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SOCIO-ECONOMIC INEQUALITIES IN MATERNITY
CARE UNDER POLITICAL INSTABILITY:
EVIDENCE FROM EGYPT, JORDAN AND YEMEN

Ahmed Shoukry Rashad and Mesbah Fathy Sharaf

Working Paper No. 1011

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Abstract

Medical care during pregnancy is crucial for protecting women from health risks during and after pregnancy, and has been consistently linked to better child health outcomes. Improving maternal health is one of the Millennium Development Goals (MDGs). This paper examines the socio-economic inequalities in maternity care utilization in Egypt, Jordan, and Yemen after the Arab Spring, using the most recent rounds of the National Demographic and Health Survey. Concentration curves and concentration indices are used to examine the demographic and socio-economic correlates of maternity care utilization, and to assess the situation under the political instability that followed the Arab Spring. In addition, we investigate the underlying factors that generate the socio-economic inequalities in maternity care utilization by decomposing the concentration index into its determinants. The analysis yields that the degree of the socio-economic inequalities in maternity care utilization varies largely within the Arab world. The level of inequality is severe in Yemen, moderate in Egypt, and minor in Jordan. Results of the decomposition analysis show that socio-economic disparities in maternity care utilization are mainly due to the lack of economic resources and its correlates among the poor. The political instability in the region did not hinder Egypt and Jordan from improving the maternal health indicators at the national level. Increasing women education, especially among the poor, and poverty reduction measures focusing on rural communities could help narrow the inequalities in maternity care and hence improves population health outcomes.

JEL Classifications: I14, I15

Keywords: Maternity Care; Income Inequality; Decomposition Analysis; Egypt; Jordan; Yemen.

ملخص

الرعاية الطبية أثناء فترة الحمل هو أمر حاسم لحماية المرأة من المخاطر الصحية أثناء الحمل وبعده، وارتبط على الدوام بالنتائج الصحية الأفضل للأطفال. تحسين صحة الأم هو واحد من الأهداف الإنمائية للألفية. تبحث هذه الورقة في عدم المساواة الاجتماعية والاقتصادية في استخدام رعاية الأمومة في مصر، والأردن، واليمن بعد الربيع العربي، وذلك باستخدام أحدث جولات المجلس الوطني للمسح الديموغرافي والصحي. نستخدم في هذه الورقة منحنيات التركيز لدراسة ارتباط العوامل الديموغرافية والاجتماعية والاقتصادية لاستخدام رعاية الأمومة، ولتقييم الوضع في ظل حالة عدم الاستقرار السياسي التي أعقبت الربيع العربي. وبالإضافة إلى ذلك، نتحرى العوامل الكامنة التي تولد عدم المساواة الاجتماعية والاقتصادية في استخدام رعاية الأمومة من خلال تحليل مؤشر التركيز في محدداته. تبين عائدات التحليل أن درجة عدم المساواة الاجتماعية والاقتصادية في استخدام رعاية الأمومة تختلف إلى حد كبير في العالم العربي. مستوى عدم المساواة مرتفع جدا في اليمن، ومعتدل في مصر، وثنائي في الأردن. وتشير نتائج التحليل أن الفوارق الاجتماعية والاقتصادية في استخدام رعاية الأمومة يرجع أساسا إلى نقص الموارد الاقتصادية وما يرتبط بها في أوساط الفقراء. ومع ذلك فإن عدم الاستقرار السياسي في المنطقة لا تعيق مصر والأردن من تحسين مؤشرات صحة الأم على المستوى الوطني. أيضا زيادة نسبة تعليم النساء، وخاصة بين الفقراء، وتدابير الحد من الفقر مع التركيز على المجتمعات الريفية يمكن أن تساعد في الحد من التفاوت في رعاية الأمومة وبالتالي تحسين النتائج الصحية للسكان.

1. Introduction

Every day, around 830 women die from preventable causes related to pregnancy and childbirth. According to the World Health Organization, at the end of 2015, roughly 303,000 women died of complications during pregnancy or childbirth. Statistics show that 99% of all maternal deaths occur in developing countries. These deaths are avoidable since the medical interventions are available and widely known. Medical care during pregnancy and childbirth allows monitoring pregnancy, and reduces the health risks to the mother and her child. As part of the global efforts to curb maternal mortality, the United Nations included the reduction in maternal mortality by two third, between 1990 and 2015, as one of the Millennium Development Goals (MDGs). Egypt, Jordan, and Yemen along with other countries have adopted these goals to be achieved by 2015.

In 2010, waves of protests and demonstrations started in several countries in the Middle East, leading to unstable political environment in the region and civil conflict in some cases. Hosni Mubarak of Egypt and Ali Abdullah Saleh of Yemen both have stepped down from power, while Jordan has witnessed a number of protests for political and economic reform. In fact, political instability adversely affects economic growth, which in turn derives households to cut their spending on health and education to cope with income loss from the political turmoil. This paper is the first to explore the performance of three major Arab countries; Egypt, Jordan and Yemen, which were affected by the Arab Spring, in closing the socioeconomic gap in maternal health care utilization.

