Oceania, South or Central America), university degree holder (yes or no), employment status (employed or unemployed/retired/housewife), marital status (married/living together or single/divorced/widow), perceived difficulty in paying rent/bills (yes or no), perceived difficulty in paying food (yes or no), and religion (religious or atheist/agnostic).

Regarding migration-related variables, participants were asked about their length of stay in Portugal ( $\leq 5$  years or  $> 5$  years), if they had Portuguese nationality (yes or no), current migrant situation (documented or undocumented), and their ability to speak Portuguese (“yes, without difficulty,” “yes, with some difficulties” or “I don’t understand Portuguese”). Participants were also asked about if they had family history of cervical disease (yes or no), had been vaccinated for HPV (yes or no), had children (yes or no), had a general practitioner (GP) appointment in Portugal (yes or no), when was their last gynecology appointment in Portugal or other country ( $< 5$  years ago,  $\geq 5$  years ago (includes never)), if they had a family doctor in Portugal (yes or no), and if they ever felt discrimination in healthcare services (yes or no).

### Statistical analysis

Data collected was stored in Google Forms platform server and extracted to an excel file to be analyzed. Statistical analysis was performed using IBM SPSS – 27 version IBM SPSS Statistics for Windows (Armonk, NY: IBM Corp.).

A descriptive analysis of the study variables was conducted. Two multivariate logistic regression models were used to determine the associations between CCS non-attendance among migrant women and independent variables. For logistic regression models, the dependent variable was classified in two categories: “CCS Attendance” if the last screening was  $\leq 5$  years ago and “CCS Non-attendance” if the last screening was  $> 5$  years (as this is the upper limit of the recommended screening intervals)<sup>21</sup> or if participants were never screened.

Model 1, adjusted for age and continent of birth, was elaborated including all the variables in study. This adjustment was used as these two variables are consistently associated with CCS participation.<sup>16–18</sup> Model 2 included variables from model 1, using a threshold of  $p < 0.200$ , and was optimized using backward elimination selection (Likelihood Ratio), until only the significant variables ( $p < 0.05$ ) remained in the model. Odds ratio (OR) and 95% confidence intervals (CI95%) were determined.

### Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki and was approved by The Ethics

Research Committee of NMS|FCM-UNL (nr. 03/2020/CEFCM).

## Results

### Sample characteristics

A total of 1157 women accessed the link, yet 57 did not fulfill the inclusion criteria for the study (were not migrants, were not living in Portugal at the time of the survey, or did not specify their country of birth) and were excluded from the analysis. Therefore, this study included a sample of 1100 migrant women.

Table 1 shows the characteristics of the participants. Half of the participants were between 35 and 54 years old (50.2%), and the majority were from South and Central America (40.8%), mostly Brazil, or Europe (39.5%). Around 73% of the participants reported having a university degree, 51% were employed, and 68.9% were married or living with a partner. Almost one-third of the sample (31.1%) reported to have difficulties paying rent or bills and 15.6% reported difficulties in buying food. Concerning religion, 67.2% reported to be religious. Finally, more than half of the participants (56.9%) had, at least, one child.

Concerning migration-related characteristics, most participants were living in Portugal for 5 years or less (69.6%), and 19% had Portuguese nationality. Regarding current migration situation, 12.3% of all participants were undocumented. About 11% of women did not understand Portuguese language, while the majority (56.9%) were able to understand the language without difficulties.

Family history of cervical disease was reported by 20.3% of participants, and most were not vaccinated against HPV (85.2%). Concerning access to healthcare services, around 77% of the sample had at least one GP appointment in Portugal, and 73.3% had their last gynecological appointment (in Portugal or another country) less than 5 years ago. In addition, 54.0% of the total sample reported to have a family doctor in Portugal, and 33.8% reported to have felt discriminated when in healthcare services in Portugal.

