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TARGETING GROUPS OF WOMEN TO REDUCE UNMET NEED FOR FAMILY PLANNING

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Abstract

One out of six Moldovan women have an unmet need for family planning. The current study explores which groups of women living in the Republic of Moldova lack behind and have a relatively high unmet need for family planning compared to other women. In addition, the study examines if the higher unmet need for family planning of these women can be explained by differences in their contraceptive use, sexual activity, fecundity or fertility intentions. The study uses data of the Generations and Gender Survey collected in the Republic of Moldova in 2020. Unmet need is examined among 2,468 women aged 15-49. Three vulnerable groups of women are identified: Women in the lowest household income quintile, women with low and medium educational levels, and women who are at the end of their childbearing years. Women in the lowest household income quintile and women with low or medium educational attainment have a lower contraceptive use and have therefore a higher unmet need compared to other women. Older women and women with more children tend to have a higher unmet need for family planning because they have fewer medium and long-term fertility intentions, while their contraceptive use, sexual activity and fecundity remain unchanged. These results suggest that access to contraceptives is not enough to ensure equal use of contraceptives. To improve universal access to family planning and reduce unmet family planning need, the Republic of Moldova could invest in policies targeted at the three most vulnerable groups of women: the poor, the low and medium educated and those at the end of their childbearing years.

Introduction

Access to family planning is fundamental to determine the course of one's own life and is therefore recognized as a human right by the World Health Organization [1]. In 2020, 17% of Moldovan women of reproductive age are not using contraceptives even though they do not want to become pregnant at that moment [2]. This percentage should reduce further in the coming years in order to reach Sustainable Development Goal 3.7 to ensure universal access to sexual and reproductive health-care services by 2030. Efforts to reduce unmet need is warranted, because over the past decades unmet need has increased in the Republic of Moldova. Among women in a union unmet need has been estimated at 7% in 1997, 11% in 2005, 10% in 2012, and 22% in 2022[1].

Unmet need for family planning is the percentage of sexually active women of reproductive age who want to stop or delay childbearing but are not using any method of contraception [3]. Unmet need is an umbrella concept combining behavioural aspects (contraceptive use and sexual activity), health aspects (fecundity), and intentions (medium- and long-term fertility intentions). Therefore, the need for contraception tends to vary over the life course and depends on age, partner status, number of children, etc. Campaigns and policies tailored to groups of women who are currently lacking behind in their use of family planning, could effectively reach the groups most in need. As such, a targeted strategy has the potential to reduce unmet family planning need and improve universal access to family planning at the same time.

Knowing which groups of women have high unmet family planning need and knowing why, is essential for developing targeted policies and campaigns. However, the majority of studies about unmet need are conducted in the Global South e.g. [4]–[6]. Factors which influence access to family planning are probably more important to explain unmet need in low income and high fertility settings in the Global South, while factors which influence the demand and desire to use available

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[1] https://www.un.org/en/development/desa/population/theme/family-planning/index.asp

contraceptives play a more important role in a middle income and low fertility setting like the Republic of Moldova [7]. In other words, it is questionable if findings from the Global South apply to the Moldovan context.

A few studies related with unmet need have been conducted in countries in the Global North. A study which examined the influence of the COVID-19 pandemic on fertility related behaviour and intentions shows that the COVID-19 pandemic could have disrupted short-term family planning in the Republic of Moldova [8]. After the unset of the pandemic Moldovan women were less likely to want to conceive, but more sexually active while overall modern contraceptive use remained unchanged [8]. An older study which examined determinants of unmet need in ten European countries in the 1990s, shows that unmet need is relatively high in countries which economies were at that time in transition, such as Bulgaria, Latvia and Lithuania [9]. Moreover, in most of the studied countries unmet need increases with family size and age and is higher among the less-educated and those in a union [9]. A recent Moldovan report based on descriptive statistics studied variations in unmet need by union status, age, educational and occupational level, income, region and population density [2]. The report shows that the percentage of unmet need is higher among married and cohabiting women, older women, higher educated women and among women who live in rural areas and outside of the capital region [2].

The aim of the current study is to explore which groups of women in the Republic of Moldova are lacking behind and have a relatively high unmet need for family planning. Particular attention is paid to unmet need among the following recognized vulnerable groups in the Republic of Moldova: adolescents, the poor, women with disabilities and women with mental health problems [10]. The influence of other factors which were previously shown to relate with unmet need in a descriptive manner are also examined [2]. A re-examination is warranted to establish if the relationships remain in a model which controls for the effect of several other factors. In addition, the influence of other commonly examined factors on unmet need are explored, such as religiosity, number of children, and the COVID-19 lockdown [8], [9], [11]. Once it is established which groups of women have a higher unmet need for family planning, the study explores why these groups of women have a higher unmet need compared to other women. In order to do this, the mediation effect of five factors are studied which determine unmet need, namely: contraceptive use, sexual activity, fecundity, medium-term fertility intention, and long-term fertility intention. The analyses are based on data of the Generations and Gender Survey (GGS) collected in 2020 in the Republic of Moldova.

1. Theory

Unmet need is affected by a multitude of factors at the individual, community and national level [12]. Factors influencing unmet need are roughly divided in supply-side factors impacting access to contraceptives and demand-side factors impacting the demand or desire to use contraceptives [13]. Historically, more attention is paid to supply-side factors. This is fuelled by the focus on high-fertility settings in the Global South, where access to family planning services is limited at least for certain regions and groups of women [7]. Yet, it becomes increasingly clear that equal access to contraceptives only reduces unmet need up to a certain point and does not necessarily eliminate inequality. Research indicates that in many settings, demand-side factors are very important and in some contexts play an even bigger role in explaining unmet need than supply-side factors [7], [13].

1.1 Supply-side factors

Elements which are mentioned to influence the supply-side of unmet need are: *Geographical accessibility* (family planning facilities are not existing or too far away), *Service quality* (limited availability of different contraceptive methods, or information about method options and side-effects is below par), *Administrative accommodation* (restricted clinic hours and unnecessary medical criteria), and *Affordability* (lack of financial resources or health insurance) [13].

Several studies showed that women living in less populated rural areas had a higher unmet need for family planning than women in urban areas e.g. [4], [14], [15]. The authors attributed this to the higher number of family planning service points and the larger variety of contraceptive options available in urban areas.

In the past years it became clear that next to man-made disasters, such as war and economic crises, natural disasters impacted the availability of family planning services. In view of the threat of the spread of COVID-19, many countries enforced lockdowns which affected access to doctors and family planning services and potentially lead to a reduction in sexual and reproductive health [16]. Research in the Republic of Moldova showed that the overall effect of the pandemic on modern contraceptive use was limited [8]. During the lockdown the use of intrauterine devices reduced and the use of condoms increased, resulting in an overall equal use of modern contraceptives before and after the pandemic [8].

