

## ORIGINAL RESEARCH ARTICLE



# Use of hormonal contraceptives among immigrant women and their daughters in Norway: Data from the Norwegian Prescription Database

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**Abstract**

**Introduction:** Immigrants and their offspring constitute 16.3% of the population in Norway. Knowledge about their contraceptive use is important in order to inform adequate family planning services. Prior research has shown less use of contraception among first-generation immigrants than among non-immigrant women. Our aim is to compare the use of hormonal contraceptives between immigrants and their adult daughters.

**Material and methods:** Information from the Norwegian Prescription Database on all hormonal contraceptives dispensed at all pharmacies in Norway in 2008 was merged with demographic, socioeconomic and immigration data from the National Population Register and information from the Regular General Practitioner Database and the Medical Birth Registry Norway. A total of 10 451 women aged 16-30 from five countries with relatively large numbers of immigrants and adult daughters living in Norway in 2008 were included in the study. Descriptive statistics and logistic regression analyses were conducted. The main outcome measure was use of any hormonal contraceptive.

**Results:** More daughters of immigrants from Vietnam compared with immigrant women from these countries (odds ratio [OR] 2.3, 95% confidence interval [CI] 1.8-2.8) and Poland (OR 2.3, 95% CI: 1.6-3.3) used hormonal contraceptives. However, no adjusted differences between generations were detected for immigrants from Pakistan (OR 1.2, 95% CI 1.0-1.4), Morocco (OR 1.0, 95% CI 0.7-1.4) or Chile (OR 1.3, 95% CI 0.8-1.9).

**Conclusions:** Further research should explore the reasons for heterogeneity in use of contraception among daughters of immigrants from different origins and explore whether daughters of immigrant mothers from some areas have unmet needs of contraception.

**KEYWORDS**

contraceptive agents, family planning, immigrant women, prescription database

**Abbreviations:** GP, general practitioner; CI, confidence interval; IUDs, intrauterine devices; OR, odds ratio.

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## 1 | INTRODUCTION

Increasing globalization has led people to move more than previously, including across continents and national borders. Immigrants and their offspring made up 16.3% of the population in Norway as per 1 January 2016: Immigrants accounted for 13.4% and their children born in Norway for 2.9%.<sup>1</sup> Research on immigrant health has been further actualized due to the latest increase in refugee numbers moving to Europe. Migration is a health determinant because of pre-migration experiences, the migration journey itself and conditions in the host country.<sup>2</sup> Thus, knowledge about how migration influences specific health topics is needed to inform appropriate healthcare.

Several studies have shown higher rates of induced abortion among minority women than majority women,<sup>3-6</sup> which may point to poorer access to or less use of available options for family planning among the minority women. In a previous study we found lower user rates of hormonal contraceptives among immigrants than among Norwegian-born women without immigrant background.<sup>7</sup> Similar results were found in a French study which showed lower crude user rates for contraception among daughters of immigrants than among both immigrant and non-immigrant women.<sup>8</sup> However, other recent studies suggest that gynecological and reproductive health outcomes in immigrants tend with time to approach those of the host country<sup>9-11</sup> as a result of acculturation processes.<sup>12</sup>

The Norwegian healthcare system is predominantly public. All residents are entitled to have a regular general practitioner (GP) who can prescribe contraceptives and insert contraceptive implants and intrauterine devices (IUDs), as can midwives and school nurses. In special circumstances, women are referred to a gynecologist. The system is based on co-payment for GPs and specialists but is free of charge for patients attending to nurses and midwives. All contraception is subsidized (partly or wholly depending on age and type of contraception) for women under the age of 21. Thus, contraception in Norway can be considered to have good accessibility and affordability.

To the best of our knowledge, no study to date has compared user rates of hormonal contraceptives between different groups of immigrants and daughters of immigrants taking into account sociodemographic characteristics that may differ between generations. Such knowledge is important to provide personalized egalitarian family planning services. The aim of this study was to compare the use of hormonal contraception between immigrants from different countries living in Norway and Norwegian-born daughters of immigrants. We hypothesized that user rates of hormonal contraceptives for daughters of immigrants would be in-between those for their immigrant mothers and non-immigrant Norwegian women. We also hypothesized that differences might occur depending on the immigrant women's place of origin.

