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How Does Poverty Differ Among Refugees? Taking a Gender Lens to the Data on Syrian Refugees in Jordan

Lucia Hanmer, Diana J. Arango, Eliana Rubiano, Julieth Santamaria and Mariana Viollaz*

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Abstract: Data collected for refugee registration and to target humanitarian assistance include information about household composition and demographics that can be used to identify gender-based vulnerabilities. This paper combines the microdata collected by United Nations High Commissioner for Refugees to register refugees with data from its Home Visit surveys to analyze income poverty rates among refugees with a gender lens. It finds distinguishing between different types of male and female principal applicant (PA) households is important in the setting of Syrian refugees in Jordan. Poverty rates for couples with children do not differ by gender of the PA but for other household types poverty rates are higher for those with female PAs. Households formed because of the unpredictable dynamics of forced displacement, such as sibling households, unaccompanied children, and single caregivers, are extremely vulnerable, especially if the principal applicant is a woman or a girl.

Keywords: gender; refugees; household poverty; vulnerability; Syria; Jordan

JEL Codes: 053; D10 I 132; J1

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Introduction

Conflict, persecution, natural disasters, and violence force millions to flee from their homes. At the end of 2017, the United Nations High Commissioner for Refugees (UNHCR) reported that there were approximately 68.5 million people who were forced to flee, 25.4 million of whom were refugees.[2] The civil war in Syria has created one of the worst humanitarian crises of our times and more than half of Syria's pre-war population of 11 million has been displaced, either across borders or within the country. The crisis is now in its eighth year and many people have been displaced multiple times. Over 6 million Syrians are currently registered as refugees with UNHCR, many of whom fled to Jordan.[3]

Jordan is ranked as the country with the seventh largest refugee population in the world and with an estimated one in fourteen people being a refugee in 2017 (89 refugees per 1,000 inhabitants). It is currently host to over 668,123 registered Syrian refugees, the vast majority of whom (83 percent) live outside refugee camps.[4] UNHCR reports that as of June 2018 the majority of Syrian refugees in Jordan live in urban areas and in poverty: over 85 percent live below the poverty line, 48 percent of refugees are children, and 4 percent are elderly.[5]

The purpose of this paper is to understand how gender inequality affects poverty among Syrian refugees in Jordan. Many reports document the hardships and human rights violations experienced by refugees, highlighting that women and children are a highly vulnerable group among refugees and it is clear that women and men, boys and girls experience and respond to forced displacement differently (World Bank, 2017a). However, to date, there is a dearth of research and empirical analysis in this field, in part because there are few datasets available for this task. Hence, there is little evidence pertaining to refugee settings on how gender-based differences affect poverty rates. Further, as Jordan and the international community develop new approaches that respond holistically to the specific needs of refugee and host communities, more evidence is needed about how gender-based constraints and vulnerability affect refugee women's ability to take up economic opportunities and to access the services and resources they need to enable their families to move out of poverty.

Our analysis applies a gender lens to a rich set of microdata on Syrian refugees in Jordan collected by UNHCR between 2011 and 2014. As these data do not capture how the changes in policies affect refugees and the constant evolution of their situation since 2014, the analysis is not intended to directly inform current policy choices and decisions. Instead, our aim is to devise an approach that can provide greater insights into gender-specific barriers, based on the premise that the experiences and potential vulnerabilities of women, men, and children are significantly different in refugee settings.

We use household-level data to examine the relationship between poverty and gender for Syrian refugees. Our approach is informed by a body of work in the academic literature that has used household survey data to examine the relationship between the gender of the household head and household

[2] http://www.unhcr.org/globaltrends2017/, accessed August 2, 2018.
[3] http://www.unhcr.org/globaltrends2017/, accessed August 2, 2018.
[4] https://data2.unhcr.org/en/documents/download/64568, accessed August 2, 2018.
[5] https://reliefweb.int/sites/reliefweb.int/files/resources/64114.pdf, accessed August 2, 2018.

income poverty. One result that has emerged from this literature is that female-headed households are extremely heterogenous and so reliance on the correlation between the sex of the household head and poverty rates is often misleading. The route to becoming a female household head reflects a variety of circumstances, including for example, widowhood, divorce, desertion and separation, which entail different degrees or complete absence of choice about becoming a household head (Chant, 2003, 2008). Women's access to labor markets and assets varies according to social class and income. Also, the means to meet household needs include the "moral economy" of community and kinship rules (Kabeer 1997) and these rules may accord different entitlements to female household heads for example, widows versus single mothers, depending on social norms. So, whether female headed households are disproportionately represented among the poor or not will depend on the circumstance leading to their headship as well as the broader social context, including the access to labor markets and assets, prevailing social norms, their kinship-based claims and other entitlements.

The UNHCR data identify principal applicants for each household and our analysis examines differences in household poverty between households with a female rather than male principal applicant.[6] The principal applicant is the person who receives assistance from UNHCR for the family and is self-selected or selected by the family. This definition of female headship has advantages over the way that household headship is commonly identified in household surveys. An often-noted drawback of the headship variable is that female headship may reflect the enumerators' perception about who should be considered a family head rather than who has the most responsibility for the family's welfare in practice.[7] Social norms can also affect whether female respondents self-identify as household heads. For example, some Eritrean returnees who would in other cultural settings be regarded as *de jure* female headed (single mothers, widows, divorcees, separated women) reported being male -headed. Other Eritrean female returnees who would be considered *de facto* heads reported headship by absent husbands or male relatives (Kibreab, 2003). Our approach is therefore to distinguish between different types of female and male principal applicant households, using a typology that reflects some of the indicators of vulnerability used by UNHCR.

We find that distinguishing between different types of female principal applicant households is important in the setting of Syrian refugees in Jordan. Most male principal applicants are one of a married couple with children whereas most female principal applicants are single care-givers, single persons or living in non-traditional family groups. While on average female principal applicant households are no more likely to be poor than male principal applicant ones, poverty rates for some types of households are higher when these households have a female principal applicant. Households that have formed because of the unpredictable dynamics of forced displacement, such as sibling households, unaccompanied children, and

[6] Identification of the head of the case (as family groupings are referred to in the UNHCR ProGres database) is determined by who best represents the family for case management purposes. It is not assumed that the household will be best represented by a man; a woman or even a child can be a head of a case, depending on standard operating procedures.

[7] Even when traditional household survey data are gathered at the individual level, the information is often collected from a single respondent. The respondent is usually the self-identified 'most knowledgeable' household member, which overwhelmingly corresponds to the 'head' of the household. In the case of a household survey that solicits information on 'headship', this information is gathered often through the question: "Who is the head of this household?"

single caregivers, are an extremely vulnerable group and especially so if principal applicant is a woman or girl. Moreover, poverty gaps between male and female principal applicant's for these households remain after humanitarian assistance is received.

To understand how gender differentiates the poverty experienced by the Syrian refugees, we use two UNHCR datasets: The Profile Global Registration System (ProGres) and Jordan Home Visits round 3 (JD-HV). The ProGres database for Jordan includes information on refugees' registration since 1935. The registration process assigns refugees a unique registration number that serves as a reference for recording data at the initial registration and in all subsequent activities, including decisions on refugee status and right of return or resettlement in a third country, as applicable. UNHCR issues refugees residing in camps a 'proof of registration' document, which they hold while they remain there. For those who live outside the camp, UNHCR provides an asylum seeker certificate stating that those on the certificate are persons of concern. The asylum seeker certificate allows Syrians to access United Nations (UN) services and assistance provided outside the camps, such as monthly cash support, nonfood goods, and healthcare (NRC and IHRC 2016). This assistance is crucial and has been reported to support a meal a day, a better roof, and dignity for Syrians who have fled to Jordan. [8]

The JD-HV database has detailed information on expenditure, sources of income, and indicators of household-level welfare, for example, as reflected by recourse to coping mechanisms, standard of accommodation, or access to water, sanitation, and hygiene (WASH). JD-HV data collected between October 2013 and December 2014 were first analyzed in Verme et al. (2016) who produced welfare aggregates and poverty measures to help target benefits and assistance to those most in need. Verme et al. (2016) draw attention to the precarious circumstances of Syrian refugees in Jordan and Lebanon. Around 55 percent of refugees in Jordan are vulnerable to monetary poverty and more than half are vulnerable to food shocks. Family size increases the probability of being poor, with the poverty rate almost doubling if the size of the family goes from one to two members and increasing by 17 percent when the number of children increases from one to two. This paper extends this analysis shining a spotlight on the gender dimensions of poverty for Syrian refugees, devising an approach that provides greater understanding of specific barriers and vulnerabilities faced by women, men, and children in refugee situations.

1. Age, Gender, and Household Poverty among Forcibly Displaced Populations

It is commonly recognized that the experience of poverty may differ between refugees and the poor among their host communities. Many of the challenges faced by the poor in the host populations are intensified for internally displaced persons (IDPs) and refugees as they are more exposed to risks and have fewer resources to overcome them (World Bank 2017a). The fragile and conflict-affected situations that led to forced displacement are frequently characterized by extreme suffering, catastrophic personal losses, illness, trauma, the infliction of disability, subjection to increased gender-based violence (GBV), and post traumatic shock. At times families are separated and children lost. Such experiences are often

[8] http://www.refworld.org/country,,UNHCR,,JOR,,5937b01e4,0.html.

combined with economic losses, for example, loss of assets and incomes, which can exacerbate poverty for some households and tip many previously middle-class into sudden poverty. Furthermore, refugees often face legal and regulatory barriers to economic and educational opportunities in the host environment that can prevent them from becoming self-reliant (loss of identity papers during flight or their confiscation at borders has been reported as a barrier). The situation if often made worse by the destruction of social networks (Buvinic et al, Thus, the stress of forced displacement can impair people's ability to take the actions needed to escape poverty (Christiansen and Harild 2009).

Understanding the gender-specific impacts of forced displacement on household poverty is essential for the design of antipoverty policies. Household poverty analysis establishes that individuals within a household are not equally vulnerable to shocks, whether the shock is to themselves or to the household (Dercon and Krishnan 2000), and that the ability of individuals to protect themselves from shocks is hence differentiated, with gender and age being probably the most prominent individual attributes along which differentiation takes place (de Walle 2013). Thus, people's ability to act to escape poverty is impaired not only by the stress of forced displacement, but also by their gender and other individual characteristics.

The gender and age composition of forcibly displaced people's households varies according to the crisis, its duration, and the countries concerned. Households' structure may change markedly in response to the crisis. Excess male mortality and morbidity as a direct and indirect result of conflict often leads to a higher incidence of widowhood (Buvinic, et al 2013). In chaotic situations of displacement, family structures are disrupted, leading to refugees travelling as unaccompanied minors, households composed of only siblings, and child-headed households, for example. Often, women and children leave conflict zones before adult males and older boys. For example, in Bosnia, women and children fled to seek refuge, whereas the men stayed behind, either to join the Bosnian armed forces or to protect their houses and community (Curtis 1995). More recently, two-thirds of refugees from South Sudan in 2016 were children under the age of 18, while adult women and men made up 21 percent and 13 percent of the refugee population, respectively (UNHCR 2017). In 2017, three-quarters of Congolese refugees were women and children (UNHCR 2018). In other crises such as the one in Syria, more men and women leave together. Despite these examples of the variation in the age and gender composition of forcibly displaced populations, microdata on refugees are scarce and we still know relatively little on the demographic structure of refugee populations and its implications for poverty.

