First Cousin Marriages and Marital Relationships In Egypt, Jordan, Turkey and Yemen[*]

Rania Tfaily[†]

University of Pennsylvania

June 15, 2005

Paper prepared for presentation at the XXV International Population Conference of International Union for the Scientific Study of Population (IUSSP), Tours, France, July 18-24, 2005

Preliminary draft

Research on first cousin marriages is limited in demography even though the practice is prevalent in many countries in the Middle East, North Africa, South Asia, sub-Sahran Africa, and among Muslim immigrants in Europe (Bittles, 1994; Reniers, 2001). The proportion of marriages that are between first cousins is around 26% in United Arab Emirates, 28% in Iran, 32% in Jordan; 34% in Yemen, and 48% in Pakistan (Al-Gazali *et al*., 1997; Gunaid *et al.*, 2004; Hussain and Bittles, 1998, 2000; Jurdi and Saxena, 2003; Khoury and Massad, 1992; Saadat *et al*., 2004). The majority of studies on marriages between biologically close relatives treats consanguineous marriages[1] as one group and fails to distinguish between different types of first cousin marriages and those between first cousins and second cousins. Anthropological studies of the Middle Eastern marriage

[*] I am indebted to Herbert L. Smith for his numerous suggestions. I have also benefited from discussions with Etienne van de Walle. I thank Paul Allison and Hassan Diab for their helpful comments and the Department of Statistics, Jordan and Central Statistical Organization, Yemen for giving me access to the data.

[†] Ph.D. candidate, University of Pennsylvania, 239 McNeil Building, 3718 Locust Walk, Philadelphia, PA 19104; Tel: 1-215-573-9618; E-mail: rania2@ssc.upenn.edu

[1] Refers to marriages between biologically close relatives: second cousins or closer (Bittles, 1994; Bittles *et al*., 1987)

system are keener on differentiating between the various categories of consanguineous marriages (Khuri, 1970); however, they tend to focus on patrilateral parallel cousin marriages to the exclusion of other forms of cousin marriages (McCabe, 1983, 1985; Tapper, 1981).

The literature on this topic- especially the bio-sociological literature- focuses on framing marriage between close relatives as a problem, highlighting the correlates of consanguineous marriages, and examining their effects of children's health (Becker *et al.*, 2001; Bittles *et al.*, 1991; Jurdi and Saxena, 2003; Stoltenberg *et al.*, 1999; Zlotogora, 1997). In this paper, I argue against restricting the study of first cousin marriages into its genetics component. Although the four different types of first cousin marriages are biologically similar, they have different social meaning and implication[2] (Bourdieu, 1990; Khuri, 1970).

Here, I examine the trend in consanguineous marriage by differentiating between patrilateral first cousins, matrilateral first cousins, and whenever possible second cousin marriages[3]. I also look at the association between women's biological affinities to their husbands and the characteristics of their marriage. The paper shows that the pattern of first cousin marriages varies by setting and by type (matrilateral vs. patrilateral). Even with the spread of education and urbanization, there is no evidence that these societal changes will be associated with reduction in all types of first cousin marriages. In fact, the results show that the prevalence of matrilateral first cousin marriages remained stable or even increased over time. I also argue that first cousin marriages differ from marriages

[2] While the same word "cousin" refers to all first cousins in English, each type of first cousins has its own terminology in Arabic.
[3] The survey questions in Egypt and Yemen do not allow further divisions of patrilateral and matrilateral first cousin marriages.

to non-relatives in at least two important characteristics: they are more stable but less intimate.

These findings are based on demographic and health survey data from Egypt (1995, 2000, 2003), Jordan (1990, 1997, 2002), Turkey (1993, 1998), and Yemen (1991, 1997). Before I describe the datasets and the results of this paper, I give a brief review about religion and consanguineous marriages, the different types of first cousin marriages, and the trend in consanguineous marriages. In the following sections, I present the findings of previous studies on the correlates of consanguineous marriages and their effects on fertility and under-five child mortality.

LITERATURE REVIEW

Religion and Consanguineous marriages

Marriages between biologically close relatives are practiced among various religious/ethnic groups such as Buddhists, Hindus of the Dravidian tradition, Jews, Muslims, Protestants and Catholics of the Middle East and South Asia and the Hans, the largest ethnic group in China (Bittles, 1994, 2003; Bittles *et al.,* 1991; Hussain and Bittles, 1998). However, there are discrepancies in the legitimacy status of particular consanguineous marriages among the various populations. While father's brother's daughter marriages are allowed in Islam and preferred among Arabs (Al-Gazali et al., 1997; Khuri, 1970; Reniers, 2001; Zlotogora et al., 2002), they are prohibited among Hindus in South India. A contrary example is the uncle-niece marriages which occurs among the Hindus and Jews but is proscribed among Muslims (Bittles, 1994).

In Islam, the Quranic prohibitions against marriages to relatives include parents, grandparents, siblings, children, uncles/aunts, nieces/ nephews in addition to non-biological relatives such as step-parents, step-children, in-laws even after divorce, and wife's sisters unless divorce or death occurs (Abd Al-Ati, 1995:128). Although it is sometimes cited that Islam encourages cousin marriages (Bittles *et al.*, 1991), there is no evidence for this in the Quran or in the Hadiths (the collection of the sayings of Prophet Mohammad) (Al-Gazali *et al.*, 1997; Hussain, 1999; Khuri, 1970)[4].

Types of first cousin marriages

First cousin marriages are categorized into two groups: parallel and cross. Parallel first cousin marriages are marriages between children of same sex sibs, while cross first cousin marriages are marriages between children of different sex sibs. Each of the two groups is further divided into two types (matrilateral and patrilateral) depending on whether the person is marrying a relative from the mother's or father's side (Yasmin and Mascie-Taylor, 1997). As such, first cousin marriages (from the husband's perspective) could be any of the following four types: father's brother's daughter (FBD) or patrilateral parallel, mother's sister's daughter (MZD) or matrilateral parallel, father's sister's daughter (FZD) or patrilateral cross, and mother's brother's daughter (MBD) or matrilateral cross[5].

The most prevalent type of first cousin marriages among Arabs is FBD (Al-Gazali *et al.,* 1997; Khlat, 1988; Khuri, 1970; Reniers, 2001; Zlotogora et al., 2002). In Sana'a,

[4] It is important to note that the prophet's daughter (Fatima) married Ali, the son of the uncle of the Prophet.
[5] In Arabic, FBD is 'bint al-amm', FZD is 'bint al-amma', MBD is "bint al-khāl', and MZD is 'bint al-khāla'.

Yemen, about half of the first cousin marriages are of the patrilateral parallel type (Gunaid *et al.,* 2004). The high prevalence of FBD is influenced by the common practice among Arab families to consult patrilateral uncles regarding the marriage of a daughter to a non-related partner (Al-Gazali *et al.*, 1997). Among Catholics and Protestants of the Middle East and South Asia, cross cousin marriages are more common than patrilateral parallel marriages (Hussain and Bittles, 1998).

Reasons for the prevalence of first cousin marriages

Several factors are given for the popularity of first cousin marriages in Middle Eastern and South Asian societies. The functional school identified economic consolidation of property, political alliance and strengthening the power of the family by bringing it together as benefits derived from cousin marriages especially FBD. However, Khuri (1970) criticized such approach and showed that the social benefits (property and power) to be reaped from FBD marriages could equally be obtained from exogamous marriages. Khuri (1970:597) argued that "the particular achievement of FBD marriage is the way in which it perpetuates, after marriage, the same social relationships which prevailed before it. By marrying a patrilateral cousin, a man does not create significant affinal relationships nor does he alter the consanguine relationships he learns from childhood."