## 2 | MATERIAL AND METHODS

This study is part of the project "Immigrant health in Norway" based on merged data from several national registries. Data from

### Key message

User rates of hormonal contraception vary between immigrants and their daughters living in Norway, depending on the mother's country of origin.

the Norwegian Prescription Database,<sup>13,14</sup> the National Population Registry,<sup>15</sup> the Regular GP Database<sup>16</sup> and the Medical Birth Registry Norway<sup>17</sup> were linked using the unique personal identity number that is given to each person legally registered in Norway for more than 6 months. A similar method was used in an earlier study comparing contraceptive use among immigrant and non-immigrant women living in Norway.<sup>7</sup>

The Norwegian Prescription Database is a national health registry including all collected supplies of prescription drugs at all pharmacies in Norway.<sup>13,14</sup> For this study we extracted information on all dispensed hormonal contraceptives such as oral contraceptives, IUDs, vaginal rings, injections, patches, and implants in 2008 (Anatomical Therapeutic Chemical (ATC) system codes; G02BA03, G02BB01, G03A and G03HB01). We established a dichotomized variable on whether or not the women had collected at least one supply of hormonal contraceptive in 2008. We used collected drug supply as a proxy for drug use, a method which is recognized in epidemiological studies.<sup>18</sup> Accordingly, the expression "use of contraceptives" refers to purchase of medication throughout this paper. Information on age, immigrant status (country of origin, length of stay in Norway and immigrant category), education and employment status and marital status was obtained from The National Population Registry.<sup>15</sup> For the purpose of the analyses we established a dichotomized variable on whether the women worked or studied in 2008.<sup>19</sup> The Regular GP Database contains information on all GPs.<sup>16</sup> In Norway, each citizen is assigned a regular GP. Information about each woman's GP was extracted (GP age, gender and immigrant status). From The Medical Birth Registry we obtained a dichotomized variable on whether or not a woman had given birth between 1 January 2008 and 30 June 2009.

The study population comprises all immigrants from Pakistan, Vietnam, Morocco, Chile, and Poland and daughters of immigrants born in Norway aged 16-30 in 2008. Norwegian women of the same age without immigrant background were included for comparison. Immigrants are defined as being born abroad by two foreign-born parents. Daughters of immigrants in this study are defined as persons born in Norway by two foreign-born parents.<sup>20</sup> The age group 16-30 was chosen because the numbers of immigrant daughters older than 30 are small. We excluded immigrants who had lived shorter than 12 months in Norway from the study population because they may have brought contraceptives from their country of origin for this time in a new country. All women who had given birth in 2008 or first half of 2009 were also excluded

**TABLE 1** Characteristics of the study population, women 16-30 y living in Norway in 2008

	Pakistan		Vietnam		Morocco		Chile		Poland	
	Immigrants	Daughters	Immigrants	Daughters	Immigrants	Daughters	Immigrants	Daughters	Immigrants	Daughters
N	1601	2398	1356	957	388	410	525	280	2364	172
Age, mean	24.7	21.6	25.4	20.2	25.0	21.2	24.9	19.5	25.6	20.6
Immigration age, mean	12.2	—	11.9	—	15.0	—	8.3	—	21.1	—
Length of stay $\geq 5$ y, %	78.9	—	79.9	—	73.5	—	89.1	—	21.4	—
In work/education, %	59.5	84.3	78.3	95.1	61.9	89.0	81.3	84.6	75.1	93.0
Norwegian-born GP, %	53.3	54.9	62.8	68.2	59.9	62.9	68.4	68.2	54.2	68.6
Female GP, %	67.9	64.8	40.5	42.5	55.2	53.8	36.9	29.2	31.4	45.3

because they did not need contraceptives during the pregnancy. Immigrants and daughters of immigrants were classified according to country of origin, using the country of the mother in the case of daughters. The five countries were selected because they are all among the largest immigrant groups in Norway and represent different world areas.

We hypothesized that daughters of immigrants used contraceptives at levels in-between immigrants and Norwegian women without an immigrant background.

## 2.1 | Statistical analyses

Descriptive analyses were conducted to explore the characteristics of the study population and the percentage of women who used oral and non-oral hormonal contraceptives in the different groups. Because age distribution varied between groups, we also conducted age-stratified analyses on overall use of contraceptives. Binary logistic regression analyses were conducted for each country separately, with immigrants as the reference for daughters of immigrants originating from the same country. Use of any hormonal contraceptive was used as a dependent variable and immigrant generation (immigrant mothers vs daughters of immigrants) as the main independent variable; as other explaining variables, we tested separately continuous age and age in five categories, work/educational status, GP gender and origin. The final model included age in five categories because the relation between contraceptive use and age was not linear, and work/educational status as independent variables. GP gender and origin did not improve the regression models and were therefore not included in the final model. There were no significant interactions between immigrant generation and the other covariables. For all statistical analyses we accepted a P-value of <0.05 as significant.