While the trend in maternal health has been over studied (see for e.g: Khadr 2009, Hogan et al., 2010, Lozano et al., 2011, Benova et al., 2014), little attention has been given in the literature to the disparities in maternal health among socioeconomic classes in the three Arab countries, especially after the Arab spring era.

In an earlier study, Lozano et al., (2011) tracked the progress toward the MDGs for health across the world, and reported that the Arab countries have made an accelerated progress in curbing maternal mortality. In fact, the strong progress in national averages may mask socio-economic disparities underneath it, since the MDGs for health call for improvement in national averages. This could be attained either by improvement in the health of the poor or the better-off. Consequently, the improvement in national averages may result from the improvement in the health of the better-off, while the poor are lagging behind.

To study the economic-related inequality in maternity care utilization under political instability, we use the most recent rounds of the Demographic and Health Survey (DHS) for Egypt, Jordan, and Yemen. We use the concentration index (C) as a measure of wealth related inequalities in child delivery by skilled health providers, which we then decompose using Wagstaff et al., (1991) approach to identify the causes of the socio-economic inequality in reproductive health.

The paper is organized as follows: Section 2 presents a brief review of the related literature. Section 3 provides a description of the data, and the empirical methodology. Section 4 presents the results which are then discussed in Section 5. Section 6 concludes the paper.

2. A Brief Literature Review

A growing number of studies have emerged to examine the inequalities in maternal health, and its determinants, in a wide range of countries [For a recent review of the literature on the equity in the utilization of maternal health care services in developing countries see Çalışkan et al., (2015)]. For example, using DHS data from 45 developing countries, Houweling et al. (2007) examined the poor–rich inequalities, by wealth quintiles, in the use of maternity care (professional delivery care and antenatal care), in comparison to other types of healthcare. They found the poor–rich inequalities in maternity care are much greater than those in

immunization coverage or treatment for childhood illnesses. In a related study, Collin et al. (2007) found marked socioeconomic inequities in the utilization of maternal health care services in Bangladesh. Despite the substantial increase in the utilization of antenatal care, utilization remained much lower, especially by the poorest rural women. Education of the woman and her husband were important determinants of utilization of the obstetric services. They also found a huge gap in access to caesarean sections, with the urban rich and educated women having excessive caesareans (at a rate of 34.8%) compared to the rural uneducated poor among whom caesarean sections were almost non-existent (at a rate of 0.1%).

In a recent study, Hajizadeh et al. (2014) used data from the latest five rounds of Bangladesh DHS to examine the trends in social inequalities in the utilization of antenatal care, facility based delivery, and skilled birth attendance between 1995 and 2010. They found that although socially disadvantaged mothers increased their utilization of care relative to mothers of higher socioeconomic status, the absolute gap in utilization of care between socioeconomic groups has increased over time. Wealthier and more educated women, as well as those living in urban areas, are the major users of maternity care in Bangladesh. Using DHS data from six sub-Saharan African countries, Alam et al. (2015) assessed the within-country geographical and wealth-based inequalities in the use of maternal care services. They found persistent inequalities in the use of three key maternal health services, favoring wealthy and urban women. Relative inequality by wealth and rural-urban residence decreased over time in countries making progress towards reducing maternal mortality, but it was not the case in countries which made insufficient progress. In a recent systematic review of thirty-six quantitative studies, Çalışkan et al. (2015) examined the progress of equity in the utilization of maternal health care services in developing countries. The survey revealed the lack of equity in the utilization of maternal health care in developing countries. Thirty-three out of 36 studies found evidence supporting severe inequities, while three studies found evidence of equity, or at least improvement in terms of equity.

The literature on maternal healthcare socio-economic inequalities in the Arab world is sparse, especially in the period preceding the Arab Spring. In an earlier study, Khadr (2009) used three consecutive rounds of the DHS, between 1995 and 2005, to monitor the progress in maternal health indicators in Egypt, and suggested that there has been substantial improvements in the national levels of maternal health indicators. However, these improvements were not enjoyed equally by women in various social groups.

In this paper, we contribute to the extant literature by analyzing the socio-economic inequality in maternal health in Three Arab countries on which limited research has been conducted, and in a region which has recently witnessed political instability.

3. Method

This paper uses data from the most recent rounds of the DHS for Egypt, Jordan and Yemen implemented in the years 2014, 2012, and 2013 respectively. The DHS is a nationally representative survey that collects data on a wide set of variables related to children and mothers health. The Survey collects information from ever-married women at reproductive age. The DHS contains information on demographic characteristics, maternity care, reproductive behavior, and housing characteristics. The surveys asked women who give birth in the last five years about access to prenatal care and its contents, type of the place of delivery, and access to postnatal care. The DHS has a complex design, which involves stratification by geographical location and cluster sampling that involves randomly selecting a number of clusters. The analysis has taken the complex survey design into account. All analyses are population weighted using the sampling weights in the survey.

The concentration index (C) is utilized as a measure of socio-economic disparities in obtaining maternity care at delivery. It is a standard measurement tool of inequalities in health economics

[Wagstaff, 2000; Van Doorslaer et al., 2006]. We then decompose the C into its contributing factors using the approach of Wagstaff et al. (1991). The merit of this method is that it allows identifying the root causes of socio-economic disparities in maternity care utilization.