Other reasons cited for the high prevalence of first cousin marriages are acquaintance and familiarity with the future daughter-in-law. This is believed to enable better assessment of the family's merits and social status, enhance husband-wife compatibility, reduce tension between the wife and her in-laws, and ensure domestic

harmony (Abu-Lughod, 1986; Al-Gazali *et al.,* 1997; Bittles et al. 1987; Givens and Hirschman, 1994; Hussain and Bittles, 1998; Khuri, 1970[6]). For instance, while it is said that a patrilateral cousin (who is also a daughter-in-law) "speaks the language of the husband's family", outsider daughters-in-law are sometimes called "enemies inside the house" as the interests of non-related daughters-in-law are perceived to be at odds with those of their husbands' families (Khuri, 1970: 608).

Time trend in consanguineous marriages

The practice of marriages between close relatives declined in many parts of the world in accordance with Goode's (1963) prediction. However, this is not the case everywhere. The proportion of consanguineous marriages have either remained stable as in Jordan (Khoury and Massad, 1992) and Pakistan (Hussain and Bittles, 1998) or increased over time such as in Iran (Givens and Hirschman, 1994), United Arab Emirates (Al-Gazali *et al.,* 1997) and Yemen (Jurdi and Saxena, 2003). The prevalence of cousin marriages remained stable between 1950's and mid 1980's in Beirut, Lebanon, while the proportion of marriages between distant relatives declined considerably. This was attributed to the weakening of ties with the extended family (Khlat, 1988).

Studies on the trends of each type of cousin marriages are rare. However, there is some evidence that patrilateral parallel marriages are declining relative to other types of first cousin marriages. In their study of marriage patterns in a Muslim Arab-Israeli village, Zlotogora *et al.* (2002) found that FBD marriages accounted for 75% of marriages between first cousins of women before 1920; however, the percentage dropped

[6] Wolf (1966, 1968) made the same argument about the advantages of minor marriages in China and Taiwan.

to 44% among women before after 1960. In contrast, the percentages of marriages between first cousins contracted on the mother's side increased from 18% to 43% over the same period.

Correlates of consanguineous marriages

Goode (1963) argued that as societies become modern and industrial, individuals have greater say in the selection of their spouses and the prevalence of arranged marriages and consanguineous marriages decline. Many studies found that educated women have higher odds of marrying non-relatives that women with less education as among Indian Muslims (Hussain and Bittles, 2000), in Iran (Givens and Hirschman, 1994), Pakistan (Hussain and Bittles, 1998, 1999), and Yemen (Jurdi and Saxena, 2003). However, such positive association is often not reported in case of men's education (Givens and Hirschman, 1994; Hussian and Bittles, 2000; Jurdi and Saxena, 2003). The prevalence of consanguineous marriages are generally lower in urban areas (Givens and Hirschman, 1994; Hussain and Bittles, 1998; Khoury and Massad, 1992) although some exceptions were reported (Hussain and Bittles, 2000; Jurdi and Saxena, 2003).

Consanguineous marriages and under five mortality

A number of studies argued that consanguineous marriages are associated with increased risks of congenital malformations, neonatal and postnatal deaths and child mortality (Becker *et al*., 2001; Dorsten *et al*., 1999; Grant and Bittles, 1997; Hussain *et al*., 2001; Pedersen, 2002; Stoltenberg *et al.,* 1998; Zlotogora, 1997). However, the impact of inbreeding on mortality is far from being settled. Some studies did not find

significant differences in early mortality by biological relation to the husband (Al-Awadi et al., 1986; Bittles *et al.,* 1987; Reddy and Modell, 1995), while others argued that the risks of inbreeding is within the range of acceptability (Bittles and Makov, 1988 as cited by Dorsten *et al.*, 1999) and that the increased risk of mortality is restricted to a small number of families (Bittles *et al.,* 1991). Using demographic and health survey data from Egypt, Pakistan, Turkey and Yemen, Warriner (1999) showed that non-genetic factors explain most of the positive association between infant mortality and consanguineous marriages and that the effects of cousin marriages on early child mortality is greatly reduced upon controlling for socioeconomic factors and local conditions.

Consanguineous marriages and fertility

Some psychological explanations (namely by Edward Westermarck) argued that early life association gives rise to innate sexual aversion between persons and that such resistance to within family relations is responsible for the emergence of the incest taboo (Wolf, 1966). Using data from Taiwan, Wolf (1970) found that marriages in which the spouses were reared together have lower fertility and higher divorce rates compared to marriages in which the couple was not acquainted with each other until their wedding. Wolf (1993) argued that a similar mechanism occurs among patrilateral parallel cousin marriages. In her anthropological study about Awlad Ali Bedouin families in Egypt, Abu-Lughod (1986: 57) quoted men who complained about the sexual relations of marriages to patrilateral first cousins:

> As one polygynously married man put it, “My other wives are better with me personally,” although he went on to explain that he

> nevertheless preferred his cousin wife [for other reasons; for example, he trusts that she would care more for the property and his children than other wives because she is kin]…Certain young men complained that the trouble with marrying a cousin was that she was like a sister. An unmarried man mused, "You don't feel like talking and flirting." And she knows everything about you, where you go, who you see."…Girls occasionally voiced a wish to see something new by marrying an outsider, since then they would leave the camp. They did not talk about the sexual aspect of marriage.

Using data from a village in southern Lebanon, McCabe (1983) compared 'bint amm' (FBD) marriages to those of couples reared apart and found evidence of higher divorce and lower fertility among the FBD marriages. However, Dodd and Prothro (1985) criticized McCabe conclusions and presented results from other areas in Lebanon which do not support Westermarck hypothesis. In a tribal population in Andhra Pradesh of India, women in consanguineous marriages reported lower mean number of pregnancies, live births and surviving children compared to women in non-consanguineous unions (Yasmin and Mascie-Taylor, 1997).

However, the above findings are not reproduced in other studies. Analysis of fertility behavior among the Habbanites tribe did not show evidence of significant differences in fertility between first cousin marriages and other types of marriages (Bonne-Tamir and Ashbel, 1978) although this could be an artifact of the small sample size of the study. Bittles et al. (1991) in South Asia and Tuncbilek and Koc (1994) in Turkey found that cousin marriages have higher fertility than non-related unions even after controlling for socioeconomic status. Among residents of South Ghor district, Jordan, a natural fertility population, there was no statistical difference in total marital

fertility rate among first cousin, second cousin, and non-consanguineous marriages (Sueyoshi and Ohtsuka, 2003).

In this paper, I look at how martial relationship differs by relation to husband. I specifically examine two aspects of marital relationships: stability and intimacy. The latter is inferred based on the duration of the interval between first marriage (cohabitation) and first birth and on the mean number of children ever born in settings with modest prevalence of modern contraception. Using demographic and health survey data from Egypt (1995, 2000, 2003), Jordan (1990, 1997, 2002) Turkey (1993, 1998), and Yemen (1991/1992, 1997), I address the following research questions: a) Is there a secular decline in the prevalence of matrilateral and patrilateral first cousin marriages over time and in various settings? b) How does the likelihood of marrying a matrilateral or patrilateral first cousin differ by women's education, engagement in (paid) work before marriage and urban childhood residence? c) Are patrilateral first cousin marriages less stable than other forms of marriages as argued by Wolf and McCabe? And d) How does the duration of first birth interval differ by relation to husband?