Wealth and income influence unmet need, however, the effect differs across countries. In countries in the process of shifting to a lower desired family size, women with more financial resources had a higher unmet need because they are among the first to adopt the wish for a smaller family [11], [15]. Instead, in societies where a smaller number of children is more common poorer women had a higher unmet need [4], [17]. This effect was explained by poor women's lack of financial resources and health insurance to obtain family planning methods.

Proximity and accessibility of family planning services can also be influenced by disabilities. A qualitative study showed that disabilities hampered transport to and access of facilities [18]. Moreover, the condition itself reduced the number of suitable modern methods which can be used [19]. In addition, health care workers did not always provide the same service to women with disabilities, because they mistakenly believed that these women were not sexually active and therefore not in need of contraceptives [18], [19]. As a result, women with disabilities were less likely to use modern contraceptives [20], [21].

Taking the supply-side elements into account, the following hypotheses are formulated:

H1: *Unmet need is higher among women living in rural areas,*

H2: *Unmet need is higher among women with a low income*, and

H3: *Unmet need is higher among women with a disability*

1.2 Demand-side factors

Elements related with the demand-side of unmet need are: *Cognitive accessibility* (lack of awareness of contraceptive methods or knowledge how to obtain these methods and services) and *Psychosocial accessibility* (lack of agency and autonomy, or adverse social and cultural norms).

Previous research showed that religious beliefs were an important reason why women were not using contraceptives even though they had access to it [11]. Although religion in itself does not prohibit the use of family planning methods necessarily [22], unmet need tended to be higher among

Christians than Muslims [14], [15]. More than 90% of the population of the Republic of Moldova is Orthodox Christian [23]. Nevertheless, opinions about the use of contraceptives vary. In 2015, about a third of Moldovans said it is morally wrong to use contraceptives, while two third of the population believed this is not wrong [23]. Therefore, if religion plays a role in unmet need in the Republic of Moldova, it is likely that the level of religiosity is more important than religious denomination itself.

Unmet need is highest among the most vulnerable in society, such as women with no or low educational levels, women with mental health problems, and adolescents [1], [24]. Less knowledge about family planning methods as well as a lack of agency and autonomy over one's own behavior, are used as explanation why women with no or lower education levels and with mental health problems had a higher unmet need [9], [14], [15], [17]. In addition, intellectual and communication disabilities can cause barriers in conversation with health care workers, which can hamper access to contraceptives further [25]. Less knowledge is also used to explain why unmet need is higher among adolescents [26]. Other reasons which are mentioned are: limited family planning service to young and unmarried women, worries about the influence of modern contraceptives on future fecundity, and worries about social norms against postponement of parenthood [27], [28]. In 2015, half of the Moldovan population believed it is morally wrong to have pre-marital sex [23]. This may be another reason why young and unmarried women feel reluctant to purchase contraceptives.

The supply-side and demand-side factors mentioned thus far, influence unmet need through their influence on access to and use of contraceptives. However, some demand-side factors are believed to influence unmet need via their relation with fecundability, sexual activity and fertility intentions. Union status is one of these factors. Research showed that women who are in a union had a higher unmet need for family planning than single women [9]. Although, union status can potentially influence unmet need through a variety of pathways, it is commonly assumed that this is caused by higher sexual activity in combination with lower use of contraceptives among women who are in a union [9].

The effect of older age on unmet need also potentially involves a multitude of demand-side pathways. The general consensus in the literature is that unmet need increases with age, because as women get older they do not desire to have more children [9]. The same argument is used to explain why women with a higher number of children had a higher unmet need for family planning in the 90s [9]. This effect may be mitigated by a lower fecundability and sexual activity of older women. Nevertheless, in Europe unmet need increased with women nearing the end of their childbearing years [9].

Research in the Republic of Moldova showed that the lockdowns in reaction to the COVID-19 pandemic affected sexual activity and fertility intentions. Sexual activity was higher during lockdowns, while fewer people were actively trying to get pregnant [8]. This in combination with a limited effect of the lockdown on modern contraceptive use, lead to the speculation that the lockdown increased unmet need [2], [8].

Taking the demand-side elements into account, the following hypotheses are formulated:

H4: Unmet need is higher during the COVID-19 pandemic,

H5: Unmet need is higher among religious women,

H6: Unmet need is higher among women who are in a union,

H7: Unmet need is higher among low educated women,

H8: *Unmet need is higher among women with mental health problems,*

H9: *Unmet need is higher among adolescents*, and

H10: *Unmet need is higher among women nearing the end of their childbearing years*

2. Methods

2.1 Data

The hypotheses are tested with GGS-II data version 0.2 (GGP2020_WAVE1_MDA_V_0.2) collected among 10,044 respondents living in the Republic of Moldova [29]–[31]. The data is representative of the non-institutionalized Moldovan population aged 15-79. Data was not collected in the breakaway region Transnistria. Following the UN definition, all women aged 15-49 (N = 2701) were selected for analyses.

The data was collected from January till December 2020 via computer-assisted personal interviewing. Fieldwork was interrupted during the lockdown in reaction to the COVID-19 pandemic from halfway March until the start of July. During this period, the answer options of the question capturing contraceptive use was extended with the option *"No use"*. As a result, the percentage of respondents who selected *"Don't know"* or *"Refusal"* dropped from 36% to 7%. In data version 0.2, *"Don't knows"*, *"Refusals"* and those who skipped the question entirely, were recoded to *"No use".* Assuming that 7% of women could not or did not want to answer the question, and assuming that about half of these women were using contraceptives at the time, this means that roughly 3.5% of women were mistakenly identified as not using contraception. To correct for this, 181 cases classified as not using contraception were randomly selected and deleted from the dataset. An additional 34 cases were deleted because it was not possible to calculate unmet need for family planning for these women. Therefore, a total sample of 2486 women was used for further analyses.

2.2 Variables

2.2.1 Dependent variable

Unmet need for family planning. Unmet family planning need distinguishes between women who have an unmet need for family planning and those who do not. The variable follows the methodological strategy of the Demographic and Health Surveys [32].

2.2.2 Mediating variables

Contraceptive use. Contraceptive use distinguishes between women who are using any modern or traditional method and those who are not. Respondents are allowed to report multiple contraceptive methods. The variable reflects the most effect method used to prevent pregnancy. From most effective to least effective, the following order is used: 1. Implants, 2. Male sterilization, 3. Female sterilization, 4. IUD, 5. Injectables, 6. Pill, 7. Patch, 8. Vaginal ring, 9. Male condoms, 10. Safe period method (traditional method), 11. Diaphragm Cervical cap, 12. Female condoms, 13. Sponge, 14. LAM, 15. Withdrawal, (traditional method), 16. Persona (traditional method), 17. Foam Cream Jelly, 18. Emergency contraception.

