

**Exposure to international migration and its effect on
women's childbearing in Turkey**

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Paper presented at the Annual Meeting of the Population Association of America, Detroit, MI 2009.

Abstract

Although the Demographic and Health Surveys (DHS) routinely collect information on migration, detailed information is lacking. In this analysis using the 2003 Turkish DHS, we describe an approach to construct measures of international migration and women's migration exposure from the household roster and individual questionnaire. After comparing our measure with other provincial-level migration estimates, we restricted our analysis to women living in higher migration provinces to better reflect Turkey's regional patterns of migration intensity and identify the effect of migration-related role and attitude changes in areas with well-established networks. Next, we employed our measures of migration exposure to explore the effects of migrant selection and migration-related changes on the number of children born. After adjusting for selection characteristics, return female migrants and migrant wives were not significantly different from women in non-migrant households; roles and attitudes did not explain differences between groups. Recommendations for improving DHS migration measurements are also discussed.

Introduction

Much of the published literature assessing the relationship between migration and fertility focuses on women's migration and childbearing behavior in destination areas, highlighting the role of economic factors and social inclusion in altering behaviors. The impact of international migration on childbearing in sending areas is less studied. As increasing attention is drawn to the fluid nature of migration, barriers to migrant integration, the importance of transnational identities, and the practice of labor migration as a survival strategy for developing countries, understanding how migration influences fertility across sending regions gains importance. We contend that the relationship between migration and fertility in sending regions is a potentially important factor to consider not only to identify the mechanisms by which the process of migration influences fertility, but also to assess how migration may alter social norms, family structures, and population development within regions of origin.

Turkey, where international migration has played an important economic role since the 1960s, provides a useful case for assessing the impact of international migration on women's fertility in migrant households. Early guest worker agreements, negotiated by the Turkish government with several Western European nations, were part of a national economic development strategy. Recruitment for guest workers led to wide-spread male labor migration from Central Anatolia and the Aegean area (Reniers 1999; Koc and Onan 2004). The wives and children of guest workers usually remained in the communities of origin. When destination states terminated guest worker programs in 1970's, some Turkish workers returned to their families. Others settled abroad, bringing their wives, children and extended family to host countries through policies of family reunification. This initiated a new phase of Turkish migration, where migration largely operated through social networks, and the composition of the migratory flow changed substantially (Koc and Onan 2004). Migration from Turkey continues to be dynamic as migratory flows and destinations diversify. Although Europe remains a primary destination for migrants pursuing legal (or clandestine) labor and marriage or family reunification, numerous other destination countries, such as the Gulf states and the countries of the former Soviet Union, have emerged as routes for more traditional male labor migration and other areas of Turkey, such as South Eastern Anatolia, have been the origin of more recent migrants (Içduygu, Sirkeci, and Muradoglu 2001; Koc and Onan 2004). This dynamic migration history has resulted in a substantial number of Turkish households with members reporting international migration experience.

How has the experience of migration influenced women's fertility in Turkey? In this analysis we use data from the 2003 Turkish Demographic and Health Survey (TDHS) to

compare the fertility of women who have varying levels of exposure to international migration: return female migrants, wives of migrants and women living in households where another family member is a migrant. Specifically, we want to assess whether, after controlling for the socio-demographic differences between women in these groups, are there significant differences in the number of children born.

Background

Research on migration and fertility suggests several ways in which migration may affect women's childbearing. One approach stresses the importance of migrant selectivity, contending that migrants are selected on characteristics, such as place of origin and educational attainment, associated with different rates of childbearing. Additionally, migrant households tend to follow particular patterns of family formation and household decision-making, affecting women's fertility preferences and ability to negotiate these preferences (Singley and Landale 1998; Lindstrom and Giorguli Saucedo 2002; Timmerman 2006). While many of these characteristics are measured at the level of the individual migrant, we anticipate their effects to be shared among others family members living in migrant sending households, prompting differences in fertility among women in these households compared to women in households without migration experience.

Research on Turkish migration provides evidence of migrant household selection on characteristics that may lead to lower fertility, such as *urban* residence and higher educational attainment. Although earlier labor migrants tended to originate from rural areas, their migration was frequently a two-stage process, whereby they first relocated to urban areas within the country and then made an international migratory trip (Reiners 1999). This initial move toward urban areas also led wives of migrants to move to urban areas to join extended kin networks (Kadioglu 1994). Urban areas, where fertility rates are lower, have been the sources for many international women migrants, as well as primary destination areas for return migrants (Kadioglu 1994; Day and İçduygu 1997; Hacetepe University 2004).