Based on Westermarck hypothesis, I expect that patrilateral first cousin marriages have the longest first birth interval as patrilateral first cousins are more likely to have grown up together compared to first cousins on the mother's side. There are other reasons to expect differences in first birth interval by relation to husband. First cousin marriages tend to be arranged rather than romantic marriages and several studies (Feng and Quanhe; 1996; Fricke and Teachman, 1993; Rindfuss and Morgan, 1983) found that couples in love marriages have higher frequency of intercourse and shorter first birth interval. If this is the case, I expect to find that women in patrilateral and matrilateral first cousin

marriages as well as second cousin marriages to have longer first birth interval compared to women married to non-relatives. It is important to note that both of the hypotheses predict that marriages to patrilateral first cousins are less stable than marriages to non-relatives.

METHODS

Sample

This study uses demographic and health survey data from Egypt (1995, 2000, 2003), Jordan (1990, 1997, 20002), Turkey (1993, 1998), and Yemen (1991/1992, 1997). The sample size of ever-married women aged 15-49 years in each of the countries is: 37,758[7], 18,000, 12,484[8], and 16,057[9] respectively. The sample of Turkey is split by ethnicity into Kurds (13.2%) and Turks (86.8%). Each of the surveys collected information on housing conditions and socioeconomic indicators, respondents' background, marriage, fertility history and family planning, breastfeeding and husbands' background.

Women were specifically asked about their relation to husband. The structure of the questions differed from one country to another. In Turkey and Jordan, the relation to first husband question is more detailed and it includes: father's brother's son; father's sister's son; mother's sister's son; mother's brother's son, while in Egypt and Yemen,

[7] The total sample in Egypt is 39,511 ever-married women ; however, 1,753 women (4.4%) were excluded because of lack of information on relation to first husband
[8] The total sample in Turkey is 12,671 ever-married women; however, 187 women (1.5%) are excluded due to lack of information on relation to first husband
[9] Yemen 1991/1992 interviewed women aged 15-54 years; however, in this paper, I exclude women aged 50 years and over

there is a distinction between first cousins on father's side and first cousins on mother's side. Also, In Egypt and Jordan, marriages between second cousins are separated from those with other distant relatives, while in Turkey and Yemen, the "others" category includes marriages to second cousins as well as distant relatives.

It is the norm in Arab and Middle Eastern countries that couples do not live together or have sexual intercourse until their marriage festival (or "zifaf"). The "zifaf" is usually preceded by a religious ceremony (or marriage contract) in which couples marry according to the Islamic Sharia. The time interval between the religious ceremony and the zifaf ranges from few hours up to several years. The length of this period- sometimes called the engagement period- has increased in recent years due mostly to the unfavorable economic conditions and the belief that couples should get to know each other before they start living together. In all of the surveys used in this paper, marriage is defined as the time in which the couple started to live together. This is in accordance with the cultural definition of marriage (rather than the religious one) and it also signifies the onset of sexual relations.

Analyses

The paper uses logistic regressions in examining the correlates of first cousin marriages and in investigating whether patrilateral first cousin marriages are more likely to end in divorce compared to other types of marriages. I use event history analyses to look at how the duration of first birth interval varies by relation to husband and by educational level and year of marriage. Finally, I report means of the number of children ever born adjusted for marital duration by relation to husband and educational level.

FINDINGS

Table 1 presents the frequency distribution of relation to husband by country. It shows that the percentages of women married to non-relatives are over 50% in all countries and it is even close to 80% among Turks. About one in three women are married to their first cousins among Kurds and in Yemen, one in four women in Egypt and Jordan, and one in eight among Turks. The prevalence of patrilateral first cousin marriages is around double that of matrilateral first cousin marriages with the exception of Turks, Turkey where both types have comparable prevalence. Table 2 indicates that patrilateral parallel is the most common type of first cousin marriages in Jordan and among Kurds and it accounts for about 50% of marriages between first cousins. However, there is no such preference among Turks.

Figures 1-5 shows the trend in relation to husband over time. The most striking feature is the lack of consistent trend across countries. The percentages of women marrying non-relatives have increased substantially in Egypt and Jordan and to a lesser extent among Turks; however, the opposite pattern is observed among Kurds, Turkey and Yemen. Similarly, there is reduction in the prevalence of patrilateral first cousin marriages in Egypt, Jordan but not among Kurds and in Yemen. Surprisingly, the trend in matrilateral first cousin marriages does not go hand in hand with that of patrilateral first cousin marriages. In fact, the prevalence of the former increases in Jordan, among Kurds and in Yemen, while it remains stable in Egypt and among Turks. Figure 6 might offer a possible explanation for the trend in first cousin marriages among Kurds and Yemen. In contrast to other settings, the mean number of living children of women aged 40 years

and over[10] has increased over time and as a result, there has been a (temporary) increase in the pool of first cousins who could be potential partners.

The first section of table 3 presents logistic regression coefficients of marriage to a relative versus non-relative. As the figures 1-5 showed, there are reductions in recent years in the likelihood of marrying relatives in Egypt and Jordan but not among Kurds, Turkey and Yemen. Educational level of the women is a very strong predictor of marriage to non-relatives in Egypt, Jordan and among Turks. The odds of marrying a relative for women who have higher education are about half the odds of women with no formal education. However, the negative effects of education are not pronounced among Kurds and in Yemen. Consistent with education, women who grew up in cities/towns and/or worked before marriage are significantly less likely to marry relatives than women who were raised in the countryside and/or did not work before their first marriage.

The second section of table 3 shows logistic regression coefficients of marriage to first cousin versus other relatives conditional on having married a relative. With the exception of Jordan, where the likelihood of marrying first cousins compared to other relatives increased over time, there are no significant time changes. Education is not a strong predictor as in the first section of table 3. With the exception of Jordan, educated women are more likely to marry other relatives rather than their first cousins. The last section of table 3 presents the logistic regression coefficients of marriage to matrilateral first cousin versus patrilateral first cousin conditional on having married a first cousin. There is a consistent trend of increases in the odds of marrying a matrilateral rather than patrilateral first cousin over time. Educated women are significantly more likely to marry

[10] Women aged 40 years and over tend to have children in their late teens and in their twenties.

their first cousins on the mother's side rather than on the father's side compared to women with no formal schooling in Egypt, Jordan and Yemen.

Table 4 provides evidence that women married to their first cousins are less likely to experience divorce in their first marriage compared to women married to non-relatives. Egypt is excluded from the table as women who married more than once were asked about relation to their current husband only. I also exclude Kurds due to the extremely small number of first marriages that ended in divorce. The sample size is also relatively small among Turks and it could account for the lack of statistical significance. In Jordan and Yemen, women who are married to their second cousins or to other relatives at a lower risk of divorce than women married to non-relatives. Social class (measured by education) is negatively associated with divorce. The odds of getting divorced of women in higher education are about one-third the odds of women with no formal education in Jordan. Women who grew up in cities/towns have greater likelihood of getting divorce compared to women who were raised in rural areas and controlling for other factors.

Tables 5 and 6 examines how the duration of first birth interval differs by relation to husband. This is an indirect measure of intimacy and frequency of intercourse between couples (Basu, 1993; Feng and Quanhe, 1996; Fricke and Teachman, 1993; Rindfuss and Morgan, 1983). Table 5 shows that the median duration of first birth interval is about one to two months longer among women married to their first cousins compared to women married to non-relatives. This is also the case in the most recent (and presumably the most accurate) marriage cohorts and across all settings. In the event history model presented in Table 6, women married to their patrilateral or matrilateral first cousin have reduced hazard ratios of experiencing first birth compared to women with no biological

relationship to their husbands in Egypt, Jordan and among Kurds even after controlling for other factors. Education, urban childhood residence and age at first marriage are strong and positive predictors of duration of first birth interval. This is consistent with the explanation that educated urban women tend to marry at a higher age to non-relatives and to have romantic marriages. In contrast, women with less education and rural childhood residence tend to marry at an earlier age and are at a greater risk of having arranged marriages and/or have fewer opportunities at meeting spouses who are non-relatives.

