

**Fertility Change in Central Asia:
How Marriage Timing & Contraceptive Use Are Evolving in
Post-Soviet Kyrgyzstan**

by

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For my family
&
those who courageously pursue their dreams.

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Abstract

Kyrgyzstan has undergone great societal change since gaining independence from the USSR in 1991. While government and economic shifts have affected many aspects of daily life, what effect have policy changes had on family formation and family planning trends, if any at all? Using two nationally representative datasets, I discovered that women in Kyrgyzstan who came of age during the transition entered marriage earlier than previous cohorts. This unusual pattern holds across diverse populations, and runs counter to worldwide marriage trends. While this fluctuation might suggest a societal shift toward more traditional ideals, it coincided with a significant influx of foreign development support for health reform and family planning services, among other programs.

While abortion was a primary method of fertility control until 1991, the adoption of modern contraceptive methods has occurred rapidly across Kyrgyzstan. Over half of the women surveyed are employing a modern method and a woman's location of residence, age at marriage and parity are the strongest predictors of use. Additionally, I found that unlike research from India and Pakistan, inclusion in traditional, co-residing family structures had little influence on the likelihood of use. I believe factors such as a highly educated populace, depressed economic conditions and declining fertility norms facilitated the rapid acceptance and adoption of modern methods. Yet, when considered

in the context of shifting marriage trends, Kyrgyzstan represents an unusual and important case. Contrary to standard patterns in which access to contraception is associated with marriage and childbearing delays, we witness the reverse in Kyrgyzstan, at least temporarily. Such findings demand further investigation to determine if the case of Kyrgyzstan is distinct or portends the potential for change in other post-soviet settings.

Chapter I

Marriage Timing & Contraceptive Use: A Literature Review

Introduction

Childbearing is an experience with profound significance for women the world over. A woman's fertility has direct bearing on her reproductive health, her identity within the family and society, the scope of her experience and even her status in some settings (Singh & Samara 1996; Lule, Singh & Chowdhury 2007). Women's opportunities, roles and responsibilities are altered when households shift in size and composition (Mistry, Galal & Lu 2009). Investigating the proximate determinants of fertility can reveal important insights into the demographic status of a nation as well as the experience and choices of its women.

In societies where non-marital fertility is rare, among the most critical determinants of fertility are marriage timing and contraceptive use (Erfani & McQuillan 2007). Entry into marriage in these settings marks a woman's sexual debut and often the initiation of childbearing. The earlier a woman enters marriage, the longer her exposure to the risk of pregnancy and the higher her potential fertility (Heaton 1996; Singh & Samara 1996). The converse is equally true: women who delay marriage in these societies often have fewer children (Hirschman 1985).

In cultures where childbearing is highly valued, fertility control may not be exercised until a woman has reached a high level of parity, if at all (Hagan, Fikree, Sherali & Hoodbhoy 1999). This has important implications for reproductive health across populations, as natural fertility can result in narrowly spaced births and pregnancies early or late in the reproductive life cycle. Such outcomes are associated with a greater risk of birth complications and even death (Stover & Ross 2010). Additionally,

early marriage and childbearing can hinder women's educational attainment, a limitation with implications for family health (Basu & Stephenson 2005; Cleland & van Ginneken 1988). The children whose mothers have even a modest level of education are at lower risk of premature death, stunting and underweight than the offspring of uneducated mothers (Basu & Stephenson 2005; Moestue & Huttly 2008). In this manner, marriage timing and the use of contraception have ramifications for fertility levels as well as the health of women and their families.

In the Central Asian nation of Kyrgyzstan, marriage timing and contraceptive use are complex and understudied topics of research. Within the past 50 years, Kyrgyzstan has experienced considerable societal change. Soviet educational, industrial and social development policies early in the 20th century introduced competing alternatives to early marriage and advanced both educational and employment opportunities for women (Corcoran-Nantes 2005). Alongside these policies, pronatalist initiatives sought to boost population levels through economic incentives and social programs for mothers and families (Zakharov 2008). Conditions changed dramatically in the post-Soviet era as adverse economic conditions and the loss of central government support sharply reduced government resources in Kyrgyzstan. Aggressive economic reforms in combination with new societal factors may be impacting marriage timing and contraceptive behaviors. These include a resurgence of traditional, conservative ideals, wider exposure to foreign media and values, increased access to modern contraceptives as well as persistent economic and employment constraints that have disproportionately affected women (Ishkanian 2003; Akiner 1997; Corcoran-Nantes 2005).

To better understand how individual and societal factors may be influencing marriage timing and contraceptive use in Kyrgyzstan, we perform a review of past research. Specifically, we seek to address the following questions: What individual and community factors are influential in determining marriage timing and contraceptive use? Which factors remain in dispute? How are these factors evidenced in Kyrgyzstan and do they serve to distinguish Kyrgyzstan from other Asian Muslim populations?

Education & Event Timing

Research exploring the relationship between education and event timing is expansive. Over time, scholars have demonstrated a strong, positive association between education and the age at first marriage that has endured across a multitude of cultures, religious groups and regions (Heaton 1996; Aryal 2006; Hirschman 1985; Bates, Maselko & Schuler 2007).

Across the literature, the findings of Singh and Samara (1996) are highly representative of many studies on marriage timing and education. In their global analysis of marriage trends, they found women who attended secondary school had a lower probability of entering marriage before the age of 20. The influence of educational differentials was most considerable in Asia and North Africa where women with a partial secondary education were one-third as likely as their less educated peers to marry as adolescents (Singh & Samara 1996).

Numerous studies have also investigated the influence of parental education on the timing of events by younger generations. Previous research in Asia suggests that as parental educational levels increase, so too do their preferences for children's age at marriage (Axinn & Thornton 1992). In fact, several studies found evidence of later marriage and childbearing among women whose parents or parents-in-law were educated, even minimally (Brien & Lillard 1994; Choe, Thapa & Mishra 2005). In Nepal, the relative risk of marriage was lower for rural women whose fathers had even minimal education (Choe et al. 2005). However, the significance of education varied by residence and level of schooling. Among urban women, a father's education below the secondary level was not a significant predictor of later marriage.

Even more provocative was the association Bates, Maselko and Schuler (2007) discovered between the education of mothers and event timing. Among rural women in Bangladesh, increasing levels of maternal education were associated with a reduced probability of early marriage by daughters. As with other education studies, there was a gradation in the significance of effects on marriage hazard that varied by level of education. The probability of early marriage was reduced among the daughters of women with any education, but only statistically significant among mothers with greater than five years of schooling. The hazard of early marriage among the daughters of women with

five or more years of education was 40% of the hazard for daughters of uneducated mothers (Bates et al. 2007). This effect was attenuated, however, once a daughter's own education was incorporated into the model.

In communities where mass education is well established, schooling can become widely recognized as a precursor to marriage. Consequently, enrollment alone may be sufficient to delay events for men and women (Yabiku 2005; Malhotra 1997). In rural Nepal, rates of marriage among women enrolled in school were 64% lower than those of the non-enrolled; in Indonesia, marriage rates were 44% lower for enrolled rural women and 62% lower for enrolled urban women as compared to their un-enrolled peers (Yabiku 2005; Malhotra 1997). These findings suggest that even in remote, agricultural communities, expectations around education can positively influence the postponement of marriage.

However, the impact schooling can have on the risk of marriage is also known to vary by the level of education attained. Throughout Asia, secondary education is a critical achievement with respect to event timing. While there is evidence that primary level schooling reduces the risk of marriage among both urban and rural women in Nepal, the impact education has on marriage delays strengthened with additional years of schooling (Choe et al. 2005). Specifically, the relative risk of marriage declined from .89 to .6 between primary and secondary educated urban dwellers and from .68 to .4 between primary and secondary educated rural women. This shows that as educational attainment increased, the risk of marriage declined. However, this is not a consistent relationship across all levels of education. In South Korea, Taiwan, Sri Lanka, Indonesia and Malaysia, education at the primary level or less actually reduced the average age of first marriage (Hirschman 1985).

While the risk of marriage may be lower while attending school, research has also shown that event hazards can change dramatically upon the conclusion of education. As Brien and Lillard (1994) demonstrate, the probability of surviving unmarried remains near 1 for Malaysian women who are pursuing education to grade 12 or higher. However, the gradient of the survival curve declines more sharply for women with higher levels of completed education. In other words, women in Malaysia may delay marriage quite successfully for years, but their risk of marriage increases considerably upon the

completion of schooling. This was found also to be the case in rural Bangladesh (Bates et al. 2007).

In addition to serving as a precursor to marriage, education can also influence delays through the exposure to alternative ideals, perspectives, norms and networks (Jayakody, Thornton & Axinn 2008; Bongaarts & Watkins 1996). Schooling outside the community can broaden a woman's network of peers and mentors and expose her to new sources of authority and socialization. Through education, women can develop alternative understandings of personal agency, the authority of older generations and different life course trajectories (Jayakody et al. 2008; Yabiku 2006; Bates et al. 2007; Aryal 2006). Such lessons can lead to new aspirations and desires for the future that can ultimately affect change in social norms. As younger generations gain education, they may feel more confident about challenging family traditions and community norms.

The relationship between expanded educational opportunities and ideational change is especially relevant in Kyrgyzstan. Under the Soviets, numerous programs and state-sponsored initiatives were enacted to increase the education of both men and women. These programs were quite successful at raising literacy levels and the numbers of Central Asian students seeking higher degrees (Corcoran-Nantes 2005). Yet, evidence of long-term ideational change is less clear, especially as it relates to gender equality.

Another mechanism through which education can influence event timing is by improving the skills and employability of young adults (Singh & Samara 1996; Malhotra 1997). Among women in Egypt, Jordan and Indonesia, employment was associated with the greatest marriage delays among groups with higher levels of education (Heaton 1996). Working women with secondary or higher levels of education delayed marriage between one to three years longer than non-working women with equivalent levels of education (Heaton 1996). However, employment was also associated with an increase in the mean age of marriage among uneducated women. Those who were uneducated but working married as much as a year later than non-working peers (Heaton 1996). Such results show the influence employment—and the income it generates—can have on the motivation to marry early. In some settings, the additional income a household receives from a working daughter can prove a strong incentive to delay marriage despite social pressure to the contrary.

Although work experience and education can collectively impact event timing, the independent effect of work on marriage is far less predictable. As we explore in the following section, work experience can influence event timing but its impact may vary across different cultural, economic and employment contexts.

Employment

Like education, employment has been an important factor in past marriage timing research. Scholars have uncovered strong associations between premarital work experience and marriage timing across the Middle East and Asia (Yabiku 2005; Heaton 1996; Hirschman 1985; Aryal 2006). As with education, there are several avenues through which employment can impact event timing. These include exposure to new networks, the generation of new aspirations and changes related to family authority (Yabiku 2005).