Additionally, several studies have found that Turkish migrants are positively selected on education (Reiners 1999; Koc and Onan 2004). In his study comparing the characteristics of Turkish migrants to Belgium with non-migrants in Turkey, Reiners (1999) found that, relative to non-migrants, Turkish labor, family-reunification, and family-formation migrants all had higher levels of educational attainment. Koc and Onan (2004) also report higher levels of educational attainment in more recent migration waves compared to earlier migrant generations. While this indicates that women in migrant households should have higher levels of education relative to

non-migrant women, there is some evidence that educational levels vary among migrant-affected women; women who migrate have higher levels of education than those who remain in the country of origin (Kadioglu 1994; Day and İçduygu 1997). Given the powerful, negative, influence of women's education on fertility, even across social, political and cultural divisions, these findings suggest individuals living in migrant households will have lower fertility than non-migrant households due to their higher levels of education (Jejeeboy 1995). This will be particularly true for migrant women.

While migrant selectivity on urban residence and higher levels of education may lead to lower fertility, other research suggests migrant selectivity also operates on factors associated with higher fertility. Traditional marriages involving kin (versus romantic) selection of partners and payments of bride's prices (i.e. financial compensation paid to the bride's family for loss of her labor) are common in Turkey (Delany 1991; Remez 1998; Önder 2007), and may be more prominent in migrant households. Several studies point out that Turkish migrants frequently marry partners from their communities of origin, unions often arranged by parents (Lievens 1999; Reiners 2001; González-Ferrer 2006; Timmerman 2006). These studies suggest that the formation or reinforcement of transnational ties is perceived as advantageous by families at origin and destination. For families in Turkey, marriage to members of migrant networks provide opportunities for socioeconomic mobility, potential remittance income and even access to otherwise unattainable foreign work visas (González-Ferrer 2006; Timmerman 2006). Migrant networks abroad may see the choice of a partner from the country of origin as a means to solidify ties with Turkey, while also assuring the selection of spouses untainted by foreign influences (Timmerman 2006; Beck-Gernsheim 2007). Scholars have linked these household strategies of family formation to attitudes limiting female autonomy and decision making and lower social status - characteristics with demonstrated links to high fertility (Kadioglu 1994; Remez 1998). Based on this research, we may expect to see more traditional marital arrangements among all groups of women with exposure to migration, and thus higher fertility.

A second approach to the study of migration and fertility focuses on factors associated with the process of international migration which may change childbearing patterns. At destination, migrants may experience changing social roles, exposure to new fertility norms and perceptions of women's status and greater access to health information and resources. These ideas may then flow back to origin families from return female migrants or as social remittances from communication across transnational networks (Lindstrom and Giorguli Saucedo 2002; Frank 2005; Fargues 2006). The impact of these social remittances is likely to be stronger in areas where migrant network connections are more well-established (Levitt 1998).

Origin families may be exposed to new ideas not only through social remittances, but also through changing responsibilities within migrant households. Household tasks typically completed by the migrant fall upon remaining household members, challenging traditional gender divisions of labor. For women within migrant households this often translates into increased financial responsibilities, including working outside the home in order to earn income to sustain the family until they receive remittances from abroad. These new roles, in turn, change attitudes toward gender roles and expectations in the household, increasing women's ability to negotiate with their partner about fertility and family size and leading to smaller sized families (Remez 1998; Kalaycioglu and Rittersberger-Tilic 2000; Yavuz 2006; Gündüz-Hoşgör and Smits 2008). Some research points to women in migrant households obtaining greater degrees of autonomy, although empirical studies indicate these changes may be temporary, limited only to the period of migration (Hondagneu-Sotelo 1992; Kadioglu 1994; Buckley 2005).

Studies of both migrant households and migrant women in Turkey indicate that international migration tends to enhance women's autonomy by contributing to changes in attitudes toward women and women's status. The degree of these changes, however, varies according to the individuals' exposure to migration. Day and İçduygu (1997, 1998) report that non-migrating relatives held somewhat more conservative attitudes towards religion, women's status, and reproductive behavior than male and female return migrants, but were less conservative in regards to these values than individuals who did not have migrant network connections. In research on the international migration experiences of Turkish women, Ayşe Kadioglu (1994, 1997) finds that, in comparison to women in non-migrating households, both women who have migrated internationally and non-migrant women within migrant households report greater financial independence and are more likely to question traditional gender roles. While Kadioglu finds that the former group experienced greater improvements in status, the differences are moderate, and return female migrants reported that their elevated autonomy, achieved through work while abroad, abated once they came back to their homes in Turkey (Kadioglu 1994). These findings also call into question the longer term effect of social remittances on attitudes of women within migrant households in Turkey.