The C is a measure of the extent of socio-economic inequalities in health care utilization. In fact, the C ranges between -1 and +1. The sign of C reflects the direction of the relation between the health variable of interest and household's position in the living standard distribution. A negative sign for the C implies that the maternity care utilization is concentrated among the poor, while a positive C suggests that it is the better-off who benefit the most. In absolute value, the magnitude of the C indicates the strength of the relation between the health variable of interest and economic status; where the higher the value of the C, the higher the degree of the concentration among the poor or the better-off depending on the C sign. Analogous to the Gini coefficient, a C with zero value indicates perfect equality. The C is computed as in equation 1 (O'Donnell and Wagstaff, 2008).

$$C = 2/\mu \text{Cov}(H, W) \quad (1)$$

Where H is an indicator of the health variable, μ is its mean, while W is a measure of living standard, and Cov is the covariance between H and W. The C is computed for the three countries. Intra and inter-country progress assessments could be made by comparing the values of the concentration indexes across countries and over time.

Wagstaff et al. (2003) showed that the C could be decomposed into the contributions of individual determinants, where each contribution is the product of the sensitivity of receiving maternity care with respect to that determinant and the level of economic-related inequality in that determinant.

For any linear model of health care (H), such as that in Equation (2):

$$H_i = \alpha + \sum_k \beta_k x_{ki} + \varepsilon \quad (2)$$

The C for H could be shown as in Equation (3):

$$C = \sum_k \left(\frac{\beta_k \bar{x}_{ki}}{\mu} \right) C_k + \frac{GC_k}{\mu} \quad (3)$$

Where μ is the average mean of maternity care utilization and $\bar{x}$ is the mean of the determinant x . C_k is the concentration index for the determinant x , and GC is the concentration index for the error term. Equation 3 shows that the overall C is composed of two parts, a part that is explained by the systemic variation in the determinants, and a part that cannot be explained by it. The unsystematic part approaches zero in a well-specified model. Thus, the C is the product of the elasticity of the dependent variable H with respect to the regressor $x \left(\frac{\beta_k \bar{x}_{ki}}{\mu} \right)$ and income related inequality in that factor C_k .

The decomposition analysis is conducted as described in the following steps: Firstly, the maternity care utilization variable is regressed on its determinants using an adequate model. This generates the coefficients of the determinants. Secondly, the average means of the dependent and the explanatory variables are computed. Thirdly, the concentration indexes for the dependent and the explanatory variables are computed using equation 1. Fourthly, the percentage contribution of each determinant is computed as in Equation (4):

$$\frac{(\beta_k \bar{x}_{ki} / \mu) C_k}{C} \quad (4)$$

The dependent variable, delivery by a skilled health attendant, is a binary variable. We opt to use the linear probability model with robust standard errors. The reason is that the logit or probit models do not yield very meaningful results since the decomposition results of binary

model are not unique, as the partial effects are at particular values of the determinants (usually the mean). The decomposition analysis includes the following standard set of covariates: mother's age, mother's educational level, health insurance coverage (binary variable equals one if covered by a health insurance and zero otherwise), households' wealth index based on the level of households' assets ownership, location of residence (urban vs rural), a binary variable taking a value of 1 if household head is a male (Zere et al. 2011). DHS data on insurance coverage were not collected for Jordan, and hence we ignore that variable in the analyses of Jordan.

4. Results

4.1 Descriptive result

Table 1 provides the basic summary statistics of receiving medical assistance during delivery by socioeconomic background. It shows that 92% of women in Egypt have received medical assistance during child delivery between 2009 and 2014, while 44% in Yemen did, and about 99% in Jordan have received medical assistance during delivery. In Egypt and Yemen, it is clearly observed that women from economically better-off households are more likely to receive medical assistance at child delivery. The demand for maternity care declines, as mothers get older. The table indicates severe inequality between urban and rural areas in Yemen, and to a lesser degree in Egypt. It is clearly observed that Jordan outperforms Egypt and Yemen in MDG 5.

Figure 1 presents the concentration curves for the three countries. These curves show the cumulative share of maternity care utilization according to the cumulative share of the population, ranked by economic status. If the concentration curve lies below the 45-degree line, it indicates that maternity care utilization is more concentrated among the rich and the converse is true. Similar to Lorenz curve, the farther a curve from the equality line, the higher the degree of inequality in maternity care use. Comparing the concentration curves for the three countries allow us to compare the intra-countries socioeconomic inequalities in receiving maternal care.

Figure 1 depicts the concentration curves for the three countries. They are all lying below the line of equality, which means mothers from economically better-off households utilize maternity care more often than mothers from low economic background. The concentration curve for Yemen lies below the concentration curves for Egypt and Jordan which reflects the higher level of socioeconomic disparities in Yemen compared to Jordan and Egypt. The concentration curve for Jordan lies slightly below the equality line, indicating a small degree of socioeconomic inequalities.