Sexual activity. Sexual activity distinguishes between women who are sexually active and those who are not. Following the UN definition, women are categorized as being sexually active if they are single and reported to have had sex in the past 4 weeks. Women who are married or in a cohabiting union are all considered to be sexually active.

Fecundity. The variable fecundity distinguishes women who are fecund with those who are not. It assumes that all women are fecund unless: the respondent reports that she or her partner is

definitely not physically able to have children, she is in menopause, she is younger than 19 years old and has never menstruated, or her last birth happened over 5 years ago and her menstrual cycle has not been restored yet.

Medium-term fertility intention. Medium-term fertility intention distinguishes between women who definitely or probably want to have a/another biological child in the next three years and those who do not.

Long-term fertility intention. Long-term fertility intention distinguishes between women who definitely or probably want to have a/another biological child ever and those who do not.

2.2.3 Independent variables: Supply-side

Population density. The variable distinguishes between people living in urban areas and regional areas.

Income. Income is constructed in the same way as in the report *"Republic of Moldova – Study of Generations and Gender"* [2]. First the categorical variable household income is set to the median income in the income-range: <1000 lei is 500 lei, 1000-3000 lei is 2000 lei, etc. Subsequently, personal household income is calculated by dividing household income with household size. Finally these are translated to quintiles where: income < 1544.13 is quintile 1; income >= 1544.13 & income < 2099.97 is quintile 2; income >= 2099.96 & income < 2760.15 is quintile 3; income >= 2760.14 & income < 3902.01 is quintile 4, and income > 3902.00 is quintile 5.

Disabilities. Disabilities are measured using the short set of disability questions endorsed by the Washington Group [33]. In the Republic of Moldova, the questions capturing difficulty seeing, hearing, walking, remembering, and self-care were fielded, but the question capturing difficulty communicating was not. The Washington Group offers a range of disability severity indicators which can be used depending on the application [34]. The indicator Highest Difficulty was deemed most suitable, because it combines disabilities across all domains and does not require a predefined cut-off point [35]. The indicator differentiates between those with *"No - no difficulty"* over all 5 domains (None), those with only *"Yes – some difficulty"* on one or more domains (Mild), those with only *"Yes – a lot of difficulty"* on one or more domains (Moderate) and those with *"Cannot do at al"* on one or more domains. Those with missing information on any of the 5 domains are recoded to missing. Because of the small number of respondents (N=6) with severe disabilities, the categories severe and moderate disabilities were merged.

2.2.4 Independent variables: Demand-side

Lockdown. The variable lockdown distinguishes between respondents who were interviewed during the months of January, February, October, November and December when no or minimal COVID-19 lockdown measures were in place, and those interviewed in March, April, July, August, and September when stricter distancing measures were in place [8]. No interviews took place in May and June when the strictest measures were in place, because these measures prevented face-to-face interviews.

Age. Age is a categorical variable distinguishing between 5-year age groups.

Union status. Union status distinguishes between women who are married or living together with a partner (cohabiting) and those who are not. Following the UN definition, the latter group is referred to as single women. This group combines women who are not in a relationship and women who are in a relationship, but are not married or living together with this partner.

Number of children. Number of children is a continuous variable capturing the number of children which are still alive. The variable includes all children mentioned by the respondent, including biological, adopted and step children.

Educational level. Education is separated in three categories. Low education consists of educational levels "Fără studii/educaţie timpurie (grădiniță, creșă etc.)", "Primar (clasele I-IV)", and "Gimnazial (clasele V-IX)", medium education of "Mediu de cultură generală/liceal (clasele X-XII)", "Secundar profesional (școală de meserie)", and "Mediu de specialitate (colegiu, tehnicum)", and high education of "Superior universitar/licență (ciclul I)", "Masterat, inclusiv rezidentiat (ciclul II)", and "Doctorat, postdoctorat".

Religiosity. Religiosity captures self-rated religiosity level ranging from 0 (not at all religious) to 10 (very religious).

Mental health problems. Mental health problems is captured with the 7 items of the Center for Epidemiologic Studies Depression Scale (CES-DAFF) which can be used to capture depressive symptoms in a population [36]. Of the original 7 items, the items "I felt lonely" and "I had crying spells" were not fielded in the Generations and Gender Survey-II. The 5 remaining items were recoded so that the answer *"Never"* corresponds to 0, *"Sometimes"* to 1, "Often" to 2, and *"Most or all of the time"* to 3. The responses were subsequently averaged, resulting in a continuous scale ranging from 0 (Least depressive symptoms) to 3 (Most depressive symptoms). The mental health indicator is only calculated for respondents who responded to all 5 items.

2.3 Analytical strategy

To test the hypotheses, logistic regression were run with family planning need as the dichotomous dependent variable. The analyses consisted of two parts. In the first part, the influence of supply-side indicators and demand-side indicators on family planning need was examined. A detailed overview of the Model preparation is provided in Appendix A. No need for family planning was taken as the reference category. A positive effect of an independent variable thus means that a higher score on the independent variable is related with an increase in unmet need for family planning. In the final model, only the variables that were statistically significant related with unmet need were kept.

The second part explored why certain groups of women have a higher need for family planning than other women. The mediating effect of five factors which determine unmet need were considered, namely: contraceptive use, sexual activity, fecundity, medium-term fertility intention and long-term fertility intention. These variables were included one by one in the model in order to establish the degree to which this factor (for example contraceptive use) explains the relationship between X (for example educational level) and Y (unmet need for family planning).

3. Results

3.1 Results supply-side factors

Table 1 Model 3 shows the results of the analyses examining the influence of supply- and demand-side factors on unmet need for family planning. In accordance with **H2**, unmet need is higher among poor women than women in the second and third income quintile. However, the effect of income is not strictly linear. Instead, unmet need is also higher among women in the highest income quintile. The income quintiles are based on household income. It is possible that women in the highest income quintiles are more likely to work, which could explain their higher unmet need.

To test this, a variable working status[2] was prepared. An additional analysis (not shown) reveals that working status does not influence unmet need and including the variable does not alter the influence of household income on unmet need.

In Model 1 with only supply-side factors, women living in regional areas were found to have a higher unmet need than women living in urban areas. However, a model including all demand-side variables and income, population density was no longer statistically significant related with unmet need and the model fit did not improve when the variable was added (a detailed description of the Model Preparation is available in the Appendix). Therefore no support was found for **H1** "Unmet need is higher among women living in rural areas". Disability did also not significantly affect unmet need for family planning. In an additional model the effect of a continuous disability variable, the Severity Continuum [35][3], on unmet need was examined, but again no statistically significant effect was found. Therefore, **H3** "Unmet need is higher among women with disabilities", is rejected.