Research on the links between fertility, migration selectivity, and processes of social change associated with migration highlight several potential pathways through which migration may influence childbearing among women living in migrant households. The majority of the research findings support the assumption that fertility is likely lower among all women living in migrant households, relative to non-migrant households, and the effect of migration on fertility will likely be greater for return female migrants compared to wives of migrants and other female

household members. Key pathways include place of residence, levels of educational attainment perceptions of traditional gender roles and other social remittances.

We employ measures of children ever born as a marker of fertility. We believe focusing on cumulative childbearing, controlling for age, will maximize potential differences between groups, whereas period measures would be subject to the influence of temporary absences associated with migration. In this analysis we examine differences between ever-married women of reproductive age within migrant and non-migrant households and across categories of exposure to migration. We expect to find fewer numbers of children born with increasing migration exposure, although this difference should be attenuated after controlling for the aforementioned differences between these groups.

Our three key hypotheses are:

1. Controlling for basic demographic variables, ever-married women living in migrant household tend to report lower numbers of children ever born than women living in non-migrant households.
2. Controlling for basic demographic variables, return female migrants tend to report lower numbers of children ever born than wives of migrants and women living in migrant households.
3. The effect of migration exposure on women's fertility will tend to be attenuated by differences in residence, educational attainment and attitudes supporting patriarchal gender roles.

Testing these three hypotheses enables us to assess fertility differences by household migration status and exposure to migration, adding to our understanding of how migration may influence the fertility of origin populations, clarify the importance of migrant selectivity in explaining observed fertility differentials and generate preliminary evidence concerning the importance of possible pathways for the influence of social remittances on fertility.

Data and Methods

Our analyses use data from the 2003 Turkish Demographic and Health Survey (TDHS), a large-scale national survey of 8,075 ever married reproductive age women (ages 15 to 49). We focus on two specific components of the survey, the household roster and the woman's individual questionnaire. The household roster collected information on regular household members, and included a migration and mobility sub-module, recording the household members' place of residence five years prior to the survey. The individual questionnaire

provides detailed information on women's age, marital status, marital arrangements, employment and attitudes toward patriarchal gender roles, in addition to fertility histories. Our analyses link these individual records to household-level data to identify migrant households and migrant types.

Identifying Migrant Households and Types of Migrants

The Demographic and Health Surveys do not consistently and systematically collect information related to household members' and women's international migration, but it is possible to generate general international migration measures from the surveys. Most surveys ask whether a usual resident is living in the household or elsewhere; few collect information on country of residence for those household members reported as living abroad (see for example the 2000 Armenian and 2005 Colombian surveys). Detailed migration histories on household members, including dates of departure and return in addition to destinations, are rarely asked (see the 2005 Moldova survey for an exception). Husbands' migration is often available from the individual woman's questionnaire and can be inferred from standard questions about whether a woman's husband is currently living in the home with her or staying elsewhere; specific country or region of husband's residence is not routinely asked. Information on women's migration is typically restricted to internal migration, classified based on differences between a woman's current place of residence (urban versus rural) and her place of residence during childhood (Mboup and Saha 1998), although some information on previous residence abroad may be available. Therefore, markers of international migration can be generated from the DHS but the process is seldom simple and not systematic across countries or survey waves.

In the absence of detailed migration histories in the household roster and individual questionnaires in the TDHS, we combined several indicators to create categories of migration and classified all women into one of four groups according to their exposure to migration: return female migrants, wives of current or return migrants, other women living in households with international migration experience, and women living in non-migrant households. To identify return female migrants, we used information from the household roster where the household respondent reported that a female usual household member resided abroad five years prior to the survey date (n=48). Twenty eight of these women met the eligibility criteria for the TDHS ever-married woman's questionnaire and completed the interview. In order to capture return migration that may have taken place more or less than five years before the survey, we also included women who reported their last place of residence as "abroad" on the

individual questionnaire (n=155). By using these two indicators of return migration, we identified 161 return female migrants.

To classify women as wives of migrants, we matched married women to spouses using usual residents' line number and three indicators from household roster. We considered currently married women whose spouse was not listed on the roster (n=366) to be wives of migrants; 227 of these women were eligible for and completed the individual interview. We used this indicator to approximate a question on husband's place of residence asked on the individual questionnaire in previous TDHS. For example, in the 1998 TDHS, married women were asked if their husband was living with them or elsewhere, but this question did not appear in the 2003 survey. In 1998 survey, there was substantial, although not complete, overlap between a husband being listed on the household roster and a woman reporting her husband as living in the household. Therefore, in absence of an explicit question on husband's residence, we used the household roster information as a substitute.