Figure 2 depicts the evolution of the concentration index for skilled birth attendance in Egypt, Jordan, and Yemen. Both Egypt and Jordan have achieved a significant drop in the degree of inequality in maternity care even after the political turmoil of what is known as the Arab spring. For Egypt, the C for skilled birth attendance has dropped from 0.289 in 1995 to 0.109 in 2008 which continued to drop to 0.038 in 2014. Similarly, the C for skilled birth attendance in Jordan has dropped from 0.052 in 1990 to 0.04 in 2007 which then continued to drop to almost zero achieving perfect equality of maternity care use in 2012. Due to non availability of data, we could not assess the progress in the degree of inequality in maternity care in Yemen.

4.2 Decomposition results

The decomposition analysis allows distinguishing inequality (variables that reflect health care need and their association with health utilization are justifiable such as age) from inequity (variables whose correlation to health utilization is unfair such as income). However, this distinction is not very valuable here, since delivery by skilled health provider is necessary to protect mothers from maternal mortality. The C is computed here by adding the residuals to the contribution of the relevant variables. Each contribution to the C is the product of the

sensitivity of maternity care utilization with respect to the corresponding determinant, and the degree of income-related inequality in that determinant. A factor with a significant effect on health care utilization, but with no income related inequality, will have a trivial contribution to the C, as opposed to one with a significant effect on health care utilization and high socioeconomic-related inequality. The decomposition table provides the overall socioeconomic inequality in delivery by skilled health provider, along with the contribution of the determinants to C of delivery by skilled health providers.

In the three countries, the concentration indexes of delivery by skilled health provider are all positive; indicating that receiving medical assistance at delivery is more concentrated among women from economically better-off households. However, the severity of the socioeconomic disparity in health care utilization varies across the three countries. Yemen is the most unfair country for pregnant women compared to Egypt, and Jordan. The C of delivery by skilled health provider in Yemen is seven times higher than that of Egypt. The level of economic inequality in maternity care is the lowest in Jordan, as nearly all women in Jordan receive some sort of medical assistance during delivery. The degree of socioeconomic inequality in maternity care is not stark in Egypt, as the recent years' witness improvement in access to maternity care. However, in the case of Egypt delivery in a private health facility, which requires fees, is more common than delivery in a public health facility. Based on Egypt's DHS data, births to women in the richest quantile were most likely to have been delivered in a private facility (73 percent).

The decomposition analysis in the three countries yields similar results. Factors like mother's age, sex of household head, health insurance coverage have a small contribution to the socioeconomic disparities in maternity care. On the other hand, it reveals that in the three countries the direct effect of wealth inequality accounts for the majority of the C. It explains 58% in the inequality (total) in Egypt, 70% in Yemen, and 62% in Jordan. Mother's illiteracy is more prevalent among the poor and is associated with a low probability of using reproductive health care. The wealth-related inequality in women's education contributes to the C by 35% in Egypt, 16% in Yemen and 22% in Jordan. Similarly, rural residence is more common among the poor and is associated with a lower likelihood of seeking maternity care. The contribution of the place of residence to the overall health inequality is equal to 14% in the case Yemen. Figures 3, 4 and 5 summarize the decomposition analysis results in the three countries. It is evident from the figures that wealth disparities and the education gap among women are the key drivers of the socioeconomic disparities in maternity care in the Arab region.

5. Discussion

This paper investigated the socio-economic inequalities in receiving medical assistance during child delivery in Egypt, Jordan and Yemen, using an up to date nationally representative surveys. Concentration curves and their decomposition are used to address the research questions of this study.

Three main findings could be drawn from the analyses. Firstly, the analysis yields that the degree of the socioeconomic inequalities in maternity care utilization varies largely within the Arab world. In Yemen, the level of inequality is severe, while in Egypt it is moderate, and in Jordan the gap in the use of maternity care is minor. Secondly, despite the dramatic rise in access to medical care during pregnancy in Egypt, and to some extent in Yemen, disparities in pregnancy care indicators between the poor and the better-off is still prominent, and family's wealth remains a significant determinant of access to medical care in Egypt as well as in Yemen. The decomposition analysis results are in line with these findings which reveal that socio-economic inequalities in maternity care are not due to the health care need by women with high socio-economic status. With the exception of Jordan, poverty itself, in the form of low level of assets ownership, explains most of the socio-economic inequalities in maternity care. Correlates of poverty (residence in rural regions, low education levels) have a significant

contribution to the C. This implies that increasing women education especially among the poor, and poverty reduction in rural regions would narrow the inequalities in maternity care. Thirdly, while it is widely predicted that the political instability would adversely affect the progress toward the MDG for health, the progress in Egypt and Jordan toward MDG for health has not been reversed and continued to improve as compared to the DHS rounds in 2008 and 2009 in Egypt and Jordan respectively. However, in Yemen, the available data does not permit such comparison.

Several factors have been suggested in the literature to explain the socioeconomic inequalities in maternity care. These include supply and demand factors, the nature of the service, accessibility/availability, affordability and cultural constraints (Houweling et al., 2007).