Similar to education, employment can draw women outside of their home communities to encounter new experiences and alternative peer networks. As such, women can gain exposure to different norms, ideas and values that may challenge traditional customs and marriage timing patterns (Yabiku 2005; Singh & Samara 1996). Social networks can be especially powerful facilitators of information dissemination and normative changes (Bongaarts & Watkins 1996). Their members may model alternative marriage timing patterns, raise awareness of the disadvantages of early marriage and otherwise provide support for postponement (Aryal 2006; Bongaarts & Watkins 2006).

Exposure to new life choices and patterns can inspire the formation of aspirations that differ from those prevalent in a woman's home community. Aspirations for later marriage can be commonplace and affirmed among peers in the new, working environment. As demonstrated in Nepal, marriage timing was closely associated with timing norms in the surrounding community (Yabiku 2006). Women who reside in communities where later marriage is considered normative may shift their aspirations in favor of longer periods of living unmarried. Work opportunities may also serve to buffer powerful community expectations. Women who are employed far from their natal home may experience greater freedom as geographic distance lessens the authority of family and community members (Caltabiano & Castiglioni 2008; Heaton 1996). Women

residing in distant and more populous areas may encounter less resistance and social pressure to marry early due to their detached location (Yabiku 2005).

The benefits of work can also provide incentives to sway the support of families in favor of marriage delays. As Singh and Samara (1996) found, urban-residing women who were employed enjoyed greater parental support for marriage delays than did other women. Financial considerations may also weigh heavily in some contexts and encourage marriage delays where otherwise there would be few (Choe et al. 2005). In these cases, women and their families may simply be unable to afford early marriage. Instead, women postpone marriage in favor of premarital employment and the economic benefits it offers (Hirschman 1985; Choe et al. 2005).

Yet, economic considerations do not always result in later marriage. In Uzbekistan, family financial pressures are believed by some scholars to have spurred earlier marriage through the late 1980s and early 1990s (Agadjanian & Makarova 2003). Under the Soviets, marital gift exchanges were one of the few practices through which families could publicly demonstrate economic and social status. Thus, weddings became a key event for family displays of wealth. Agadjanian and Makarova (2003) theorize that Soviet policies of *Perestroika* combined with economic uncertainty following Uzbek independence may have magnified the pressure families felt to assert their financial status during this time. Indeed, an increase in marriage among young women is clearly seen in Uzbekistan during this period.

In addition to premarital employment, research has demonstrated that parental employment can be an equally important influence in determining the timing of family formation. In Nepal, paternal employment in a non-service, non-agricultural field was associated with an increase of 1.2 years in median age of first marriage. Less of a difference in median age was noted between women whose fathers worked in service occupations and those in non-service fields (Aryal 2006). A similar association between paternal occupations and marriage timing by daughters was also found in Malaysia. Like Nepal, a father's occupation in a professional field was associated with a lower hazard a daughter would marry at an early age (Brien & Lillard 1994). A higher hazard of early marriage was demonstrated among the daughters of agricultural or farm workers.

The nature and type of occupation is also of importance when considering the event timing of employed women, themselves. Several studies have distinguished between the risk of early marriage among women who are self-employed, students or engaged in professional or agricultural labor (Feng & Quanhe 1996; Aryal 2006). Across these categories, significant relationships have been evidenced between employment type and event risk. Not surprisingly, higher level, professional occupations are often associated with later marriage (Aryal 2006; Hirschman 1985; Blossfeld & Huinink 1991). In his five-nation study of Asia, Hirschman (1985) found that non-familial employment strongly influenced the timing of first marriage. Employment in the service industry or blue-collar work increased the average age of first marriage by 1.8 to 2.5 years. Women in clerical occupations delayed family formation still further, postponing marriage 5.4 years later than the average. However, both agricultural workers and the unemployed reported entering marriage around a year earlier (Hirschman 1985). In Nepal, women engaged in the service sector had the lowest risk of first marriage, while the risk of marriage for female agricultural workers was nearly equivalent to that of women who were still in school (Aryal 2006). In this setting, the relative risk of marriage for female students was the highest of all employment categories (.885). This finding runs counter to many studies of education's effect on marriage as it demonstrates that enrollment in school does not necessarily ensure marriage postponement. It may also allude to the greater influence of employment over education as a facilitator of marriage delays.

Cultural Norms

While education and employment may affect change at the individual level, cultural traditions and norms are forces that impact whole communities. Norms and traditions guide behavior and experiences, often beginning early in life. These can include directives regarding the marriage process, its timing, proscribed family structures, gender roles and childbearing customs. In this way, traditions and norms can guide the life choices of women as well as sanction the roles and opportunities available to them. Understanding the cultural context of a community is crucial to deciphering normative timing patterns and where change may be underway (Choe et al. 2005; Caltabiano & Castiglioni 2008).

Given the power of cultural norms, it is not surprising these forces have been explored extensively in demographic theory (Malhotra & Tsui 1996). Several pre-eminent studies of European populations have revealed compelling evidence linking cultural characteristics to demographic behaviors (Coale & Watkins 1986; Hajnal 1965). Rather than diffusing along geographic borders, past demographic patterns have spread across populations with shared cultural traditions. Ansley Coale and the European Fertility Project evaluated historic, pre-twentieth century patterns of marital fertility across the continent. Their findings challenged early modernization theory by demonstrating regions that transitioned to lower fertility norms were not bound by equivalent levels of industrialization. Rather, patterns of delayed marriage and lower fertility were shared among regions with similar ethnic, religious or linguistic characteristics (Anderson 1986).

The research of Hajnal (1965) similarly emphasized culture as a critical force in event timing. His study of historic European marriage trends revealed distinct variations in marriage timing across groups of contrasting cultural traditions and norms. Regions varied both in the timing patterns of marriage entry and the proportions of women who ever married. While approximately 75% of women in Eastern Europe were married between ages 20-24, an equivalent proportion remained *unmarried* at these ages in Western Europe. The differences were so distinct as to enable delineation of an east-west dividing line separating the regions of different traditions.

Hajnal attributed these distinct marriage patterns to contrasting family formation customs and their impact on economic considerations. In the east, large, extended families co-resided together, lessening the necessity that couples establish an economically independent household upon entering marriage. As a result, couples in the east could and did marry earlier. By contrast, norms in the west dictated that new couples establish independent households upon entering marriage. Consequently, marriage was delayed until couples amassed sufficient economic resources to live on their own. These traditions resulted in later marriage ages among women in the west and earlier marriage norms in the east (Hajnal 1965).

In the spirit of these seminal studies, numerous research efforts have sought to advance our understanding of cultural influences on event timing outside the European

setting. Several scholars have argued persuasively for increased attention to cultural context, particularly when investigating pre-transition populations (Fricke, Syed & Smith 1986; Maholtra & Tsui 1996). These include groups where early marriage and high fertility are dominant behaviors and widespread fertility control has yet to be adopted. If norms are indicative of prevalent timing preferences, research that advances understanding of pre-transition settings and their traditions can aid scholars in identifying early signs of shifting norms and demographic change (Caltabiano & Castiglioni 2008). Studies of pre-transition or transitioning populations include explorations of various regional, ethnic, and religious traditions and their impact on the timing of family formation and its structure (Aryal 2006; Hirschman 1985; Choe et al. 2005). Much of this research has been conducted in Asia, which may provide interesting parallels as well as points of contrast with Central Asian populations.

In India, studies of marriage and childbearing rates suggest regional traditions to be potent drivers behind patterns of union formation and the length of the first birth interval (Basu 1993). Using a combination of census and qualitative data, Basu (1993) investigated family formation trends among women from Uttar Pradesh and Tamil Nadu regions of India. Unusual patterns of marriage timing and marital fertility emerged from these analyses. While the women of Uttar Pradesh marry years earlier, their fertility rate does not reflect this longer exposure to the risk of pregnancy. Nearly three times as many Uttar Pradesh women are married by age 19, yet their age-specific fertility rate is less than half that of their peers from Tamil Nadu (Basu 1993). The differences between these groups narrows among women age 20-24, but distinct fertility patterns persist even as marriage timing variables are controlled.

As with the work of Hajnal (1965), unique kinship systems and marriage traditions may explain the unusual event timing patterns of Indian women. In both regions, families are patrilocal and brides leave the natal home to marry. However, traditions of Uttar Pradesh demand that brides marry into higher status families outside their village of origin. Tamil Nadu brides, by contrast, often marry relatives and remain in their home village. There is also less emphasis on hierarchy. The cultural norms of both regions affect the status and position of new brides as well as their age of marriage. Basu's analysis (1993) suggests that the acceptance and familiarity Tamil Nadu women

experience with their new households may ease their transition into marriage and facilitate earlier motherhood. This is not the case for new brides from Uttar Pradesh. These women join less known households, distant from their natal homes and have little autonomy or status in the new family structure. Such conditions are believed influential in facilitating birth delays (Basu 1993).

In comparing two regions of Nepal, Niraula and Morgan (1996) find variations in marriage customs and norms that also reflect different values and degrees of normative change. Arranged marriage is a prevalent tradition in both Tarai and Hill regions, yet the timing of marriage differs and in each community is reinforced by unique social rewards. Marriage occurs earlier in Tarai regions where families enjoy greater prestige for arranging early unions. In Hill regions there are fewer social incentives for early unions. Here, families often postpone marriage arrangements in favor of education or other opportunities. There are also fewer social sanctions for marriage delays in these regions. Consequently, more diverse marriages are originating from Hill regions and couples are entering unarranged unions in greater proportions. While arranged unions remain dominant, Niraula and Morgan (1996) found 45 unarranged marriages in this region as compared to just three in the Tarai region. This may be indicative of change in marriage norms both in terms of timing and autonomy in mate selection.

In the context of culture, research has also focused attention on the impact ethnic, religious and caste differentiations can have on marriage age (Agadjanian 1999; Caltabiano & Castiglioni 2008; Celik & Hotchkiss 2000). As the values and beliefs associated with marriage vary across groups, so too can timing behavior. (Agadjanian & Makarova 2003). Dahal, Fricke and Thornton (1993) found a woman's natal clan to be closely related to the risk of first marriage in Nepal. The relationship was so strong it actually distinguished clans from those that shared other marital traditions and customs (Dahal, Fricke & Thornton 1993). This shows that in some settings, kin or ethnic affiliation may actually supersede a community's shared culture in predicting the timing of first marriage.

Factors of Contraceptive Use

Like marriage timing, contraceptive use occurs within a context framed by the characteristics of the individuals involved and the communities in which they live (Wong & Mason 1985). The availability of contraceptive resources is essential in facilitating their use. However, preferences and norms supportive of lower fertility can be critical to the wider adoption of reliable methods (Caldwell, Khuda, Caldwell et al. 1999). Since patterns of use can vary across whole communities, this lends importance to research that explores both macro- and micro-level factors (Wong & Mason 1985). Numerous studies have examined the relationship between contraceptive use and various demographic variables, partner and relationship characteristics and resource accessibility (Manlove 2004; Ford, Pence, Miller & Resnick 2005; Lam 2006). An equally rich literature exists probing the interplay between contraceptive use, norms and characteristics such as age, region of residence and parity (Kamal & Islam 2010; Withers, Kano & Pinatih 2010).