We also classified currently married women who were matched to spouses residing abroad at the time of the survey (n=9) or who resided abroad five years prior to the survey date (n=37) as wives of migrants. The latter measure was further refined using information from the individual questionnaire. To take into account that women may not have been married to their husband at the time he lived abroad, we omitted women who were not living in a first marital union for five or more years. Through combining these measures, we identified 247 women who completed the individual interview as wives of migrants. Some of these women had been migrants themselves, and we therefore excluded them from this group – leaving 228 wives of migrants in our sample.

The third category of women exposed to migration were women who were neither return migrants nor wives of migrants, but who lived in a household where at least one usual resident reported international migration experience. As a first step in identifying women in this group, we used the household roster information to classify female usual residents 15 years of age or older according to whether they lived in a migrant or non-migrant household. We considered women who lived in a household in which a regular member was reported to be currently living abroad (n=44 female usual residents), had resided abroad five years prior to the survey (n=102), or where a spouse was not on the roster (n=1044) to be living in a migrant household. In addition to these indicators, we included women living in the same household as a woman who reported her last residence as abroad on the individual questionnaire, but who was not a return migrant herself (n=4). After combining these indicators, we identified 685 women who

were living in a migrant household, 296 of which were neither return migrants nor wives of migrants.

Given the complex nature of estimating migration experience, we evaluated our measure of migration in the 2003 TDHS against other estimates of migration in Turkey that focused on regional patterns of migration intensity. To do this we computed regional frequencies of migration using a “maximum measure” of migration that counted any household member on the roster as a migrant if their last residence was abroad, currently lived abroad or was a spouse of a household member not listed on the roster. In reviewing these frequencies, we found that areas reported in the literature as primary sources of international migration, such as Central and South Eastern Anatolia and the Aegean (Reniers 1999; İçduygu, Sirkeci, and Muradoglu 2001; Koc and Onan 2004), did not constitute the largest percentages of migrants (Table 1). We then compared our results to more recent estimates of international migration from Turkey. In a 2006 report, Coskun used the 2000 Turkish national census to compute rates of international migration at the provincial level, using information on a regular household members’ current residence, and then categorized provinces into five levels of migration intensity. Although these rates may be underestimates since they did not include household members’ residence five years prior to the census date, these are the only recent regional statistics available by which to evaluate the TDHS migration measures. Additionally the provincial estimates produced from the 2000 census correspond to provinces with high levels of international migration in earlier estimates.

Given these results, we restricted the TDHS sample to ever married reproductive age women living in the 65 provinces that had rates of migration of five migrants per 1000 residents or higher according to Coskun’s classification. We did this in order to maximize sample size, as well as to focus our analysis on areas where migrant networks are more well-established since the effect of social remittances would likely be stronger there (Levitt 1998). As an additional means of refining the migration measure, we excluded from the analysis women living in the metropolitan area of Istanbul, as this area demonstrates significantly different trends in a variety of fertility indicators than the rest of the country (Hacettepe University 2004). These restrictions resulted in a somewhat improved association between the constructed migration measure and region of residence.

By focusing on this restricted set of provinces, we retained a considerable percentage of the sample. Nearly 75 percent of reproductive age women identified as living in a migrant household in the TDHS lived in the restricted set of higher migration provinces. In the remainder of our analysis, we use this restricted sample of 5927 ever married women: 128

return female migrants, 172 wives of migrants, 210 women living in migrant households, and 5417 women in non-migrant households.

The characteristics of ever-married reproductive aged women that were included in this analysis were age, duration of first marriage, rural residence, educational attainment, current employment, traditional marriage arrangement, patriarchal gender attitudes, and number of children ever born. We categorized duration of first marriage into five year intervals, and classified women's highest level of education into the following categories: no education, primary, and secondary education or higher. Given past research, we considered whether a woman was currently working as an indicator of enhanced women's status.

We identify traditional marriage arrangements using a composite score coding questions on social practices surrounding marriage, including the following questions in the construction of this score: whether a woman had an arranged marriage, religious (versus civil) ceremony was priority, her family was paid bridesmoney, and the marriage was a consanguineous union. One point was assigned to each affirmative response. These indicators, used in previous studies, generated a score ranging from 0 (not at all traditional) to 4 (very traditional) (Remez 1998; Ergocmen et al 2004; Yavuz 2006). A composite measure of status questions is used to evaluate patriarchal gender attitudes. Women's agreement or disagreement with the following items were included in this measure: men should make the important decisions in the family, men are wiser than women, a woman should not argue with her husband even if she disagrees with him, and it is better for a male child to have an education. One point was assigned to each item with which a woman agreed, resulting in an attitude score that ranged from 0 (egalitarian attitudes) to 4 (patriarchal attitudes).