### Characterization of CCS non-attendance among migrant women

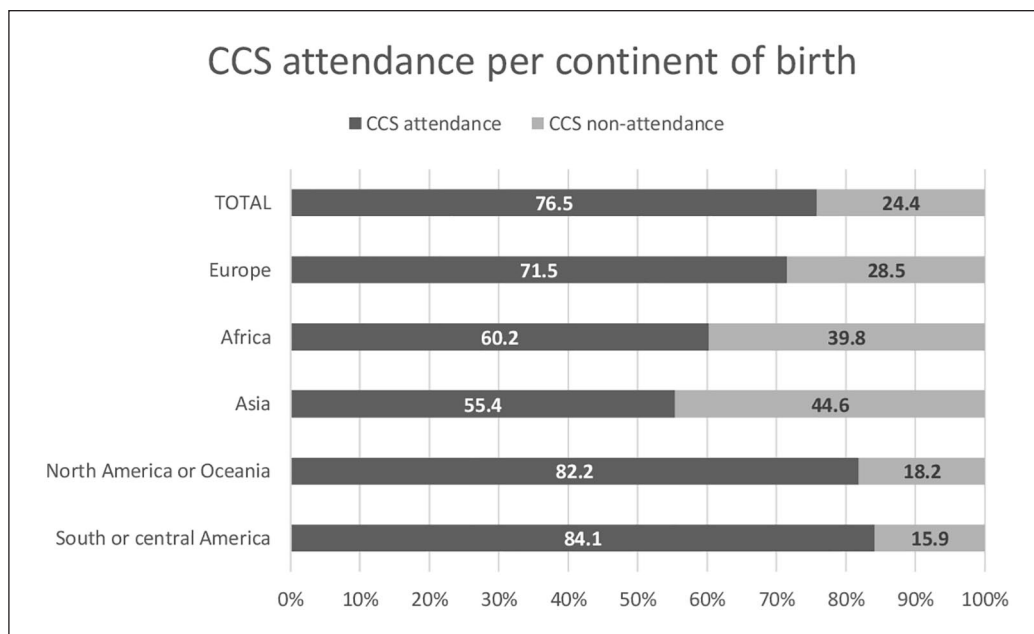
A total of 24.5% women report to be CCS non-attenders in the sample. Figure 1 shows the distribution of reported CCS attendance by continent of birth.

The highest percentage CCS non-attendance was higher among participants born in Africa and Asia (29.5% and 32.3%, respectively). The lowest percentage of CCS non-attendance was observed among participants from South or Central America (16.1%), and North America or Oceania (17.8%).

**Table 1.** Characteristics of the study participants.

		TOTAL (n=1100)	
		N	%
<b>Sociodemographic variables</b>			
Age	≤34 years	326	30.7
	35–54 years	534	50.2
	≥55 years	203	19.1
Continent of birth	Europe	435	39.5
	Africa	78	7.1
	Asia	65	5.9
	North America or Oceania	73	6.6
	South or Central America	449	40.9
University degree	Yes	803	73.2
	No	294	26.8
Employment status	Employed	561	51.3
	Unemployed/retired/housewife	532	48.7
Marital status	Married/living together	756	68.9
	Single/divorced/widow	341	31.1
Difficulties in paying rent/bills	Yes	340	31.1
	No	755	68.9
Difficulties in paying food	Yes	171	15.6
	No	924	84.4
Religion	Religious	669	67.2
	Atheist/agnostic	326	32.8
Having children	Yes	624	56.9
	No	473	43.1
<b>Migration-related variables</b>			
Length of stay in Portugal	≤5 years	766	69.6
	>5 years	334	30.4
Portuguese nationality	Yes	209	19.0
	No	891	81.0
Current migrant situation	Documented	959	87.7
	Undocumented	134	12.3
Ability to understand Portuguese	Yes, without difficulty	622	56.9
	Yes, with some difficulties	352	32.2
	Unable to understand Portuguese	119	10.9
<b>Health-related variables</b>			
Having family history of cervical disease	Yes	223	20.3
	No	876	79.7
Having had the HPV vaccine	Yes	163	14.8
	No	937	85.2
Having ever had a GP appointment in Portugal	Yes	849	77.2
	No	251	22.8
Last gynecology appointment	<5 years ago	806	73.3
	≥5 years ago	294	26.7
Having family doctor in Portugal	Yes	593	54.0
	No	505	46.0
Having ever felt discriminated in healthcare services	Yes	369	33.8
	No	724	66.2

HPV: human papillomavirus; GP: general practitioner.