A common approach to thinking about the relationship between poverty and gender is to examine differences between male- and female-headed households. Many studies have found that poverty rates among female-headed households are higher than those of male-headed households in many parts of the world (see Buvinic and Gupta 1997; Chant 1997; Quisumbing, Haddad and Pena 2001 cited in de Walle 2013). However, the link between household poverty and female headship is not straightforward due to the heterogeneity of female-headed households (Chant 2003, 2008). Female-headed households include women who are widowed, divorced or separated as well as abandoned women and married women with a nonresident (polygynous or migrant) husband and can also encompass married women or women living with a male partner who self-report as household heads (Klasen, Lechtenfeld, and Povel 2015; Ruwanpura and Humphries 2004;). Whether these female-headed households are poor or not will depend on the

broader social context, including the gender norms that determine women's access to markets (including labor markets) and other institutions and, their kinship-based claims and other entitlements (Kabeer 1997). One strand of the literature has therefore focused on more homogenous groups of female-headed households, for example, widows or single mothers (Appleton 1996; Horrell and Krishnan 2007; de Walle 2013) or explored alternative classifications of households to female headship alone, encompassing demographics or household structure and ethnic group in specific country settings (Ruwanpura and Humphries 2004; Van de Walle and Milazzo 2015).

There has been little research on the link between household female headship and poverty in fragile and conflict-affected settings. A study of Sri Lanka found that displacement caused precipitous income losses for both female- and male-headed families but that losses for male-headed households were higher. On average, female-headed households lost 76 percent of their income while male-headed households lost 80 percent. However, this resulted in a larger share of female-headed than male-headed households falling below the poverty line (Amirthalingam and Lakshman 2012). Widows are especially vulnerable in situations of conflict and forced displacement due to the loss of resources tied to husbands and the destruction of social networks (Brück and Schindler, 2009). Widow-headed households in post-genocide rural Rwanda were found to have a higher incidence of poverty than male-headed households, even after controlling for the distribution of size and composition of these types of households (Schindler 2010).

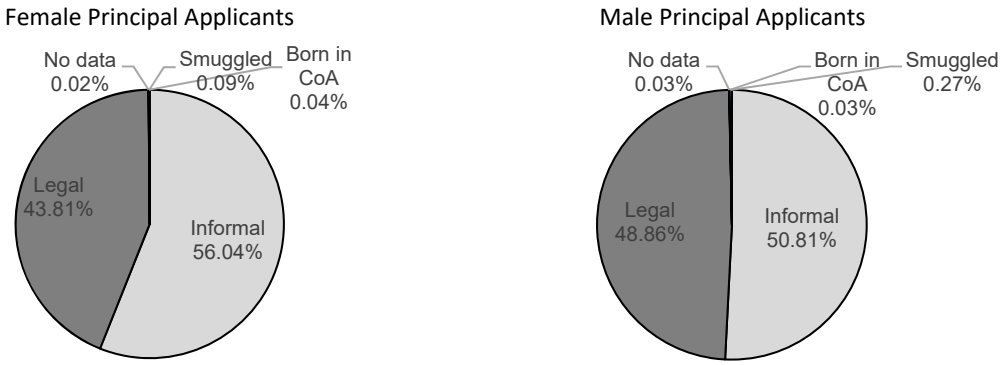
2. Syrian Refugees in Jordan

Syrian refugees fleeing to Jordan came mainly from the governorates that are closest to Jordan: Daraa, which borders Jordan, and Homs, another southern Syrian governorate. Nearly all the refugees are concentrated in the four northern governorates (Irbid, Al Mafraq, Zarqa, and Amman) with over half settled in the governorates that border Syria (Al Mafraq and Irbid) (Verme et al. 2016). Between January 2012 and December 2013, the total number of Syrian refugees registered by UNHCR increased from around 3,000 to 574,354 and as of May 2018, there are 666,113 UNHCR-registered Syrian refugees living in Jordan. Of these, 21 percent live in camps and the remainder live with host communities mostly in northern and central Jordan.[9]

Figure 1 shows that many people fleeing Syria between 2011 and 2014 (56 percent of female principal applicants and half of male principal applicants) came to Jordan informally by crossing the border and thus arrived without formal residency rights or work permits. Officially, Syrian refugees arriving in Jordan at that time were required to go to one of Syria's refugee camps and register with UNHCR as refugees. They could leave the camps if sponsored by a Jordanian relative who was over 35 years old. The remaining percentages correspond mainly to legal entries, as the percentages associated with people born in the city of arrival, through smuggling, or with missing data are very small. Interestingly, gender differences in the percentages of legal and informal entry status are statistically significant.

[9] https://data2.unhcr.org/en/situations/syria/location/36, accessed June 21, 2018.

Figure 1. Legal status of Syrian refugees upon arrival

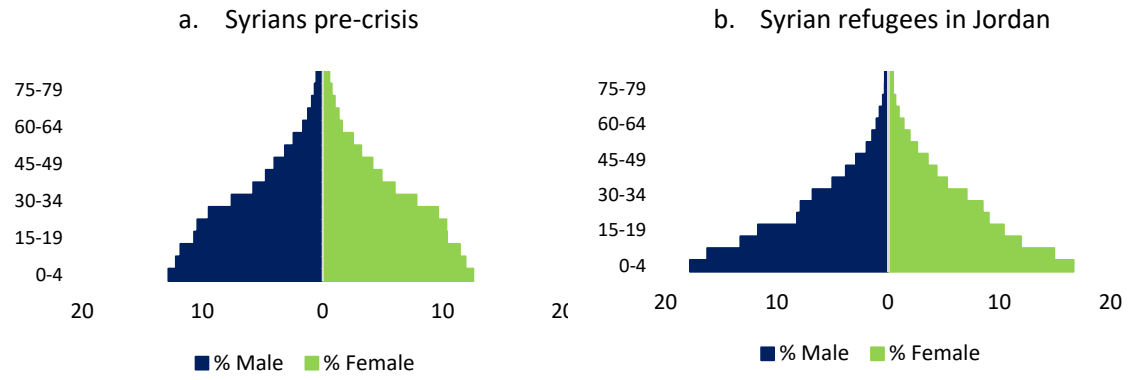


Source: Own calculations using Home Visits data for Syrian refugees that arrived in Jordan after 2011.
Note: CoA = City of arrival.

Demographic Characteristics

Women and children left Syria in large numbers and therefore, as is often the case for refugee populations, the demographic characteristics of the refugee population differ from that of pre-crisis Syria. Figure 2 shows that before the refugee crisis, the Syrian population was very young, with the largest population cohorts being children under 15 (Panel a), but the Syrian refugee population in Jordan is even younger (Panel b). Children under 15 accounted for 36 percent of the population in Syria in 2010 but represent 45 percent of the refugee population living in Jordan. In pre-crisis Syria, 3.5 percent of the population was 65 years or older, but among the Syrian refugees, this group only accounts for 2 percent of the population.

Figure 2. Age pyramid by sex of Syrians in Syria and Syrian refugees in Jordan



Source: Own calculations based on United Nations, Department of Economic and Social Affairs, Population Division 2017 and ProGres data.

The sex-ratio of Syrian refugees in Jordan differs from that of the pre-crisis population in Syria. Women account for 52 percent of the refugees in Jordan, whereas in Syria in 2010 they represented 49 percent of the population. This is mainly explained by the increase in the share of women under 20 from 46.2 percent in 2010 to 53.9 percent in the female refugee population. In contrast, the proportion of women in all the

remaining age groups decreased in the refugee population compared to pre-crisis Syria. The pattern is similar for male refugees. Men under 20 represent 59 percent of the male refugee population, compared to 47.6 percent in 2010. Young adult males seem to be missing from the refugee population as the proportion of young adult male refugees is lower than their share in the population of Syria in 2010: 8.2 percent of Syrian male refugees are between 20 and 24 years old compared to 10.4 percent in Syria in 2010. The reduction in the share of males ages 20–24, 2.2 percentage points, compares to a 1.3 percentage point decrease in the proportion of female refugees in the same age group.

Refugee Education

The Government of Jordan opened its schools and health services to refugees living in the communities. Nevertheless, many Syrian children remain outside school and numbers were highest in the years just after their arrival. The proportion of Syrian school-age children enrolled in formal education was 53 percent in 2014, up from 44 percent in 2013 (UNHCR 2014). Household poverty is one of the reasons behind these low enrollment figures. However, boys and girls face different barriers to staying in school. UNICEF (2017) reports that for boys, child labor, school violence, and the high costs of schooling (for transportation and stationery supplies) are the main barriers to their enrollment. For girls, barriers include the distance to the nearest school, the high cost of transportation, the need to help with household chores, health problems, and families refusing to educate their daughters. According to the JD-HV database, the most common reasons parents gave for their children not attending school were financial constraints (35 percent), lack of capacity in schools (29 percent), or that children were required to work to support their family (14 percent). By 2016, the enrolment rate of Syrian refugee school-age children in Jordan was 83 percent, 54 percent in formal education, and 29 percent in nonformal education (World Bank 2017b).[10]

Refugee Employment

It has been hard for refugees to find work in Jordan. The slowdown in growth in Jordan pre-dates the arrival of Syrian refugees and the economy has been increasingly unable to absorb new labor market entrants. Between 2010 and 2016, labor force inactivity increased, employment decreased, and unemployment increased in Jordan (Malaeb and Wahba, 2018). To work legally in Jordan, refugees must have a work permit (Verme et al 2016). However, there is a list of professional jobs, including physicians, engineers, teachers, and workers in the services sector, that can only be done by Jordanian nationals (ILO 2015). Since the agreement of the Jordan Compact in 2016, the Government of Jordan has taken steps to open formal employment opportunities for Syrians. It has waived the fees required to obtain a work permit for Syrian refugees in a number of occupations open to foreign workers and simplified the documentation requirements. These measures have encouraged employers to regularize their workers;

[10] Nonformal education services include catch-up courses, dropout and basic literacy programs, and learning support services offered in Makani Centers of the United Nations Children's Fund (UNICEF) (UNICEF 2017). The Makani Centers are multifunctional spaces providing learning support, psychosocial support, and a safe environment with opportunities for play.

over 49,000 refugees currently have active work permits, while the total number of permits being issued and renewed since early 2016 stands at over 100,000 allowing refugees to look for jobs.[11]

Female labor force participation is extremely low in both Jordan and Syria. Before the conflict, in 2010, the female labor force participation was 15.4 percent in Jordan and 13.3 percent in Syria compared to 67.6 percent and 72.7 percent for males, respectively. Employment rates in Jordan were 11.9 percent for women and 60.7 percent for men, compared to 10 percent and 68.5 percent for Syrian women and men, respectively. Unemployment rates in both countries were similar for women, at around 23 percent, but not for men as male unemployment rates were 5.8 percent in Syria compared to 10.3 percent in Jordan.[12] Agriculture was a more important source of employment in Syria than in Jordan, accounting for 15.2 percent of employment in 2009 compared with 3 percent in Jordan, and the industrial sector had a smaller employment share in Syria compared to Jordan (Verme et al. 2016). In Syria, women living in rural areas are likely to have been working on family farms and in the agricultural sector, doing part-time seasonal jobs or as unpaid family workers.[13] According to estimations, approximately 70 percent of all agricultural work is performed by women. Women carry the obligation of physically planting seeds, weeding, threshing, harvesting, processing, and so on. Women and children are singularly responsible for fruits and vegetable production, poultry, and livestock (Verner 2017).