Demographics

Age is a characteristic of particular relevance to the analysis of contraceptive behaviors. In pronatalist cultures, increasing age can be positively associated with contraceptive behaviors as older women with higher parities are more impelled to control their fertility than younger women (Alpu & Fidan 2006). Among some Muslim populations, age has been found to be a powerful predictor of contraceptive use. Research in Jordan revealed a strong association between increasing age and the use of either traditional or modern contraceptive methods (Sueyoshi, Al-Khozah & Ohtsuka 2006). While fewer than half of women under age 30 were using any method, at least 71% of women above age 29 were employing some method of fertility control. Among these groups, use of traditional methods was less prevalent but varied by generation. Almost three times as many women over age 40 were employing traditional methods as compared to women age 15-29 (Sueyoshi et al. 2006).

Yet, contraceptive use does not increase consistently with age and methods preferences have been observed to differ between generations. In Turkey, generational patterns of use were variable across method types. While older women had higher odds of using modern methods than younger groups, the use of traditional methods was 2.3

times more likely among young women (Alpu & Fidan 2006). However these patterns were sharply contrasted among Middle Eastern populations. Research in Iran revealed the odds of modern contraceptive use actually declined with increasing age. Unlike the patterns found in other Muslim populations, younger Iranian women actually had a greater likelihood of using modern methods than older peers (Sadat-Hashemi, Ghorbani, Majdabadi & Farahani 2007).

In other settings, patterns of contraceptive have been observed to fluctuate across generations. In Bangladesh, the odds of contraceptive use were actually greater for rural women age 25-34 than for both older and younger groups (Kamal & Islam 2010). As in Jordan, the lowest proportion of reported contraceptive use was among younger women (<25). In fact, women age 25-34 were twice as likely to be current users of any method than those below 25 and reported the greatest proportion of modern method use. By comparison, traditional method use was far more prevalent among women in the oldest cohort (Kamal & Islam 2010). Although spousal communication around family planning was not a significant predictor of method type, it did have a net effect on overall contraceptive use. This suggests that communication norms may play a role in generational differences in contraceptive use. Among women who had discussed family planning, nearly four times as many were using contraceptives than those who stayed silent on the topic (Kamal & Islam 2010).

Age-related differences in contraceptive use can also be impacted by perceptions of pregnancy risk and community norms around family planning. In communities where contraceptive resources are accessible, older women may be less likely to rely on any method of fertility control if they believe themselves no longer fecund or at lesser risk of pregnancy. This explanation has been proposed to explain sharp disparities in the fertility preferences and reported contraceptive use of women in Bali, Indonesia. Among women over the age of 26 who desired no more children, those age 33 and older were 40% less likely to use contraceptives than their younger counterparts (Withers et al. 2010).

Similarly, young adults may be less likely to employ contraception if perceived community norms hinder their access. In pronatalist communities and those where non-marital sexual activity is stigmatized, simply the act of seeking contraceptive resources can be heavily stigmatized. In several international settings, research has shown that

young adults are often less comfortable attending clinics or seeking health services and reproductive health advice (Bernstein & Juul Hansen, 2006). Such factors could explain why younger women may rely more heavily on traditional methods to control their fertility.

The location of a woman's residence can have important bearing on access to contraceptive resources as well as the likelihood of use. Not surprisingly, women in urban settings are observed as users of contraceptive methods more frequently than rural dwellers. Studies in Turkey show that urban women had 1.24 times greater odds of using modern methods as compared to rural women (Alpu & Fidan 2006). Among women in western Turkey, a region more heavily urbanized than the east, the likelihood women employed modern or traditional contraceptives was five times greater than in the east. This indicates that even the odds of traditional method use were lower among women in the east than in any other region (Alpu & Fidan 2006). Research across Asia has shown rates of contraceptive use vary between urban and rural regions of India, Nepal and Bangladesh (Jayaraman, Mishra & Arnold 2009). In India, some 66% of married women reported current contraceptive use; southern women reported contraceptive use in greater numbers than in the north. Methods preferences also varied by region. Nearly twice as many women in the south were relying upon sterilization as compared to women in the north. However, a higher proportion of northern women were using other modern methods such as the IUD, oral contraception, condoms, implants or injectables (Jayaraman, Mishra & Arnold 2009). These regional differences in use are believed attributable to differing fertility norms, gender preferences and other cultural and social developmental factors. While southern India is distinguished for having lower overall fertility, a more educated female populace and greater levels of economic development, northern India displays higher levels of fertility and a greater emphasis on the birth of sons (Jayaraman, Mishra & Arnold 2009). Women in the south are believed drawn to reversible contraceptive methods as a result of community fertility norms and values that validate large families and those with multiple sons.

Across Bangladesh, region of residence has been found to be associated with the likelihood of contraceptive use as well as increasing parity (Kamal & Islam 2010; Khan & Raeside 1997). While rural residency was a significant predictor of higher parity,

contraceptive use behaviors were observed as varying across different rural regions. Chittagong was specifically distinguished as a region with higher fertility and cultural values that are more traditionally conservative and pronatalist in nature (Khan & Raeside 1997). Not surprisingly, Chittagong women also displayed among the lowest rates of modern contraceptive use in the country (Kamal & Islam 2010). In this manner, important cultural differences around fertility and contraceptive use may be observed both between and within urban and rural communities. These findings further elevate the importance of research that delineates regional norms and values in combination with fertility control behavior.

Resource limitations including reduced access to education campaigns and information may similarly underscore regional differences in support for and use of contraceptives. In Bangladesh, location of residence was the strongest determinant of exposure to family planning outreach campaigns. Rural residents had a lower level of exposure to family planning messages than all other groups, including residents of small cities and towns (Islam & Hasan 2000). Contraceptive use patterns followed a similar trajectory as current users reported higher exposure to health messages than non-users and the probability of using modern contraception increased with exposure to health messages (Islam & Hasan 2000). For rural residents, geographic isolation can reduce the likelihood of contraceptive as a consequence of resource limitations in terms of supplies as well as information.

Parity & Fertility Preferences

Scholars of Central Asia have noted considerable fertility differentials between women of urban and rural residence, different ethnic groups and varying educational levels (Buckley 1998; Agadjanian 2002; Agadjanian & Makarova 2003). While the existing literature shows a clear relationship between demographics and fertility, family size and stated fertility preferences have not been explored fully as predictors of contraceptive behavior in this context. Identification of prevalent cultural values and norms and women's own fertility desires can reveal much about the factors potentially inhibiting or facilitating the use of contraception (Kar & Cumberland 1984).

In much previous research, strong associations have been observed between parity and the likelihood of contraceptive use. In diverse settings throughout Asia and the Middle East, increasing parity has been found to have a positive effect on contraceptive use and a negative effect on the desire for additional children (Sadat-Hashemi, Ghorbani et al. 2007; Kamal & Islam 2010; Jayaraman, Mishra & Arnold 2009). However, closer analysis of these relationships suggests greater complexity than these initial associations may indicate, particularly as cultural norms and access to contraceptives are considered.

In cultures where son preference remains strong, family composition can be a critical factor in determining the parity at which contraceptive use becomes feasible (Jayaraman, Mishra & Arnold 2009). In Pakistan, women with three or more sons were nearly twice as likely as women with fewer sons to be using a modern method (Fikree et al. 2001). Among rural women in Bangladesh, those with one son had 1.6 times the odds of using contraceptives when compared to those with no sons (Kamal & Islam 2010).

Yet, even in these settings, the use of contraceptives can fluctuate with increasing family size. In India and Nepal, the likelihood of modern method use was greatest among women with two sons, but actually declined for women with three or more male children (Jayaraman, Mishra & Arnold 2009). Among urban women in Pakistan, the odds of modern contraceptive use were higher for women with three or more sons than women with three or more daughters (Fikree et al. 2001). A similar pattern in the odds of contraceptive use was also observed in Bangladesh as women with between three and four children had the greatest odds of using contraceptives than women at all other parity levels. In fact, women with five or more offspring had *lower* odds of contraceptive use than women with just one or two children (Kamal & Islam 2010). Although not fully explored in these analyses, higher parity may be as much an outcome of limited access to contraceptives as that of fertility preference in these settings.

However, research has also demonstrated that the behavior of individuals is not always consistent with their reported preferences (Ajzen 1988; Sadat-Hashemi, Ghorbani et al. 2007). In Iran, nearly 40% of women surveyed were not active users of contraceptives, despite expressing a desire for no more children (Sadat-Hashemi et al. 2007). Complicating these associations between preferences and behavior are cultural values and norms stemming from societal as well as religious sources. Although not

explored in the Iranian study, research in Jordan revealed that as many as 75% of Muslim women believed contraceptive use to limit family size was prohibited under Islam (Sueyoshi et al. 2006). A nearly equivalent proportion of Jordanian Muslims believed using contraception without the support of a spouse was forbidden. In this manner, perceptions of religious tenets may actually moderate the relationship between a woman's fertility preferences and her use of contraception (Sueyoshi et al. 2006).

As fertility is the outcome of a couple's shared behavior, it is also indelibly influenced by the politics of gender and power. In patriarchal cultures and communities where male decision-making is paramount, parity concerns and fertility preferences of women may be less evidenced in contraceptive use behaviors. Studies of fertility preferences in rural Kenya indicate higher odds of contraceptive use among couples in which male support for fertility control is greatest. However, the highest odds are visible among couples who share a preference to prevent any further pregnancies (Dodoo & Tempeis 2002). A similar phenomenon is visible among urban couples whose fertility preferences agree, but not in cases of discordance. In contrast to rural patterns, when urban couples disagree on whether to stop fertility, the women's preferences are more predictive of actual contraceptive use (Dodoo & Tempenis 2002).

Such findings highlight the importance of research that probes both fertility preferences as well as cultural values and gender dynamics in deciphering contraceptive use patterns and unmet need.

Marital Characteristics & Timing

Marriage age and spousal differentials in age or education can be indicators of power differentials within marital relationships that can have important influence on contraceptive use behaviors. Additionally, these factors can provide insights into normative family structures and prevalent values of a community. Prior research has shown some correspondence between marriage timing, spousal characteristics and women's status as reflected in marriage traditions, household power and access to education (Casterline, Williams & McDonald 1986). More specifically, settings in which women married at young ages and had large negative age or education differentials with a spouse were frequently also settings characterized by polygyny, patrilocal traditions and

lower social status for women (Casterline et al. 1986). Women in these communities spend a longer period of their adult lives in marriage, limiting opportunities for education and employment and raising potential parity (Barbieri & Hertrich 2005). All such factors have important implications for contraceptive use and methods decision-making.