3.2 Results demand-side factors
The results presented in Table 1 Model 3 show that unmet need was higher during the COVID-19 lockdown than during the period with no or minimal restrictions in place, which is in line with **H4**. Moreover, it was found that unmet need is higher among women who are in a union than among single women, supporting **H6**.

Unmet need increases with age and number of children, which supports **H10** which states that unmet need is higher among women nearing the end of their childbearing ages. However, the age effect is not strictly linear. In fact, unmet need increases until age 40-44, but is lower again among women aged 45-49. The analyses also show that education influences unmet need. The effect is in the expected direction, however, differently than hypothesized, low educated women do stand out for their higher unmet need, but instead, high educated women stand out for their lower unmet need. It is possible that the effect is partly explained through working status of women. However, additional analyses revealed that this was not the case. The conclusion is therefore that **H7** "Unmet need is higher among low educated women", is partially confirmed.

Unmet need was not higher among religious women. Religiosity is captured with a question in which individuals had to score their own level of religiosity on a scale from 1 to 10. From additional analyses in which the influence of church attendance[4] and a categorical variable of religiosity[5] on unmet need were examined, the same conclusion was drawn. **H5** was therefore rejected. **H8** "Unmet need is higher among women with mental health problems" was not confirmed either. On the contrary, women with more depressive symptoms were found to have a lower unmet need for family

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[2] Working status differentiates between women who are employed (Employed, Self-employed, Employed with 1+ employees, and In military or civic service) and women who are not employed (In education or training, Helping Family Member in a family farm, Unemployed, Retired, Taking care of the home or family, On maternity or paternity leave, On parental leave or childcare leave, Ill or disabled for a long time or permanently, and Other).

[3] The Severity Continuum is constructed by scoring the answers on the five domains, where "No - no difficulty" is scored 0, "Yes – some difficulty" is scored 1, "Yes – a lot of difficulty" is scored 5, and "Cannot do at al" is scored 25, and summing the recoded domain values for each individual.

[4] Church attendance is a continuous variable reflecting how many times an individual attends a religious service on a yearly basis.

[5] Women who rated themselves from 0-4 on religiosity were recoded as "Little religious", those with 5 were recoded as "Medium religious", 6-7 as "Pretty religious", 8-9 "Very religious", and 10 as "Completely religious".

planning. The analyses were repeated with the use of loneliness[6] as an expression of mental health problems. However, loneliness did not influence unmet need for family planning. Hypothesis 8 was therefore rejected. Adolescents - another potentially vulnerable group – did also not have a significant higher unmet need for family planning. In fact, family planning need was significantly lower among adolescents compared to other age-groups. Therefore, **H9** was rejected.

3.3 Mediation through contraceptive use, sexual activity, fecundity and fertility intentions

Next, the mediation effects of behavioural aspects (contraceptive use and sexual activity), health aspects (fecundity), and intentions (medium- and long-term fertility intentions) are examined. For easy comparison, Model 3 of Table 1 is shown again in Model 1 of Table 2. The mediation effect of contraceptive use is shown in Model 2, sexual activity in Model 3, fecundity in Model 4, medium-term fertility intentions in Model 5, and long-term fertility intentions in Model 6.

Unmet need is assumed to be higher among the poor, because they face financial barriers to obtain family planning services. The results presented in Model 2 are in line with this reasoning. After including contraceptive use in the model, the higher unmet need among women in the first income quintile compared to women in the second and third income quintile disappears. And the lower unmet need of women in the fourth quintile compared to the first quintile, is the only significant effect of income that remains.

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[6] The 6-item De Jong Gierveld Scale was used to capture loneliness. The scale combines 3 items on emotional loneliness with three items on social loneliness (Gierveld & Tilburg, 2006). In the Moldovan Generations and Gender Survey questionnaire, one of the questions capturing social loneliness "There are many people I can trust completely" was replaced with "I have many people around me who can count on me in any situation". Because the latter item does pertain to social loneliness and because this item is also positively phrased, the latter item is used instead. Apart from this divergence, the scale could be constructed in the way suggested by Gierveld and Tilburg (2006). For negatively worded items, neutral and positive answers are scored as 1, for positively worded items, neutral and negative are scored 1. The scores across all 6 items are subsequently summed, resulting in a continuous scale ranging from 0 (Least lonely) to 6 (Most lonely).

Table 1. Effect of supply-side and demand-side factors on unmet need for family planning for women aged 15-49.

variables	Model 1	Model 2	Model 3
Intercept	-1.66*** (0.14)	-3.57*** (0.56)	-4.27*** (0.73)
Regional density - Rural	0.44*** (0.12)		
Income (ref. Q1)			
Q2	-0.92*** (0.27)		-0.78** (0.28)
Q3	-0.72** (0.27)		-0.69* (0.28)
Q4	-0.52* (0.26)		-0.45 (0.27)
Q5	-0.16 (0.13)		-0.04 (0.14)
Disability (ref. None)			
Mild	0.03 (0.13)		
Moderate or Severe	-0.05 (0.31)		
COVID-19 lockdown		0.31** (0.12)	0.36** (0.12)
Religiosity		-0.04 (0.03)	
In a union		1.17*** (0.19)	1.22*** (0.21)
Education (ref. Low)			
Medium		-0.16 (0.13)	-0.11 (0.14)
High		-0.75*** (0.18)	-0.65*** (0.19)
Depression		-0.55*** (0.13)	-0.50*** (0.14)
Age (ref. 15-19)			
20-24		0.93 (0.57)	1.12 (0.77)
25-29		1.13* (0.56)	1.50* (0.75)
30-34		1.20* (0.55)	1.64* (0.75)
35-39		1.36* (0.55)	1.73* (0.75)
40-44		1.77** (0.55)	2.15** (0.75)
45-49		1.37* (0.56)	1.73* (0.75)
Number of children		0.23*** (0.06)	0.21*** (0.06)

Based on the results of a previous study in the Republic of Moldova which examined the effect of the COVID-19 pandemic on fertility related behaviours and intentions [8], it was expected that unmet need was higher during the lockdown due to higher sexual activity in combination with a lower number of women who were actively trying to get pregnant. In contrast, the results in Model 2 show that the increase in unmet need during the lockdown is related to a lower use of contraceptives. Emery and Koops [8], constructed the lockdown variable slightly different[7]. However, additional analyses using a lockdown variable that was constructed in the same way, resulted in similar observations.

In the Republic of Moldova women who are in a union are more likely to have an unmet need than single women. Based on the literature it was expected that this is due to a combination of higher sexual activity and lower use of contraceptives among women who are in a union. However, Model 3 shows that the effect of union status on unmet need was mostly mediated through sexual activity.

Unmet need is often highest among the most vulnerable in society, such women with no or low educational levels. Pathways mentioned through which having a lower education results in a higher unmet need are less knowledge about family planning methods as well as a lack of agency and autonomy over one's behavior. Thus far, the results showed that in the Republic of Moldova, higher educated women stand out with their lower unmet need compared to medium and low educated women. The results in Model 2 show that the lower unmet need of higher educated women can be explained by the higher use of contraceptives among this group.