Finally we used the total number of children ever born to assess the impact of migration on fertility. The total number of children ever born was based on women's self-report of live births.

Methods

For the first part of the analysis, we examined demographic and selection characteristics as well as migration-related role and attitude changes for ever-married women according to their exposure to international migration. Weighted means and standard deviations were calculated for continuous variables and percentages for categorical variables. The statistical significance of differences in these characteristics between these groups was determined using linear and logistic regression models for continuous and categorical variables, respectively.

We next used Poisson regression to assess the relationship between exposure to migration and the total number of children ever born. We first modeled the effect of the migration exposure variables. To control for possible differences in women's place in the life course, we included duration of women's marriage in the model; this measure provided a statistically significant better fit to the data than women's age. By including educational attainment, rural residence, and traditional marriage arrangement score as covariates in the model, we assessed whether the effect of migrant selection changed the association between migration exposure and number of children. Finally, we evaluated whether migration-related status changes (measured using current employment and our composite measure of adherence to patriarchal attitudes) affected the association between the migration exposure groups and total number of children.

Results

Characteristics of ever-married reproductive aged women are presented by category of migration exposure in Table 2. Not all groups of women exposed to migration demonstrated characteristics associated with migrant selection. Women living in households where another family member was a migrant had higher traditional marriage scores but *lower* levels of education and relative to women living in non-migrant households. Wives of migrants also did not demonstrate statistically significant differences on migrant selection characteristics compared to women living in non-migrant households. However, this group of women was younger and had been married for a shorter duration of time than women without exposure to international migration, suggesting wives of migrants are in a different place in the life course. Women who had been migrants themselves exhibited only some of the characteristics suggested to be associated with migrant selection. This group had higher levels of education and was less likely to live in rural areas than women in non-migrant households, but had the lowest traditional marriage score among all groups of women.

In evaluating characteristics thought to be associated with migration-related changes in roles and attitudes, we again did not find a consistent trend across groups of exposure to international migration. Neither women living in migrant households nor wives of migrants were significantly different than women in non-migrant households with regards to being currently employed or scores on the scale of patriarchal attitudes, indicating that these groups are not more likely to believe that women are relatively equal to men. However, return female migrants did have significantly lower scores on the patriarchal attitudes scale (0.95 as compared to 1.31 for women in non-migrant households). Although trends for return female migrants were in the

expected directions on migrant selection and migration-related changes, in general our initial results do not support findings reported elsewhere in the literature, where authors found wives and relatives of migrants occupy a middle position relative to return migrants and non-migrants.

In preliminary assessments of migration exposure and childbearing, we found that greater levels of exposure to international migration were significantly associated with the number of children born (Figure 1). Specifically, approximately 30 percent of migrant wives had three or more children, compared with 44 percent of women in non-migrant households who had three or more children. Only 20 percent of return female migrants reported having three or more children. There were no significant differences between women living in households where another family member was a migrant and women in non-migrant households.

We then used Poisson regression to investigate how migrant selection and migration-related changes in role and attitudes might explain the differences in the number of children born. Both return female migrants and wives of migrants had lower mean number of children than women in non-migrant households, and the strength of the association was similar for both groups (Table 3; unadjusted model). After adjustment for marital duration (Multivariate Model 1) the association between number of children born and wives of migrants was attenuated, but remained statistically significant; controlling for marital duration did not substantially alter the association for return female migrants. Next, we assessed whether factors associated with selection could further explain the effect of migration on number of children born. In a model that included educational attainment, rural residence and traditional marriage arrangements (Multivariate Model 2), migration exposure was no longer a significant predictor of the number of children born to ever-married women. To assess the possible effect of more egalitarian status for women, perhaps due to the migrant process, we included women's current employment and patriarchal attitudes score along with marital duration in Multivariate Model 3. Return female migrants and wives of migrants continued to have lower mean numbers of children after adjustment for these variables. In the multivariable adjusted models, longer marital duration, rural residence, and higher scores on traditional marriage and patriarchal attitudes were independently associated with a higher mean number of children born. In contrast, higher educational attainment and current employment were associated with having fewer children.