Gender-based norms about female labor market participation, in addition to the lack of work permits outside camps, are another challenge for female refugees wanting to find a job and integrate into the Jordanian labor market. Results of focus group discussions indicate that both men and women in Jordan resist the idea of women working. While many women highlighted the role of women in the workforce, others said that the idea of women's work clashed with traditional values. Men, on the other hand, justified their resistance to women's labor force participation by stating that job opportunities were scarce, salaries were low, and they were treated poorly (European Regional Development and Protection Programme, the United Nations High Commissioner for Refugees, and World Bank, 2016). Gender-based violence may be another barrier to women's labor market participation by limiting their mobility outside the home. Small scale needs assessments of Syrian refugee[14]show high levels of sexual and gender-based violence including rape, assault, harassment, and intimate partner violence (Masterson, 2014, Samari, 2017).

At the time that the data were gathered for our research, access to employment was limited. At the end of 2015, only 5,700 Syrian refugees were working legally in Jordan. A much larger number worked in the informal sector; estimates range from 42,000 to 150,000 (World Bank 2016). It is estimated that unemployment among the Syrian refugee community stood at 60 percent (ILO 2017). Hence, lack of

[11] https://reliefweb.int/sites/reliefweb.int/files/resources/64114.pdf, accessed August 2,2018.
[12] Data from International Labour Organization (ILO) 2016.
[13] Studies of the agricultural sector in the late 1990s show that poorer women are traditionally responsible for crop and livestock production. Forty-five per cent of farm family labor is provided by unpaid females (100% for the care of animals) (IFAD 2001) and more recent research shows that women's responsibility for agricultural production has increased since (Galièa, Jiggins, and Struika, 2013).
[14] In Lebanon, Jordan and Turkey.

economic opportunities meant that many refugees were often reliant on running down savings while also depending on humanitarian aid and assistance (ILO 2017).

In this context, women are especially vulnerable, often reliant on the income of male family members and facing barriers to labor market participation. For example, very few Syrian women initially applied for work permits; 95 percent of work permits issued by 2016 had been issued to men. Qualitative research suggests that women who work are more likely to be household principal applicants and, in some regions of Jordan, those who work are almost exclusively employed in agriculture. Yet, women's ability to contribute to their families' standard of living is increasingly important (Care International in Jordan, 2016). Some contribute to the family income through informal home-based work such as food catering of traditional Syrian specialties.[15]

The lack of economic opportunities for men and women has had repercussions for their children. For many refugee families, marriage is a source of financial security, protection, and status, and they are willing to marry their daughters at a younger age. Before the crisis, 13 percent of marriages celebrated in Syria involved children under 18. With the outbreak of the conflict, the percentage of Syrian marriages involving girls ages 15–17 in Jordan increased from 12 percent in 2011 to 31.7 percent in 2014 (UNICEF 2014). As yet, little is known about the reasons for increased rates of child marriage in Jordan, but recent research among Syrian refugees in Lebanon reveals that contributing factors include Syrian parents thinking that the risks of gender-based violence and harassment are higher in Lebanon than they were in Syria and that some Syrian girls choose to marry as a way to exit unfavorable living conditions (Bartels et al. 2017).

Early marriage, often forced, is recognized as a form of GBV and increases the bride's potential of experiencing negative physical and mental health consequences. Compared to girls who marry later, child brides are at greater risk of having children at younger ages before they are emotionally and physical mature (Klugman et al 2014). Early motherhood frequently which contributes to complications during pregnancy and childbirth, making early pregnancy the number one cause of death for girls ages 15–19 and increasing the rate of stillbirth or infant death by 50 percent in mothers under 20 years of age.[16] Child brides are also more likely to drop out of school, earning less over their lifetimes and living in poverty. Additionally, there is an increased likelihood that girls who marry early will experience physical, sexual, or emotional intimate partner violence; have their physical mobility restricted; and/or have only limited decision-making power. More fundamentally, child brides may be disempowered in ways that deprive them of their basic rights to health, education, and safety, including lack of access to education and later, to employment opportunities (Wodon et al. 2017).[17]

[15] Female participants in Irbid had found work in agriculture, and most had been working in the sector for some time. The female participants in Irbid were also almost all heads of their households and responsible for income, while the female participants in Mafraq were, for the most part, dependent on the income of male family members (ILO 2017).
[16] https://www.girlsnotbrides.org/themes/health/ accessed January 4, 2018.
[17] It is worth noting that these documented consequences of child marriage are drawn from populations that are not forcibly displaced. The impact of displacement is likely to exacerbate some of the profound consequences of early marriage.

3. UNHCR Data on Syrian Refugee Households in Jordan

The analysis that follows uses information about individuals and households who arrived in Jordan between 2011 and 2014. Almost all these households (98.8 percent) are not living in camps but living with host communities in different places—mostly in Amman (31.7 percent), Irbid (28.3 percent), Mafraq (14.4 percent), and Zarqa (11.8 percent). The analysis is based on two UNHCR datasets: the ProGres database and JD-HV dataset. The ProGres dataset records the Syrians arriving in Jordan who register as refugees with UNHCR. It contains demographic and other information on the principal applicant and all the other individuals registered under the principal applicant.[18] We refer to the principle applicant and the individuals registered with them as a household. The JD-HV dataset contains more information on the socioeconomic characteristics of households and individuals and data on household expenditure, which are used to measure poverty. The ProGres database has information for a total of 54,408 Syrian refugee households, comprising 208,014 individuals, for whom JD-HV data are also available.[19]

Our analysis proceeds as follows. First, using the ProGres data we track the relationships between the different members of the household and the principal applicant. Next, we categorize all households into eight types that reflect some of the indicators of vulnerability used by UNHCR and capture some of the household characteristics that result from forced displacement:[20]

- **Couple with children**: Married couple (at least one of whom is at least 18 years old) with children of their and/or the children of others (classified by UNHCR as separated children).
- **Single person**: One adult (person 18 years or older) reporting no other dependents or cohabitees
- **Single caregiver**: One adult living with children of his/her own below the age of 18 and/or separated children and/or one or more elderly persons and/or disabled persons
- **Couple without children**: Married couples (at least one of whom is at least 18 years old) without children or members of their extended family in their own household, includes couples with adult sons and daughters.
- **Unaccompanied children**: Person or group of people below the age of 18 without an accompanying adult.
- **Siblings:** Household of brothers and sisters that share one or both parents, including at least one adult
- **Extended family and other households**: Households with or without children, that include extended family members such as in-laws, uncles, cousins. An example is married couples or widows/widowers living with their married sons/daughters and their children. Examples of other

[18] While there is no specific guidance on who should be designated as the principal applicant, UNHCR benefits and food assistance are allocated to this person. It is therefore reasonable to consider the principal applicant as the household head.
[19] It is important to note that the JD-HV data collection is not a randomly selected sample of the ProGres database and that it is designed for targeting. There are three criteria to select cases for Home Visits. The first is newly registered cases, included by default. The second is cases that are due for reassessment. The third refers to urgent cases that require a visit for urgent needs (Verme et al. 2016).
[20] For example, UNHCR specifically identifies single woman at risk, single older person, and single parent or caregiver.

households include; an adult PA with both parents and adult siblings; an adult PA with nephews/nieces all of whom are adults; adult PA with nephews/nieces some of which are children, some of whom are adults; adult PA with adult sons/daughters of his/her own, plus minors/disabled/elderly

- **Polygamous**: Families with one adult male who has registered more than one wife with or without children

Finally, to examine poverty, we match each individual household with its respective case (household) in the JD-HV dataset and separate the households into those with male and female principal applicants.

Table 1. Characteristics of male and female principal applicant households

	Male PA	Female PA	All PAs	Frequency Male PA	Frequency Female PA	Frequency All PAs
All PAs, %	66.2	33.8				
Elderly PA (65+)	5.37	10.64	7.15	1,934	1,958	3,892
Marital status (%)						
Married with spouse in HH	69.00	6.84	47.99	24,850	1,258	26,108
Married without spouse in HH	12.80	52.70	26.29	4,609	9,694	14,303
Widowed	1.05	24.59	9.01	379	4,523	4,902
Single or engaged	16.52	10.23	14.39	5,949	1,881	7,830
Divorced or separated	0.63	5.65	2.33	226	1,039	1,265
Absent spouse/no spouse	31.00	93.16	52.01	11,163	17,137	28,300
Age of PA (average, years)	38.07	40.91	39.03	36,013	18,395	54,408
Education of PA (%)						
Less than 6 years	16.95	30.69	21.60	6,106	5,646	11,752
6–11 years	60.98	51.49	57.77	21,961	9,472	31,433
More than 12 years	18.79	15.12	17.55	6,767	2,781	9,548
Family type (%)						
Couple with children	63.94	6.26	44.25	21,351	1,083	22,434
Single person	19.41	30.34	23.14	6,482	5,249	11,731
Single caregiver	2.52	54.78	20.36	843	9,477	10,320
Couple without children	9.46	1.43	6.72	3,159	248	3,407
Unaccompanied children	0.93	1.53	1.13	310	265	575
Siblings	1.24	1.51	1.34	415	262	677
Extended and other	2.48	4.12	3.04	827	713	1,540
Polygamous	0.02	0.02	0.02	6	3	9
All Nontraditional	36.06	93.74	55.75	12,042	16,217	28,259

Source: Own calculations based on ProGres and JD-HV database.
Note: PA = principal applicant. PA is determined by UNHCR at the time of refugee registration. HH = Household
Nontraditional=all family types apart from couples without children. This table contains data on PAs 54,408 (26 percent) of all tracked Syrian refugees.

One-third of Syrian refugee households have female principal applicants with the corresponding two-thirds of households having a male principal applicant. There are clear differences between the characteristics of male and female principal applicant households' in terms of education, marital status, and family type (Table 1).

The average age of male and female principal applicants is similar; however, female principal applicant households are more likely to be seniors (over 65 years old) than male principal applicants. Most female principal applicants are married (60 percent) but they are more likely to be living without their spouse than a male principal applicant; 53 percent of female principal applicants are living without their spouse compared to only 13 percent of male principal applicants. More female than male principal applicants are

widowed (25 percent of female principal applicants compared to 1 percent of male principal applicants). Overall 93 percent of female principal applicants either have no spouse or their spouse is not living with them, suggesting that this is an important route to becoming a principal applicant for a woman.

Most household principal applicants (58 percent) have between 6 and 11 years of education and only 18 percent have more than 12 years of education. Female principal applicants are less educated than their male counterparts, 31 percent of female principal applicants have less than 6 years of education, and only 15 percent of them have more than 12 years of education. In contrast, only 17 percent of male principal applicants have less than 6 years of education and 19 percent have more than 12 years of education.

Turning to family structure, the disruption caused by displacement is clearly illustrated by the family types. Less than half of Syrian refugee households (44 percent) are couples with children. One in five households is a single caregiver household, and single-person households account for nearly a quarter of all refugee households. Male and female principal applicants are also clustered in different family types. While most male principal applicant are in a couples with children (64 percent), over half of female principal applicants are single caregivers and nearly a third are single persons. The corresponding percentages for male principal applicants are much lower with only 3 percent being single caregivers and 19 percent being single persons.

In sum, the characteristics of male and female principal applicant households are very different. Being a female principal applicant is very often associated with having no male partner or an absent one whereas being a male principal applicant is mostly associated with having a spouse and often children too. Combining the marital categories where there is no spouse (widows, single or engaged, and divorced or separated) with those where the spouse is absent shows that 93 percent of female principal applicants fall into this category compared to 31 percent of male principal applicants. Similarly, while the majority of male PAs fall into the couple with children family type, almost all female principal applicants (94 percent) of live in nontraditional (mostly non-nuclear) family types.