Table 7 shows that in settings with relatively modest prevalence of modern contraception (among Kurds and in Yemen), women married to their first cousins have lower mean number of children ever born compared to women married to non-relatives even after controlling for educational level and duration of marriage. This is consistent with the results in tables 5 and 6 which suggest that first cousin marriages are less intimate compared to marriages between non-relatives.

REFERENCES

Abd Al-Ati, Hammudah. 1995. *The Family Structure in Islam.* Plainfield-Indiana: American Trust Publications. First Published in 1977

Abu-Lughod, Lila. 1986. *Veiled Sentiments: Honor and Poetry in a Bedouin Society*. Berkeley: University of California Press.

Al-Awadi, S.A., K.K. Naguib, M.A. Moussa, T.I. Farag, S.A. Teebi, and M.Y. El-Khalifa. 1986. "The Effect of consanguineous marriages on reproductive wastage." *Clinical Genetics* 29:384-88.

Al-Gazali, L. I., A. Bener, Y. M. Abdulrazzaq, R. Micallef, A. I. Al-Khayat, and T. Gaber. 1997. "Consanguineous Marriages in the United Arab Emirates." *Journal of Biosocial Science* 29, no. 4: 491-497.

Al-Thakeb, Fahed T. 1985. "The Arab Family and Modernity: Evidence from Kuwait". *Current Anthropology* 26, no. 5: 575-580.

Basu, Alaka Malwade. 1993. "Cultural Influences on the Timing of First Births in India: Large Differences that add up to Little Difference." *Population Studies* 47, no. 1: 85-95.

Becker, Susan M., Zohair Al Halees, Corazon Molina, and Richard M. Paterson. 2001. "Consanguinity and congenital heart disease in Saudi Arabia." *American Journal of Medical Genetics* 99, no. 1: 8-13.

Bittles Alan H.,William M. Mason, Jennifer Greene, and N. Appaji Rao. 1991. "Reproductive Behavior and Health in Consanguineous Marriages." *Science* 252, no. 5007: 789-794.

Bittles, A. H. 2003. "The Bases of Western Attitudes to Consanguineous Marriage." Developmental *Medicine and Child Neurology* 45, no.2: 135-138.

Bittles, A. H., A. Radha Rama Devi, H. S. Savithri, Rajeswari Sridhar, and N. Appaji Rao. 1987. "Consanguineous Marriage and Postnatal Mortality in Karnataka, South India." *Man* 22, no. 4: 736-745

Bittles, A.H. and E. Makov. 1988. "Inbreeding in Human Populations: An Assessment of the Costs." Pp. 153-67 in Human Matting Patterns, prepared by the society for the study of Human Biology, symposium series 28. Cambridge: Cambridge University Press.

Bittles, Alan H. 1994. "The Role and Significance of Consanguinity as a Demographic Variable." *Population and Development Review* 20, no. 3: 561-584.

Bongaarts, John and Robert G. Potter. 1983. *Fertility, Biology, and Behavior*. New York: Academic Press.

Bonne-Tamir, B., and S. Ashbel. 1978. “The Habbanite Isolate: Demography and its genetic implications.” *Man* 13, no. 1: 72-87.

Bourdieu, Pierre. 1990. *The Logic of Practice*. Stanford: Stanford University Press. Originally published as Le Sens Pratique in 1980.

Central Statistical Organization (CSO)[Yemen] and Pan Arab Project for Child Development (PAPCHILD) [Egypt] and Macro International Inc. (MI). 1994. *Yemen Demographic and Maternal and Child Health Survey 1991/1992.* Calverton, Maryland: CSO and MI.

Davis, Kingsley and Judith Blake. 1956. “Social Structure and Fertility: An Analytical Framework.” *Economic Development and Cultural Change* 4: 211-35.

Department of Statistics and Macro International Inc. 1998. Jordan Population and Family Health Survey Central Statistical Organization (CSO)[Yemen] and Pan Arab Project for Child Development (PAPCHILD) [Egypt] and Macro International Inc. (MI). 1994. *Yemen Demographic and Maternal and Child Health Survey 1991/1992.* Calverton, Maryland: CSO and MI.

Dodd, Peter C. and E. Terry Prothro. 1985. “Comment on FBD Marriage.” *American Anthropologist* 87, no. 1: 133-135.

Dorsten, Linda Eberst, Lawrence Hotchkiss, and Terri M. King. 1999. “The Effect of Inbreeding on Early Childhood Mortality: Twelve Generations Of An Amish Settlement.” *Demography* 36, no.2*:* 263-271.

El-Zanaty, Fatma, and Ann Way. 2001. *Egypt Demographic and Health Survey 2000.* Calverton Maryland [USA]: Ministry of Health and Population [Egypt], National Population Council and ORC Macro.

Feng, Wang, and Yang Quanhe. 1996. “Age at Marriage and the First Birth Interval: The Emerging Change in Sexual Behavior in Young Couples In China.” *Population and Development Review* 22, No.2: 299-320.

Fricke, Tom, and Jay D. Teachman. 1993. “Writing the Names: Marriage Style, Living Arrangements, and First Birth Interval in a Nepali Society.” *Demography* 30, no.2: 175-188.

Given, Benjamin P., and Charles Hirschman. 1994. “Modernization and Consanguineous Marriage in Iran.” *Journal of Marriage and the Family* 56, no. 4: pp. 820-834.

Goode, William J. 1963. *World Revolution and Family Patterns*. New York: Free Press.

Grant, J.C., and A. H. Bittles. 1997. "The Comparative Role of Consanguinity in Infant and Childhood Mortality in Pakistan." *Annals of Human Genetics* 61, no.2: 143-149.

Gunaid, A. A., N.A. Hummad, and K.A. Tamim. 2004. "Consanguineous marriage in the capital city Sana'a, Yemen." *Journal of Biosocial Science* 36, no. 1: 111-121.
Hacettepe University, Institute of Population Studies [Turkey] and Macro International Inc. 1999. *Turkish Demographic and Health Survey 1998.* Calverton, Maryland [USA]: MI.

Hussain R., and A. H. Bittles. 1998. "The Prevalence and Demographic Characteristics of Consanguineous Marriages in Pakistan." *Journal of Biosocial Science* 30, no. 2: 261-275.

Hussain R., and A. H. Bittles. 1999. "Consanguineous Marriage and Differentials in Age at Marriage, Contraceptive Use and Fertility in Pakistan." *Journal of Biosocial Science* 31, no. 1:121-138

Hussain, R. 1999. "Community Perceptions of Reasons for Preference for Consanguineous Marriages in Pakistan." *Journal of Biosocial Science* 31, no. 4: 449-461.

Hussain, R., A. H. Bittles, and S. Sullivan. 2001. "Consanguinity and early mortality in the Muslim populations of India and Pakistan." *American Journal of Human Biology* 13, no.6: 777-787.

Hussain, R., and A. H. Bittles, 2000. "Sociodemographic Correlates of Consanguineous Marriage in the Muslim Population of India." *Journal of Biosocial Science* 32, no.4: 433-442.

Jurdi, Rozzet, and Prem C. Saxena.2003. "The Prevalence and Correlates of Consanguineous Marriages in Yemen: Similarities and Contrasts with Other Arab Countries." *Journal of Biosocial Science* 35: 1-13.

Khlat M, Khoury M.1991. Inbreeding and diseases: demographic, genetic, and epidemiological perspectives. *Epidemiol Rev* 13:28-41.

Khlat, M. 1988. "Consanguineous marriages in Beirut: Time trends, spatial distribution." *Social Biology* 35: 324-330.