Discussion

In this analysis we found that exposure to international migration did result in differences in the number of children born for some groups of women. The effect of international migration was strongest for women who were return migrants. Women in this group had 25 percent fewer

children than women living in non-migrant households. The difference in the number of children born was largely explained by the effect of selection characteristics rather than migration-related changes in roles and attitudes. Return female migrants in Turkey had higher levels of education and were less likely to come from rural areas, and after controlling for these differences, there were no longer significant differences between women in this group and women in non-migrant households.

While return female migrants exhibited roles and endorsed attitudes reflective of more egalitarian views toward women's status compared to women in non-migrant households, these roles and attitudes had only modest impacts on the association between women's own international migration experience and number of children born. As we were not able to determine whether these changes occurred as a result of migration or were common among women prior to migrating abroad, it may be that return female migrants were selected on these characteristics as well. Alternatively, the inability of these factors to explain the effect of migration and fertility could be due to the measures themselves. These particular measures may only operate indirectly on fertility, and the use of indicators that would more directly reflect the relationship between changes of women's status and fertility, such as abilities to negotiate contraception and family size, might yield different results.

Although we found some support for the effect of migration on fertility for return female migrants, we did not find significant differences in selection characteristics and women's status among women in the other migration exposure categories compared to women in non-migrant households. These results are contrary to findings reported elsewhere in the literature, where women in these groups were found to occupy a middle position between return female migrants and women in non-migrant households (Kadigoglu 1994; Day and Içduygu 1997, Day and Içduygu 1998). In fact, women in these groups resembled women in non-migrant households more than return migrants. This may be due to the fact that we are measuring migration exposure and fertility differences at a time when Turkey has already experienced substantial social changes; the growth in educational attainment and urban residence, along with improvements in women's status, that have taken place across Turkey over the last several decades may likely have a much stronger effect on changing fertility patterns among all groups of women than exposure to international migration (Day and Içduygu 1998; Hacettepe University 2004; Yavuz 2006). Therefore, those women with the direct experience of international migration are a particularly select group and differences in fertility are more pronounced.

It is also interesting to note that fertility differences between wives of migrants and women in non-migrant households were explained by differences in marital duration. As noted above, this result suggests that wives of migrants are in a different phase of the life course. This finding is likely due to two related factors. First, male labor migrants are typically younger than non-migrants, and, it likewise follows, that their marital partners would be younger as well. Additionally, male labor migration may be intertwined with other early life course processes such as family formation. Shortly following marriage, men may migrate in order to earn income to establish and support an independent household, either in their country of origin or abroad (Koc and Onan 2004; Lindstrom and Giorguli Saucedo 2007). Therefore, women married to migrants are less exposed to marriage and the risk of pregnancy within the marital union, resulting in fewer children born.

The findings of this study should be interpreted within the context of its limitations. Although it is one of the main sources of demographic information in many countries, the DHS is not designed to measure international migration. The indicators of exposure to international migration that we created from the information available in the 2003 TDHS resulted in relatively small sample sizes in each of the migration exposure categories. It is possible that we may have been able to detect stronger effects of migration exposure on fertility with a larger sample of women exposed to migration. Furthermore, in the absence of migration histories, our migration measures are primarily capturing recent migration, and we can only make inferences about the relationship between migration and changes in roles, attitudes and behaviors. The inclusion of more detailed migration histories would not resolve all of these issues, however, it would help us to better determine associations such as whether the effect of migration on fertility was more pronounced in traditional sending areas versus more recent sending areas.

Finally, we have used the number of children born as our measure to determine fertility differences. This measure is a proxy by which to assess the effect of migration on completed fertility, and may not completely capture the way in which migration affects childbearing at the end of a woman's reproductive years. However, we believe this method provides the best means by which to assess differences across categories of migration exposure relative to other measures such as total fertility rates, which are subject to the influence of temporary absences associated with migration, or use of limiting contraceptive methods that would further restrict our sample.

For this analysis, we constructed a measure of women's exposure to international migration and used it to assess the relationship between migration and fertility. Using this measure we found that the effect of migration on fertility was strongest for return female

migrants followed by wives of migrants. While the effect of migration on fertility for return female migrants was largely explained by selection characteristics, such as education and urban residence, differences in fertility between wives of migrants and women in non-migrant households was primarily due to women in these groups being in different places in the life course, particularly duration of marriage.

However, our results do not completely explain how exposure to international migration affects fertility and, therefore, raise several issues that should be addressed with further analysis. In particular, whether the effect of international migration was more pronounced among earlier cohorts of women living in Turkey prior to wide-spread social changes taking place in the country needs to be explored in future research that incorporates retrospective cohort experiences or cross-sections for additional periods. There is also a need for qualitative research investigating the ways that migration affects factors associated with fertility and fertility decision-making among all groups of women exposed to international migration.