## 2.2 | Ethical approval

This study is part of the project "Immigrants' health in Norway", which has been approved by the Regional Committee for Medical and Health Research Ethics (ref. 2009/1747) in 2009 and the Norwegian Data Inspectorate (ref. 10/00069-6 IUR) in 2010. The Norwegian Directorate of Health (ref. 10/6022) has given an exemption from the duty of confidentiality.

## 3 | RESULTS

The study comprised 6234 immigrants, 4217 daughters of immigrants from the same countries of origin and 306 666 Norwegian women with no immigrant background. Table 1 shows that daughters of immigrants were younger than immigrants for all countries. Mean age at immigration for immigrants varied between 8.3 years (Chile) and 21.1 years (Poland), and the percentage of women with at least 5 years of stay in Norway varied from 21.4% (Poland) to 89.1% (Chile). The share of women in education or in work among

**TABLE 2** Use of hormonal contraceptives among immigrants and daughters of immigrants 16 and 30 y old, living in Norway in 2008

	Pakistan		Vietnam		Morocco		Chile		Poland	
	Immigrants	Daughters	Immigrants	Daughters	Immigrants	Daughters	Immigrants	Daughters	Immigrants	Daughters
N	1601	2398	1356	957	388	410	525	280	2364	172
Total use of contraceptives <sup>a</sup> , %	13.1	12.6	28.1	44.9	29.6	20.0	45.5	49.6	20.9	47.1
Oral contraceptives, %	9.4	10.8	22.8	41.6	24.7	17.8	39.2	46.4	17.9	42.4
Contraceptives, non-oral, <sup>b</sup> %	4.3	2.1	6.8	4.9	5.7	3.4	8.2	6.4	3.5	8.1

<sup>a</sup>Some women may have used both oral and non-oral contraceptives.

<sup>b</sup>Includes hormonal IUDs, implants, vaginal rings, injections and patches.

immigrants varied from 59.5% (Pakistan) to 81.3% (Chile). A higher percentage of daughters of immigrants from all countries either worked or studied (from 84.3% to 95.1%) as compared with immigrants. In all groups, a larger share of daughters of immigrants had a Norwegian GP as compared with immigrants. The percentage of women with a female GP was highest among women from Pakistan and Morocco for both generations.