Table 2. Household composition of male and female principle applicant households

	All	Male PA	Female PA	Couple with children		Couple without children		Unaccompanied children		Extended	
				Male PA	Female PA	Male PA	Female PA	Male PA	Female PA	Male PA	Female PA
Panel A: Household composition (average)											
Number of household members	3.80	4.13	3.16	5.27	5.32	2.23	2.37	1.38	1.66	3.95	2.67
Number of adult men	1.0	1.3	0.4	1.2	1.1	1.0	1.0	n.a.	n.a.	1.7	0.8
Number of adult women	0.9	0.8	1.1	1.1	1.3	1.0	1.3	n.a.	n.a.	1.5	1.7
Number of children <18	1.9	2.0	1.7	3.0	2.9	n.a.	n.a.	1.4	1.7	0.7	0.1
Number of children <5	0.8	0.9	0.6	1.3	1.1	n.a.	n.a.	0.1	0.3	0.3	0.0
Panel B: Child marriage											
Number of child brides (total)	788	623	165	364	17	220	5	4	112	13	1
Percentage of child brides	1.4	1.7	0.9	1.7	1.6	7.0	2.0	1.3	42.3	1.6	0.1

Source: Own calculations based on ProGres and JD-HV database.

Note: PA = principal applicant. PA is determined by UNHCR at the time of refugee registration. This table contains data on PAs 54,408 (26 percent) of all tracked Syrian refugees.

Table 3. Income sources, income, and expenditure per capita of male and female principal applicant households

	All	Couple with children		Single person		Single caregiver		Couple without children		Unaccompanied children		Siblings		Extended	
		Male PA	Female PA	Male PA	Female PA	Male PA	Female PA	Male PA	Female PA	Male PA	Female PA	Male PA	Female PA	Male PA	Female PA
Income sources (%)															
UNHCR monthly financial assistance	11.3	14.8	14.3	1.3	5.5	8.4	12.9	4.9	7.1	17.9	19.8	5.9	9.8	9.1	7.6
Humanitarian aid/ Charity/WFP vouchers	93.5	93.0	93.9	91.3	95.3	93.1	95.2	94.4	97.1	92.2	94.7	93.1	94.1	92.2	94.7
Remittances	4.6	2.1	4.5	5.4	3.8	4.3	10.8	4.4	5.0	2.0	3.4	5.4	5.9	4.1	7.5
Employment	1.9	2.4	1.9	3.0	0.3	1.6	0.8	1.8	0.8	1.0	0.0	2.7	1.2	2.3	1.6
Daily or irregular work	32.0	42.3	28.2	48.4	4.6	38.8	14.0	27.6	9.1	39.7	3.4	60.1	22.0	35.0	26.9
Pension	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.5	0.4	0.0	0.0	0.0	0.4	0.5	0.0
Income and expenditure (in JD per capita)															
Income	53.4	46.3	39.5	114.9	38.6	52.8	38.2	57.7	37.7	81.9	34.2	82.9	45.2	50.6	51.0
Expenditure	88.6	75.4	71.6	149.9	95.4	91.6	71.9	112.9	85.6	82.2	61.7	96.1	75.9	92.6	98.5
Expenditure before assistance	58.3	44.4	40.9	122.7	65.8	61.8	41.1	83.9	54.2	52.9	31.3	68.0	46.4	61.1	67.8
Increase in expenditure after assistance (%)	51.8	69.9	75.0	22.2	45.0	48.3	75.0	34.6	58.1	55.5	97.1	41.3	63.5	51.6	45.2

Source: Own calculations based on ProGres and JD-HV database.

Note: PA = principal applicant. PA is determined by UNHCR at the time of refugee registration. This table contains data on PAs 54,408 (26 percent) of all tracked Syrian refugees.

Table 2 provides more details about the household composition of the different family types for male and female principal applicants. We include information on children under five and child brides as they are considered individuals who are particularly vulnerable and face heightened protection risk.[21] Panel A shows that on average Syrian refugee households have four family members. On average, households have only one or no children under 5 but they have one or two children between the ages of 5 and 18. Male principal applicant households are larger on average than female principal applicant households (four compared to three people) and on average have more than one adult male in the household. In contrast, female principal applicant households have on average less than one adult male household member. On average, couples with children have the largest households (approximately five adults) and the most children (approximately four). There is little difference between male and female principal applicant households in this family type (but note that female principal applicant households account for only 5 percent of this family type). Extended families with male principal applicants are on average larger and more likely to have children than female-headed extended families.

Panel B of Table 2 shows that there are 788 child brides in our dataset. Nearly half of these adolescent girls already have children (381 are in a couple with children). A large proportion (42 percent) of female principle applicants that are unaccompanied children are already married.

Table 3 shows the differences in the sources of income and amounts of expenditure between male and female principal applicant households, according to family type. Regardless of the family type and gender of the principal applicant, humanitarian aid, charity, and World Food Programme (WFP) vouchers are a source of income for most households; more than 90 percent of households' report receiving incomes of this type. The second most important source of income for most family types is daily or irregular work. Nearly one in three households receives income from this source. Regardless of family type, there is a large difference between the proportion of male and female principal applicant households that receive income from this type of work. The difference is largest for single person and unaccompanied child households where less than 5 percent of female principal applicant households of these family types have daily or irregular work compared with 40 percent or more of the male principal applicant households in these categories. The next most important source of income is UNHCR financial assistance. For several family types, this income source is more important when the principal applicant of the household is a woman. For instance, among single caregiver families, 13 percent of female principal applicant households report receiving incomes from this source compared with 8 percent of male principal applicant households. Less than one in 20 households receives remittances. Female principal applicants are more likely to receive remittance in all family types. The largest gender gap is for single caregiver households where over 10 percent of female principal applicants receive remittances compared to 4 percent of male principal applicants.

Before assistance is received, income and expenditure per capita is higher for male principal applicant households than for female principal applicant households, except for extended family households (3

[21] See, for example, UNHCR's Emergency Handbook. https://emergency.unhcr.org/entry/125333/identifying-persons-with-specific-needs-pwsn.

percent of our dataset) where they are the same. Differences are especially large for single persons and unaccompanied children. In these two cases, income per capita for male principal applicants is more than twice that of female principal applicants. Differences in income per capita are also larger between male and female single persons and unaccompanied children than other household types. The only exception to this pattern is extended families, where both income and expenditure per capita are slightly larger in households with a female principal applicant.

Comparing expenditure per capita before and after households received assistance shows that expenditure was much lower before receipt of assistance for all family types. The before-after comparison shows increases in expenditure per capita that range between 22 percent (for a single person with a male principal applicant) and 97 percent (for unaccompanied children with a female principal applicant). Except for extended families, increases in per capita expenditure are larger for female principal applicant than male principal applicant households. However, in no case does assistance close the gap in expenditure per capital between male and female principal applicant households.

Tables 1, 2, and 3 show that there are differences in characteristics, composition, and income and expenditure between the household types. They also show where gender gaps exist between male and female principal applicants of the different household types. There are several notable gender gaps that can be expected to influence the poverty risk faced by households. First, a higher proportion of males reside in households with a male principal applicant and the opposite is true for households with a female principal applicant. As male labor force participation is less constrained than female labor force participation, this is a likely risk factor for female principal applicant households. Second, some categories of family types appear to be especially vulnerable if the principal applicant is a woman or girl. Single-caregiver households with female principal applicants have more children on average but less access to daily and irregular work than male principal applicant single caregiver households. While more of these female principal applicant households receive remittances from relatives than male single caregiver principal applicants (10 percent versus 4 percent), their expenditure per capita is considerably lower than that of households with male principal applicants. Unaccompanied children with a female principal applicant also emerge as a very vulnerable group. Many are married to an absentee spouse and, compared with unaccompanied children with a male principal applicant, unaccompanied children with a female principal applicant have little access to irregular and daily work compared with other family types, and their expenditure levels before assistance are the lowest of any category.

4. Poverty and gender differences among Syrian refugee households

This section discusses poverty rates among Syrian refugee households. First, we compare poverty rates of male and female principal applicant households, disaggregating by marital status and family type. Next, we turn to the correlates of poverty, presenting the results of poverty models for male and female principle applicants. Finally, we explore the hypothesis that female applicants face gender-specific barriers by using propensity score matching (PSM) to produce a group of male and female principal applicants that share similar demographic characteristics.

Poverty rates of male and female principal applicant Syrian refugee households

We begin with a comparison of poverty rates between male and female principal applicant households before and after UNHCR and World Food Programme (WFP) assistance.[22] The poverty line is Jordanian dinars (JD) 50 per capita per month (US$5.25 purchasing power parity [PPP] per capita per day). It was set using the monetary threshold that UNHCR used to target its cash assistance program at the time. UNHCR assistance was JD 50 per month for households with one or two members, JD 100 for households with three to five people, and JD 120 for households that have more than five members. WFP assistance was JD 24 per person per month.

Table 4 shows that over half of all refugee households (53 percent) registered with UNHCR are poor before UNHCR and WFP assistance. There is no difference between the poverty rates of male and female principal applicant households overall. UNHCR and WFP assistance reduces overall poverty rates by large amounts; household poverty falls from 53 percent to 11 percent for households on average.

About 62 percent of households of married male and female principal applicants who are living with their spouses are poor. Poverty rates are lower for all the other marital categories, ranging from 21 percent for single principle applicants to 53 percent for principle applicants who are married but living without their spouse. There is no significant difference between poverty rates of male and female principal applicants who are married and living together. However, poverty rates are significantly higher for female principal applicant households compared with male principle applicants in all the other marital categories.

UNHCR and WFP assistance reduces poverty rates for all marital categories. However, a gender-poverty gap opens up after UNHCR assistance; overall the poverty rates of female principal applicant households are 3 percentage points higher than those of male principal applicant households. After assistance, poverty rates of female principal applicant households who are married but living without their spouse, single or engaged or divorced or separated, are significantly higher than those of male principal applicant households in the same categories.

Turning to family types, over two-thirds of couples with children (who account for 45 percent of households) are poor before assistance and there is no difference between the poverty rates of male and female principal applicant households. Again, on average poverty rates are lower for all other family types ranging from 14 for single-person households to 60 percent for single-caregiver households. Thirty-six percent of all family types apart from married couples with children (called here nontraditional family types) are poor. Clearly nontraditional households are much less vulnerable to poverty than couples with children. However, within this group, there is a large gender gap in poverty rates. Apart from extended and other households, poverty rates are much higher for female principal applicant households than male principal applicant households for all other nontraditional family types. Female single caregivers have the highest rate of poverty (61 percent) followed by unaccompanied children and siblings (41 and 43 percent, respectively). The largest gender-poverty rate gap is between male and female principal applicants who

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[22] Verme et al. (2016) calculated these indexes using reported expenditure during the home visits.