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Table 1. Comparisons of maximum and restricted measures of international migration by region of residence in the 2003 Turkish Demographic and Health Survey

Percent of individual migrants by region		
	Maximum Measure	Restricted Measure
Istanbul	23.8	--
West Marmara	3.3	4.3
Aegean	12.1	14.6
East Marmara	11.3	16.1
West Anatolia	10.7	15.1
Mediterranean	12.1	17.2
Central Anatolia	5.9	8.4
West Black Sea	5.8	7.3
East Black Sea	2.5	3.5
Northeast Anatolia	4.6	5.8
Central-east Anatolia	2.4	2.5
Southeast Anatolia	5.5	5.3
Total	100.0	100.0

Table 2. Characteristics of ever- married reproductive aged women by household migration status

	Women living in		Women living in	
	non-migrant households (n=5,417) %	Household member is a migrant (n=210) %	migrant households Husband is a migrant (n=172) %	Woman is a migrant (n=128) %
Age group, years ^{†††}				
15 – 19	2.7	5.0	3.6	0.0
20 – 29	29.9	29.1	46.6	36.0
30 – 39	37.2	29.3	29.7	36.1
40 – 49	30.2	36.6	20.1	28.0
Duration of first marriage, years ^{†††}				
0 – 4	15.8	20.3	30.0	17.1
5 – 9	17.6	15.9	27.2	22.2
10 – 14	18.4	13.7	10.5	12.7
15 – 19	16.7	11.9	10.7	23.0
20 – 24	15.0	16.2	6.8	11.7
25 or more	16.3	22.0	14.7	13.2
Education ^{††,***}				
None	15.3	26.4	11.1	2.4
Primary	58.2	50.8	60.7	23.3
Secondary or more	26.4	22.8	28.2	74.3
Rural residence ^{††,***}	34.3	23.7	42.1	9.8
Currently employed	27.7	24.4	22.0	33.9
	mean (se)	mean (se)	mean (se)	
Traditional marriage score ^{††,***} (range: 0 – 4)	1.53 (0.02)	1.79 (0.09)	1.43 (0.08)	0.95 (0.11)
Patriarchal attitudes score ^{***} (range: 0 – 4)	1.31 (0.03)	1.29 (0.10)	1.29 (0.12)	0.75 (0.12)

se – standard error

†Women in households where other household member is a migrant significantly different than women in non-migrant households: †p<0.05, ††p<0.01, †††p<0.001

† Women whose husband is a migrant significantly different than women in non-migrant households: †p<0.05, ††p<0.01, †††p<0.001

*Women who were migrants significantly different than women in non-migrant households: *p<0.05, **p<0.01, ***p<0.001