In effect, the findings for Egypt need to be viewed with some caution, as the increased use of maternity care in Egypt is mainly stemming from an increased use of private health facilities. Although public health facilities provide services at low or no charge, and the vast majority of the population has a health unit within five kilometers from their residence, affordable private care remains the preferred health care provider. The market for maternity care is mainly controlled by private health providers. In 2008, 63% of the women who delivered in a health facility used private facilities and incurred expense for the service (El-Zanaty & Way, 2009). One potential explanation for the domination of private maternal care that requires user fees is the perception of public health care providers as an inferior service. The reliance on private health care in Egypt was found to be pushing a substantial proportion of households into poverty and deprivation (Rashad and Sharaf 2015, Rashad and Sharaf 2015). Yip and Orbeta (1999) developed an index that measures the individuals' perception of the quality of health care. They found that the private sector substantially outscores government health sector across all dimensions of quality. They suggested that the public failure in the provision of health care that meet consumers' needs is mainly due to the poor quality of public health facilities. Another potential explanation for the low usage of public health facilities is the diversion of patients by doctors of the public sector to their private clinics, as physicians of Ministry of Health and Population (MOHP) are allowed to work in the private sector. There is evidence that MOHP doctors increase their working hours at private sector at the expense of their working hours at MOHP facilities. There is a remarkable inverse association between working hours at MOHP facilities and working hours at private clinics (Nandakumar et al. 2000).

Several programs have been conducted in developing countries to reduce the economic inequalities in maternity care. These include conditional cash transfers, private provider reimbursement, and voucher schemes (Morris et al., 2004 ; Meuwissen et al., 2006; Agha, 2011; Ahmed and Khan, 2011; Sosa-Rubí et al. 2011). Health and social policy reforms that incorporate these programs could have a positive impact on the utilization of maternity care in Yemen as well as Egypt which would help in reducing health care disparities and improve population health outcomes.

6. Conclusion

This paper examined the socio-economic inequalities in maternity care utilization in Egypt, Jordan, and Yemen, using up to date data from the National Demographic and Health Survey. We measured the degree of socioeconomic inequalities in the three countries using Cs and compared them with the help of the concentration curves. We found inequalities in maternity care utilization are much smaller in Jordan than in Egypt and Yemen. The analysis reveals that the degree of socio-economic inequality is alarming in Yemen. The decomposition analysis shows that socioeconomic disparities in maternity care utilization are mainly due to the lack of economic resources and its correlates among the poor. Increasing women education, especially among the poor, and poverty reduction measures focusing on rural communities could help narrow the inequalities in maternity care and hence improves population health outcomes.

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Figure 1: Concentration Curves for Medical Assistance at Delivery: Egypt, Jordan and Yemen