Across Africa, spousal age differences were highly significant in predicting modern contraceptive use, though to differing degrees (Barbieri & Hertrich 2005). When viewed in aggregate, small age differences (-4 to 4 years) raised the likelihood couples had used a modern method by 2.4 times that of couples with large (15+ years) differences in age. Although socioeconomic characteristics such as education, residence location and marriage type also proved important in predicting contraceptive behaviors, when tested together, large age differences persisted in significance. This indicated spousal age differences had an independent effect on the likelihood of contraceptive use (Barbieri & Hertrich 2005).

A similar relationship has been observed between age and risk of unintended pregnancies among couples in Vietnam and the U.S. Vietnamese women with older spouses (4+ years) had a 1.7 times greater likelihood of reporting unintended pregnancies than peers with younger or similarly aged husbands (Le, Magnani, Rice, Speizer & Bertrand 2004). Among American women, the likelihood of experiencing an unplanned pregnancy was greatest for those under 30 whose partners were 3+ years older (Darroch, Landry & Oslak 1999). Adolescents were particularly at risk. Nearly 70% of those under the age of 18 who had large age differentials with partners (6+ years) reported unplanned pregnancies, compared to just 23% of women 3-5 years younger and 17% of women 2 years younger than their partners. Additionally, adolescents with much older partners also had very low odds of using contraceptives (Darroch et al. 1999).

Among Vietnamese populations, age of marriage was also found to be an important predictor of unintended pregnancy. Specifically, women who married at age 20 or older had 33% lower odds of encountering an unplanned pregnancy than women who married as adolescents (Le et al. 2004).

While many studies have demonstrated the positive effect education can have on contraceptive use, fewer have investigated the impact spousal educational differentials have on behavior (Gubhaju 2009). Although large educational differentials have been

found to have a negative effect on the likelihood of use, the converse is not necessarily true. In Nepal, use of any method was greatest for couples in which husbands had six or more years of education than their wives (Gubhaju 2009). Furthermore, a smaller proportion of women with more education than their husbands reported use of any method (49.6%) as compared to women with no education (52.6%).

Intriguing contraceptive preferences were also evidenced across educational differentials. Couples in which the husband's education far exceeded the wife's were 1.6 times more likely to rely on male sterilization than couples with equivalent schooling. By contrast, female sterilization proved far less common. In fact, the relative risk of reliance on female sterilization actually decreased as a woman's educational level rose (Gubhaju 2009).

Co-residency of Older Adults

Like age, parity and age at marriage, the composition of a woman's household can have bearing on her use of fertility control (Kamal & Islam 2010; Barbieri & Hertrich 2005; Saikia & Singh 2009). Autonomy has been investigated in several Asian settings and has been found to be positively associated with an increased likelihood of contraceptive use and receipt of other reproductive health care (Saleem & Bobak 2005; Mistry, Galal & Lu 2009; Bloom, Wypij & Das Gupta 2001). However, the autonomy of women and their ability to exercise independent decision-making widely varies by culture and region. Although the presence of an older female relative does not automatically depress the decision-making power of younger women, exploring the influence older female relatives do have on contraceptive behaviors remains an important focus of research (Mumtaz & Salway 2007; Fikree, Khan, Kadir, Sajan & Rahbar 2001). Just as spousal preferences and attitudes can impact the likelihood of contraceptive use, so too can senior household members exert pressure in support or opposition to fertility control (Casterline, Sathar, ul Haque 2001; Kadir, Fikree, Khan & Sajan 2003). The process through which women act on their preferences to exercise fertility control can be complicated by the norms and values of older relatives, especially if they hold positions of authority within the household.

The presence of older female relatives is especially important to ascertain in cultures in which female health and fertility are seen as falling within the domain of older women. In these settings, cultural norms dictate that decision-making around pregnancy, antenatal care, delivery assistance and other reproductive health services be exercised by older women who are perceived as having more experience and knowledge of these matters (Mumtaz & Salway 2007). Yet as alluded, co-residency with senior women does not assure young women will receive health care or access to contraceptive resources. In some settings, co-residency is associated with a reduced likelihood of contraceptive use. In India, women in nuclear households were found to have greater odds of using modern contraception and receiving prenatal care than women in households with older female relatives (Saikia & Singh 2009). Among women co-residing with in-laws, their odds of practicing permanent contraception declined by a factor of .5 when compared to women who lived alone with a spouse.

Within research on co-residency, communication about family planning has been found to occur more commonly between mothers-in-law and daughters-in-law than between mothers and their sons (Kadir, Fikree, Khan & Sajan 2003). In Pakistan, over a third of mother- and daughter-in-law pairs who were surveyed reported discussing family planning with one another. While more than a fifth of these older women used family planning discussions to state their opposition to fertility control, other research in Pakistan revealed communication between mothers- and daughters-in-law was positively associated with contraceptive use (Fikree et al. 2001). Of young women who discussed family planning with an older female relative, their odds of employing a modern method were nearly four times greater than women who did not. Additionally, the support older relatives expressed for family planning was deemed significant. Young women whose use of fertility control was not strictly forbidden by a mother-in-law had 1.7 times greater odds of actually employing a modern method than peers whose relatives disapproved.

Yet, the opposition to contraceptive use by mothers-in-law does not necessarily ensure young women will comply with these preferences. Kadir et al. (2003) found that nearly twice as many young mothers desired no more male children as compared to the preferences expressed by senior female relatives (Kadir et al. 2003). Close to half of these young women persisted in adopting contraceptive methods despite the stated opposition

of their mothers-in-law. This finding suggests that even in households in which young women and older relatives hold contrasting fertility preferences, young women can negotiate these differences. Other studies in Pakistan have shown that educated women may not directly challenge household decision-making hierarchies, but have accessed reproductive health services and resources in spite of opposition from older relatives (Mumtaz & Salway 2007). These results show the dynamics of cross-generational relationships may be more complex than what has been suggested in the literature.

Indeed, research on the influence of co-residency on health behavior has not produced consistent results across all settings. Co-residency was not a statistically significant factor in a woman's likelihood of receiving prenatal care in northern India (Bloom, Wypij & Das Gupta 2001). Rather, her connections with natal relations were more significant in predicting access to care. This finding complicates the interpretation of other national-level research in India that revealed a reduced likelihood of antenatal care and contraceptive use among young women in joint households and suggests that regional variations may be an important focus for future research (Saikia & Singh 2009). Interestingly, northern India has been distinguished in prior research for reflecting lower levels of female education, autonomy and higher fertility when compared to other regional populations (Jayaraman, Mishra & Arnold 2009).

In Kyrgyzstan, government policies related to education, economic and social development shifted considerably over the past five decades. However, little is known how extensively marriage timing and contraceptive use have been impacted and in what manner. To better understand how education, employment and cultural factors may be influencing marriage and contraceptive use in Kyrgyzstan, we next explore the historical, political and cultural context of this setting. To further contextualize Kyrgyzstan within the region of Central Asia and the greater Muslim world, we also compare characteristics of its development with that of other Asian Muslim populations.

Background: History, Population & Culture of Kyrgyzstan

A landlocked nation in the heart of Central Asia, Kyrgyzstan is a highly mountainous country with a population of 5.4 million people (WHO 2011). Once a critical artery on the Silk Road, the Central Asian region was annexed by Russia in 1876 (Anderson 1999).

In 1936, the Kyrgyz Soviet Socialist Republic was formally designated a republic of the USSR. Under the Soviets, Kyrgyzstan benefited from state-sponsored economic and industrial growth that included trade with fellow republics, the development of expansive health and educational systems as well as a modernized infrastructure (Anderson 1999; Corcoran-Nantes 2005). These advances notwithstanding, Kyrgyzstan remained one of the poorest republics of the USSR and as much as 25% of its republican income came in the form of subsidies from Moscow (Falkingham, Klugman, Marnie & Micklewright 1997; Meimanaliev, Ibraimova, Elebesov & Rechel 2005). Following the loss of central government support in 1991, Kyrgyzstan suffered a shocking economic decline. Between 1990-95, Kyrgyzstan's GDP fell 50%, agricultural production slipped some 33% and industrial production declined almost two-thirds (Ackland & Falkingham 1997; Anderson 1999). Inflation spiraled from 200% to over 900% between 1991-92 as price controls were lifted (Anderson 1999). Estimates of household poverty vary, but it's widely agreed that levels increased, particularly in southern and rural communities. In 1993, 52% of rural residents were living below the poverty level and 27% of these individuals were experiencing severe poverty. The incidence of poverty was less in urban areas where 31% of the population lived below the poverty level and 10% were in extreme poverty (Ackland & Falkingham 1997). During this period, nearly 70% of households in the southern region of Jalalabad fell below the poverty level (Ackland & Falkingham 1997). There is evidence that women have suffered disproportionately, as well. With the loss of funding from Moscow, many Soviet-era social programs that supported families and women's employment have been reduced or eliminated (Akiner 1997). Austerity measures introduced in 1993 ended nearly all government-funded preschool programs, raising the cost for working mothers to maintain employment (Anderson 1999). In the same year, it was estimated that women constituted nearly 70% of the unemployed (Akiner 1997). Since independence, the incidence of severe poverty has been much higher for female-headed households particularly in urban areas (Falkingham et al. 1997).

Although known as "little Switzerland" for its impressive glaciers and mountain ranges, Kyrgyzstan's geographic features are actually extremely diverse. The landscape varies from alpine conditions in the Tien Shan mountain range to subtropical in the Fergana valley. In spite of possessing great beauty, Kyrgyzstan lacks many of the

profitable, natural resources its neighbors enjoy. Kazakhstan’s extensive oil fields are projected to render it the fifth largest oil producer in the world. Uzbekistan possesses natural gas as well as plentiful arable land for the production of cotton and grain. Kyrgyzstan has great potential in the realms of hydroelectric power and gold extraction but its progress in these industries has been stunted by regional politics, poor infrastructure and geographic challenges (Olcott 2005).

The Kyrgyz population is predominately rural and spread across seven regions. Only 36% of the population resides in urban areas (WHO 2011). Among regions, those in the north and south are bifurcated geographically by a mountain range and socially by contrasting ethnic, religious, cultural and historic experiences (Anderson 1999). While ethnic Kyrgyz dominate the northern regions, ethnic Uzbeks reside in large numbers in the south and constitute the second largest ethnicity in Kyrgyzstan (Schmidt & Sagynbekova 2008). Historically, the Kyrgyz were distinguished for their nomadic heritage and residence in yurt communities where egalitarian gender roles were common.