**Figure 1.** Distribution of reported CCS attendance among migrant women by continent of birth.

### Factors associated with CCS non-attendance among migrant women

Table 2 shows results of the multivariate logistic regression models with the associations between CCS non-attendance and its associated factors.

Results of Model 1 suggest that non-attendance to CCS was more likely among women aged  $\geq 55$  years, Africans and Asians, single/divorced/widowed women, those with no university degree, women reporting difficulties paying rent/bills or difficulties buying food. Undocumented women were also more likely to report CCS non-attendance. Women who never had a GP appointment in Portugal, those whose last gynecology appointment was  $\geq 5$  years ago, those without a family doctor, and those who reported experience of discrimination in healthcare were also more likely to non-attend CCS. A lower CCS non-attendance was found among women from North America or Oceania and from South or Central America, and among women who have HPV vaccine.

Model 2 provided the set of the factors with the strongest association with CCS non-attendance, which included age, continent of birth, marital status, having children, HPV vaccine, GP appointment in Portugal, and last gynecology appointment. Women aged  $\leq 34$  years have a higher chance to CCS non-attendance, as well as African and Asian women compared to Europeans. Single/divorced/widowed women are 2.746 times more likely to be non-attenders compared to married women. Finally, CCS non-attendance is higher among those who never had a GP appointment in Portugal and among women whose last gynecology appointment was  $\geq 5$  years ago. On the other

hand, lower CCS non-attendance was observed among South and Central American women, women who had children, those with a length of stay in Portugal of  $\leq 5$  years, and among women who have had HPV vaccine.

### Discussion

Overall, it was observed a prevalence of non-attendance of 24.5% among this sample of migrant women. Younger age, being born in Africa or Asia, being single/divorced/widowed, never having had a GP appointment in Portugal and not having regular gynecology appointments are the factors with a higher association with non-attendance to CCS, whereas, being born in South and Central America, shorter length of stay in Portugal ( $\leq 5$  years), having had HPV vaccination, and not having children have a lower association with CCS non-attendance. The strongest associations were found between CCS non-attendance and age, continent of birth, marital status, HPV vaccination, and having had a medical appointment.

CCS non-attendance among migrant women in this study is higher than CCS non-attendance of the general population in Portugal in 2014 (13.2%).<sup>15</sup> However, it is lower than the proportions found in recent European studies with migrant populations.<sup>22–24</sup> These discrepancies may be explained by the educational level of the sample (73.2% of this study sample has a university degree whereas in other studies the percentage may be lower), by different sociocultural norms of the target migrant populations, and by the definition of CCS non-attendance, which in this study was classified as having the last screening  $> 5$  years, but in other studies a different time interval