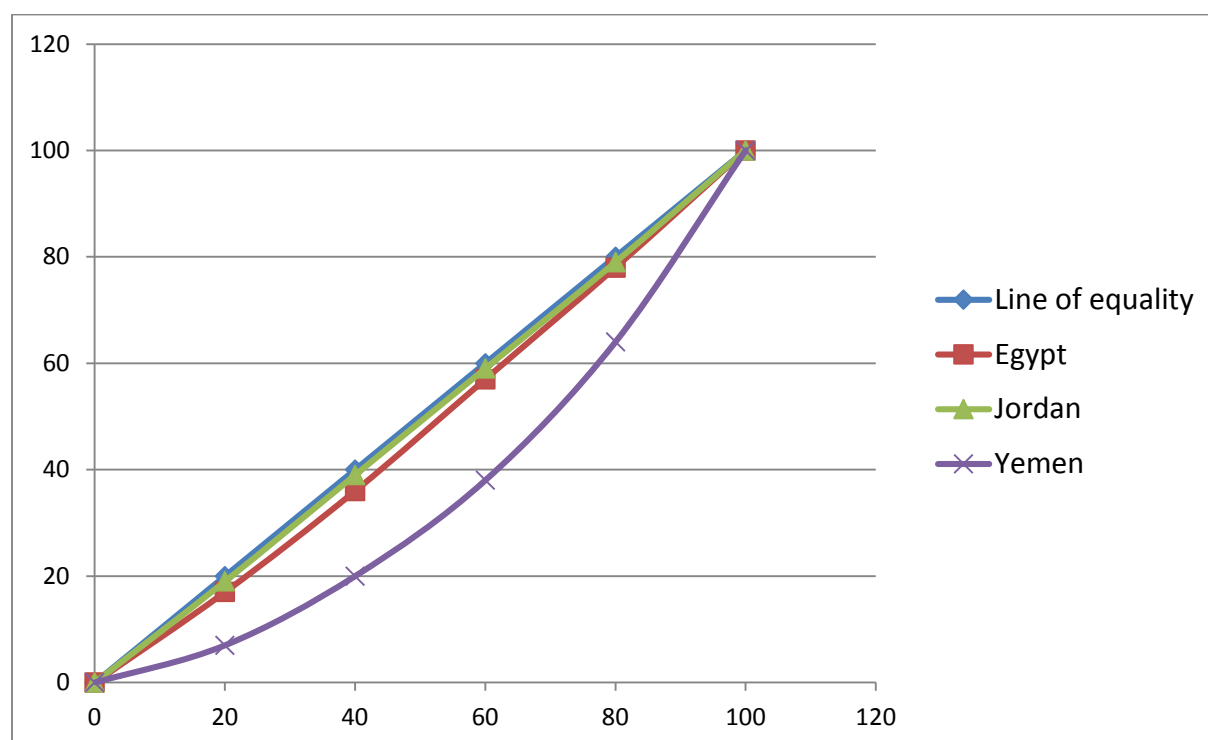
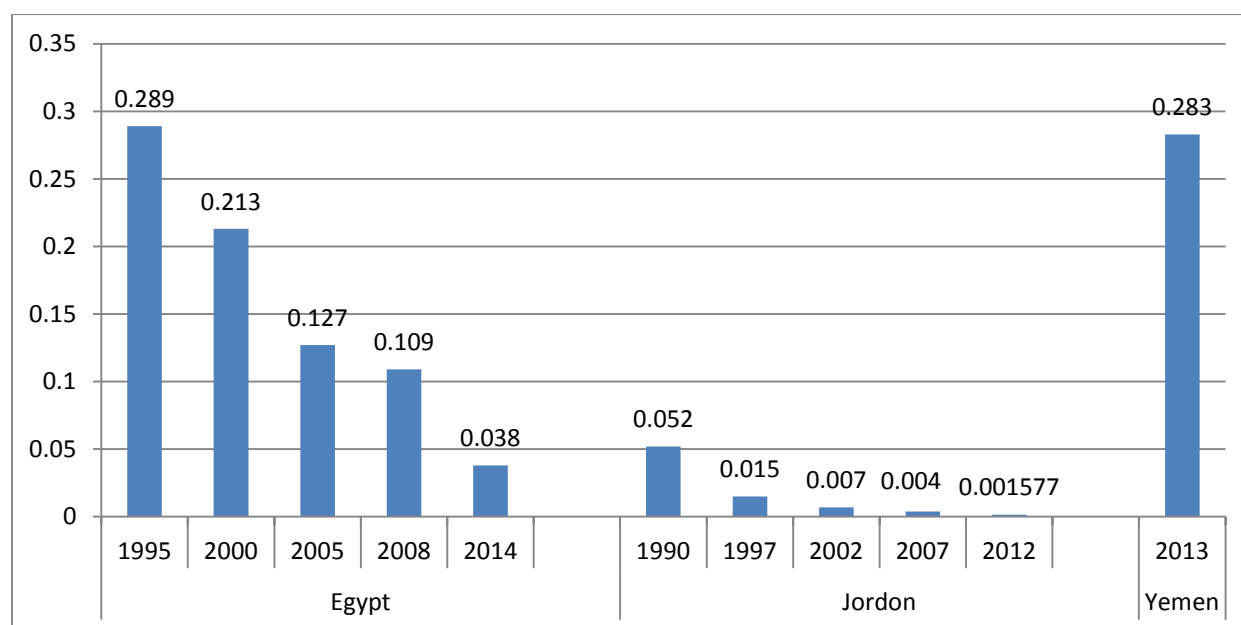


Figure 2: Concentration Index for Skilled Birth Attendance



Source: data from various rounds of the DHS.