Differences in contraceptive use are also mentioned in the literature to explain the higher unmet need of women with mental health problems. It was already established that in the Republic of Moldova, women with depressive symptoms have a lower unmet need instead of a higher unmet need. In addition to this, Models 2-6 show that the lower unmet need among women with depressive symptoms cannot be explained by any of the mediating variables alone. Additional models in which multiple mediators are entered at once show that the effect of depression is mostly mediated through a combination contraceptive use and medium-term fertility intentions.

Age had a mostly linear and positive effect on unmet need. The only deviation of this linearity is that women aged 45-49 have a slightly lower unmet need compared to women aged 40-44. The results in Table 2 Model 4 show that this slight drop in unmet need for women in the oldest age-group can be explained by the lower fecundability of this group of women. In addition, and as expected based on the literature, a reduction in long-term fertility intentions (Model 6) explain why unmet need steadily increases with age. Unmet need also increases with the number of children a women has. This effect was mediated through medium and long-term fertility intentions, but mostly through medium-term fertility intentions (Model 5 and 6).

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[7] In the paper of Emery & Koops [8], the COVID-19 lockdown variable differentiates between the period before and after March 2020.

Table 2. Effect of supply-side, demand-side, and mediating factors on unmet need for family planning for women aged 15-49.

variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	-4.27*** (0.73)	-4.00*** (0.75)	-4.83*** (0.76)	-9.24*** (1.25)	-3.91*** (0.73)	-3.18*** (0.74)
Income (ref. Q1)						
Q2	-0.78** (0.28)	-0.43 (0.36)	-0.82** (0.28)	-0.88** (0.29)	-0.82** (0.29)	-0.83** (0.28)
Q3	-0.69* (0.28)	-0.60 (0.35)	-0.68* (0.28)	-0.76** (0.28)	-0.66* (0.28)	-0.68* (0.28)
Q4	-0.45 (0.27)	-0.68* (0.33)	-0.44 (0.27)	-0.50 (0.28)	-0.32 (0.28)	-0.39 (0.27)
Q5	-0.04 (0.14)	-0.20 (0.18)	-0.07 (0.14)	0.03 (0.14)	-0.01 (0.14)	0.02 (0.14)
COVID-19 lockdown	0.36** (0.12)	0.20 (0.16)	0.36** (0.12)	0.40** (0.13)	0.41** (0.13)	0.39** (0.12)
In a union	1.22*** (0.21)	2.08*** (0.23)	-0.13 (0.28)	1.31*** (0.21)	1.30*** (0.21)	1.21*** (0.21)
Education (ref. Low)						
Medium	-0.11 (0.14)	-0.09 (0.17)	-0.12 (0.14)	-0.18 (0.14)	-0.16 (0.14)	-0.11 (0.14)
High	-0.65*** (0.19)	-0.28 (0.24)	-0.68*** (0.19)	-0.80*** (0.19)	-0.58** (0.20)	-0.64*** (0.19)
Depression	-0.50*** (0.14)	-0.44** (0.16)	-0.49*** (0.14)	-0.45** (0.14)	-0.53*** (0.14)	-0.55*** (0.14)
Age (ref. 15-19)						
20-24	1.12 (0.77)	1.20 (0.80)	0.90 (0.77)	1.07 (0.77)	1.84* (0.78)	1.13 (0.77)
25-29	1.50* (0.75)	1.27 (0.78)	1.33 (0.76)	1.43 (0.75)	2.19** (0.77)	1.35 (0.76)
30-34	1.64* (0.75)	1.55* (0.77)	1.48* (0.75)	1.63* (0.75)	2.07** (0.76)	1.24 (0.76)
35-39	1.73* (0.75)	1.80* (0.77)	1.57* (0.75)	1.75* (0.75)	1.99** (0.76)	1.14 (0.76)
40-44	2.15** (0.75)	2.37** (0.77)	2.00** (0.75)	2.31** (0.75)	2.21** (0.76)	1.40 (0.76)
45-49	1.73* (0.75)	1.34 (0.78)	1.61* (0.76)	2.50*** (0.76)	1.73* (0.76)	0.93 (0.76)
Number of children	0.21*** (0.06)	0.41*** (0.08)	0.20*** (0.06)	0.24*** (0.06)	0.03 (0.06)	0.09 (0.06)
Uses contraception		-20.53 (480.10)				
Is sexually active			2.12*** (0.40)			
Is fecund				4.91*** (1.01)		
Wants child in next 3 years					-3.42*** (0.42)	
Wants child at some point						-1.29*** (0.18)

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4. Discussion

In order to reduce unmet need for family planning further and to ensure equal universal access to sexual and reproductive health-care services in the Republic of Moldova, it is important to understand which groups of women are lacking behind. In this study, the influence of several factors were examined which have been shown to influence unmet need in other national contexts.

This study confirms the previously mentioned vulnerable status of women in the lowest household income quintile [10]. The mediation models confirm that this difference can be explained by a lower use of contraceptives among poor women. These results contrast with the outcomes of a recent Moldovan report in which no consistent pattern of the same income-groups on unmet need was found [2]. However, this outcome was based on descriptive analyses. The current study showed that income was correlated with several other independent variables. It is therefore possible that the effect of income only appears after controlling for these variables. Furthermore, the current study identifies women nearing the end of their childbearing years as a vulnerable group. The effect of age and number of children on unmet need are mediated through fertility intentions. This suggests that after women had more children and they reach an older age, their fertility intentions reduce, while their fecundity, sexual activity and contraceptive use remain largely unchanged.

Adolescents are also labelled as a vulnerable group in the Republic of Moldova [10]. However, in the current study adolescents were not found to have a higher unmet need for family planning. This contradicts findings from previous studies conducted in Africa [14], [15], [27]. However, it is in line with the findings of a paper which examined unmet need in several European countries in the 80s and 90s [9]. Perhaps in the Republic of Moldova certain types of modern contraceptives, such as condoms, are easily accessible without the involvement of others. This may limit the influence of social norms on actual use. In order to rule out the possibility that unmet need was underreported because adolescents are reluctant to report they are sexually active to an (older) interviewer [15], it is recommendable to repeat such a study using online interviewing techniques. Other good news was that no clear urban-rural divide in unmet need was found in the current study. This contrasts with descriptive findings which showed that unmet need is higher in rural areas of the Republic of Moldova (20%) than in urban areas (12%) [2]. The current study shows that population density influences unmet need, but that this effect disappears once the models are controlled for other factors such as union status, educational attainment and number of children. The finding also conflicts with several other studies which show a rural-urban divide. However, most of these studies are conducted in low-income countries e.g. [4], [14], [15]. It appears that in a relatively small middle-income country like the Republic of Moldova, family planning services are be better spaced across the country and women can obtain their desired family planning methods regardless of where they live.