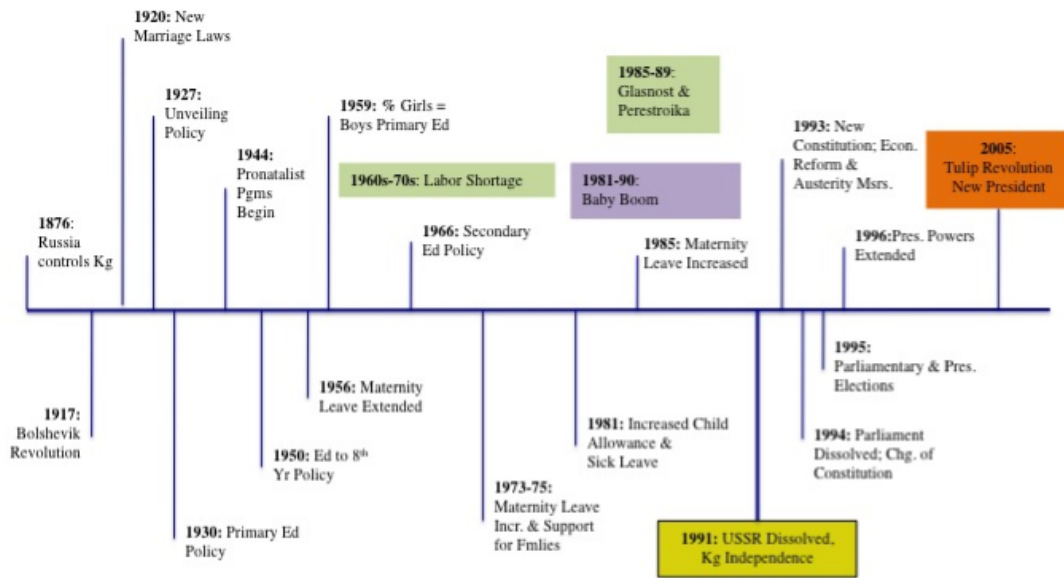


Figure 1.1: Timeline of Major Policies & Events, Kyrgyzstan

Uzbeks, by contrast, were oasis populations who settled early into sedentary communities (Corcoran-Nantes 2005). These conditions informed Uzbek gender roles and enabled sex-segregated traditions to be adopted more easily (Jones & Grupp 1987).

Although Islam is the dominant religion in Kyrgyzstan and Central Asia, its practice and traditions are complex and vary across the region. In the south of Kyrgyzstan, women generally marry earlier and Muslims practice customs of seclusion and veiling. Northern populations converted more recently to Islam and traditions of female seclusion and veiling are less common.

In their effort to dominate Central Asia, early Soviet leaders employed strategies intended to accentuate class identities and weaken traditional belief systems. Redistribution of land and the forcible settlement of nomadic groups were important components of these strategies, however they mainly succeeded in solidifying mistrust of Soviet initiatives among indigenous groups (Northrop 2004). When these early strategies proved ineffective, Soviet leadership focused reforms on Central Asian women who were characterized as victims of oppression and a “Surrogate proletariat” (Northrop 2004; Massell 1974). Political proponents maintained that by altering regional norms of femininity, the Communist doctrine could gain critical proponents and do so at the expense of traditional culture and religious principles (Northrop 2004; Massell 1974; Lubin 1981). Thus, programs to build greater equality and draw women into the public sphere through education, employment and political involvement were not conceived purely as attempts to improve the lives of women but as a means for securing popular support (Agadjanian & Makarova 2003; Corcoran-Nantes 2005). Many of the earliest laws sought to reform traditional customs around marriage. These included prohibitions against marriage for women younger than 16 as well as arranged and polygamous unions and the payment of bride price. New laws expanded women’s rights regarding divorce, family inheritance and child custody in a manner that challenged traditional Islamic law (Heyat 2000; Werner 2004). Schooling laws passed in 1930, 1950 and 1966 similarly expanded educational requirements. These policies spurred significant shifts in the average level of education attained (Jones & Grupp 1987).

Labor pressures inspired many pronatalist and workforce policies aimed at raising fertility and increasing women’s involvement in the professions. Beginning in the 1930s,

these included restrictions on abortion and divorce, the taxation of childless couples as well as generous new benefits for mothers such as free childcare, state-funded family allowances and maternity leave (Goldman 1993; Akiner 1997). Support for working mothers was further extended in the 1950s and through the 1970s as policy-makers targeted women to fill an increasing gap in the labor pool as workers and mothers to the next generation of laborers (Buckley 1989). Debate around the “double burden” carried by working mothers who balanced both employment and family duties intensified in the 1970s. This led to further expansion of childcare services, maternity leave and higher monthly allowances for expanding families. Notably, working mothers received greater financial incentives than did full-time mothers for their second and third births (Jones & Grupp 1987). This had the effect of spurring a baby boom from 1981-90 across the USSR, although application of the policy in Central Asia was delayed until 1983 (Jones & Grupp 1987; Zakharov 2008).

In addition to raising women’s participation in education and the workforce, Soviet efforts also involved direct investment in Kyrgyzstan’s infrastructure, industrial development and health care. The scope and impact of these investments is most readily evidenced when Kyrgyzstan’s development and health indicators are compared against those of other Muslim populations in Asia. As displayed in Table 1, Kyrgyzstan remains a predominately rural nation. However, the growth of its urban communities was facilitated under Soviet rule (Anderson 1999).

Country	Population	Grwth Rate	Life Expectancy	Infant Mortality	Total Fertility Rate	Mean Age Marriage	% Urban Pop	Contraceptive Prevalence	Education		
				per 1000 births					Literate	Primary	Secondary+
Afghanistan (year)	16.5 million 1985	0.60% 1980-5	37 yrs 1980-5	193.8 1980-5	6.9 1980-5	17.8 1979	18.50% 1985	2% 1972-3			
Pakistan (year)	103 million 1985	3.80% 1980-5	54 yrs 1980-5	120 1980-5	7 1980-5	19.8 1981	29.80% 1985	7.60% 1984-5	11 ^a	6.7 ^a 1975	4 ^a
Turkey (year)	50.3 million 1985	2.50% 1980-5	61.6 yrs 1980-5	92 1980-5	3.9 1980-5	20.7 1980	45.90% 1985	51% 1983	59 ^b	38.5 ^b 1983	9.14 ^b
Kyrgyzstan (year)	3.6 million ^c 1980	2.3% ^d 1960-92	67 yrs ^c 1985	41.6 ^c 1985	4.1 ^e 1982-3	20.9 ^f 1989	38.3% ^c 1985	60% ^c 1997	99 ^g	28.5 ^g 1970	34.9 ^g

Source: 1985 UN World Population Prospects, unless otherwise noted
a: 1976 Pakistan Fertility Survey ; b: 1983 Turkish Fertility Survey ; c: 2011 European Health for All Database ; d: 1994 UNDP Human Development Report; e: 1987 Jones & Grupp; f: 1989 Russian Census ; g: 1986, Akiner

Table 1.1: Key Social Development & Health Indicators of Afghanistan, Pakistan, Turkey & Kyrgyzstan

By the mid-1980s, almost 40% of the population resided in urban areas, a slightly smaller proportion than in Turkey. Yet, Kyrgyzstan boasted between 10-20% more urban dwellers than Pakistan and Afghanistan.

Through the 1980s, Kyrgyzstan was a far smaller country in overall population. In 1980, its population numbered just over 3.6 million, a fraction of the size of the Turkish and Pakistani populations. However all three nations boasted relatively high growth rates. In fact, Kazakhstan was the only Central Asian nation with a growth rate below 2% during this period (UNDP 1994). These high levels of annual growth were mirrored in national fertility rates. The average woman was bearing around seven children over the course of her reproductive lifetime in Afghanistan and Pakistan. Slightly lower parities were observed in Turkey and Kyrgyzstan where the average woman bore between four and five children, respectively.

While modern contraception was not readily available during the Soviet period, women in Kyrgyzstan did have access to abortion. By some estimates, women in Kyrgyzstan relied on this method of fertility control more so than other Muslim groups in Central Asia (Jones & Grupp 1987; Bauer, Green & Kuehnast 1997). In 1985, it was estimated that for every 100 live births approximately 55 pregnancies ended in termination (Bauer, Green & Kuehnast 1997).

Female educational levels also varied across these Muslim countries. While only 11% of Pakistani women were literate in the mid-1970s, basic literacy was nearly universal among women in Kyrgyzstan. Literacy levels in Kyrgyzstan were greater than those in Turkey as were the proportions of women receiving a primary-level education or more. Nearly four times as many Kyrgyz women had a secondary education or more than women in Turkey. Although literacy and education indicators are not available for Afghanistan during this period, it's clear that the female population in Soviet Kyrgyzstan was highly educated in comparison to many of its Muslim neighbors.

In addition to education, Soviet investment in health care is also reflected in many health indicators for Kyrgyzstan. Initiatives to improve services for mothers and their infants were especially successful at reducing infant mortality rates. While 92 out of every 1000 Turkish infants died before reaching their first birthday, in Kyrgyzstan the rate was less than half that of Turkey. In fact, Kyrgyzstan boasted the lowest infant

mortality rate of these four nations. Furthermore, infants born in Kyrgyzstan had greater projected longevity than their counterparts in Turkey, Pakistan and Afghanistan. By 1985, the life expectancy at birth in Kyrgyzstan had reached 67 years, three decades longer than in Afghanistan and 13 years longer than in Pakistan. These dramatic differentials in basic health indicators demonstrate the degree to which development efforts positively impacted population health in Kyrgyzstan.

These differences were particularly evidenced across women's event timing and reproductive health indicators. Through the late 1970s and early 1980s, adolescent marriage was quite common in both Afghanistan and Pakistan. As reflected in mean age of marriage statistics, the average Afghan woman entered her first union before turning 18. In Pakistan, average marriage age was slightly higher as women became brides just prior to their 20th birthday. By comparison, Turkish and Kyrgyz women waited up to a year longer to marry. In 1989, Kyrgyz women were marrying around age 21, on average.

Patterns of contraceptive use were also quite divergent across these nations. Between the 1970s-80s, less than 10% of married women in Pakistan and less than 5% in Afghanistan reported contraceptive use. In fact, the number of married women using contraceptives was seven times higher in Turkey than in Afghanistan. Similarly, over half of married women in Kyrgyzstan were contraceptive users in 1997. Such indicators show how dramatically the level of health and economic development differed across Asia.

In 1991, dissolution of the USSR eliminated funding support critical to maintaining many of these health and education programs. Between 1995 and 2003, government investment in health declined from 4% to 1.8% of GDP (USAID 2007). Aggressive market reform efforts and restructuring of public enterprises, banking and agriculture have improved conditions in the interim, but the pace of economic recovery has been slow. Kyrgyzstan relied heavily on international loans to finance reforms and it now carries the largest debt-to-income ratio in the region (Olcott 2005). Despite these challenges, the government in Kyrgyzstan began comprehensive reform of its health care system in 1993 with international support. By late 1996, Kyrgyzstan was estimated to have received upwards of \$680 million in assistance from international organizations and foreign nations (Abazov 1999). This effort has included the creation of mandatory health

insurance, strengthening of primary health care, the expansion of local health and family planning services, the creation of contraceptive resource distribution systems and updated health educational programs for medical professionals (USAID 2007).