Figure 3: Summary of Contribution to C in Egypt

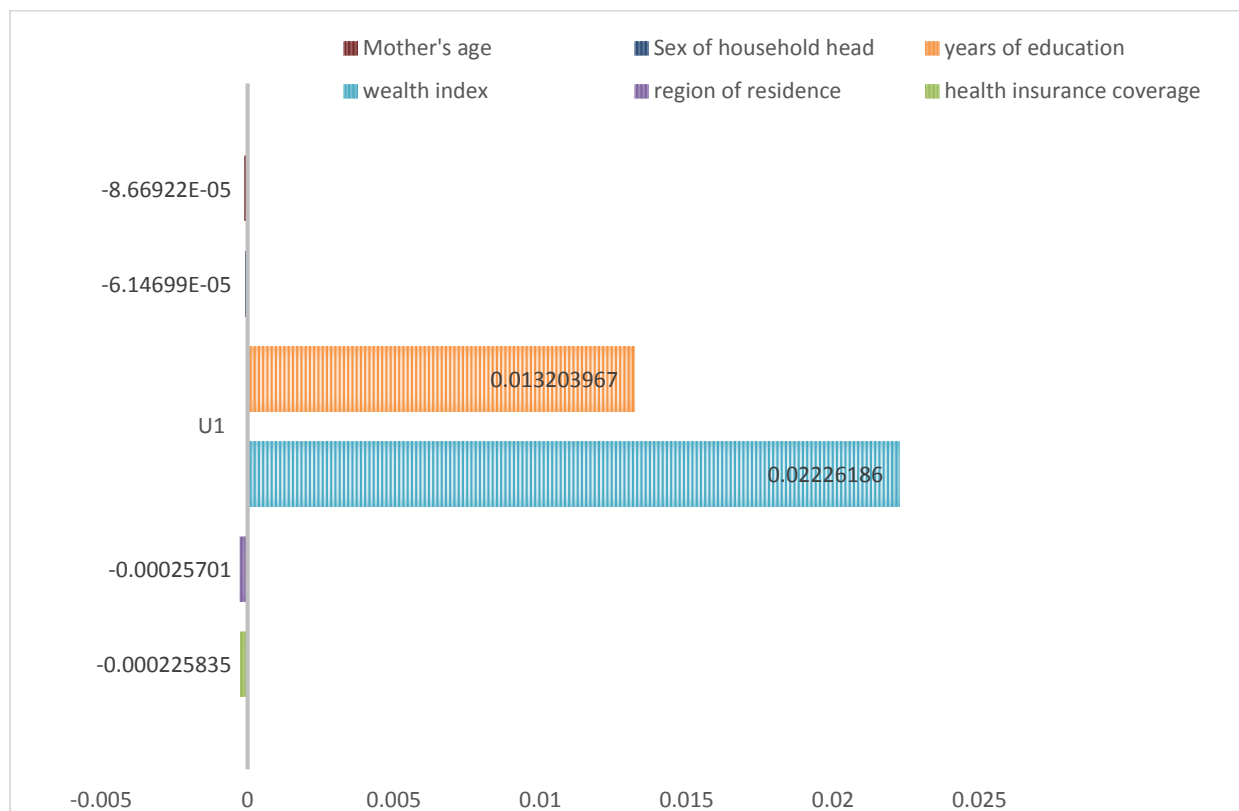


Figure 4: Summary of Contribution to C in Jordan

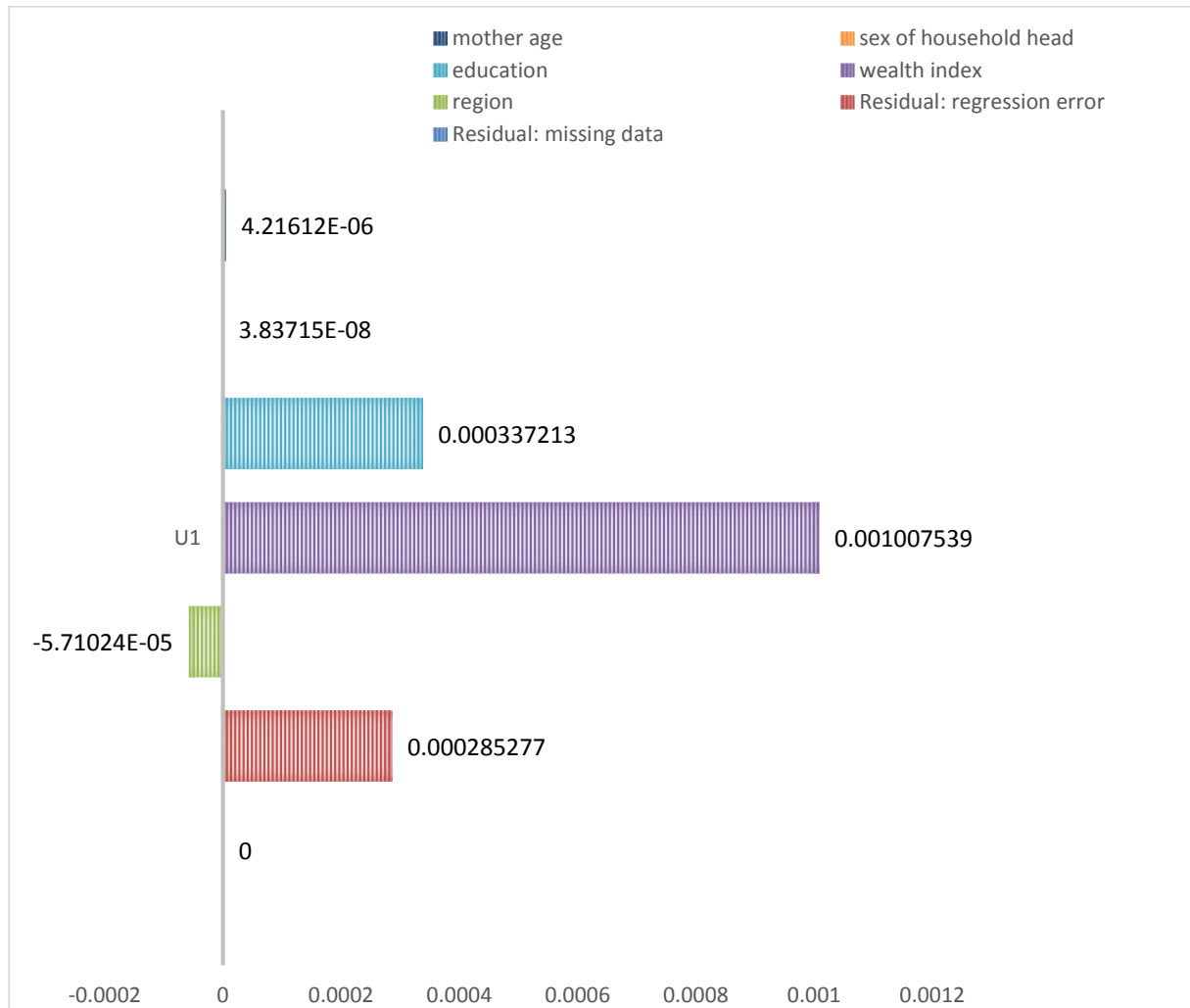


Figure 5: Summary of Contribution to C in Yemen

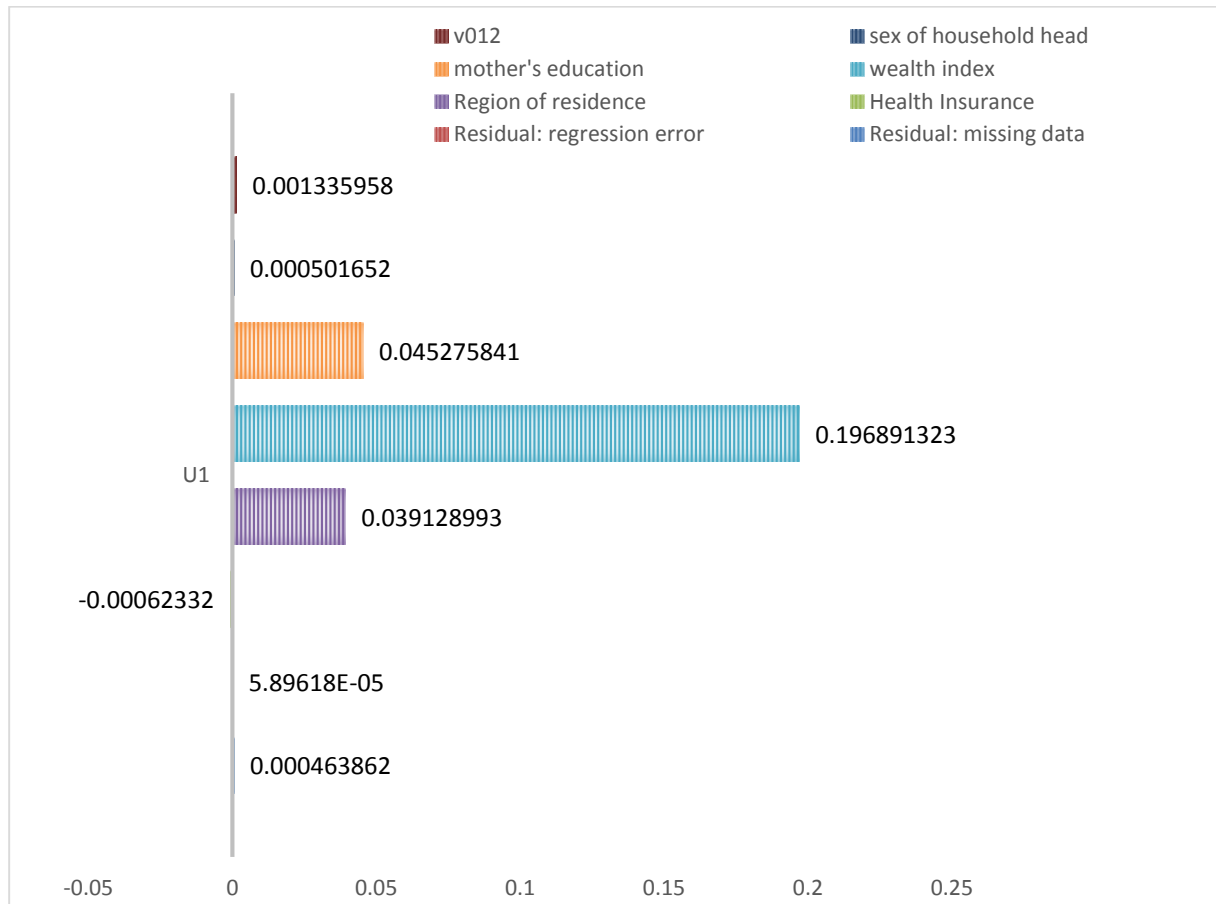


Table 1: Summary Statistics- Maternity Care by Socioeconomic Background

	Egypt (%)	Yemen (%)	Jordan (%)
Region of residence			
Urban	97	72	100
Rural	89	33	100
Age in 5-year groups			
15-19	92	50	98
20-24	92	49	100
25-29	92	43	99
30-34	92	43	100
35-39	90	39	100
40-44	91	39	99
45-49	86	27	100
Quantiles of wealth index factor score			
Lowest quantile	83	18	99
2	86	28	100
3	94	38	100
4	96	57	100
Highest quantile	99	77	100
Total	92	44	100

Table 2: Decomposition Analysis of Egypt, Yemen and Jordan

Factors	Egypt		Yemen		Jordan	
	Contribution to C	% Contribution to C	Contribution to C	% Contribution to C	Contribution to C	% Contribution to C
Mother's age	-0.00009	-0.23%	0.001	0.00	0.000004	0.27
Sex of household head	-0.00006	-0.16%	0.001	0.00	0.00000	0.00
Mother's education	0.013	34.75%	0.045	16	0.00034	21.38
Wealth index factor score (5 decimals)	0.022	58.58%	0.197	70	0.00101	63.88
Type of place of residence	-0.00026	-0.68%	0.039	14	-0.00006	-3.62
Covered by health insurance	-0.00023	-0.59%	-0.001	0	-	-
Residual: unexplained	0.003	9%	0	0	0.000285	18%
Inequality (total)	0.038	100	0.283	100	0.001577	100