Table 4. Poverty rates of male and female principal applicant households before and after assistance from UNHCR and the WFP, percentage

Poverty rate:	Before assistance			After assistance			Gender gap %		Observations
	Male PA	Female PA	All	Male PA	Female PA	All	Before assistance	After Assistance	
All	53.1	53.0	53.1	10.6	13.0***	11.2	−0.13	22.83	45,919
Marital status									
Married with spouse in the HH	62.2	62.6	62.2	12.0	12.7	12.0	0.76	6.06	24,895
Married without spouse in the HH	46.0	57.1***	52.9	10.0	13.0***	11.9	24.03	29.75	11,190
Widowed	41.2	46.4*	45.9	9.4	12.5	12.2	12.65	33.45	3,135
Single or engaged	16.6	41.0***	20.8	4.3	15.8***	6.2	153.31	266.52	5,830
Divorced or separated	25.3	39.5***	36.4	6.3	10.9*	9.9	56.23	72.56	869
Family type									
Couple with children	67.5	67.6	67.5	12.8	13.5	12.9	0.19	5.20	21,779
Only-person	8.5	25.8***	13.9	2.2	6.9***	3.7	204.54	223.14	7,720
Single caregiver	45.2	60.9***	59.5	9.1	14.5***	14.0	34.70	58.67	8,172
Couple without children	21.6	38.8***	22.7	5.4	11.8***	5.8	79.60	119.78	2,842
Unaccompanied children	34.0	53.7***	41.2	16.0	31.5***	21.6	57.75	97.28	296
Siblings	36.2	55.8***	42.8	8.0	24.2***	13.4	54.24	203.44	566
Extended and other	44.5	29.5***	38.0	9.4	6.1**	8.0	−33.75	−34.47	1,367
All Nontraditional	19.0	50.9***	35.6	4.6	12.7***	8.8	167.86	177.52	20,963

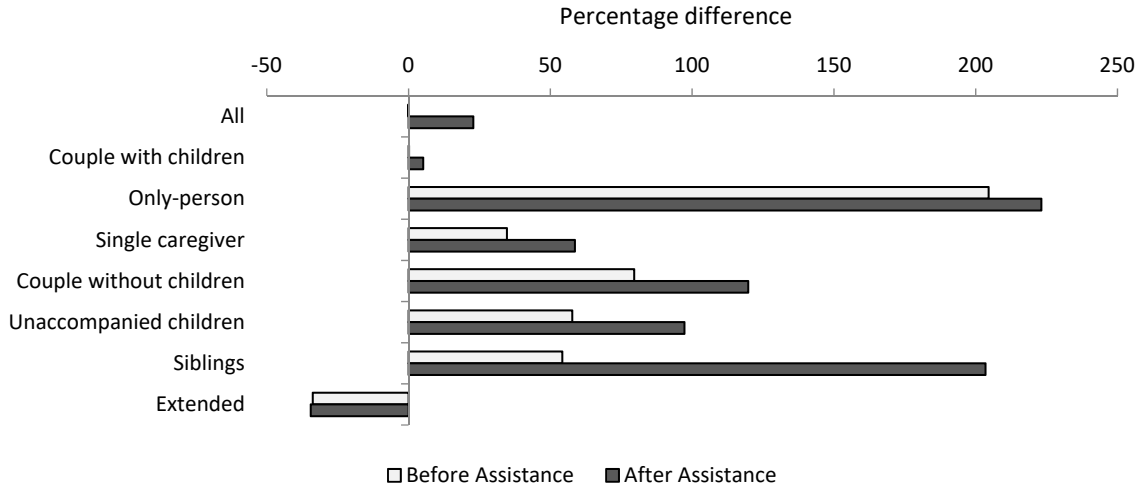
Source: Own calculations based on ProGres and JD-HV database. Gender gap is calculated as the percentage difference between female and male poverty rates.

Note: PA = principal applicant; HH = household. Nontraditional family types are all family types apart from couples with children. Differences between male and female PA poverty rates by marital status and family type are statistically significant at *10 percent level, **5 percent level, or ***1 percent level.

are unaccompanied children or principal applicants of sibling households (20 percentage points). Poverty rates among extended families with male principle applicants (1.5 percent of the households) are about a third higher than poverty rates for extended and other families with female principle applicants. This suggests that along with female principal applicants of unaccompanied children and siblings (1 percent of the database), male principal applicants of extended and other families are also a small but vulnerable group.

After UNHCR and WFP assistance, poverty rates fall for all. However, the rate of reduction varies between male and female principal applicants according to their marital status and family type. Gender-poverty gaps remain for principal applicants who are married but without their spouse, single or engaged, widowed, or divorced or separated. Turning to family types, there is a large reduction in poverty for all household types, regardless of the gender of the principal applicant. The largest reduction is for couples with children; poverty rates decrease from 68 percent to 13 percent (an 80 percent reduction). Unaccompanied children now experience much higher poverty rates than other households, especially if the principal applicant is a girl; their poverty rate is reduced by 50 percent, a smaller reduction than that of the other family types. After assistance, the gender-poverty gap remains: except for extended and other families, female principal applicant households have significantly higher rates of poverty than male principal applicant households in all nontraditional family types. For extended and other families, poverty rates of male principal applicants are significantly higher than poverty rates of female principal applicants.

Figure 3. Gender-poverty gaps, percentage difference before and after assistance



Source: Authors' elaboration.
Note: Poverty gap = (Pf − Pm) / Pm × 100, where Pf = poverty rate of female principal applicant households, Pm = poverty rate of male principal applicant households.

In sum, humanitarian assistance makes a great difference, substantially reducing poverty for all. However, as Figure 3 shows, the extent to which assistance reduces poverty rates varies across family types and a gender-poverty gap with female principal applicants at a disadvantage appears. When households are

disaggregated by their family type, there are significant differences in poverty rates between male and female principal applicants for all nontraditional family types. For nontraditional households the gender-poverty gap disadvantages female principal applicants for all family types except extended and other families where male principal applicants are at a disadvantage. Compared to the gender-poverty gap before assistance, the gender-poverty gap after assistance increases most for sibling households.

Why are non-traditional households more likely to be poor when they have a female-principal applicant?

In the previous subsection, we found that the households of female principal applicants, who are not one of a married couple living with children, are more likely to be poor than their male counterparts. To determine why these types of female principal applicant households may be poorer than equivalent male principal applicant households, we examine two alternative hypotheses: (a) female principal applicant households have certain characteristics that make them more vulnerable poverty or (b) female principal applicant households are discriminated against or face gender-specific barriers to accessing economic opportunities. Hence, even those female principal applicant households that have the same characteristics as male principal applicant households are more likely to be poor.

To explore the first hypothesis, we estimate econometric models of the probability of being poor separately for households with male and female principal applicants. We estimate Linear Probability Models (LPMs) with heteroskedasticity consistent standard errors. A Wald test rejects the hypothesis that the male and female principal applicant households are drawn from the same distribution, so we run separate regressions for male and female principal applicants to allow for heterogeneous effects of the independent variables on the incidence of household poverty for male and female PA households. We chose the LPM for two reasons: (a) to avoid strong modeling assumptions about the error term in the underlying model and (b) to facilitate the interpretation of estimated coefficients. Additionally, we ran logit models to check that the marginal effects were nearly identical to the estimates of the LPM model. In this case, when only few estimates lie outside the unit interval, an LPM is expected to produce largely unbiased and consistent estimates. As our aim is to identify correlates and not to forecast poverty rates, the LPM supported by robustness checks is a legitimate choice (Friedman 2012).

Our main model is

$$P_i = \beta_0 + X_i'\beta_1 + W_i'\beta_2 + \varepsilon_i \quad (1),$$

where *i* represents a household; P_i = 1 if household *i* is below the poverty line and P_i = 0 if the household is on or above the poverty line; X_i represents a vector of individual characteristics of the principal applicant; W_i is a vector of household characteristics; and ε_i is a normally distributed error term. We selected the set of explanatory variables (see Appendix 1 for details) based on theory and ran models adding them progressively. We found that the sign of the coefficients and the significance level of individual variables were stable across models. All the estimations presented below use the most comprehensive set of regressors.[23]

[23] The results of the model selection exercise for the other poverty models are available on request.

Table 5. Correlates of poverty of Syrian registered refugees: Female and male principal applicant households

	Poverty before assistance		Poverty after WFP asst.		Poverty after WFP+UNHCR	
	Female PA	Male PA	Female PA	Male PA	Female PA	Male PA
	(1)	(2)	(3)	(4)	(5)	(6)
PA Characteristics						
Age of PA	−0.0779	0.156	−0.0688	0.122	−0.142	−0.0100
	(0.0494)	(0.0299) ***	(0.0460)	(0.0278) ***	(0.0363) ***	(0.0212)
Education 6—11 years	−0.831	−2.899	−1.656	−3.356	−3.904	−4.408
	(1.064)	(0.599) ***	(1.024)	(0.604) ***	(0.811) ***	(0.485) ***
Education >12 years	−4.141	−7.826	−3.771	−6.356	−4.919	−5.916
	(1.436) ***	(0.748) ***	(1.333) ***	(0.698) ***	(1.007) ***	(0.530) ***
Married, absent spouse	−1.126	−5.012	3.719	−2.505	0.965	0.469
	(4.484)	(2.200) **	(4.238)	(1.730)	(3.157)	(1.343)
Widowed	3.486	−4.918	7.624	−1.308	3.505	−1.625
	(4.431)	(3.671)	(4.217) *	(3.164)	(3.154)	(2.186)
Single or engaged	3.536	0.668	7.134	0.480	3.002	1.443
	(4.688)	(2.094)	(4.383)	(1.703)	(3.210)	(1.307)
Divorced	0.959	−3.847	6.880	0.626	3.621	1.711
	(4.713)	(3.537)	(4.420)	(2.921)	(3.292)	(2.225)
HH characteristics						
Household size	11.75	13.39	5.113	8.174	3.038	4.459
	(0.340) ***	(0.208) ***	(0.345) ***	(0.216) ***	(0.277) ***	(0.169) ***
Children <5 years	1.889	−2.117	4.396	−1.081	3.909	0.204
	(1.211)	(0.764) ***	(1.178) ***	(0.798)	(0.894) ***	(0.591)
Women and girls, %	−8.696	−7.069	1.380	−4.260	2.844	−0.599
	(2.230) ***	(1.638) ***	(2.127)	(1.622) ***	(1.672) *	(1.217)
No. of male adults	−8.291	−11.01	−3.786	−4.794	0.187	1.172
	(0.766) ***	(0.466) ***	(0.825) ***	(0.579) ***	(0.688)	(0.492) **
Elderly person	8.205	3.533	9.237	2.956	6.694	3.465
	(1.994) ***	(1.552) **	(1.778) ***	(1.401) **	(1.325) ***	(1.100) ***
Disabled person	6.631	5.679	8.083	6.971	1.467	0.724
	(1.791) ***	(0.789) ***	(1.803) ***	(0.861) ***	(1.319)	(0.629)
Wage income	−8.596	−6.172	−5.532	−5.876	−2.968	−1.387
	(3.759) **	(1.394) ***	(3.409)	(1.026) ***	(2.578)	(0.797) *
Remittance income	−9.806	−12.12	−6.850	−7.711	−3.975	−2.419
	(1.359) ***	(1.253) ***	(1.168) ***	(0.885) ***	(0.816) ***	(0.601) ***
Legal entry status	−5.000	−7.937	−4.272	−4.808	−2.912	−3.007
	(0.908) ***	(0.510) ***	(0.840) ***	(0.487) ***	(0.619) ***	(0.357) ***
Family type						
Only-person	4.012	−1.768	4.317	10.73	5.226	9.297
	(4.723)	(2.330)	(4.504)	(1.938) ***	(3.346)	(1.488) ***
Single caregiver	1.514	1.789	−0.297	3.687	3.460	2.297
	(4.490)	(2.726)	(4.306)	(2.210) *	(3.219)	(1.692)
Couple w/o children	1.744	-9.033	4.406	3.100	6.528	5.129
	(4.087)	(1.185) ***	(3.567)	(1.001) ***	(2.810) **	(0.758) ***
Unaccompanied child.	21.09	7.423	26.59	23.87	24.36	21.17
	(6.518) ***	(3.969) *	(6.523) ***	(3.606) ***	(5.597) ***	(3.053) ***
Siblings	12.41	10.10	12.62	8.912	15.78	5.807
	(5.749) **	(3.181) ***	(5.534) **	(2.492) ***	(4.446) ***	(1.982) ***
Extended and other	−5.798	−1.570	−4.104	0.404	2.039	1.535
	(4.708)	(1.795)	(4.359)	(1.547)	(3.234)	(1.183)
Polygamous	−12.79	−11.40	4.266	−23.71	−13.38	−5.022
	(24.70)	(18.18)	(26.27)	(17.02)	(2.667) ***	(15.81)
Observations	11,699	30,360	11,699	30,360	11,699	30,360
R-squared	0.225	0.384	0.070	0.162	0.070	0.110

Note: PA = principal applicant; HH = household. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Omitted categories: less than 6 years of education, married with spouse in the household, illegal entry status, couple with children; Governorate dummies are included but not reported.