Women with disabilities and mental health issues were not found to have a higher unmet need for family planning. However, it is too early to draw firm conclusions based on this observation. The reason is that the data was collected face-to-face among non-institutionalized individuals. Therefore, a relatively healthy population of women is captured with good social skills, which could explain why no effect of disabilities was found. Nevertheless, this suggests that disabilities have to be rather severe before they influence unmet need in the Republic of Moldova. The relatively healthy study population could also explain why women with mental health problems did not have a higher unmet need. Moreover, although depressed and lonely women were not found to have a higher unmet

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need for family planning, this does not rule out that women with different types of mental health issues have a higher unmet need.

A final point of caution is related with the way unmet need and sexual activity is captured. Women in a union were all assumed to be sexually active, while single women were only assumed to be sexually active when they had sex in the past four weeks. However, a study on sexual activity by marital status and age has shown that sexual activity among women in a union is instead closer to 80%, while potentially more single women would have been labelled as sexually active if a larger reference period than four weeks was used [37]. In other words, the methodological strategy used in the current study tends to overestimate sexual activity and as a result unmet need among women in a union and underestimates sexual activity and unmet need among single women. Because the aim of the study was to follow the UN guidelines to construct unmet need in order to make the results comparable with other studies, it was decided to keep the analyses as they were. However, it is likely that the effect found of union status on unmet need, which was completely mediated through sexual activity, is in reality lower or even non-existent when information on self-reported sexual activity would have been used for women in a union.

The assumption that women in a union are sexually active could also have led to an underestimation of the effect of the lockdown on unmet need. Previous research with the same data showed that during the lockdown Moldovan women increased their sexual activity [8]. It is likely that this increase in sexual activity mostly happened in the group of women who are in a union. The expectation was that this increase in sexual activity could have temporarily increased unmet need. However, because women in a union are always labelled as being sexually active, this effect of the lockdown was not captured in this study. Another reason why the effect of the lockdown might be underestimates is that fieldwork was stopped during the months of the strictest lockdown. Regardless, the current study finds that natural disasters, like the COVID-19 pandemic, can increase unmet need in a middle income country such as the Republic of Moldova. Furthermore, it is shown that this effect can be explained by lower contraceptive use during the months when stricter lockdown measures were in place. This latter finding is different from a previous study which showed that the lockdown did not have a significant effect on contraceptive use [8]. The fact that this previous study focused on modern contraceptive use only, while the current study focussed on traditional and modern contraceptive use is most likely the root of this difference. This is endorsed by a previous report based on descriptive statistics which shows that any contraceptive use and traditional contraceptive use were higher pre-lockdown than post-lockdown, while modern contraceptive use remained the same.

The results of the current study provide some anchors for future research. Similarly to this study, another study has found that unmet need is not only highest among the poorest but also among the richest in society [4]. The richest in society would probably be able to deal with an unplanned pregnancy, and are therefore not recognized as a vulnerable group in the current study. Nevertheless, from a theoretical point of view it would be interesting to understand why in some societies the highest income quintiles have a lower contraceptive use. Another surprising finding which may deserve attention in the future is that unmet need is lower among women with more depressive symptoms. The mediation models showed that the effect was explained by a combination of higher contraceptive use and higher medium-term fertility intentions among women with depressive symptoms. However, even when knowing this, the findings remain puzzling. Finally, the current study suggests that unmet need was higher during the COVID-19 lockdown because the use of traditional methods reduced, but the use of modern methods remained the same. The reasons

behind this finding remain unclear, more so because the literature suggests that any increase in unmet need as a result of the COVID-19 pandemic should be attributable to a reduction in the use of modern contraceptive methods [16].

5. Policy Implications

The lower use of contraceptives among poor Moldovan women is probably caused by their lower financial resources which reduces their access to family planning services. This finding is worrying as this entails approximately 20% of women aged 15-49 and these women will presumably face difficulties if their unmet need results in an unplanned pregnancy. Therefore, it is recommended to target policies to women with the lowest household incomes. In 2014, the Republic of Moldova approved a plan to offer free contraceptives for vulnerable groups [38]. As part of this plan people with a low income can receive free family planning. With the current study it is not possible to establish if the free-of-charge access to modern contraceptives reduced income-inequalities in unmet need. However, it is clear that it did not eliminate inequality. In fact, a hospital survey conducted in 2019 shows that 27% of Moldovan women who recently gave birth mention costs as a reason for not using contraceptives at the time of conception [38]. Male condoms are the most commonly used contraceptive in the Republic of Moldova; among couples and singles alike [2]. People might not obtain condoms through their doctor, which could explain why free family planning through the family doctor's office does not eradicate income-inequality in unmet need.

The study also shows that low and medium educated women have a higher unmet need for family planning than highly educated women. This is caused by a lower contraceptive use. From the literature in other countries it is known that highly educated women have a better understanding of contraceptive methods, are better informed or less concerned about possible side effects of contraceptives, and have more agency over their own behaviour. The previously mentioned hospital survey found that the number of Moldovan women who do not use contraceptives because their partner does not want to is negligible [38], therefore a lack of agency over their own behaviour is less likely to play an important role in explaining educational differences. Moldovan women did mention fear for adverse effects, inconvenience of use and lack of knowledge as reasons for not using contraception [38]. The same study also showed that women used contraceptives inconsistently and many Moldovan women were not able to identify the most effective contraceptive method; 39% thought that male condoms are the most efficient, 25% choose hormonal pill, 17% IUD, and only 2% female sterilization [38].[8] This was a selective group of women who just delivered a baby. Nevertheless, taking all of the above into account, access to contraceptives by itself are probably not enough to ensure universal use of contraceptives in the Republic of Moldova. Investments in increasing knowledge about contraceptives and its side-effects are required. Given that about 80% of Moldovan women have a low or medium education level, perhaps a nation-wide media campaign is most suited to obtain this objective. Such a campaign could target men and women alike, because the majority of couples make the decision about contraceptive use together [38].

In addition, attention should be paid to women who already have children and would like to postpone the birth of the next child to a later point and to older women who do not want to have a(nother) child. These women could be reached via the health care services they use while being pregnant or after they have delivered a baby. For women who want to postpone the birth of the next child, a conversation could focus on the availability of reversible methods which do not influence

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[8] The order of effectiveness of these contraceptives is (from most to least effective): female sterilization, IUD, hormonal pill, male condoms.

future fecundability. Only few Moldovan women know about progesterone pills, while this is a suitable contraceptive after giving birth [38]. Conversations with women who are older or who have reached their desired family size, could instead focus on long acting contraception options. With this in mind the Republic of Moldova could make efforts to ensure access to long acting contraceptives which are currently not available, such as implants and injectables. A recommendation which is also made by the European Parliamentary Forum for Sexual & Reproductive Rights [39]. Even in countries with very high use of modern contraceptives, unwanted pregnancies are common and can be disastrous for individual women [40]. Therefore it is recommendable that Moldovan women keep access to induced abortion, and this option should be available as early as possible [40].