Khoury, S.A., and D. Massad. 1992. "Consanguineous marriage in Jordan." American Journal of Medical Genetics 43, no. 5: 769-775

Khuri, Fuad I. 1970. "Parallel Cousin Marriage Reconsidered: A Middle Eastern Practice That Nullifies the Effects of Marriage on the Intensity of Family Relationships." *Man* 5, no. 4: 597-618.

McCabe, Justine. 1983. "FBD Marriage: Further Support for the Westermarck Hypothesis of the Incest Taboo?". *American Anthropologist* 85, no. 1: 50-69.

McCabe, Justine. 1985. “FBD Marriage, Westermarck, and Incest Taboos: Replies to Dodd and Prothro, Graber, and Kopytoff. *American Anthropologist* 87, no. 1: 135-138.

Pedersen J. 2002. “The influence of consanguineous marriage on infant and child mortality among Palestinians in the West Bank and Gaza, Jordan, Lebanon and Syria.” *Community Genetics* 5, no. 3: 178-181.

Reddy, P.H. and B. Modell. 1995. “Consanguinity and Reproductive Behavior in a Tribal Population ‘The Baiga’ in Madhya Pradesh, India.” *Annals of Human Biology* 22:235-46.

Reniers, Georges. 2001. “The post-Migration Survival of Traditional Marriage Patterns: Consanguineous Marriages Among Turks and Moroccans in Belgium.” *Journal of Comparative Family Studies* 32, no. 1: 21-45.

Rindfuss, Ronald R., and S. Philip Morgan. 1983. “Marriage, Sex, and the First Birth Interval: The Quiet Revolution in Asia.” *Population and Development Review* 9, no. 2: 259-278.

Saadat, M., M. Ansari-Lari, and D.D. Farhud. 2004. “Consanguineous marriages in Iran.” *Annuals of Human Biology* 31, no.2: 263-269.

Stoltenberg, Camilla, Per Magnus, Anders Skrondal, and Rolv Terje Lie. 1999. “Consanguinity and recurrence risk of birth defects: a population-based study.” *American Journal of Medical Genetics* 82, no. 5: 423-428.

Sueyoshi, S., and R. Ohtsuka. 2003. “Effects of polygyny and consanguinity on high fertility in rural Arab population in South Jordan.” *Journal of Biosocial Science* 35, no. 4: 513-526.

Tapper, Nancy. 1981. “Direct Exchange and Brideprice: Alternative Forms in a Complex Marriage System.” *Man* 16, no. 3:387-407.

Tuncbilek, E., and I Koc. 1994. “Consanguineous marriage in Turkey and its impact on fertility and mortality.” *Annals of Human Genetics* 58, no.4: 321-9.

Warriner, Ina Katherine. 1999. “Non-Traditional Approaches to Traditional Demographic Questions: Three Essays on Fertility and Mortality.” University of Pennsylvania: Unpublished dissertation.

Wolf, Arthur P. 1966. “Childhood Association, Sexual Attraction, and the Incest Taboo: A Chinese Case.” *American Anthropologist* 68, no.4: 883-898.

Wolf, Arthur P. 1968. “Adopt a Daughter-in-Law, Marry a Sister: A Chinese Solution to the Problem of the Incest Taboo.” *American Anthropologist* 70, no. 5: 864-874.

Wolf, Arthur P. 1970. “Childhood Association and Sexual Attraction: A Further Test of the Westermarck Hypothesis.” *American Anthropologist* 72, no. 3:503-515.

Wolf, Arthur P. 1993. “Westermarck Redivivus.” *Annual Review of Anthropology* 22: 157-175.

Yasmin, J. M. Naidu, and C. G. N. Mascie-Taylor. 1997. “Consanguinity and its Relationship to Differential Fertility and Mortality in The Kotia: A Tribal Population of Andhra Pradesh, India.” *Journal of Biosocial Science* 29, no. 2:171-180.

Zlotogora, J., H. Habiballa, A. Odatalla, and S. Barges. 2002. “Changing family structure in a modernizing society: A study of marriage patterns in a single Muslim village in Israel.” *American Journal of Human Biology* 14, no. 5: 680-682

Zlotogora, Joël. 1997. “Genetic disorders among Palestinian Arabs: 1. Effects of consanguinity.” *American Journal of Medical Genetics* 68, no. 4: 472-475