Table 5 presents the results obtained when P_i indicates whether household *i* was poor before UNHCR and WFP assistance, columns (1) and (2); after WFP assistance, columns (3) and (4); and after assistance from both UNHCR and WFP, columns (5) and (6). For the most part, the characteristics and attributes of households that are associated with lower (or higher) risk of household poverty are the same for both male and female principal applicant households before and after receiving assistance. However, often the strength of the association (size of the coefficients) differs by quite large amounts according to the gender of the principal applicant.[24]

As is commonly found, individual education attainment is associated with poverty risk. However, our results show that there is a significant difference between the reduction in poverty risk associated with more years of education for male and female principal applicant households. For male principal applicant households, compared to having no education, a 3-percentage point reduction in poverty risk is associated with 6–11 years of education; in contrast, the associated risk reduction for 6–11 years of education for female principal applicants is 1 percentage point. More than 12 years of education is also associated with an 8-percentage point poverty risk reduction for male principal applicants compared with a 4-percentage point reduction for female principal applicants.

Marital status is, in the main, not significantly linked to household poverty. The exception is for households with married male principal applicants who are unaccompanied by their spouse. For these households, the likelihood of poverty is lower compared with the base category of male principal applicants with children who are accompanied by their spouse.

Household size and care of dependents are associated with poverty risk. Larger household size is associated with increased poverty risk for both male and female principal applicant households, and the effect is slightly greater for male principal applicants. Having an elderly or disabled person in the household is also associated with a higher poverty risk for both male and female principal applicants. Having an elderly person in the household is associated with an 8-percentage point greater poverty risk for female principal applicants compared to a 3-percentage point greater risk for male principal applicants. However, the greater poverty risk associated with having a disabled person in the household is only slightly larger for female principal applicants compared to male principal applicants.

Getting income from employment and receiving remittances from relatives reduces poverty risk for both female and male principal applicant households. Interestingly, as in some countries remittances are particularly important for keeping female-headed households out of poverty (Buvinic and Gupta, 1997; Castañeda et al. 2016; World Bank 2001), receiving remittances is associated with a larger reduction of poverty risk for male than female principal applicants for Syrian refugees in Jordan. Entering the country legally as opposed to informally crossing the border is associated with lower household poverty, especially for male principal applicant households. For both male- and female-principal applicant households, a higher number of adult males is also associated with lower poverty, but the effect is larger when the principal applicant is a man.

[24] We estimate whether differences between the coefficients obtained for female and male principal applicant models are statistically significant from 0. Results are included as part of the text and the exact calculations are available upon request.

Compared to couples with children, households consisting of unaccompanied children and siblings are especially likely to be poor, even more so if they have female principal applicants. Principal applicant girls are clearly very vulnerable compared to both couples who are married with children and with principal applicant boys. Couples without children are less likely to be poor than couples with children if the principal applicant is a man, but this is not true for couples without children where the principal applicant is female.

We compare the impact of having assistance in two stages, first looking at the impact of WFP assistance alone (JD 24 per person, per month) and then the impact of WFP assistance combined with assistance from UNHCR, which varies according to household size. Looking first at the characteristics that reduce poverty risk, we see that education continues to reduce poverty risk and the effect of having some education over and above primary has a stronger impact after assistance is received than before, for both male and female principal applicant households. Having 12 years or more education continues to reduce the risk of poverty more for male principal applicant households than for female principal applicant ones but the difference in the impact of education on male versus female is statistically significant only after WFP assistance. Once female principal applicant households receive assistance, either WFP or both WFP and UNHCR, income from employment is no longer associated with lower poverty risk. For male principal applicant households, income from employment continues to be linked to lower likelihood of household poverty, even after receiving assistance. Given that women's access to jobs is particularly constrained, UNHCR and WFP assistance appears to play an important protective role. Whatever the level of assistance, receiving remittances from relatives remains an important factor in reducing poverty risk for both male and female principal applicant households.

Looking at the characteristics that are associated with higher poverty risk, we see that some are no longer associated with higher risk of poverty after assistance from both WFP and UNHCR has been received. WFP assistance alone is not enough to reduce the risk of poverty associated with a disabled person for either male or female principal applicant household. However, the combined assistance removes the association between household poverty and having a disabled person in the household, suggesting that UNHCR assistance is well targeted towards some of the most vulnerable households. However, households where elderly people live continue to face greater risk of poverty and the association is particularly strong for female principal applicant households after WFP and UNHCR assistance. Household size continues to be linked to a higher likelihood of household poverty for both male and female principal applicant households although its impact is reduced after assistance.

After receiving assistance, households with young children that have female principal applicants emerge as being more vulnerable to poverty than male principal applicant households with young children. The link between the number of adult males in the household and lower poverty risk is no longer present for female principal applicant households after combined assistance of WFP and UNHCR is received and appears to have a small but significant positive impact on the likelihood of poverty for male principal applicant households.

It seems therefore that humanitarian assistance has been well targeted toward households with disabled people but that better targeting is needed to meet the needs of households with elderly people, large households, and female principal applicant households with children under five.

Other factors that continue to have large and significant links to the likelihood of poverty relate to family type—compared to couples with children, siblings, unaccompanied children, couples without children, and single men living without family are more likely to be poor. Unaccompanied children are over 20 percentage point more likely to be poor than couples with children. After WFP and UNHCR assistance, sibling households with female principal applicants are 16 percentage points more likely to be poor than a couple with children compared with 6 percentage point higher likelihood of male principal applicant sibling households. These family types are clearly very vulnerable and the emergence of single men as a category who appear vulnerable to poverty in the context of humanitarian assistance needs further examination. Interestingly, after other characteristics are controlled for, extended and other families do not face increased risk of poverty compared to couples with children either before or after assistance.

Accounting for the differences in poverty between male and female principle applicants

We use a Blinder-Oaxaca decomposition to examine which explanatory variables account for most of the observed differences in the poverty rates of female and male principal applicant households in the full dataset. This approach divides the mean of the gender-poverty gap into three components: one component is attributable to differences in magnitudes of the determinants of the poverty rates (the explained or endowment component), a second component is attributable to differences in the effects of these determinants (the unexplained or coefficient component), and a third component is attributable to the interaction between endowments and coefficients.

Table 6 shows the results of decomposing the poverty gap between households with a female and a male principal applicant into major components that include age, education, marital status, income, legal entry status of the principal applicant, and household size and location variables.

Before assistance (Panel A of Table 6), the mean difference in poverty rates between households with a female compared to a male principal applicant was under 1 percentage point (poverty rates were marginally higher among female principal applicant households, so we focus our discussion on the poverty after assistance (Panel B of Table 6). Panel B shows a gender-poverty gap of 2.53 percentage points, of which 1.85 percentage points (73 percent) is due to endowments and most of the remainder is due to the unexplained component. The variables that account for most of the poverty-gender gap are household size and variables related to marital status and family type. The negative sign for household size shows that the larger the differences in household size between male and female principal applicants, the smaller the gender-poverty gap is, suggesting that large households are a poverty risk for male principal applicant households. In contrast, the positive sign for the presence of children under 5 shows that for female principal applicant households that have children under five the gender-poverty gap increases. It is also worth noting that differences in education explain a much smaller proportion of the gender-poverty gap after assistance than before. However, the positive sign means that differences in education between male and female principal applicants are translated into larger differences in the poverty-gender gap.

Table 6. Blinder-Oaxaca decomposition of the gender-poverty gap

		Poverty gap decomposition		
	Total	**Endowments**	**Coefficients**	**Interaction**
Panel A: Before assistance				
Total	**0.58**	**−9.05**	**3.22**	**6.41**
Age of PA	−0.29	0.15	0.43	−0.87
Education	0.90	0.52	0.46	−0.08
Married with spouse in the HH	3.29	3.63	−2.79	2.45
Household size	−6.24	−6.55	−0.47	0.78
Couple with children	−7.63	−6.93	−5.66	4.97
Children <5 in the HH	1.29	0.06	1.58	−0.35
Proportion of females	−0.67	−0.58	0.05	−0.14
Elderly person in the HH	0.97	0.22	0.40	0.36
Disabled person in the HH	−0.16	−0.22	0.10	−0.04
Employment Income	−0.84	−0.83	−0.02	0.01
Legal entry status	1.80	0.73	1.32	−0.25
Located in Ajloun city	1.90	0.76	1.54	−0.40
Located in refugee camp	0.04	0.01	0.07	−0.03
Constant	6.21	—	6.21	—
Panel B: After WFP+UNHCR assistance				
Total	**2.53**	**1.85**	**−0.16**	**0.84**
Age of PA	−0.47	−0.22	0.25	−0.50
Education	0.20	0.67	-0.55	0.07
Married with spouse in the HH	1.78	1.75	0.26	−0.23
Household size	−2.32	−2.76	-0.67	1.12
Couple with children	2.98	2.79	1.51	−1.33
Children <5 in the HH	1.30	0.12	1.51	−0.34
Proportion of females	0.53	−0.99	-0.80	2.33
Elderly person in the HH	0.66	0.21	0.24	0.21
Disabled in the HH	0.07	−0.02	0.14	−0.05
Employment Income	−0.42	−0.25	0.03	−0.20
Legal entry status	0.34	0.28	0.07	−0.01
Located in Ajloun city	0.94	0.26	0.92	−0.24
Located in refugee camp	0.01	0.01	−0.01	0.00
Constant	−3.07	—	−3.07	—

Note: PA = principal applicant; HH = household.

Do female principle applicants face gender-specific barriers?

To examine the hypothesis that female principal applicants face gender-specific barriers that increase their vulnerability to poverty, we use PSM to select male and female principal applicant households that have a similar set of observable characteristics. Thus, for this analysis, all households are similar except for the gender of the principal applicant.[25] One of the main drawbacks from this specification is that we must assume that the likelihood of being registered as principal applicant depends only on observable characteristics rather than unobservables. We use a Mahalanobis distance measure as an alternative technique to control for the potential nonrandom selection of observable variables for male and female principal applicants. Matching based on this metric has been proven to be one of the best procedures because it not only matches based on the propensity score, but it also reduces the distance across the covariates included.

[25] PSM is increasingly used to preprocess data before applying parametric techniques. Evidence suggests that this approach makes parametric models produce more accurate and inferences less dependent on the model.

We match households that are similar in a set of individual- and household-level covariates, including per capita family income, proportion of females in the household, education of the principal applicant, marital status of the principal applicant, the presence of elderly or disabled people in the household, and whether the household receives income from employment or remittances.[26] We find a good match for approximately 34,000 households in the database.[27] We proceed with the analysis by estimating equation (1) using the matched sample, adding a dummy for female principal applicant.