**Table 2.** Logistic regression models of CCS non-attendance among migrant women and independent variables.

		Model 1		Model 2	
		OR (CI 95%)	P	OR (CI 95%)	P
<b>Sociodemographic variables</b>					
Age	≤34 years	1.368 (0.975–1.920)	0.070	1.684 (1.058–2.568)	0.027
	35–54 years (reference)				
	≥55 years	1.907 (1.302–2.795)	<0.001	1.023 (0.644–1.625)	0.923
Continent of birth	Europe (Reference)				
	Africa	1.754 (1.040–2.958)	0.035	2.623 (1.393–4.939)	0.003
	Asia	2.195 (1.259–3.829)	0.006	2.286 (1.148–4.554)	0.019
	North America and Oceania	0.472 (0.238–0.935)	0.031	0.641 (0.287–1.434)	0.279
	South and Central America	0.529 (0.373–0.749)	<0.001	0.624 (0.407–0.956)	0.030
University degree	Yes (Reference)			-	
	No	1.483 (1.073–2.050)	0.017		
Employment status	Employed (Reference)			-	
	Unemployed/retired/housewife	1.276 (0.930–1.751)	0.131		
Marital status	Married/living together (Reference)				
	Single/divorced/widow	1.872 (1.375–2.547)	<0.001	2.746 (1.869–4.034)	<0.001
Difficulties in paying rent/bills	Yes	1.740 (1.255–2.412)	<0.001	-	
	No (Reference)				
Difficulties in paying food	Yes	2.244 (1.531–3.289)	<0.001	-	
	No (Reference)				
Religion	Religious (Reference)			-	
	Atheist/Agnostic	0.945 (0.66–1.354)	0.759		
Having Children	Yes (Reference)				
	No	0.763 (0.553–1.052)	0.098	0.643 (0.434–0.952)	0.028
<b>Migration-related variables</b>					
Length of stay in Portugal	≤5 years	0.759 (0.553–1.042)	0.088	0.632 (0.423–0.956)	0.025
	>5 years (Reference)				
Portuguese nationality	Yes (reference)			NA	
	No	1.246 (0.822–1.888)	0.300		
Current migrant situation	Documented (Reference)			-	
	Undocumented	1.755 (1.132–2.722)	0.012		
Ability to understand Portuguese	Yes, without difficulty (Reference)			-	
	Yes, with some difficulties	0.990 (0.639–1.533)	0.963		
	Unable to understand Portuguese	1.251 (0.725–2.160)	0.421		
<b>Health-related variables</b>					
Family history of cervical disease	Yes	0.844 (0.581–1.227)	0.374	-	
	No (Reference)				
HPV vaccine	Yes	0.519 (0.320–0.842)	0.008	0.490 (0.278–0.864)	0.014
	No (Reference)				
Ever had a GP appointment in Portugal	Yes (reference)				
	No	1.468 (1.046–2.060)	0.026	1.557 (1.020–1.020)	0.040
Last gynecology appointment	<5 years ago (Reference)				
	≥5 years ago	10.423 (7.332–14.817)	<0.001	11.529 (7.903–16.820)	<0.001
Family doctor	Yes (Reference)			-	
	No	1.492 (1.109–2.007)	0.008		
Discrimination in healthcare services	Yes	1.380 (1.011–1.885)	0.043	-	
	No (Reference)				

CCS: Cervical cancer screening; HPV: human papillomavirus; GP: general practitioner.

Model 1 shows the results of all study variables adjusted for age and continent of birth; Model 2 shows the statistically significant variables resulting from the logistic regression model (Method—backward selection: LR) that included variables of model 1 with  $p < 0.200$ .

may be used. Furthermore, 40.8% of our sample come from South and Central America, mainly from Brazil, and evidence suggests that these women are particularly active in seeking CCS.<sup>17,24</sup> This study's results show that African and Asian women are more likely to be CCS non-attenders, whereas women from South and Central America are more likely to attend CCS.

Scoping reviews about participation in screening among migrant women suggests that sociodemographic characteristics and migration-related factors can influence cervical cancer screening non-attendance.<sup>17,25</sup>

Numerous studies mention conflicting evidence about the influence of age, marital status, and parity with CCS non-attendance.<sup>16,17</sup> In this study, a non-linear relationship of age and screening attendance was found, which may help explain why women in extreme age groups (younger and older) had higher participation and other studies had lower participation in CCS. Being married seems to be a strong determinant of CCS attendance in this study. The role of the husband may be influenced by different cultural norms. In some countries, having the support of one's husband or partner may be an incentive to CCS participation in certain cultural backgrounds, whereas in others, the husband's participation may be influenced negatively.<sup>26,27</sup> Parity is negatively associated with screening attendance, possibly because women with children tend to prioritize children's care, and have other life priorities that stops them to attend preventive measures, as argued by other authors.<sup>27</sup>

Lower education, lower income, and unemployment have been consistently associated with lower CCS participation.<sup>17,25</sup> In this study, no strong associations with education or employment were found, possibly because most participants in this study may have a higher socioeconomic status, as most of the women have a university degree, are employed, and do not report difficulties in paying rent or buying food.