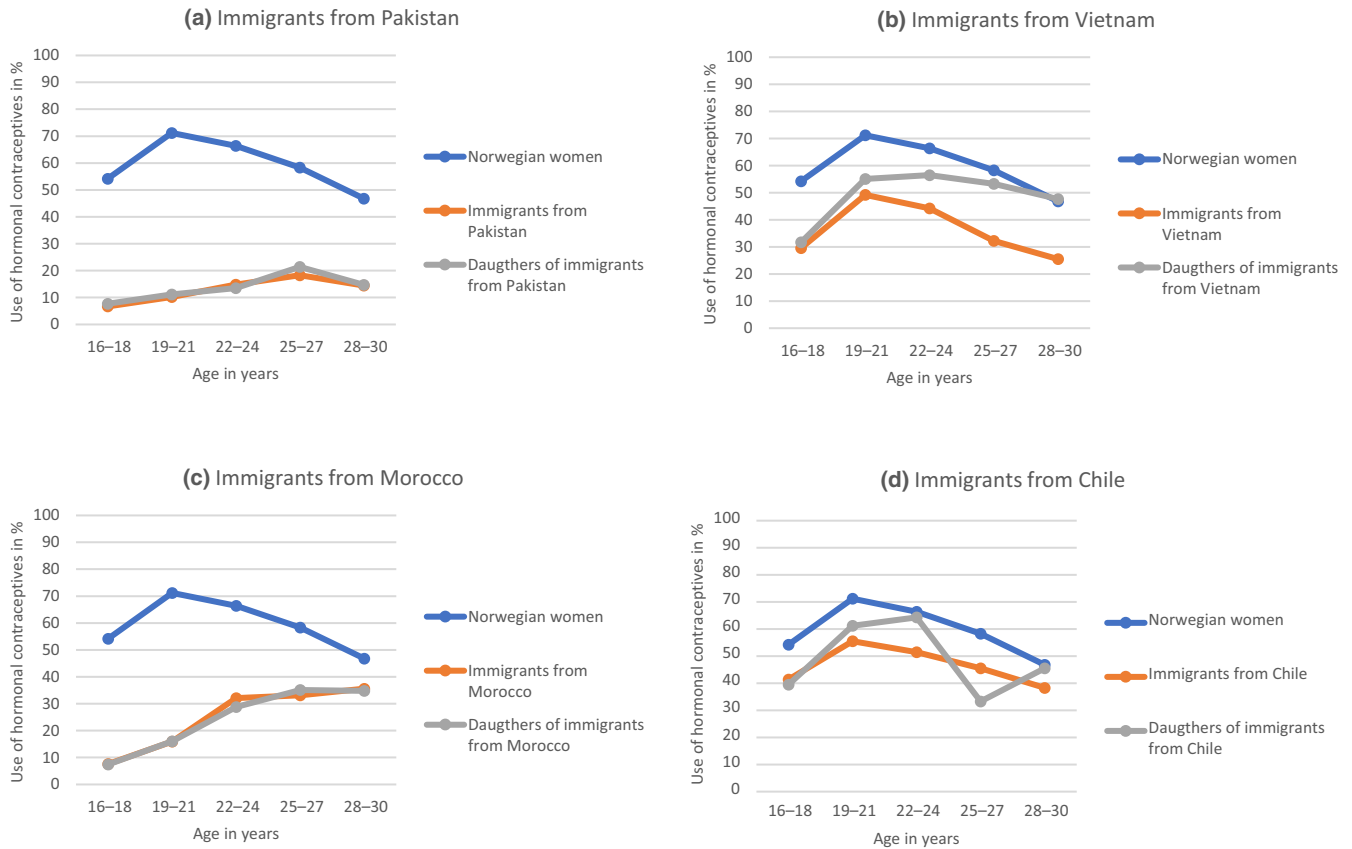
Table 2 shows that the percentage of women who collected at least one supply of hormonal contraceptives varied among the different immigrant groups, with Pakistan showing the lowest user rates and Chile the highest. For all groups but those from Morocco, higher percentages of daughters of immigrants used oral contraceptives as compared with immigrants. Regarding non-oral contraceptives, immigrants had higher user rates than daughters of immigrants, with the exception of daughters of immigrants from Poland.

Figure 1A-D shows the percentage of immigrants and daughters of immigrants from Pakistan, Vietnam, Morocco and Chile who were dispensed at least one prescription of hormonal contraceptives in 2008. Norwegian women are depicted in all figures for comparison. No figure for Poland is presented because there were too few women in the oldest age groups. Similar patterns of contraceptive use for both generations were found for immigrants and daughters of immigrants from both Pakistan and Morocco. User rates of hormonal contraception increased more with age among daughters of immigrants from Vietnam than among immigrants from the same country, reaching Norwegian levels in the two oldest age groups. The rates for contraceptive use among daughters of immigrants from Chile are in-between immigrants from Chile and Norwegian women except for women aged 25-27.

Table 3 shows the results from logistic regression analyses for use of hormonal contraceptives among daughters of immigrants compared with immigrants. Analyses are presented as crude odds ratios (OR) and adjusted OR for age and working/education status as explained in Material and methods. Daughters of immigrants from Vietnam (OR 2.3, 95% confidence interval [CI] 1.8-2.8) and Poland (OR 2.3, 95% CI 1.6-3.3) had significantly higher adjusted odds of using hormonal contraceptives than did immigrants of the respective countries. No significant differences were found between the two generations with backgrounds from Pakistan, Morocco or Chile in the adjusted analyses. Taking immigrants and daughters of immigrants together, age (5 age groups) was a significant predictor for contraceptive use in women from all 5 countries. The youngest women used the fewest contraceptives, whereas the age group using the most contraceptives varied across the countries. Being in work/education was significantly associated to contraceptive use for women from Vietnam, Chile and Poland, but had no significant impact for women from Morocco and Pakistan.