The improvement of reproductive health services and resources was a main aim of the reform effort. As part of its strategy, access to a diversity of modern contraceptives has been increased, nationwide. Citizens with mandatory health insurance are eligible to purchase a range of oral contraceptives and an injectable at reduced cost (USAID 2007). However, the UNFPA, USAID and Global Fund, among others have been actively donating contraceptive supplies for distribution through health facilities since the early 1990s (Corcoran-Nantes 2007; USAID 2007). In 2006 alone, funding for contraceptive supplies from UNFPA, USAID and the Global Fund totalled \$638,000 (Armand, O'Hanlon, Seligman et al. 2006). These donated supplies have included oral contraceptives, condoms, intrauterine devices and injectables (USAID 2007).

Advances have been made in birth delivery services and the accessibility of contraception in Kyrgyzstan. In 2006, between 92-99% of pregnant women received antenatal care at least once prior to delivery (UNICEF 2006). UNICEF estimates that nearly 97% of new births were delivered in formal health care facilities over the same period. Yet, maternal mortality rates remain at elevated levels. Between 2006-2008, the number of women who died while pregnant or following the termination of a pregnancy ranged from 81 to 104 per 100,000 live births (WHO 2011; UNICEF 2006). Under-five mortality rates in Kyrgyzstan are slightly higher than those of neighboring countries at 37 per 1000 live births (WHO 2011). In 2010, Kazakhstan and Uzbekistan reported under-five mortality rates of 29 and 36, respectively.

Fertility rates have significantly declined in Kyrgyzstan over the past several decades. Today, fertility rates in Kyrgyzstan are slightly higher than those of its nearest neighbors. In 2009, the total fertility rate for Kyrgyzstan was 2.5 as compared to 2.3 in Kazakhstan and 2.2 in Uzbekistan (WHO 2011). However, the adolescent pregnancy rate in Kyrgyzstan is neither the highest nor lowest in the region. According to the WHO's most recent figures (2011), 29 per 1000 women age 15-19 were pregnant in Kyrgyzstan as compared to 31 in Kazakhstan and 26 per 1000 in Uzbekistan.

Marriage Timing Dynamics in Kyrgyzstan

Previous research has revealed strong relationships between educational attainment and marriage timing dynamics. While the degree of delay can vary between cultures, we anticipate that Soviet-era education policies and changing educational norms will be evidenced in marriage delays across Kyrgyzstan. As schooling opportunities expanded and educational requirements were formalized, it is likely that the pursuit of schooling beyond the primary level became a normative expectation in many communities. Furthermore, as the education of women became more widespread, we expect it had an increasingly positive effect on marriage timing among subsequent generations. As observed elsewhere, the educational level of parents has bearing on the marriage timing of younger generations. In Kyrgyzstan we anticipate that the effect education has on marriage timing will build over time and may result in normative change whereby unions prior to the completion of schooling will become less common. However, given the traditional importance of marriage and kin networks in this context, we do not anticipate any shifts in the proportions of women who enter marriage. Rather, it will remain a near universal experience but one commonly delayed until schooling has been completed.

Like education, employment has been found to have a negative effect on early marriage trends in many Muslim settings. Given government policy and program emphasis on women's employment through the duration of the Soviet period, we expect to observe high proportions of women employed in Kyrgyzstan. Across regions, women in higher status professions who reside in urban centers will likely reflect the greatest delays of entry into marriage. More modest delays are expected among rural groups. We anticipate such differences will stem from cultural differences as well as occupational and social network characteristics. Women in rural communities have more proximate family and community networks on which to rely for support (Akiner 1997). However, it is also expected that close rural networks could function to reinforce earlier marriage norms as compared to the networks of urban women. Among women who come of age during *Perestroika* policies, we expect to see a reduced age of marriage particularly among ethnic Uzbeks residing in Kyrgyzstan. This pattern would mirror that observed in

neighboring Uzbekistan, which some scholars believe was motivated by economic conditions of that period.

Given the historic, cultural and religious differentials between ethnic groups in Central Asia, we anticipate that normative marriage timing patterns of ethnic Kyrgyz women will most closely reflect those of women in Kazakhstan. These groups share a common nomadic heritage in which gender roles were relatively equivalent. Religious traditions and cultural norms between these groups are similar and we expect to see these commonalities reflected in marriage timing norms. While all groups practice patrilocal marriage traditions, arranged marriages are more common among ethnic Uzbeks and may distinguish their timing patterns from those of ethnic Kyrgyz populations (Barbieri, Blum, Dolkigh & Ergashev 1996; Akiner 1997). However, a rise in the frequency of bride kidnapping in Kyrgyzstan may also serve to offset normative differences between ethnic Uzbek and Kyrgyz timing patterns, particularly in economically depressed communities.

Contraceptive Use Dynamics in Kyrgyzstan

Review of the contraceptive use literature has led us to identify several factors that are expected to impact patterns of contraceptive use in Kyrgyzstan. As a traditionally pronatalist culture whose high fertility norms were further reinforced by Soviet policies, we expect low rates of contraceptive use to be observed among young married women. It is anticipated that all methods of fertility control will be more widely employed by older women at higher parities and that increasing age will be associated with increased likelihood of contraceptive use. Given the high levels of education that span several generations of women in Kyrgyzstan, we believe that knowledge and use of modern methods will be more widespread than traditional methods. This may be the case especially in urban areas where access to modern methods is greater. Traditional methods will be employed by an overall smaller proportion of women, predominately those in rural communities.

Regional differences in cultural traditions, religious values and fertility preferences are expected to further inform contraceptive patterns across Kyrgyzstan. As revealed in other Islamic cultures, women in more traditionally observant Muslim

communities have a greater likelihood of perceiving fertility control as a forbidden activity under Islam. If similar interpretations of Islamic law are present in Kyrgyzstan, we expect they will be more prevalent among women in the south. Higher parity fertility norms will likewise be more common in this region.

Different patterns of contraceptive use are also expected to be visible among women in the north and east of Kyrgyzstan. Given its proximity to the capital city, northern women will likely reflect contraceptive use patterns and norms that more closely parallel those of urban dwellers. Their access to modern methods will be greater than in other regions and fertility norms will be more supportive of contraceptive use at lower parities. By contrast, women in the east are predominately rural dwellers and may be expected to demonstrate lower rates of modern contraceptive use. Community norms in this region will be more supportive of large families and thus women who do employ contraceptive methods are more likely to be those at higher parities.

Additionally, factors such as spousal fertility preferences, marriage timing and age differentials between couples are also expected to vary in importance across regions. Given the high educational levels observed in Kyrgyzstan and the historically equivalent access women and men have had to schooling, we anticipate educational differentials between spouses to play a less significant role in determining contraceptive use patterns. However, in communities where patriarchal traditions and more segregated gender roles are practiced we expect fertility preferences and contraceptive use to be more closely associated with the preferences of men. More specifically, it's anticipated that women in the south will defer contraceptive use decision-making to their husbands. Earlier marriage and larger age differentials are expected to be observed among southern populations and ethnic Uzbeks, in particular. As with fertility preferences, we expect contraceptive use patterns to be dictated by men in these settings. Furthermore, we predict lower rates of contraceptive use will be evidenced among women who have married early and entered unions with men several years older than themselves. Marriage timing and age differentials are expected to be less influential in determining contraceptive use in the remaining regions of Kyrgyzstan.

Conclusion

Research exploring how individual- and community-level factors influence marital fertility remains critically relevant to the study of many post-Soviet settings. In Central Asia, fluctuations in marriage timing have challenged prevailing, global patterns of a rise in median age at first marriage. Similarly, patterns of contraceptive use have defied easy explanation as fertility rates have declined despite a modern resurgence of traditional ideals and a dearth of contraceptive resources under the Soviets. These shifts in marriage timing and contraceptive use are rendered more unusual by the context in which they have occurred. Across Muslim nations in Asia, Kyrgyzstan holds an enviable position as a nation with a moderate level of social development, including high levels of literacy and improving population health. While past research shows that increasing education and employment opportunities can positively influence marriage delays and fertility control, the legacy of Soviet-era development policies in present-day Kyrgyzstan is less clear. More research is needed to elucidate precise periods of timing fluctuations, dominant patterns of contraceptive use behaviors and the social circumstances surrounding these changes. Such research could advance our understanding of the nuanced dynamics behind marriage timing and contraceptive use in Kyrgyzstan as well as lend important insights into marital fertility patterns elsewhere in Central Asia and the developing Muslim world.

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Chapter II

Marriage Timing in Kyrgyzstan: Defining or Defying Convention?

Introduction

Over the past 50 years, the age of marriage for women has been increasing around the world (McDonald 1985; Mensch, Singh & Casterline 2005). World Fertility Survey research revealed wide declines in median age of marriage throughout East and Southeast Asia between the early 1950s and late 1960s (McDonald 1985). More recent international studies have shown sharp reductions in the proportion of women entering marriage as adolescents. These shifts have been evidenced in Asian contexts, the Middle East and parts of Africa (Mensch et al. 2005). However, little is known how marriage trends have evolved in post-Soviet Central Asia and whether large-scale societal shifts have inspired change in the timing of first marriage.

Changes in marriage timing proffer important health benefits to women and their families. In cultures where premarital sex is uncommon, delays in marriage postpone sexual debut. This has key implications for a woman's risk of adolescent pregnancy, birth complications, lifetime fertility and risk of infectious disease. Adolescent brides have a longer exposure to the risk of pregnancy and larger potential family size (Heaton 1996; Singh & Samara 1996). Research has also revealed powerful associations between women's education and the health of their families (Cleland & van Ginneken 1988; Basu & Stephenson 2005). Even at minimal levels, the children of women with some education are less likely to be stunted or underweight and have a lower risk of mortality (Basu & Stephenson 2005; Moestue & Huttly 2008). Entering marriage later not only provides a woman time to pursue schooling or work, it can portend better health for herself and her future kin

In the Central Asian nation of Kyrgyzstan, marriage timing is a critical, yet understudied subject of research. Over the past half-century, considerable shifts in policy,

governance and economic structures have had a profound effect on women and their families (Corcoran-Nantes 2005). Yet, little is known how marriage timing has changed, if at all, over this period. We intend to narrow this gap by investigating historic trends in marriage timing across five cohorts of Kyrgyz women. Among the goals of our research, we aim to identify the dominant patterns of entry into marriage and where fluctuations may be evident. We explore what contrasting patterns may reveal about prevalent cultural traditions and values, shifting ideals and consider the influence policy and structural factors have had on women and their families over this period.