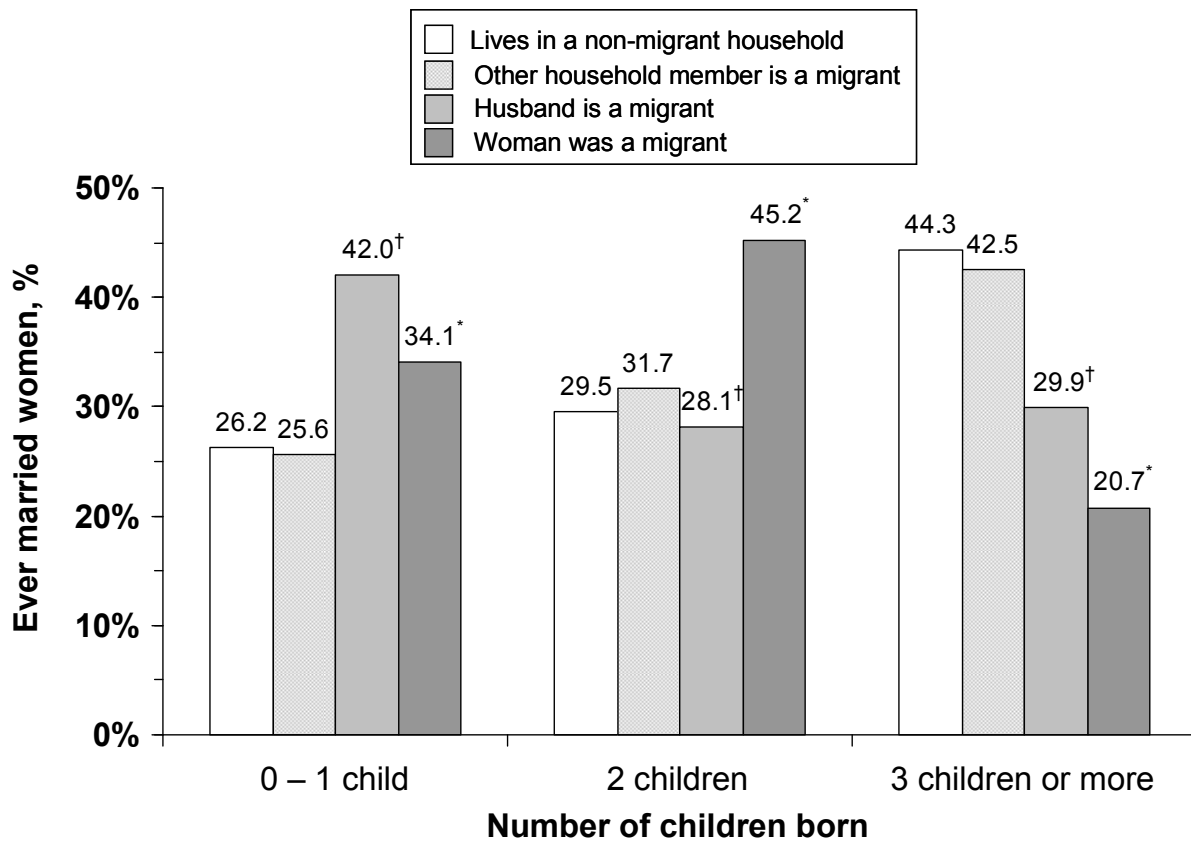
Table 3. Unadjusted and adjusted Poisson regression models for the number of children born to ever married women

	Unadjusted Model		Multivariate Model 1		Multivariate Model 2		Multivariate Model 3	
	IRR	(95% CI)	IRR	(95% CI)	IRR	(95% CI)	IRR	(95% CI)
Migration								
Woman was a migrant	0.76	(0.66, 0.88)***	0.79	(0.70, 0.89)***	1.00	(0.90, 1.11)	0.83	(0.74, 0.93)**
Husband was/is a migrant	0.72	(0.66, 0.85)***	0.90	(0.82, 0.99)*	0.93	(0.84, 1.02)	0.89	(0.82, 0.98)*
Lives in a migrant household	1.05	(0.94, 1.17)	1.04	(0.95, 1.15)	0.98	(0.90, 1.07)	1.05	(0.95, 0.15)
Duration of first marriage, years								
0 – 4	1.00		1.00		1.00		1.00	
5 – 9	2.31	(2.16, 2.46)***	2.31	(2.17, 2.46)***	2.24	(2.10, 2.40)***	2.31	(2.17, 2.47)***
10 – 14	3.27	(3.06, 3.50)***	3.26	(3.04, 3.49)***	3.08	(2.87, 3.30)***	3.26	(3.05, 3.48)***
15 – 19	3.83	(3.57, 4.12)***	3.83	(3.56, 4.12)***	3.49	(3.25, 3.75)***	3.77	(3.50, 4.05)***
20 – 24	4.30	(4.00, 4.62)***	4.28	(3.98, 4.60)***	3.80	(3.54, 4.09)***	4.20	(3.92, 4.51)***
25 or more	5.38	(5.03, 5.76)***	5.36	(5.02, 5.73)***	4.33	(4.04, 4.64)***	5.19	(4.85, 5.56)***
Education								
None	1.00		--	--	1.00		--	--
Primary	0.58	(0.55, 0.61)***	--	--	0.73	(0.69, 0.76)***	--	--
Secondary or more	0.37	(0.35, 0.39)***	--	--	0.62	(0.58, 0.65)***	--	--
Rural residence								
	1.25	(1.18, 1.32)***	--	--	1.11	(1.07, 1.15)***	--	--
Traditional marriage score								
	1.30	(1.28, 1.32)***	--	--	1.14	(1.12, 1.16)***	--	--
Currently employed								
	1.00	(0.95, 1.06)	--	--	--	--	0.94	(0.90, 0.99)*
Patriarchal attitudes score								
	1.13	(1.11, 1.14)***	--	--	--	--	1.09	(1.08, 1.11)***

IRR – incidence rate ratio
 -- not included in model

*p<0.05, **p<0.01, ***p<0.001

Figure 1. Number of children born among reproductive aged women by household migration status



†p<0.001 compared to women in non-migrant households

*p<0.001 compared to women in non-migrant households