## 4 | DISCUSSION

Our study shows differences in user rates of hormonal contraceptives between immigrants and daughters of immigrants that vary



**FIGURE 1** (A-D) Use of hormonal contraceptives in 2008 among immigrant women and daughters of immigrants from different countries

depending on the immigrants' country of origin. Daughters of immigrants from Vietnam and Poland had higher user rates for hormonal contraceptives compared with immigrants, whereas this was not the case for daughters of immigrants from Pakistan, Morocco or Chile. Age was the most important predictor for contraceptive use for most groups. Being in work/education predicted contraceptive use for women with backgrounds from Vietnam, Chile and Poland, but not for women from Morocco and Pakistan.

The national health registries provided a unique opportunity to link complete data on use of hormonal contraceptives purchased by an unselected population of immigrants, their offspring and non-immigrant women living in Norway with sociodemographic variables. The nationwide study design provided a large study population and prevented selection and information bias. Also, linkage enabled immigrants to be classified according to both generation and background country of origin and to examine heterogeneity among countries.

Our study has also some limitations. We have no information on whether the women were sexually active or were planning to get pregnant and therefore did not need contraception. Possible differences in family planning depending on parity could not be studied either. Thus, this study cannot state the quality of family planning services, and any need for better services for some groups of immigrants. We decided to exclude pregnant women from the analyses, since we assumed that they did not need

contraception. Nevertheless, one could argue that different proportions of women in the different groups could have become pregnant without planning their pregnancy. Therefore, all analyses were also conducted including women who had given birth in 2008-2009 (not shown); however, the results were not significantly different. Also, the registries lack information on use of non-hormonal forms of contraception, which could vary between immigrants and daughters of immigrants. Specifically, neither condoms, which are a popular prevention method among the youngest women, nor copper IUDs, were included in the study. We used collected contraception supply as a proxy for use, for which there is no available information on a population basis. However, this method is recognized as an acceptable proxy in epidemiological studies.<sup>18</sup> Although we address differences between immigrants depending on generation and country of origin, there will still be variation within groups, especially so among daughters of immigrants with different degrees of acculturation, which our data cannot measure. In fact, the variable we used to capture education and work status does not give detailed information about the socioeconomic status for each woman. However, we chose to construct such a variable because more women with immigrant backgrounds than non-immigrants rely on their family for economic support and would not have a reliable registered salary corresponding to their actual living standard. The same applies for level of education, which is poorly related to actual working place for many

**TABLE 3** Logistic regression, crude and adjusted<sup>a</sup> OR (95% CI) for use of hormonal contraceptives in 2008 among immigrant women and daughters of immigrants aged 16-30 y

	Pakistan		Vietnam		Morocco		Chile		Poland	
	Crude OR	Adjusted OR <sup>a</sup>	Crude OR	Adjusted OR <sup>a</sup>	Crude OR	Adjusted OR <sup>a</sup>	Crude OR	Adjusted OR <sup>a</sup>	Crude OR	Adjusted OR <sup>a</sup>
Immigration generation										
Immigrants (ref)	1	1	1	1	1	1	1	1	1	1
Daughters	1.0 (0.8-1.2)	1.2 (1.0-1.4)	2.1 (1.8-2.5)	2.3 (1.8-2.8)	0.6 (0.4-0.8)	1.0 (0.7-1.4)	1.2 (0.9-1.6)	1.3 (0.8-1.9)	3.4 (2.5-4.6)	2.3 (1.6-3.3)
Age										
16-18 y (ref)	–	1	–	1	–	1	–	1	–	1
19-21 y	–	1.6 (1.1-2.3)	–	2.8 (2.1-3.7)	–	2.3 (1.1-4.6)	–	2.0 (1.2-3.1)	–	2.3 (1.5-3.5)
22-24 y	–	2.6 (1.8-3.6)	–	2.8 (2.1-3.7)	–	5.6 (2.8-11.0)	–	1.9 (1.1-3.3)	–	1.2 (0.8-1.8)
25-27 y	–	3.5 (2.5-4.9)	–	2.0 (1.5-2.8)	–	5.8 (2.9-11.4)	–	1.5 (0.9-2.7)	–	0.9 (0.6-1.3)
28-30 y	–	2.7 (1.9-3.9)	–	1.6 (1.2-2.2)	–	6.3 (3.2-12.3)	–	1.2 (0.7-2.1)	–	0.8 (0.6-1.2)
Work/educational status										
No work/education (ref)	–	1	–	1	–	1	–	1	–	1
In work/education	–	1.3 (1.0-1.6)	–	1.4 (1.1-1.8)	–	0.9 (0.6-1.3)	–	2.5 (1.7-3.7)	–	2.5 (1.9-3.2)