Factors of Marriage Timing

Past studies have delineated a number of factors known to influence marriage timing either as facilitators or forces of delay. Cultural norms and traditions are among the most visible and powerful factors as they are introduced early in life and are reinforced across whole communities. They've been the focus of several preeminent demographic studies and underscore much of demographic theory (Hajnal 1965; Cleland 1985; Coale & Watkins 1986). Early research in Europe revealed patterns of delayed marriage and lower fertility were shared among regions with similar ethnic, religious or linguistic characteristics (Anderson 1986). The work of Hajnal (1965) showed variations in marriage timing were so distinct as to be delineated geographically, separating cultures of eastern Europe from those in the west.

Beyond Europe, many studies in Asia have demonstrated analogous relationships between cultural norms and median age of marriage. Across regional populations of India, Basu (1993) found important parallels between marriage formation customs and the timing of first union. Comparing the customs of two regions, Basu found that those who married earlier practiced traditions of exogamy and hypergamy that separated brides from their natal families and depressed their status in the marital home. In regions where marriage occurred later, Basu found intra-kin unions were more common. As most entered endogamous marriages, women maintained connections with birth families and may have been less isolated, as a result (Dyson & Moore 1983).

Group differences in marriage timing have similarly been observed between populations of contrasting ethnicities, religions and castes (Dahal & Fricke 1993;

Agadjanian & Makarova 2003; Caltabiano & Castiglioni 2008). This has led some to argue that deciphering the cultural context of a community is fundamental to understanding normative timing patterns and delineating where change may be underway (Caltabiano & Castiglioni 2008).

Among factors known to delay marriage, education and employment have been extensively studied across a multitude of cultures and regions (Heaton 1996; Aryal 2006; Bates, Maselko & Schuler 2007). Global comparative studies have shown that even partial completion of secondary education reduces a young woman's risk of adolescent marriage, almost universally (Singh & Samara 1996). Interestingly, parental education also shows significance as a predictor of marriage age. The education of fathers, even at modest levels, was found to reduce the hazard of early marriage among daughters in Nepal (Choe, Thapa & Mishra 2005). In Bangladesh, the hazard of early marriage for daughters whose mothers had five or more years of education was 40% of the hazard for daughters of uneducated mothers (Bates et al. 2007).

Education is believed to influence marriage timing primarily as a force for ideational and normative change (Bongaarts & Watkins 1996; Jayakody, Thornton & Axinn 2008). Schooling improves literacy and can introduce alternative ideals and perspectives as well as new sources of authority and socialization beyond the family (Yabiku 2006; Aryal 2006). Additionally, education builds skills that can impact the likelihood of employment for young adults (Singh & Samara 1996; Malhotra 1997). Studies of female employment among Muslim groups showed that working women with at least a secondary education delayed marriage 1 to 3 years later than equivalently educated, non-working peers (Heaton 1996).

Scholars have uncovered strong associations between premarital work and the timing of marriage (Hirschman 1985; Heaton 1996; Yabiku 2005). Like education, employment exposes young adults to new networks and aspirations that may challenge traditional norms and family authority (Yabiku 2005). It can also draw young adults geographically away from natal communities. Such distance can weaken traditional normative influences and provide attractive financial incentives for later marriage (Caltabiano & Castiglioni 2008). Singh and Samara (1996) found that urban women who were employed enjoyed greater parental support for marriage delays than their

unemployed peers. For some families, even a modest supplementary income provided by a working daughter can be a strong inducement for later marriage (Choe et al. 2005).

However, the influence of employment on marriage timing can fluctuate across occupation type. In Nepal and Malaysia, paternal employment in a non-service, non-agricultural profession was associated with later marriage of daughters (Brien & Lillard 1994; Aryal 2006). Conversely, a higher risk of early marriage was evidenced among the daughters of agricultural workers (Brien & Lillard 1994). Across Asia, Hirschman (1985) found non-familial employment in service industries or blue-collar work raised the average age of marriage by 1.8 to 2.5 years. Clerical workers delayed marriage an average of 5.4 years, while the unemployed and agricultural workers entered marriage almost a year earlier, on average (Hirschman 1985).

Employment, education and cultural norms are of particular salience to investigations of marriage timing in Central Asia. As discussed in the following section, women were in a unique position throughout the twentieth century as the focus of government campaigns and the recipients of state-funded incentives for schooling and employment. Yet, the manner in which these new roles were introduced, the policies employed to promote their expansion, cultural and power differentials between traditional and governing populations likely moderated their influence. For these reasons, Kyrgyzstan is an especially fascinating setting for exploring the intersection of structural change and individual-level factors on the timing of marriage.

Background: History, Population & Culture of Kyrgyzstan

A landlocked nation in the heart of Central Asia, Kyrgyzstan is a highly mountainous country with a population of 5.3 million people (World Health Organization 2011). Once a critical artery on the Silk Road, the Central Asian region was annexed by Russia in 1876 (Anderson 1999). In 1936, the Kyrgyz Soviet Socialist Republic was formally designated a republic of the USSR. Under the Soviets, Kyrgyzstan's physical infrastructure and economic state evolved rapidly. New trade was facilitated with fellow republics, expansive health and educational systems were constructed and infrastructure was modernized (Anderson 1999; Corcoran-Nantes 2005). These advances notwithstanding, Kyrgyzstan remained one of the poorest republics of the USSR and as

much as 25% of its republican income came in the form of subsidies from Moscow (Falkingham, Klugman, Marnie & Micklewright 1997; Meimanaliev, Ibraimova, Elebesov & Rechel 2005). Following its sudden independence from the USSR in 1991, Kyrgyzstan suffered a shocking economic decline. Between 1990-95, Kyrgyzstan's GDP fell 50%, agricultural production slipped some 33% and industrial production declined almost 67% (Ackland & Falkingham 1997; Anderson 1999). Inflation spiraled from 200% to more than 900% between 1991-92 as price controls were lifted (Anderson 1999). Estimates of household poverty vary, but it's widely agreed that levels increased, particularly in the southern region and rural communities. At this time, nearly 70% of households in the southern region of Jalalabad fell below the poverty level (Falkingham et al. 1997). There is evidence that women suffered disproportionately during this period of transition. The loss of central-government support necessitated the elimination of many social programs that supported families and enabled women to more easily balance motherhood and employment (Akiner 1997). Austerity measures introduced in 1993 ended nearly all government-funded preschool programs, raising the cost of employment for working mothers (Anderson 1999). Such changes likely contributed to rising unemployment among women. In 1991, it was estimated that women constituted nearly 70% of the unemployed (Akiner 1997). Additionally, the incidence of severe poverty has been much higher for female-headed households particularly in urban areas (Ackland & Falkingham et al. 1997).

The population of Kyrgyzstan is predominately rural and spread across seven regions. Only 36% reside in urban areas (World Health Organization 2011). Among regions, those in the north and south are bifurcated geographically by a mountain range and socially by contrasting ethnic, religious, cultural and historic experiences (Anderson 1999). While ethnic Kyrgyz dominate the northern regions, ethnic Uzbeks reside in large numbers in the south and constitute the second largest ethnicity in Kyrgyzstan (Schmidt & Sagynbekova 2008). Historically, the Kyrgyz were distinguished for their nomadic heritage and residence in yurt communities where egalitarian gender roles were common. Uzbeks, by contrast, were distinguished as oasis populations who settled early into sedentary communities (Corcoran-Nantes 2005). These conditions informed Uzbek

gender roles; sex-segregated traditions are more common among these groups (Jones & Grupp 1987).

Although Islam is the dominant religion in Kyrgyzstan, distinctions in its practice also vary regionally. In the south, Muslim women generally marry earlier and practice customs of seclusion and veiling. Northern populations converted more recently to Islam and customs of female seclusion and veiling are less widespread. As a consequence of geography, northern groups also lived in closer proximity to Russian settlers and more readily reflect western influences in their values and lifestyles (Akiner 1997). Political affiliations also fall along regional lines. Northern groups were long perceived by those in the south as having benefitted from their proximity to Russian settlers and geographically based political affiliations remain vital in the present day.

In their effort to dominate Central Asia, early Soviet leaders employed strategies intended to accentuate class identities and weaken traditional belief systems. Redistribution of land and the forcible settlement of nomadic groups were important components of these strategies, however they mainly succeeded in solidifying mistrust of Soviet initiatives among indigenous groups (Northrop 2004). When these early strategies proved ineffective, Soviet leadership focused reforms on Central Asian women who were characterized as victims of oppression and a “Surrogate proletariat” (Northrop 2004; Massell 1974). Political proponents maintained that by altering regional norms of femininity, the Communist doctrine could gain critical proponents and do so at the expense of traditional culture and religious principles (Northrop 2004; Massell 1974; Lubin 1981). Thus, programs to build greater equality and draw women into the public sphere through education, employment and political involvement were not conceived purely as attempts to improve the lives of women but as a means for securing popular political support (Agadjanian & Makarova 2003; Corcoran-Nantes 2005). Many of the earliest laws sought to reform traditional customs around marriage. These included prohibitions against marriage before the age of 16, arranged and polygamous unions and the payment of bride price. New laws expanded women’s rights regarding divorce, family inheritance and child custody in a manner that challenged traditional Islamic law (Heyat 2000; Werner 2004). Schooling laws passed in 1930, 1950 and 1966 similarly expanded

educational requirements. These policies spurred significant shifts in the average level of education attained (Jones & Grupp 1987).

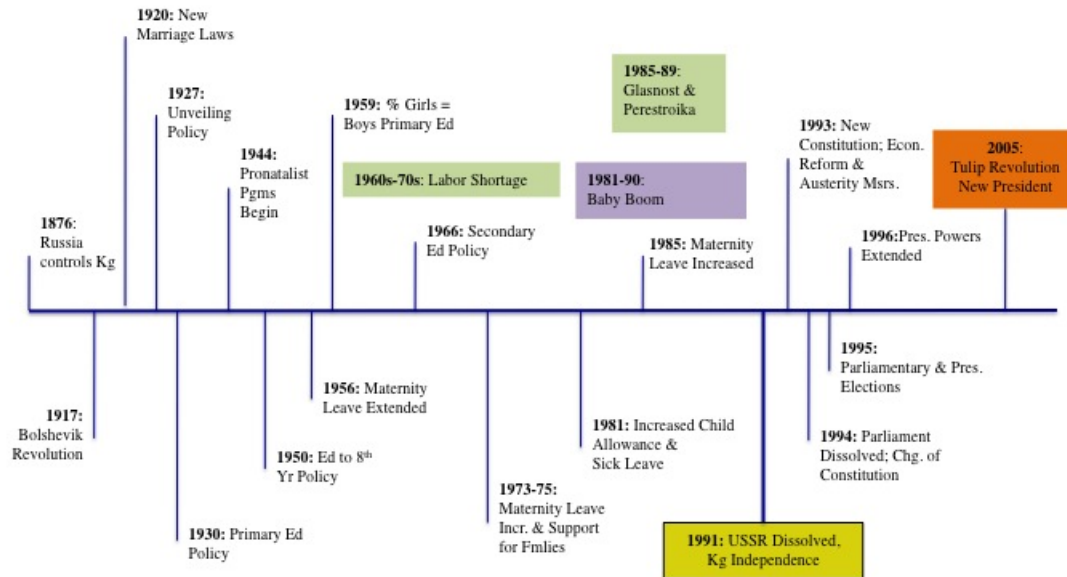


Figure 2.1: Timeline of Major Policies & Events, Kyrgyzstan

Labor pressures inspired many pronatalist and employment policies to raise fertility and women’s involvement in the labor force. Beginning in the 1930s, these included restrictions on abortion and divorce, the taxation of childless couples as well as generous new benefits for mothers such as free childcare, state-funded family allowances and maternity leave (Goldman 1993; Akiner 1997). Support for working mothers was further extended in the 1950s and through the 1970s as Soviet policy-makers targeted women to fill an increasing gap in the labor pool as workers and mothers to the next generation of laborers (Buckley 1989). However, debate around the “double burden” carried by working mothers intensified in the 1970s and led to further growth of childcare services, maternity leave and higher monthly allowances for expanding families. At this time, working mothers were awarded greater financial incentives than full-time mothers for their second and third births (Jones & Grupp 1987). Some scholars credit this benefit with spurring a baby boom between 1981-90 across the USSR, although its application was delayed in Central Asia until 1983 (Jones & Grupp, 1987; Zakharov 2008).