FIGURE 1 Relation to husband: 1956-2003, Egypt

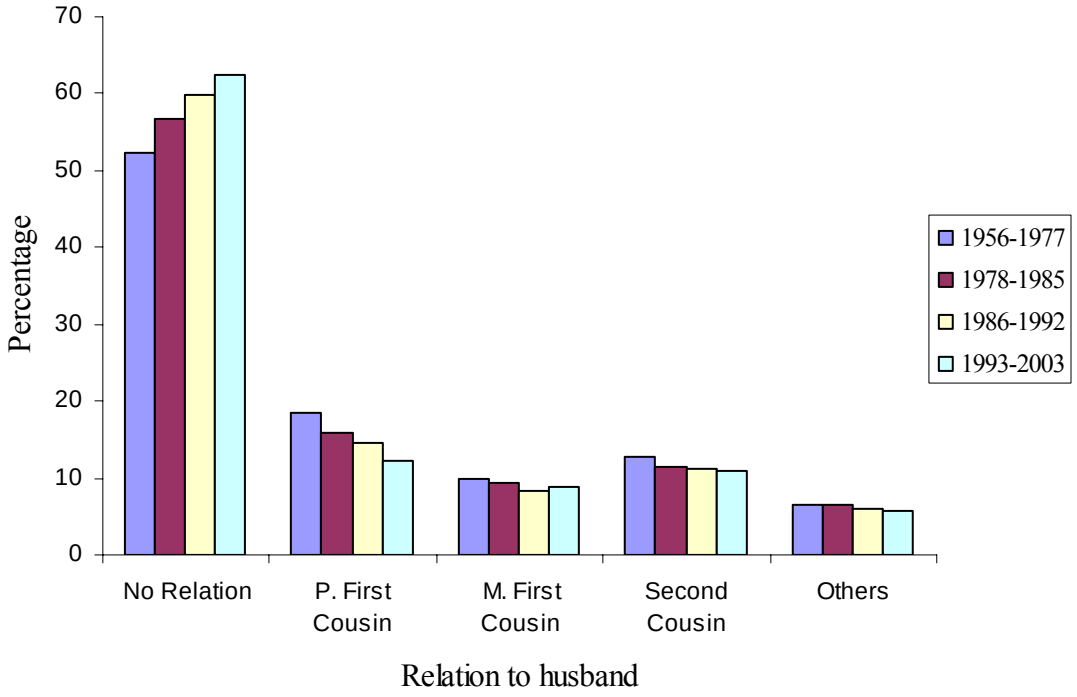

FIGURE 2 Relation to husband: 1954-2002, Jordan

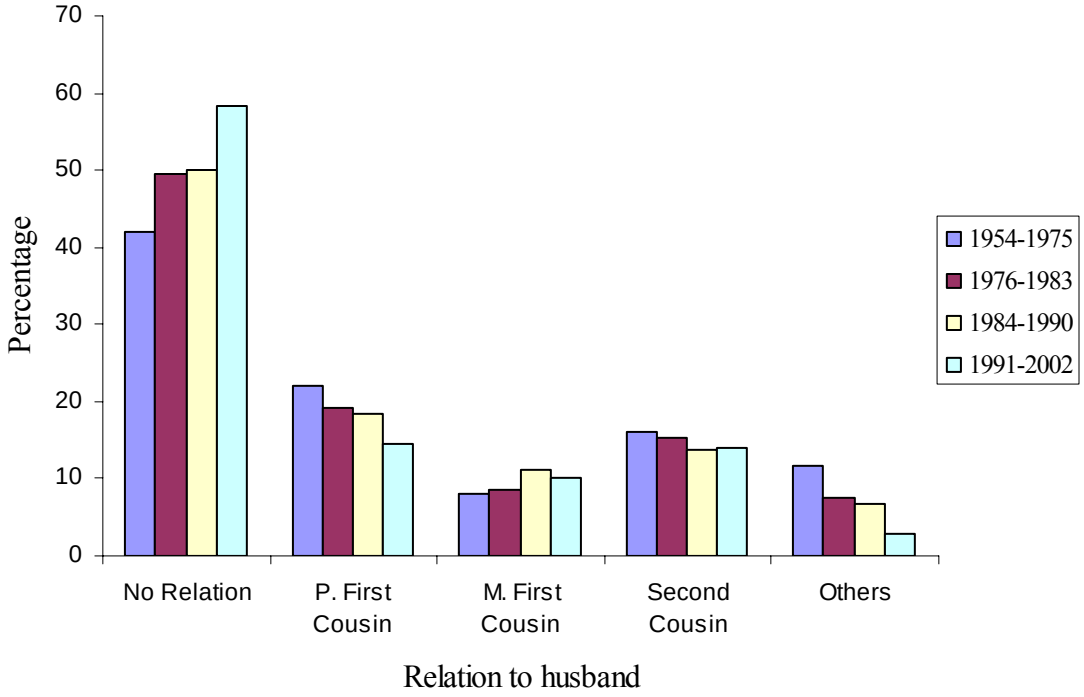

FIGURE 3 Relation to husband: 1958-1998, Kurds, Turkey

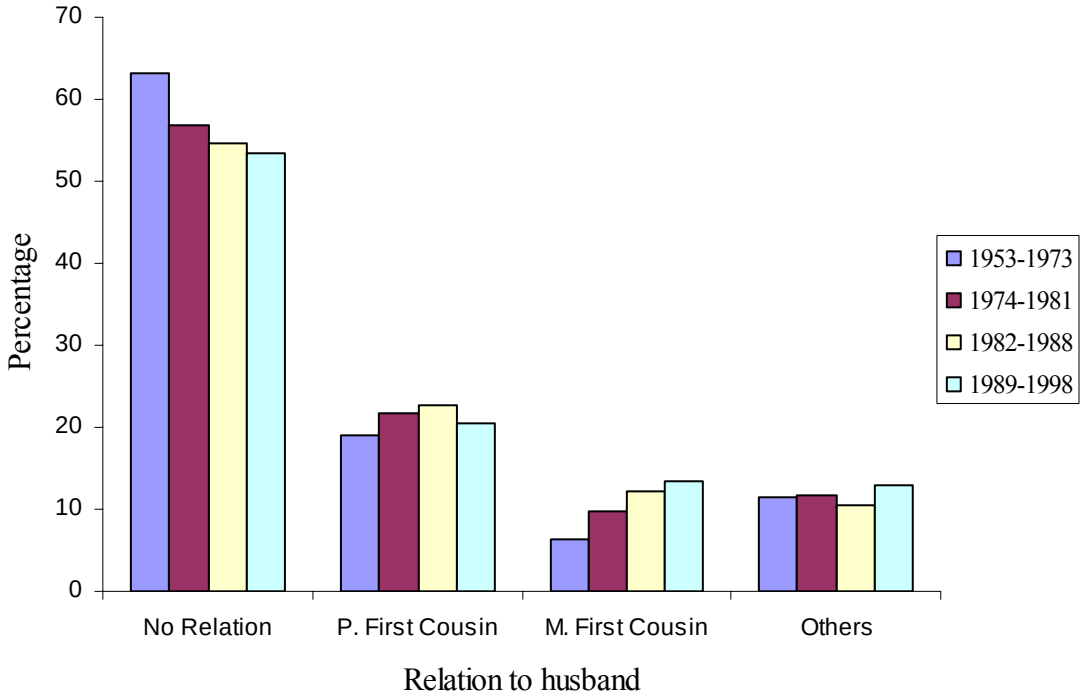

FIGURE 4 Relation to husband: 1953-1998, Turks, Turkey

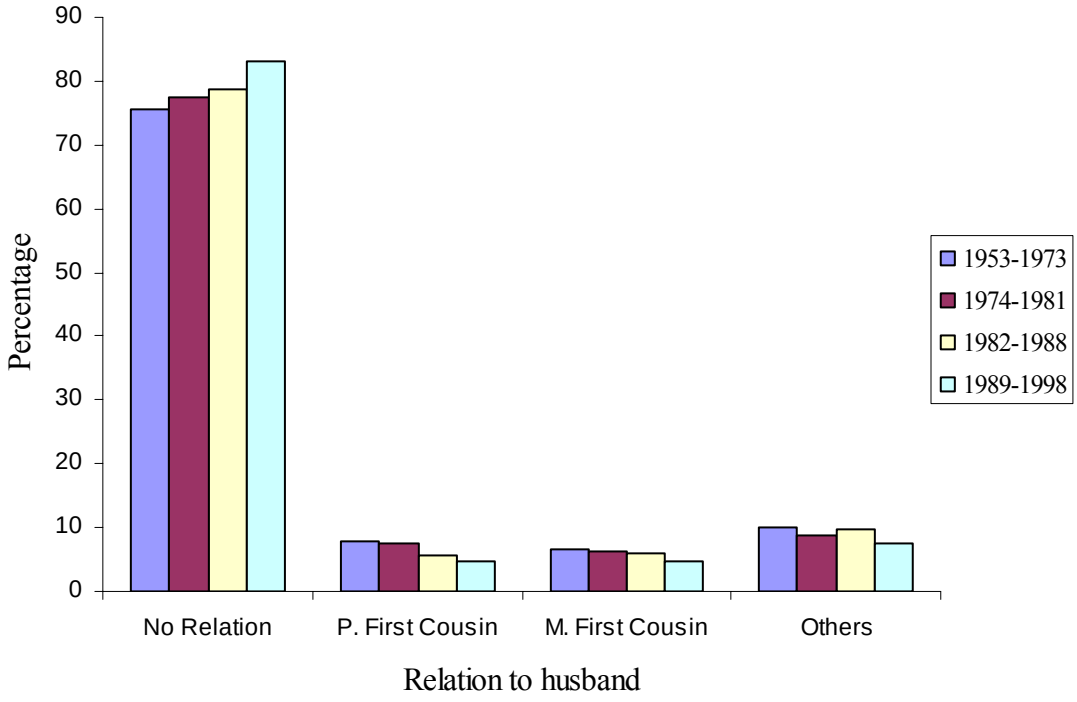

FIGURE 5 Relation to husband: 1948-1997, Yemen

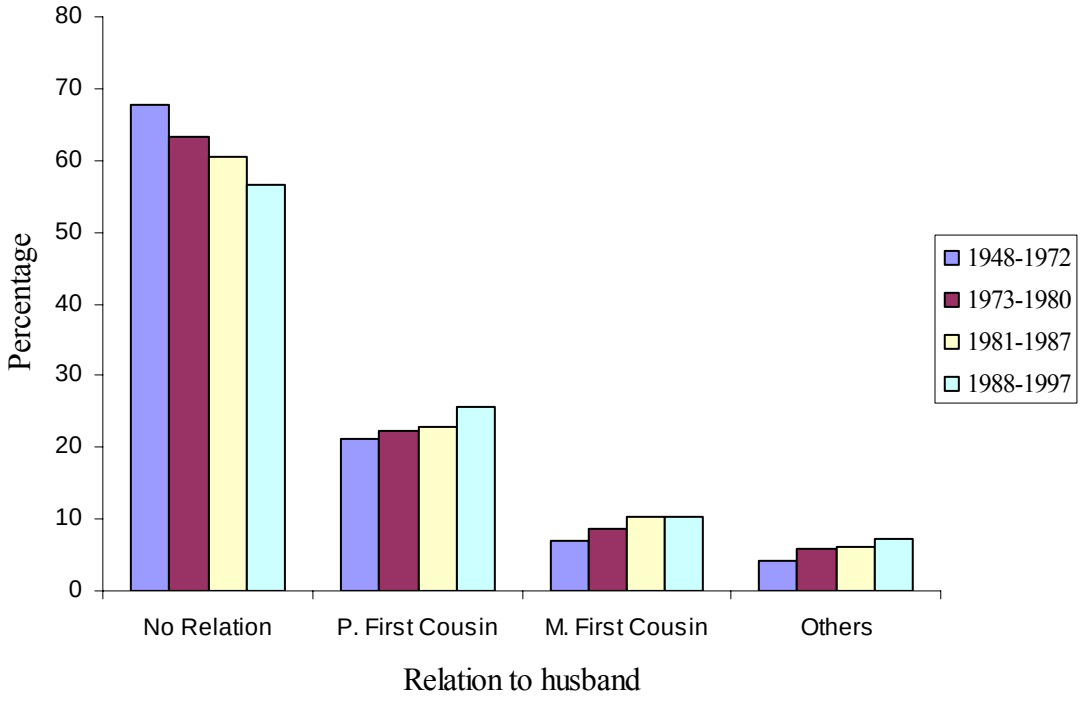

FIGURE 6 Changes in means of the numbers of children surviving of women aged 40 years and over

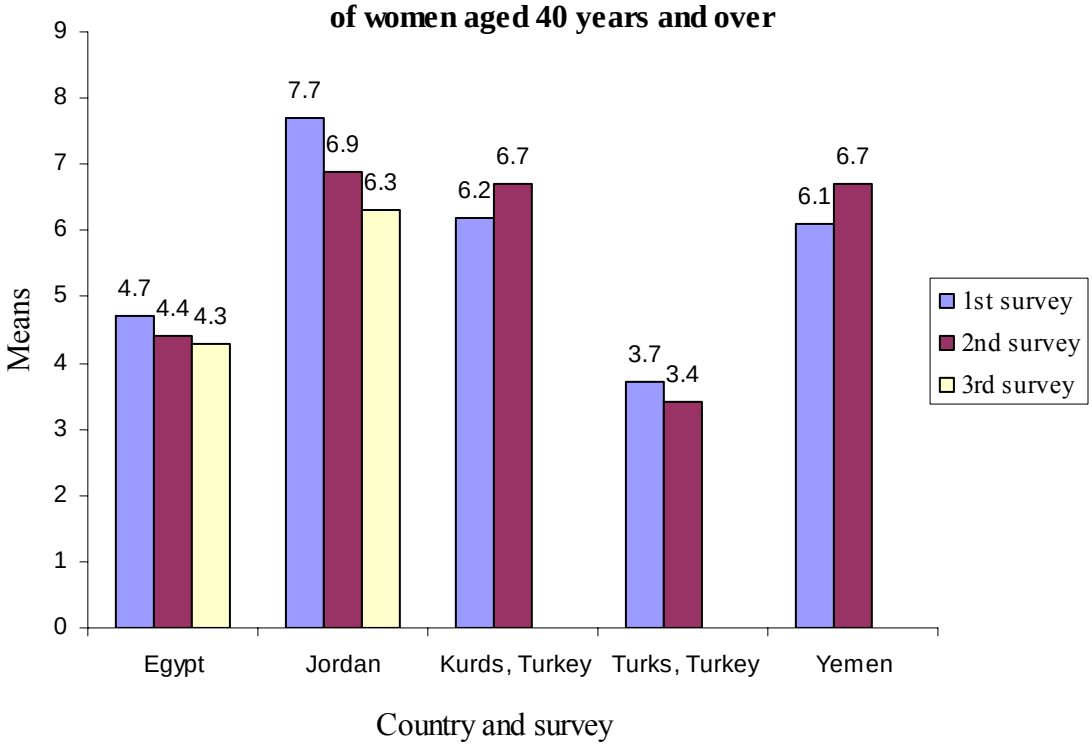

TABLE 1 Frequency distribution of relation to husband

Relation to Husband	Egypt[1]	Jordan	Kurds, Turkey[1]	Turks, Turkey[1]	Yemen
No Relation	58.09	50.14	56.45	78.87	61.91
P. First Cousin	15.19	18.51	21.03	6.46	23.01
M. First Cousin	9.06	9.54	10.83	5.86	9.11
Second Cousin[2]	11.50	14.75	-	-	-
Others[3]	6.17	7.06	11.70	8.81	9.58
N	*37,758*	*18,000*	*1,598*	*10,484*	*16,057*
Marriage Years	1956-2003	1954-2002	1958-1998	1953-1998	1948-1997

[1] Women who married more than once were excluded from the analyses of all surveys of Egypt (1995, 2000, and 2003) and Turkey (1993) due to lack of information on relation to first husband

[2] It is possible to distinguish marriages between second cousins from those between other relatives in Egypt and Jordan only.

[3] "Others" includes distant relatives in Egypt and Jordan; second cousins and distant relatives in Turkey; and second cousins and distant blood relatives in Yemen

TABLE 2 Frequency distribution of types of first cousin marriages

Type of First Cousin	Jordan[1]	Kurds, Turkey	Turks, Turkey
Father's brother's son	45.87	49.12	26.34