Table 7 shows the results of two models for each poverty outcome; the difference between the models is that the number of adult men is included as an additional control in columns (2), (4), and (6) but is not included as a regressor in columns (1), (3), and (5). Columns (1) and (3) of Table 7 show that before UNHCR assistance, female principal applicants who are like male applicants in terms of education, household composition, marital status, and income sources are more likely to be poor than male principal applicant households, even after controlling for family type, household size, and a number of other characteristics that affect vulnerability to poverty. However, once the number of adult males in the household is controlled for, the association of greater poverty with female principal applicants disappears—columns (2) and (4). After UNHCR assistance is received—columns (5) and (6)—households with female principal applicants are no longer more likely to be poor and the number of adult males in a household has no significant impact on the likelihood of poverty either.

Other research suggests that the ability to work informally or use networks to access economic opportunities, including negotiating housing rent or prices of other important expenditures, are possible reasons why having more adult men can help keep households out of poverty (World Bank, 2016; ODI UNICEF and UNHCR, 2017). However, while on average male principal applicant households have more than one adult male, female principal applicant households have less than one adult male.

Our results suggest that assistance is well targeted in terms of providing resources needed to lift female principal applicant households above the poverty line as after assistance the association between female principal applicants and a greater likelihood of poverty disappears. The impact of having more adult males in the household on the likelihood of poverty is also offset by the assistance. Thus, controlling for difference in observable characteristics between male and female principal applicant households, female principal applicant households are no more likely to be poor than their male counterparts after UNHCR assistance.

[26] Although the use of more covariates guarantees a successful matching, it reduces the probability of finding observations on the common support. This is known as the dimensionality paradox (Guo and Fraser 2015). Given the large set of households that the dataset surveyed, we had more room for flexibility on this aspect. Out of 53,320 observations, 9,058 were of the common support.

[27] The density function of the matched male principal applicant households resembles the density function of female principal applicant households, as confirmed by the balancing test, which shows a reduction of 100 percent in the differences between the matched households across all covariates. (See Appendix 2)

Table 7. Correlates of poverty of Syrian refugee households before and after humanitarian assistance, matched sample

	Poverty before assistance		Poverty after WFP ast		Poverty after WFP+UNHCR	
	(1)	(2)	(3)	(4)	(5)	(6)
Female PA	6.308	1.082	3.931	1.279	1.843	1.338
	(2.298) ***	(2.177)	(2.103) *	(2.149)	(1.756)	(1.809)
Characteristics of PA						
Age of PA	−0.0927	−0.0187	−0.00533	0.0322	−0.0635	−0.0564
	(0.0980)	(0.0989)	(0.0981)	(0.0992)	(0.0824)	(0.0838)
Education 6-–11 years	−4.975	−5.529	−1.675	−1.955	−4.551	−4.605
	(1.797) ***	(1.782) ***	(1.884)	(1.871)	(1.459) ***	(1.460) ***
Education >12 years	−6.473	−7.317	−4.245	−4.674	−6.442	−6.523
	(2.128) ***	(2.118) ***	(2.140) **	(2.142) **	(1.522) ***	(1.520) ***
Married, absent spouse	−0.0586	−0.103	−0.866	−0.888	2.805	2.801
	(5.108)	(5.071)	(4.674)	(4.648)	(3.916)	(3.908)
Widowed	3.852	4.358	3.701	3.958	4.548	4.597
	(5.182)	(5.151)	(4.778)	(4.766)	(4.101)	(4.096)
Single or engaged	−2.027	−2.053	−2.264	−2.278	0.529	0.527
	(3.853)	(3.821)	(3.698)	(3.697)	(3.146)	(3.145)
Divorced	1.484	2.034	4.804	5.083	5.087	5.140
	(6.682)	(6.666)	(5.645)	(5.612)	(4.200)	(4.197)
Household characteristics						
Household size	10.54	12.74	4.773	5.890	3.419	3.632
	(0.389) ***	(0.461) ***	(0.416) ***	(0.498) ***	(0.361) ***	(0.436) ***
Children <5 years	0.0833	−1.569	4.036	3.198	3.986	3.826
	(1.948)	(1.953)	(2.008) **	(2.019)	(1.764) **	(1.760) **
Women and girls, %	4.172	−2.868	5.103	1.531	3.233	2.552
	(4.831)	(4.929)	(4.336)	(4.444)	(3.269)	(3.366)
No. of male adults		-9.249		-4.693		-0.894
		(0.897) ***		(1.016) ***		(0.898)
Elderly person	3.078	3.471	6.820	7.020	10.09	10.12
	(3.892)	(3.855)	(3.756) *	(3.747) *	(3.217) ***	(3.217) ***
Disabled person	4.164	4.324	7.255	7.336	2.537	2.553
	(1.899) **	(1.908) **	(2.247) ***	(2.263) ***	(1.865)	(1.868)
Wage income	−7.760	−7.054	−10.76	−10.41	−6.088	−6.020
	(4.178) *	(4.271) *	(3.610) ***	(3.599) ***	(2.386) **	(2.389) **
Remittance income	−12.20	−12.79	−6.625	−6.922	−3.347	−3.404
	(4.176) ***	(4.143) ***	(2.678) **	(2.648) ***	(2.192)	(2.188)
Legal entry status	−9.412	−8.847	−5.837	−5.550	−4.718	−4.663
	(1.583) ***	(1.573) ***	(1.488) ***	(1.487) ***	(1.195) ***	(1.199) ***
Family type						
Only-person	−3.873	−2.767	7.421	7.982	9.881	9.988
	(4.961)	(4.922)	(4.445) *	(4.438) *	(3.451) ***	(3.449) ***
Single caregiver	0.719	−1.697	3.408	2.182	0.763	0.529
	(5.281)	(5.281)	(4.893)	(4.889)	(4.073)	(4.096)
Couple without children	−3.983	−0.497	1.561	3.330	3.347	3.684
	(3.655)	(3.623)	(2.862)	(2.888)	(2.394)	(2.425)
Unaccompanied children	32.26	29.89	42.10	40.89	31.00	30.77
	(8.230) ***	(8.293) ***	(8.790) ***	(8.793) ***	(8.254) ***	(8.253) ***
Siblings	20.56	22.81	20.85	21.99	18.48	18.70
	(6.183) ***	(6.141) ***	(6.747) ***	(6.738) ***	(6.087) ***	(6.088) ***
Extended and other	−14.79	−10.17	−3.040	−0.692	2.002	2.449
	(4.959) ***	(4.943) **	(4.600)	(4.572)	(3.984)	(3.996)
Polygamous	−19.79	−14.28	−3.275	−0.478	−14.21	−13.68
	(21.69)	(22.03)	(23.95)	(24.60)	(2.686) ***	(2.669) ***
Observations	34,000	34,000	34,000	34,000	34,000	34,000
R-squared	0.208	0.219	0.073	0.077	0.076	0.076

Note: PA = principal applicant; HH = household. Robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Omitted categories: less than 6 years of education, married with spouse in the household, illegal entry status, couple with children, governorate dummies not reported.

The association of female principal applicants with higher rates of poverty before assistance when households have been matched suggests that there are gender-specific barriers faced by female principal applicant households. Our results are consistent with women's limited access to labor markets and economic opportunities being foremost among such barriers. With more income in the form of assistance or more adult men who can earn income in the household, the association between female principal applicants and a higher likelihood of poverty disappears.

5. Conclusion

Numerous reports about refugees say that women and children are especially vulnerable. By combining UNHCR's ProGres data with household survey data, we have been able to shed more light on one aspect of this vulnerability—its association with income poverty for Syrian refugee households in Jordan whose principal applicant is a woman.

The combination of ProGres and JD-HV data provides a rich source of information from which evidence on gender-specific vulnerability to poverty can be distilled. The microdata stored in the ProGres database identifies a principal applicant and allows us to trace the relationship of people in each household to the principal applicant. By asking respondents to identify themselves as principal applicants as opposed to head of the household and by linking applicant status to receipt of benefits, the questionnaire for the ProGres database circumvents the social norms that make women reluctant to identify themselves as household heads or limit their ability to think of themselves in that way.

Our findings support the view that many women are especially vulnerable to poverty and shed some light on some of the drivers of the vulnerability of Syrian refugees in Jordan by establishing links between household poverty, female headship, and the demographic characteristics of households. One-third of registered Syrian refugee households in Jordan have female principal applicants. Analysis of the demographic characteristics of male and female principal applicant households show that they are very different. Over half of all married female principal applicants are living without their spouse, a further quarter are widows and many others have no spouse as they are single, divorced or separated. In contrast, most male PAs (69 percent) are one of a married couple who are living together and only 13 per cent have an absent spouse. Altogether 93 percent of female principal applicants either have an absent spouse or no spouse, only 31 percent of male principal applicants are in this situation.

The disruption that forced displacement causes to family structures, and its gender specific impact is clearly captured by applying a gender lens to these data. Most female principal applicants (55 percent) are single caregivers and a further 30 percent are single person households. In fact, most female PAs (94 percent) live in nontraditional family types whereas only 36 percent of male principle applicants live in nontraditional family types. Overall, the composition of male and female PA households is markedly different. First, a higher proportion of adult males reside in households with a male principal applicant and the opposite is true for households with a female principal applicant. As male labor force participation is less constrained than female labor force participation, this is a likely risk factor for female principal applicant households. Second, some categories of family types appear to be especially vulnerable if the principal applicant is a woman or girl. Single-caregiver households with female principal applicants have more children on average but less access to daily and irregular work than male principal applicant single caregiver households. While more of these female principal applicant households receive remittances

from relatives than male single caregiver principal applicants (10 percent versus 4 percent), their expenditure per capita is considerably lower than that of households with male principal applicants. Unaccompanied children with a female principal applicant also emerge as a very vulnerable group. Many are married to an absentee spouse and, compared with unaccompanied children with a male principal applicant, unaccompanied children with a female principal applicant have little access to irregular and daily work compared with other family types, and their expenditure levels before assistance are the lowest of any category.

Our findings are consistent with other research that shows the link between female headship and household is ambiguous due to the heterogeneity of female-headed households (Chant 2003, 2008; Klasen et al, 2015). There is no significant difference between poverty rates of male and female principal applicant households before humanitarian assistance is received, so female principal applicants are not disproportionally represented among the poor. Poverty rates are highest for couples with children (44 percent of the households in our database); over two-thirds of these households have incomes below the poverty line before assistance is received. Before assistance, the poverty rate for nontraditional households (only person, single caregivers, couples without children, unaccompanied children, sibling households, and extended and other families) is 35 percent, much lower than that of couples with children. However, for this group of households, there is a gender-poverty gap; poverty rates are considerably higher for female principal applicant households than for male principal applicant households (51 percent compared to 19 percent).

Our analysis shows that it is important to go beyond disaggregation by the sex of the household head to assess whether gender-poverty gaps are an important consideration for policy. Female principal applicants are disproportionately represented in household types that have different demographic characteristics to those of male principal applicants. In terms of marital status, three out of four female PAs are married women with absent spouses or widows; less than one in five male PAs fall into in these categories. In terms of family types, female PAs live for the most part in non-nuclear family structures, often as single caregivers. Women in these circumstances and their households have a higher risk of poverty than households with male PAs in the same circumstances.

Differences in household composition, particularly the number of dependents – young children, disabled and elderly persons – education level of the PA and access to labor markets and remittance incomes are the factors most strongly associated with poverty. Once these household and individual characteristics are controlled for neither marital status nor family type (with some exceptions) is associated with household poverty for either male or female principal applicants. Unaccompanied children and sibling households are the exceptions. They are clearly highly vulnerable as these family types remain strongly correlated with household poverty after controlling for other individual and demographic characteristics. Unaccompanied children or siblings with a female PA are especially vulnerable. The factors associated with poverty for both male and female principal applicant households are similar. Education acts as a protective factor for all households and its impacts remain significant after assistance is received. Larger households and households that care for people such as the disabled, elderly and children under five are more likely to be poor. Having a larger number of adult males is linked to lower risk of household poverty for both male and female PAs. The most likely as explanation is that adult males are able to get work,

often in the informal sector, and that their greater mobility and networks are used to access labor and other markets and institutions to provide resources that keep households out of poverty.