<sup>a</sup>Adjusted for age (five categories) and working/education status. Adjusted results for age and working/education status include first- and second-generation immigrants together.

immigrants. Our data are from 2008 and the proportion of different groups using contraception might have changed since then. However, our study focuses on the differences between generations adjusted for age, which are probably linked to acculturation, integration policies and cultural competence among practitioners, all of which change slowly. Lastly, comparing observational cross-sectional data is challenging because of possible cohort effects and personal changes during the life span that cannot be captured with this design. The use of longitudinal data in the future could help to disentangle trends and associations.

In contrast to our results, the only other similar study we are aware of showed lower crude rates for contraception use among daughters of immigrants than among first-generation immigrants in France.<sup>8</sup> However, the French study did not adjust the crude rates and did not group women by country of origin, and consequently did not examine the heterogeneity that our study was able to detect.

Typically, register data do not allow for examination of the reasons behind our results, but we suggest some possible interpretations. Our findings did not completely fit our hypothesis of daughters of immigrants using contraceptives at levels in-between immigrants and Norwegian women without immigrant backgrounds

for all groups, especially regarding immigrants from Pakistan and Morocco. This might indicate that daughters of immigrants originating from some countries move to a lesser extent than others against mainstream use of contraception in their acculturation processes. In this line, it has been stated that when new immigrants are faced with the challenges of acclimating to a new society and a new way of life, they may anchor themselves strongly to traditional religious and cultural expectations regarding family, sexuality and fertility.<sup>21</sup> The reasons for immigrant women to move to Norway in the first place, be it labor, refugee or family reunification, select different populations coming to Norway from the different countries and should also be considered in further studies. However, we detected different patterns depending on age for some groups. For Vietnam and Chile, the user rates of hormonal contraception seemed to reach user rates of Norwegian women without immigrant backgrounds in the oldest age groups. This finding is consistent with our previous study on contraception use among immigrants and Norwegian-born women without immigrant backgrounds which revealed that the differences were greatest among the youngest women.<sup>7</sup> As this age group is the one with the highest system availability of free of charge school nurses and subsidized oral contraceptives, this may reflect an increase in acculturation with age, although it is also possible that immigrant

women become sexually active later than Norwegian-born women do. However, for daughters of immigrants from Chile, the lack of difference with respect to immigrants might have different explanations, as the user rates of contraceptives were higher among first-generation immigrants from Chile than among immigrants from other countries.

Apart from possible explanations at the individual level, system-related factors should also be considered. The heterogeneity across groups depending on their immigrant background is also observed in that being in work/education predicted contraceptive use only for some groups. Thus, the gap between access to information and implementation of knowledge should be further explored. Although other studies show that the sources of information for reproductive health related issues are broader for daughters of migrants,<sup>22</sup> simply better access to information through school and the internet might not be enough for women from different countries to change behaviors. Furthermore, although our data on GP immigrant background did not explain the use of contraception, system-related barriers, as the lack of consistent and accurate knowledge about contraception among providers have been previously described<sup>23</sup> and might affect differentially the various immigrant groups. Along this line, two later studies from Norway show that general practitioners have few or no specific strategies to approach patients with different cultural backgrounds<sup>24</sup> and hesitate to talk about cervical cancer screening with some immigrant groups that they perceive as less interested in such conversations based on features such as clothing, accompanying persons or assumed religion. This might also be the case for daughters of immigrants if they keep some of their external identity features, such as wearing a hijab, as might be the case for Morocco or Pakistan.

## 5 | CONCLUSION

We found higher user rates for hormonal contraceptives among daughters of immigrants from Vietnam and Poland than among immigrants from the same countries, whereas this was not the case for daughters of immigrants from Pakistan, Morocco and Chile.

Further research should explore the reasons for the heterogeneity in degree of acculturation among different groups of daughters of immigrants regarding contraception. In addition to factors directly linked to the immigrant background of women, other socioeconomic and system-level explanations, such as integration policies or the cultural competence among providers, should also be further explored to better understand why user rates on hormonal contraception are low in some groups of daughters of immigrants despite their being born in Norway.

## CONFLICT OF INTEREST

The authors all declare that they have no conflict of interests.

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