Father sister's son	18.47	16.90	26.10
Mother's brother's son	14.19	17.29	23.63
Mother's sister's son	21.47	16.70	23.93
N	3,037	509	1,291
Marriage years	1954-2002	1958-1998	1953-1998

[1] 1997 and 2002 surveys only as the 1990 dataset does not include such detail on relation to husband.

TABLE 3 Coefficients of logistic regressions of relation to (first) husband controlling for survey year

Variables	Married to a relative vs. non-relative				
	Egypt[1]	Jordan	Kurds, Turkey[1]	Turks, Turkey[1]	Yemen
Marriage year,					
1st quartile	-	-	-	-	-
2nd quartile	-0.053†	-0.141**	0.252	0.032	0.190***
3rd quartile	-0.080*	-0.075	0.361*	0.016	0.289***
4th quartile	-0.116***	-0.277***	0.415*	-0.184*	0.437***
No schooling	-		-	-	-
Primary	-0.099***	-0.227***	-0.053	-0.248***	0.203***
Secondary	-0.313***	-0.246***	-	-0.869***	0.089
Higher	-0.784***	-0.745***	-	-	-
Countryside	-	-	-	-	-
City/town	-0.547***	-	0.007	-0.424***	-0.271***
Did not work	-	-	-	-	-
Worked	-0.418***	-	-0.109	-0.182***	-0.418***
N	37,739	18,000	1581	10,343	16,026
Log likelihood	-24631.8	-12229.9	-1076.3	-5193.8	-10559.8
	If married to a relative, first cousin vs. other relatives				
Marriage year,					
1st quartile	-	-	-	-	-
2nd quartile	-0.025	0.057	0.083	0.188	-0.216†
3rd quartile	-0.044	0.215***	0.463	-0.043	-0.171
4th quartile	-0.050	0.207**	0.467†	0.128	-0.163
No schooling	-	-	-	-	-
Primary	-0.190***	0.134†	-0.632***	-0.254*	-0.107
Secondary	-0.164***	0.193**	-	-0.255	-0.236
Higher	-0.346***	0.049	-	-	
Countryside	-	-	-	-	-
City/town	-0.048	-	0.330†	-0.101	-0.363***
Did not work	-	-	-	-	-
Worked	-0.017	-	-0.240	0.135	-0.163
N	15,818	8,975	687	2,196	6,106
Log likelihood	-10734.9	-6124.0	-385.8	-1473.0	-2633.1