Finally, it is important to keep in mind that the Generations and Gender Survey is a longitudinal survey which follows women over time by interviewing them every three years. These longitudinal data collections could function as a methodological set-up to test the effectiveness of policy measures and campaigns. For example by questioning a large enough random sample of the Moldovan population before and after the introduction of policy measures or the launch of a media campaign. This will not be an easy task and will require careful planning and coordination among the different parties. However, if successful, this strategy will result in exciting data which can be used for cost-benefit analyses and to measure the effectiveness of different implemented strategies.

References

[1]   WHO, "Family Planning: A Global Handbook for Providers," 2018.

[2]   Ministerul Muncii și Protecției Sociale al Republicii Moldova, Biroul Național de Statistică (eșantionul studiului), UNFPA, and NIDI-GGP (partener și distribuitor), "Republica Moldova – Studiul Generații și Gen," 2021.

[3]   United Nations; Department of Economic and Social Affairs; Population Division, "World Contraceptive Use 2014," 2014. Accessed: May 20, 2022. [Online]. Available: POP/DB/CP/Rev2014

[4]   M. F. Asif and Z. Pervaiz, "Socio-demographic determinants of unmet need for family planning among married women in Pakistan," *BMC Public Health*, vol. 19, no. 1, p. 1226, 2019, doi: 10.1186/s12889-019-7487-5.

[5]   M. K. Mutua *et al.*, "Wealth-related inequalities in demand for family planning satisfied among married and unmarried adolescent girls and young women in sub-Saharan Africa," *Reprod. Health*, vol. 18, no. 1, p. 116, 2021, doi: 10.1186/s12978-021-01076-0.

[6]   S. Sánchez-Franco and C. González-Uribe, "Age disparities in unmet need for contraception among all sexually active women in Colombia: Demographic Health Survey 2015," *Women Health*, vol. 61, no. 6, pp. 562–571, Jul. 2021, doi: 10.1080/03630242.2021.1936350.

[7]   L. Senderowicz and N. Maloney, "Supply-Side Versus Demand-Side Unmet Need: Implications for Family Planning Programs," *Popul. Dev. Rev.*, Mar. 2022, doi: https://doi.org/10.1111/padr.12478.

[8]   T. Emery and J. C. Koops, "The impact of COVID-19 on fertility behaviour and intentions in a middle income country," *PLoS One*, vol. 17, no. 1, p., Jan. 2022, doi: 10.1371/journal.pone.0261509.

[9]   E. Klijzing, "Are there unmet family planning needs in Europe?," *Fam. Plann. Perspect.*, vol. 32,

no. 2, pp. 74–81, 88, 2000, doi: 10.2307/2648215.

[10]   Ministerului Sănătății Muncii și Protecției Sociale al Republicii Moldova, "Regulamentul cu privire la asigurarea populației din grupurile vulnerabile de vârstă reproductivă cu contraceptive," Chişinău, 2020.

[11]   S. Mills, E. Bos, and E. Suzuki, "Unmet need for contraception: At a glance," The World Bank Washington, DC, 2010.

[12]   M. S. Alie, G. F. Abebe, and Y. Negesse, "Magnitude and determinants of unmet need for family planning among reproductive age women in East Africa: multilevel analysis of recent demographic and health survey data," *Contracept. Reprod. Med.*, vol. 7, no. 1, p. 2, 2022, doi: 10.1186/s40834-022-00168-x.

[13]   Y. Choi, M. S. Fabic, and J. Adetunji, "Measuring Access to Family Planning: Conceptual Frameworks and DHS Data," *Stud. Fam. Plann.*, vol. 47, no. 2, pp. 145–161, Jun. 2016, doi: https://doi.org/10.1111/j.1728-4465.2016.00059.x.

[14]   A. Nzokirishaka and I. Itua, "Determinants of unmet need for family planning among married women of reproductive age in Burundi: a cross-sectional study," *Contracept. Reprod. Med.*, vol. 3, no. 1, Dec. 2018, doi: 10.1186/s40834-018-0062-0.

[15]   A. B. Oginni, A. Ahonsi, and S. Adebajo, "Trend and Determinants of Unmet Need for Family Planning Services among Currently Married Women and Sexually Active Unmarried Women Aged 15-49 in Nigeria (2003-2013)," 2015. [Online]. Available: http://aps.journals.ac.za

[16]   A. Dasgupta, V. Kantorová, and P. Ueffing, "The impact of the COVID-19 crisis on meeting needs for family planning: a global scenario by contraceptive methods used," *Gates Open Res.*, vol. 4, 2020.

[17]   S. Bellizzi, H. L. Sobel, H. Obara, and M. Temmerman, "Underuse of modern methods of contraception: Underlying causes and consequent undesired pregnancies in 35 low-and middle-income countries," *Hum. Reprod.*, vol. 30, no. 4, pp. 973–986, Sep. 2015, doi: 10.1093/humrep/deu348.

[18]   K. Bremer, L. Cockburn, and A. Ruth, "Reproductive health experiences among women with physical disabilities in the Northwest Region of Cameroon," *Int. J. Gynecol. Obstet.*, vol. 108, no. 3, pp. 211–213, Mar. 2010, doi: https://doi.org/10.1016/j.ijgo.2009.10.008.

[19]   N. W. Greenwood and J. Wilkinson, "Sexual and Reproductive Health Care for Women with Intellectual Disabilities: A Primary Care Perspective," *Int. J. Family Med.*, vol. 2013, p. 642472, 2013, doi: 10.1155/2013/642472.

[20]   M. T. Casebolt, K. Singh, I. S. Speizer, and C. T. Halpern, "Use of modern contraceptives by women with disabilities in Rajasthan, India: An analysis of the annual health survey," *Sex. Reprod. Healthc.*, vol. 31, p. 100699, 2022, doi: https://doi.org/10.1016/j.srhc.2022.100699.

[21]   W. Mosher, R. B. Hughes, T. Bloom, L. Horton, R. Mojtabai, and J. L. Alhusen, "Contraceptive use by disability status: new national estimates from the National Survey of Family Growth," *Contraception*, vol. 97, no. 6, pp. 552–558, 2018.

[22]   S. Joshi, "Religion is not a barrier to family planning," *Nature*, vol. 588, p. S165, 2020, [Online]. Available: https://link.gale.com/apps/doc/A649636888/HRCA?u=anon~e1ce4949&sid=googleScholar&xi

d=999b896e

[23] Pew Research Center, "Religious Belief and National Belonging in Central and Eastern Europe.," 2017. [Online]. Available: www.pewresearch.org.