Humanitarian assistance received in 2013/14 made massive differences to the poverty experienced by Syrian refugee households, lifting around three-quarters of poor households out of poverty. But, even after assistance, unaccompanied children and sibling households remain vulnerable, especially so if the principal applicant is a woman or a girl. Some of the association between household poverty and care of vulnerable people is reduced after assistance is received. Humanitarian assistance appears to have been well targeted toward households with disabled people but, either more assistance or better targeting is needed to meet the needs of households with elderly people, large households, and female principal applicant households with children under five. The emergence of single men as a category who appear vulnerable to poverty in the context of humanitarian assistance needs further examination.

Humanitarian assistance is not intended to close gender poverty gaps, nevertheless given the concerns about vulnerable populations it is a relevant consideration. After humanitarian assistance is received a gender poverty gap that works against female PA households appears for households overall. Decomposition analysis shows that the gap is statistically explained by the presence of children under 5, differences in education and household size. For female principal applicant households having more children under five and less year's education increases the gender-poverty gap but as their household size increases the gender poverty gap closes. Large households are thus associated with poverty for both male and female PA households.

Differences between the demographic characteristics of the households with male and female PAs are correlated with the likelihood of household poverty. Female principal applicant households are more likely to be poor when they have more elderly dependents and children under 5, are less educated and receive less wage income or remittances compared to male PAs. But this is not the only explanation, gender-specific barriers or gender discrimination which prevent women accessing markets and services are also a factor.

We find that when female principal applicant households with the same characteristics as male principle applicant households are given the same opportunities (in this case the assistance from WFP and UNHCR), they do as well as male principal applicant households. Comparing female and male PA households that have similar characteristics, female principal applicant households are still more likely to be poor than male principal applicant households in the absence of receiving humanitarian assistance. However, once assistance is received, female principal applicant households are no more likely to be poor than equivalent male principal applicant households.

Other findings are consistent with research on Syrian refugees in Jordan that identifies gender-specific barriers to labor market participation and social norms that limit women's mobility outside the home and their agency in markets as factors that increase refugee households' vulnerability (World Bank, 2016; ODI UNICEF and UNHCR, 2017). Our analysis shows that when female principal applicant households with the same characteristics as male principle applicant households have adult males in the household the association between female PA and a higher likelihood of poverty disappears. We interpret this effect as being due to adult males acting as an asset to female PA households as they do not face the same barriers to accessing markets as women.

UNHCR policies guiding targeting of assistance to Syrian refugees have changed since 2013/14, and therefore policy recommendations for Syrian refugees in Jordan cannot be based on the findings presented here. Rather, our study shows that it is possible to apply a gender lens to available data and produce results that quantify differences between male and female headed households' incidence of poverty and identify some of the demographic characteristics that are linked to greater poverty risk. Moreover, our findings indicate that it is of utmost importance to distinguish between different types of female and male principal applicant households to understand poverty in the setting of the Syrian refugees in Jordan.

More generally, our findings suggest that unless gender disadvantage is considered in the design of development policies to replace humanitarian assistance the poverty reduction gains it achieves may not be sustained. In the short-term it will be important to build the capacity for women to move into the labor market so that they can have access to economic opportunities which can replace the value of assistance or the advantages that an adult male brings to a household. Including cash transfers and other types of social protection that can reach the households that are especially vulnerable – unaccompanied children, siblings and single caregivers- is equally important. Finally, the strong protective role that education plays underlines the importance of ensuring remedial action is taken so that all children and young adults who have missed education due to displacement can make up the schooling they have missed.

Finally, although the UNHCR data enabled us to examine some of the impacts that gender differences have on household poverty, there are some important data gaps. The JD-HV data show the proportion of both male and female principal applicants who are employed and do daily or irregular work. However, employment details of other members of the household and more detailed gender-disaggregated data on labor market participation (that includes the numbers of days/hours worked, daily or hourly earnings, sector of employment, and type of work) are needed to understand the difference between labor market opportunities for men and women. Other research points to the increased prevalence of GBV, especially faced by women and girls. Besides being a human rights violation, GBV is a manifestation of women's lack of agency and can affect women and girl's ability to access economic opportunities and services due to mobility constraints caused by actual and perceived GBV risks. GBV is thus a major cause of gender-based vulnerability and therefore good data on GBV risk (that is, collected following UN Guidelines (UNDESA and UNWomen, 2013)) is needed to increase understanding of the impacts of exposure to GBV on refugee women and their families and allow us to explore the links between GBV and household poverty.

Appendix 1. Variable Definitions

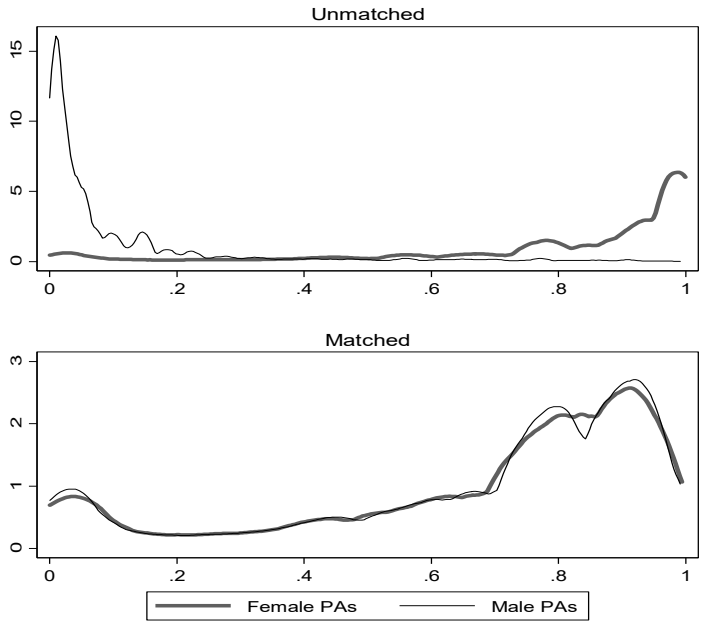
Table A1.1. Variable definitions

Variable	Definition
Age of PA	Age of the principal applicant (PA)
Children under 5	1 if there are one or more children below the age of 5 (inclusive) in the household
Disable	1 if there are one or more disabled persons in the household
Education	Categorical variable. We classified education of the PA in three groups: below years, 6-11 years, and more than 12 years of education
Elderly	1 if there is one or more persons above the age of 65 (inclusive) in the household
Entry status	Categorical variable. ProGres reports 5 entry statuses of which we selected the three categories with the largest number of PAs: Informal, formal, and smuggled.
Expenditure	Raw addition of all expenditure categories, which include rent, bills, food, healthcare, education, and others.
Family Type	Categorical variable. For a detailed definition see section 4
Household size	Number of people included in the case records of each PA in Individual ProGress dataset
Wage Income	1 if the household receives income from employment and/or daily or irregular work
Income from remittances	1 if the household receives income from remittances
Income per capita	Raw sum of household income from all sources; work, pension, assets in Syria transfers, donations, other organizations' humanitarian aid, and other divided by household size
Male Adults	Number of males above 18 (inclusive) in the household
Marital Status	Categorical variable. The classification includes married PAs with spouse in the household, married PAs without spouse in the household, widowed, single or engaged, and divorced or separated.
Proportion of female	Number of female divided by the household size
Location	Categorical variable for 11 Governorates/cities. Ajloun City, Aqaba, Balqa, Irbid Jerash, Karak, Maan, Madaba, Mafraq, Tafilah, Zarqa.
In Camp	1 if the household is located in a refugee camp
Poverty before UNHCR and WFP assistance	1 if household expenditure before UNHCR plus WFP assistance is below the poverty line (JD50)
Poverty before UNHCR assistance	1 if household expenditure after WFP assistance but before UNHCR assistanc is below the poverty line (JD50)

Source: Authors' elaboration.

Appendix 2. Propensity Score Matching

Figure A2.1. Densities before and after matching



Note: Propensity matching was done using a kernel and a Mahalanobis distance measure. Out of 53,320 observations, 9,058 are off the common support. Propensity score on the horizontal axis.

Table A2.1. PSM - Probit regression

Dependent variable: Female PA	**Coefficient**	**Standard Errors**	**z**	**P>z**
Log of income per capita	−0.384	0.017	−23.080	0.000
Proportion of females	3.549	0.040	87.730	0.000
Education of PA				
6−11 years	−0.139	0.023	−6.080	0.000
More than 12 years	−0.177	0.029	−6.100	0.000
Marital status				
Married with spouse in the household	2.386	0.021	113.980	0.000
Widowed	3.000	0.040	74.350	0.000
Single or engaged	1.425	0.031	45.720	0.000
Divorced	2.651	0.063	42.180	0.000
Elderly in the household	−0.215	0.037	−5.780	0.000
Disable in the household	−0.228	0.031	−7.380	0.000
Receives income from employment	−0.110	0.075	−1.460	0.143
Receives income from remittances from relatives	0.759	0.041	18.380	0.000
Constant	−2.051	0.069	−29.830	0.000
Number of observations	53,320			
P>chi2	0.000			
Pseudo R2	0.651			

Notes: Omitted categories: less than 6 years of education, married with spouse in the household. Propensity matching was done using a kernel and a Mahalanobis distance measure.

Table A2.2. Balancing test

Variable	Unmatched/ Matched	Mean		% bias	% bias reduction	t-test	
		Treated	Control			t	p>|t|
Log income per capita	U	3.47	3.81	−53.6		−55.8	0.00
	M	3.46	3.45	0.0	100	0.0	0.99
Proportion of Female	U	0.73	0.38	141.4		156.1	0.00
	M	0.53	0.53	0.5	99.6	0.6	0.58
Education of PA							
6−11 years	U	0.52	0.61	−18.9		−20.7	0.00
	M	0.62	0.62	0.0	100	0.0	1.00
More than 12 years	U	0.15	0.19	−9.9		−10.7	0.00
	M	0.16	0.16	0.0	100	0.0	1.00
Marital Status							
Married with spouse in the HH	U	0.53	0.13	94.2		109.9	0.00
	M	0.69	0.69	0.0	100	0.0	1.00
Widowed	U	0.25	0.01	75.2		97.4	0.00
	M	0.12	0.12	0.0	100	0.0	1.00
Single or engaged	U	0.10	0.17	−18.7		−19.7	0.00
	M	0.04	0.04	0.0	100	0.0	1.00
Divorced	U	0.06	0.01	29.1		36.8	0.00
	M	0.02	0.02	0.0	100	0.0	1.00
Elderly in the HH	U	0.12	0.06	22.5		26.0	0.00
	M	0.03	0.03	0.0	100	0.0	1.00
Disabled in the HH	U	0.07	0.11	−15.5		−16.3	0.00
	M	0.05	0.05	0.0	100	0.0	1.00
Receives income	U	0.01	0.03	−13.6		−13.8	0.00
from wages	M	0.00	0.00	0.0	100	0.0	1.00
Receives income	U	0.08	0.03	20.7		24.3	0.00
from remittances	M	0.05	0.05	0.0	100	0.0	1.00

Note: Omitted categories: less than 6 years of education, married with spouse in the household.

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