Fluency in Portuguese is not associated with CCS non-attendance in this study, unlike what is described previously;<sup>17,25</sup> yet, a shorter length of stay was associated with lower CCS non-attendance. This was also observed in a Norwegian study, in which most women migrated from South America or Europe.<sup>28</sup> While the continent of origin may explain this trend, as women from America and Europe seem to attend more to CCS, other variables not included in this study may account for this lower non-attendance, such as women being screened in their home countries. Further studies are needed to better understand the reasons why migrant women who moved recently have a higher participation in CCS.

In this study, the underuse of healthcare services, namely GP appointments or gynecological appointments, is associated with CCS non-attendance. Access to healthcare services is a major issue among migrants,<sup>29</sup> which therefore affects CCS participation.<sup>17,25</sup> In Portugal, to participate in the population-based CCS program, women

must have an appointment with a GP,<sup>21</sup> but they can also participate in opportunistic screening, if followed by a gynecologist or if they access private healthcare services. Thus, the underuse of GP and gynecological appointments are associated with lower CCS non-attendance. However, women may have an appointment with their GP for other reasons and are screened opportunistically.

Finally, even though most women in this study have not been vaccinated (as HPV vaccination has been recently used as a primary prevention strategy for cervical cancer),<sup>30</sup> results suggest that vaccinated women are more likely to attend CCS. It is hypothesized that vaccinated women may be more conscious about cervical cancer and may also have a better economic condition since HPV vaccine may be expensive in certain situations.

The large and diverse sample size is a major strength of this study, with a wide range of different countries of birth and different sociocultural backgrounds. Also, using adjusted statistical analysis allow a robust association of the factors associated with CCS non-attendance. Also, the use of an online survey has several advantages, including more accuracy of the data as the answers of the participants get directly into the system which eliminates human error on manual data insertion, and participants tend to be more honest answering an online questionnaire. Also, participants have the flexibility to take the survey according to their time availability which may increase participation.

Some limitations may be considered. This sample is not representative of the Portuguese migrant population. Also, this is a cross-sectional study which implies that it is not possible to make causal inferences. In addition, by providing the survey only in Portuguese and English, the team was unable to reach migrant women residing in Portugal who are unable to speak neither of the languages. Women had to have access to the Internet to fill in the questionnaire, which may have led to sample bias as only women with access to the Internet could participate. The high percentage of women with university degree may be the result of selection bias. Finally, the small sample size in some origin groups would affect the precision of the model and could jeopardize drawing robust conclusions. Therefore, the model performed included all women, with the continent of origin being one of the independent variables, although this option limits the identification of CCS attendance determinants that may differ by cultural background.

## Conclusion

The results of this study show that migrant women have a high CCS non-attendance, especially when compared with studies on CCS non-attendance on Portuguese women. It is necessary to develop strategies to increase participation considering the inequalities identified and the findings suggest that these strategies should consider the continent of birth, which is related to women's

cultural background, beliefs, and previous experiences, as well as marital status and parity of women, as they seem to be the strongest predictors of CCS non-attendance. These findings may help to develop interventions targeting migrant women to improve their CCS attendance and increase cervical cancer prevention.

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### Author contribution(s)

**Patrícia Marques:** Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Writing—original draft; Writing—review & editing.

**Mariana Gerales:** Data curation; Formal analysis; Investigation; Methodology; Writing—original draft.

**Ana Gama:** Investigation; Methodology; Writing—review & editing.

**Bruno Heleno:** Conceptualization; Investigation; Methodology; Project administration; Supervision; Writing—review & editing.

**Sónia Dias:** Conceptualization; Investigation; Methodology; Project administration; Supervision; Validation; Writing—review & editing.

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### Supplemental material

Supplemental material for this article is available online.

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