[24] M. I. Rodriguez, E. Kismodi, and J. Cottingham, "Ensuring human rights in the provision of contraceptive information and services: guidance and recommendations," 2014.

[25] M. W. Gichane, M. Heap, M. Fontes, and L. London, "'They must understand we are people': Pregnancy and maternity service use among signing Deaf women in Cape Town," *Disabil. Health J.*, vol. 10, no. 3, pp. 434–439, 2017, doi: https://doi.org/10.1016/j.dhjo.2017.03.016.

[26] E. Kennedy, N. Gray, P. Azzopardi, and M. Creati, "Adolescent fertility and family planning in East Asia and the Pacific: a review of DHS reports," *Reprod. Health*, vol. 8, no. 1, p. 11, 2011, doi: 10.1186/1742-4755-8-11.

[27] N. C. A. Ahissou *et al.*, "Modern contraceptive use among adolescent girls and young women in Benin: a mixed-methods study," *BMJ Open*, vol. 12, no. 1, p. e054188, Jan. 2022, doi: 10.1136/bmjopen-2021-054188.

[28] J. T. Bertrand, K. Hardee, R. J. Magnani, and M. A. Angle, "Access, quality of care and medical barriers in family planning programs," *Int. Fam. Plan. Perspect.*, pp. 64–74, 1995.

[29] A. H. Gauthier, S. L. F. Cabaço, and T. Emery, "Generations and Gender Survey study profile," *Longit. Life Course Stud.*, vol. 9, no. 4, pp. 456–465, 2018, doi: 10.14301/llcs.v9i4.500.

[30] A. Vikat *et al.*, "Generations and Gender Survey (GGS): towards a better understanding of relationships and processes in the life course.," *Demogr. Res.*, vol. 17, pp. 389–440, 2007, doi: 10.4054/DemRes.2007.17.14.

[31] Republic of Moldova - Generations and Gender Survey, "Ministry of Health, Labour and Social Protection of the Republic of Moldova, National Bureau of Statistics (sample development), UNFPA, NIDI-GGP (partner and data distributor)," 2020.

[32] S. E. K. Bradley and C. Westoff, "Revising Unmet Need for Family Planning," Calverton, Maryland, 2012. [Online]. Available: https://www.researchgate.net/publication/263424553

[33] N. E. Groce and D. Mont, "Counting disability: emerging consensus on the Washington Group questionnaire," *Lancet Glob. Heal.*, vol. 5, no. 7, pp. e649–e650, Jul. 2017, doi: 10.1016/S2214-109X(17)30207-3.

[34] "Washington Group on Disability Statistics. Short set of disability questions." https://www.cdc.gov/nchs/data/washington_group/WG_Short_Measure_on_Disability.pdf (accessed Apr. 25, 2022).

[35] Washington Group on Disability Statistics, "Disability Identification-Moving Beyond A Dichotomy," 2021. [Online]. Available: http://www.washingtongroup-disability.com/.

[36] L. S. Radloff, "The CES-D Scale: A Self-Report Depression Scale for Research in the General Population," *Appl. Psychol. Meas.*, vol. 1, no. 3, pp. 385–401, Jun. 1977, doi: 10.1177/014662167700100306.

[37] P. Ueffing, A. N. Z. Dasgupta, and V. Kantorová, "Sexual activity by marital status and age: a comparative perspective," *J. Biosoc. Sci.*, vol. 52, no. 6, pp. 860–884, 2020, doi: DOI: 10.1017/S002193201900083X.

[38]   S. Irina, C. Maria, and C. Olga, "Exploring the Knowledge, Attitudes and Use of Contraception Methods in Relation to Unintended Pregnancy, an Experience from the Republic of Moldova," 2020, doi: 10.21203/rs.3.rs-30953/v1.

[39]   European Parliamentary Forum for Sexual & Reproductive Rights, "European Contraception Policy Atlas - Moldova." https://www.epfweb.org/node/740 (accessed May 20, 2022).

[40]   ESHRE Capri Workshop Group, "Why after 50 years of effective contraception do we still have unintended pregnancy? A European perspective," *Hum. Reprod.*, vol. 33, no. 5, pp. 777–783, May 2018, doi: 10.1093/humrep/dey089.

Appendix

Model preparation

As a first step, the influence of all variables related with the supply-side factors on unmet need were examined. Chi-square tests of independence between all independent variables revealed the issue of multicollinearity between income and population density. However, further exploration of different models revealed that both variables also have a strong independent effect on unmet need. Moreover, Akaike Information Criterion (AIC) revealed that the model including both variables performed best, and was therefore selected. The result of the final model examining the influence of the supply-side factors on unmet need for family planning is shown in Table 1 Model 1.

Chi-square tests of independence identified the issue of multicollinearity between several demand-side variables. Multicollinearity exists between union status and all other demand-side factors, except the COVID-19 lockdown and education and all other demand-related factors, except depression and the COVID-19 lockdown. In addition, the tests pointed to multicollinearity between age and number of children and between religiosity and depression. Because the latter are continuous variables, this was further explored by calculating the Pearson correlations. This revealed that the correlation between religiosity and depression (-.04) was very low.

The first model with demand-side factors examined the influence of the lockdown, age, religiosity and depression on unmet need. In a next step, number of children was added to the model. The results showed that age and number of children have an independent effect on unmet need and the model fit is highest when both variables are added to the model. I therefore continued with a model including both variables. Including education in the model showed that it has an independent effect on unmet need without influencing the conclusion based on the effects of the other independent variables. In addition, the overall model fit improved. Educational attainment was therefore kept in the model. Finally, union status was added. Including this variable changed the effect of age on unmet need. In the model excluding union status, adolescents are significantly less likely to have an unmet need, compared to all other age-groups. After including union status, no significant differences are found between women aged 15—19 and women aged 20-24. The significant lower likelihood of unmet need of women aged 15-19 as compared to women aged 25+, remained statistical significant, although the point-estimates reduced in size. The results of the final model, including the demand-side independent variables is shown in Table 1 Model 2.

All supply-side and demand-side variables which were found to be significantly related to unmet need were selected and included in the final model. The Chi-square tests of independence identified several instances of multicollinearity between supply-side and demand-side indicators. Multicollinearity existed between population density and union status, educational attainment, and number of children, as well as between income and education and number of children. A model including all demand-side variables and income shows that income has a largely independent effect on unmet need, without affecting the influence of demand-side variables much, resulting in a general improvement of the model. Income was therefore added to the final model. However, in a model with all demand-side variables and income, population density was no longer statistically significant related with unmet need and the model fit did not improve when the variable was added. Population density was therefore not including in the final model presented in Table 1 Model 3.

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