TABLE 3 (Continued)

Variables	If married to a first cousin, matrilateral vs. patrilateral				
	Egypt[1]	Jordan	Kurds, Turkey[1]	Turks, Turkey[1]	Yemen
Marriage year,					
1st quartile	-	-	-	-	-
2nd quartile	0.055	0.028	0.322	0.017	0.139
3rd quartile	0.017	0.260**	0.464	0.183	0.262**
4th quartile	0.220**	0.392***	0.711*	0.192	0.152
No schooling	-	-	-	-	-
Primary	0.120*	0.451***	0.045	0.061	0.208*
Secondary	0.157**	0.622***	-	-0.239	0.235†
Higher	0.171	0.667***	-	-	-
Countryside	-	-	-	-	-
City/town	0.279***	-	-0.107	0.062	0.035
Did not work	-	-	-	-	-
Worked	0.125†	-	-0.257	0.042	0.354†
N	9,151	5,049	503	1,279	5,148
Log likelihood	-6002.0	-3182.8	-319.4	-882.4	-3057.1

† p <0.10; * p <0.05; ** p <0.01; *** p <0.001

[1] Women who married more than once were excluded from the analyses of all surveys of Egypt (1995, 2000, and 2003) and Turkey (1993) due to lack of information on relation to first husband

TABLE 4 Coefficients of logistic regressions of marital disruption of first marriage

	Divorced vs. still married		
Variables	Jordan[1]	Turks, Turkey[2]	Yemen[1]
No relation	-	-	-
P. first cousin	-0.281**	-0.317	-0.447***
M. first cousin	-0.483***	-0.074	-0.433***
2nd cousin	-0.422***	-	-
Others	-0.584***	-0.366	-0.304**
Marriage year	-0.024***	-0.046***	-0.042***
No schooling	-	-	-
Primary	-0.204†	-0.219	0.025
Secondary	-0.396***	-0.043	-0.429***
Higher	-1.065***	-	-
Countryside	-	-	-
City/town	-	0.643***	0.316***
Did not work	-	-	-
Worked	-	0.114	0.635***
Marriage age	-0.013	-0.023	-0.032***
1st survey	-	-	-
2nd survey	0.320***	-	0.245***
3rd survey	0.398***	-	-
N (divorced)	895	188	2,102
N (total)	17,579	4,791	15,624
Log likelihood	-3444.9	-766.6	-5917.5

† p <0.10; * p <0.05; ** p <0.01; *** p <0.001

[1] The surveys in Jordan and Yemen lack information on how the first marriage ended. In these analyses, women who married more than once are assumed to have experienced divorce in their first marriage.
[2] 1998 survey only as the 1993 TDHS does not include information on relation to first husband for women who married more than once

TABLE 5 Medians of durations between first marriage and first birth by relation to husband and year of marriage

Marriage year and country	No relation (reference)	P. First Cousin	M. First Cousin	Second Cousin	Others
Egypt:					
1956-1977	18	19	19	20	20
1978-1985	16	18	17	18	16
1986-1992	14	16	15	15	15
1993-2003	13	14	14	13	13
Jordan:					
1954-1975	14	16	14	16	16
1976-1983	13	14	15	13	15
1984-1990	13	13	13	13	12
1991-2002	12	14	13	13	14
Kurds, Turkey:					
1958-1973	23	21	44	-	29
1974-1981	18	24	23	-	22
1982-1988	19	19	16	-	20
1989-1998	17	18	19	-	16
Turks, Turkey:					
1953-1973	17	20	20	-	17
1974-1981	14	13	15	-	14
1982-1988	14	16	13	-	13
1989-1998	14	15	14	-	14
Yemen:					
1948-1972	52	52	53	-	46
1973-1980	28	29	28	-	26
1981-1987	22	26	23	-	24
1988-1997	22	23	24	-	21

TABLE 6 Hazard coefficients of event history analyses of time interval between first marriage and first birth[1] by relation to husband

Variables	Egypt	Jordan	Kurds	Turks	Yemen
No relation	-	-	-	-	-
P. first cousin	-0.041*	-0.058**	-0.115	-0.046	-0.032
M. first cousin	-0.050*	-0.061*	-0.192*	-0.037	0.000
2nd cousin	-0.048**	-0.028	-	-	-
Others	-0.035	-0.041	-0.034	0.026	0.057
Marriage year,					
1st quartile	-	-	-	-	-
2nd quartile	0.099***	0.011	0.202*	0.139***	0.375***
3rd quartile	0.170***	0.021	0.232**	0.187***	0.514***
4th quartile	0.312***	-0.016	0.306***	0.164***	0.547***
No schooling	-	-	-	-	-
Primary	0.059***	0.119***	0.125†	0.083**	0.117***
Secondary	0.199***	0.256***	-	0.110**	0.102*
Higher	0.154***	0.391***	-	-	-
Countryside	-	-	-	-	-
City/town	0.052***	-	-0.003	0.052*	0.187***
Did not work	-	-	-	-	-
Worked	-0.010	-	-0.068	0.009	0.069
Marriage age	0.001	0.004†	0.032***	0.011***	0.032***
Moved to place	-	-	-	-	-
Always there	-0.010	-0.013	0.050	-0.030	-0.102***
Did not use cc	-	-	-	-	-
Used cc	-0.582***	-0.547***	-0.200	-0.351***	-0.457***
N	36,406	16,777	1,469	9,675	13,924
Log likelihood	-317238.5	-135347.9	-8504.6	-72783.5	-104677.5

† p <0.10; * p <0.05; ** p <0.01; *** p <0.001

[1] Women who married once only

TABLE 7 Means of children ever born adjusted for marital duration[1] by educational level

Country	No relation (reference)	P. First Cousin	M. First Cousin	Second Cousin	Others
Egypt:					
No education	4.1	4.3***	4.2	4.1	4.2
Primary	4.1	4.3*	4.3	4.2	4.3
Secondary	2.6	2.6	2.5†	2.5	2.6
Higher	2.7	2.8	2.9	2.5†	2.8
All Women	3.4	3.8***	3.7***	3.7***	3.7***
Jordan:					
No education	6.9	7.2*	6.8	7.2*	7.2*
Primary	5.7	5.9	5.9	6.1*	5.9
Secondary	3.9	4.1***	3.7*	4.2***	4.0
Higher	3.3	3.4	3.1	3.5*	3.2
All Women	4.4	4.9***	4.3	4.9***	5.2***
Kurds, Turkey:					
No education	5.0	4.7	4.1**	-	5.0
Primary+	3.2	2.8	2.2***	-	3.1
All Women	4.4	4.2	3.5***	-	4.3
Turks, Turkey					
No education	3.7	3.8	3.7	-	3.9*
Primary	2.6	2.7	2.6	-	2.7
Secondary+	2.2	2.4†	2.2	-	2.2
All Women	2.7	3.0***	2.9**	-	2.9***
Yemen					
No education	5.4	5.0***	5.0***	-	5.0**
Primary	3.2	2.9*	2.9*	-	2.9†
Secondary+	3.1	2.7*	2.4**	-	2.6*
All Women	4.9	4.7***	4.5***	-	4.4***

† p <0.10; * p <0.05; ** p <0.01; *** p <0.001

[1] Women who are still in their first marriage only; the differences by relation to husband are slightly larger when I use all women and do not adjust for marital duration.