In addition to raising women’s participation in education and the workforce, Soviet policies also involved direct investment in regional infrastructure, industrial development and health care. While these changes were not universally welcomed, their scope and impact is clearly evidenced in the development and health indicators of Kyrgyzstan. As displayed in Table 2.1, Kyrgyzstan remains a predominately rural nation. However, by the mid-1980s, almost 40% of the Kyrgyz population resided in urban areas, a slightly smaller proportion than in Turkey. Yet, Kyrgyzstan had between 10-20% more urban dwellers than Pakistan and Afghanistan.

Country	Population	Grwth Rate	Life Expectancy	Infant Mortality	Total Fertility Rate	Mean Age Marriage	% Urban Pop	Contraceptive Prevalence	Education		
				per 1000 births					Literate	Primary	Secondary+
Afghanistan (year)	16.5 million 1985	0.60% 1980-5	37 yrs 1980-5	193.8 1980-5	6.9 1980-5	17.8 1979	18.50% 1985	2% 1972-3			
Pakistan (year)	103 million 1985	3.80% 1980-5	54 yrs 1980-5	120 1980-5	7 1980-5	19.8 1981	29.80% 1985	7.60% 1984-5	11 ^a	6.7 ^a	4 ^a
Turkey (year)	50.3 million 1985	2.50% 1980-5	61.6 yrs 1980-5	92 1980-5	3.9 1980-5	20.7 1980	45.90% 1985	51% 1983	59 ^b	38.5 ^b	9.14 ^b
Kyrgyzstan (year)	3.6 million ^c 1980	2.3% ^d 1960-92	67 yrs ^c 1985	41.6 ^c 1985	4.1 ^e 1982-3	20.9 ^f 1989	38.3% ^c 1985	60% ^c 1997	99 ^g	28.5 ^g	34.9 ^g

Source: 1985 UN World Population Prospects, unless otherwise noted
a: 1976 Pakistan Fertility Survey ; b: 1983 Turkish Fertility Survey; c: 2011 European Health for All Database ; d: 1994 UNDP Human Development Report; e: 1987 Jones & Grupp; f: 1989 Russian Census ; g: 1986, Akiner

Table 2.1: Key Social Developmeng & Health Indicators of Afghanistan, Pakistan, Turkey & Kyrgyzstan

Through the 1980s, Kyrgyzstan boasted a smaller overall population of just over 3.6 million, a fraction of the size of the populations in Turkey and Pakistan. However, all three nations boasted relatively high growth rates. In fact, Kazakhstan was the only Central Asian nation with a growth rate below 2% during this period (UNDP 1994). These high levels of annual growth were mirrored in national fertility rates. The average woman was bearing around seven children over the course of her reproductive lifetime in Afghanistan and Pakistan. Slightly lower parities were observed in Turkey and Kyrgyzstan where the average woman bore between four and five children, respectively.

Educational levels among women also varied across these countries. While only 11% of Pakistani women were literate in the mid-1970s, basic literacy was nearly universal among women in Kyrgyzstan. Literacy levels in Kyrgyzstan were greater than those in Turkey as were the proportions of women receiving a primary-level education or more. The female population in Soviet Kyrgyzstan was highly educated in comparison to many of its Asian neighbors.

In addition to education, Soviet investment in health care also distinguished Kyrgyzstan from other Asian nations. Initiatives to improve services for mothers and their infants were especially successful at reducing infant mortality rates. While 92 out of every 1000 Turkish infants died before reaching their first birthday, in Kyrgyzstan the rate was less than half that of Turkey in the early 1980s. Furthermore, infants born in Kyrgyzstan had greater projected longevity than their counterparts in Turkey, Pakistan and Afghanistan. By 1985, the life expectancy at birth in Kyrgyzstan had reached 67 years, three decades longer than in Afghanistan and 13 years longer than in Pakistan.

These differences were particularly evidenced across women's event timing and reproductive health indicators. Through the late 1970s and early 1980s, adolescent marriage was quite common in both Afghanistan and Pakistan. By comparison, Turkish and Kyrgyz women waited up to a year longer to marry. In 1989, Kyrgyz women were marrying around age 21, on average.

In 1991, dissolution of the USSR eliminated funding support critical to maintaining many of these health and education programs. Between 1995 and 2003, government investment in health declined from 4% to 1.8% of GDP (USAID 2007). Aggressive market reform efforts and restructuring of public enterprises, banking and agriculture have improved conditions in the interim, but the pace of economic recovery has been slow. Kyrgyzstan relied heavily on international loans to finance reforms and it now carries the largest debt-to-income ratio in the region (Olcott 2005). Despite these challenges, the Kyrgyz government began comprehensive reform of its health care system in 1993 with international support. By late 1996, Kyrgyzstan was estimated to have received upwards of \$680 million in assistance from international organizations and foreign nations (Abazov 1999). This effort has included the creation of mandatory health insurance, strengthening of primary health care, the expansion of local health and family planning services, the creation of contraceptive resource distribution systems and updated health educational programs for medical professionals (USAID 2007).

The improvement of reproductive health services and resources was a main aim of the reform effort. As part of its strategy, access to a diversity of modern contraceptives has been increased, nationwide. Citizens with mandatory health insurance are eligible to purchase a range of oral contraceptives and an injectable at reduced cost (USAID 2007).

However, the UNFPA, USAID and Global Fund, among others have also been actively donating contraceptives supplies for distribution through health facilities since the early 1990s (Corcoran-Nantes 2007; USAID 2007). In 2006 alone, funding for contraceptive supplies from UNFPA, USAID and the Global Fund totalled \$638,000 (Armand, O’Hanlon, Seligman et al. 2006). These donated supplies have included oral contraceptives, condoms, intrauterine devices and injectables (USAID 2007).

Advances have been made in birth delivery services and the accessibility of contraception in Kyrgyzstan. In 2006, between 92-99% of pregnant women received antenatal care at least once prior to delivery (UNICEF 2006). UNICEF estimates that nearly 97% of new births were delivered in formal health care facilities over the same period. Yet, maternal mortality rates remain at elevated levels. Between 2006-2008, the number of women who died while pregnant or following the termination of a pregnancy ranged from 81 to 104 per 100,000 live births (WHO 2011; UNICEF 2006). Under-five mortality rates in Kyrgyzstan are slightly higher than those of neighboring countries at 37 per 1000 live births (WHO 2011). In 2010, Kazakhstan and Uzbekistan reported under-five mortality rates of 29 and 36, respectively.

Fertility rates have significantly declined in Kyrgyzstan over the past several decades. Today, fertility rates in Kyrgyzstan are slightly higher than those of its nearest neighbors. In 2009, the total fertility rate for Kyrgyzstan was 2.5 as compared to 2.3 in Kazakhstan and 2.2 in Uzbekistan (WHO 2011). However, the adolescent pregnancy rate in Kyrgyzstan is neither the highest nor lowest in the region. According to the WHO’s most recent figures (2011), 29 per 1000 women age 15-19 were pregnant in Kyrgyzstan as compared to 31 in Kazakhstan and 26 per 1000 in Uzbekistan.

To better understand marriage timing in this dynamic context, we propose the following research questions.

RQ1: Across cohorts born 1948-1972, has the timing of entry into first marriage shifted across generations and do these shifts correspond to periods of policy and economic change?

Does Kyrgyzstan demonstrate a gradual increase in age of first marriage, as demonstrated elsewhere in Asia (McDonald 1985; Mensch et al. 2005)? Soviet policies may have

facilitated later marriage, as increased educational obligations hindered early unions for many women (Akiner 1997). We aim to explore if gains in education and employment may be evidenced in normative changes and the diminishment of social incentives that favored adolescent unions (Jayakody et al. 2008). We also seek to investigate if economic conditions following 1991 may be associated with marriage delays.

RQ2: Have women with low levels of educational attainment, those living in rural communities and in the southern region entered marriage earlier than others?

As demonstrated elsewhere, will women with lower levels of education marry earlier than more educated peers (Singh & Samara 1996)? As adolescent brides often reside in areas where cultural norms support early marriage, we seek to identify regions of Kyrgyzstan where early marriage is more common. These could include rural communities and those in the southern region where populations were more removed from Russian cultural influences and less accepting of Soviet-era policies (Akiner 1997).

RQ3: Have women with high levels of educational attainment, those living in urban areas and in the northern region entered marriage later than others?

As reflected in the literature, will women with higher levels of education enter marriage later than less educated peers (Heaton 1996)? Specifically, we aim to explore if the introduction of Soviet-period laws and incentives correspond with marriage timing changes and if these changes were disproportionately reflected in the marriage behavior of populations in the north and those near urban centers (Akiner, 1997).

RQ4: Are observed shifts in marriage timing limited to Kyrgyzstan or visible in neighboring Kazakhstan and Uzbekistan?

The structural change encountered by Kyrgyzstan was not contained within its borders. We seek to investigate if timing trends are evidenced more widely across Central Asia. As populations in Kyrgyzstan and Kazakhstan share a nomadic heritage, do their patterns of marriage reflect these commonalities? Conversely, do the marriage patterns of populations in Uzbekistan contrast with those in Kyrgyzstan? Prominent demographic research has demonstrated demographic change often occurs along cultural rather than

geographic borders and we seek to investigate this phenomenon in Central Asia (Coale, Anderson & Harm 1986).

To address these questions we employ national-level data from Kyrgyzstan that were collected in 1997 and 2006. National-level data collected from Kazakhstan in 1995 and Uzbekistan in 1996 were used to investigate regional patterns.

Data & Methods

Data

Data employed for this study were obtained from the 1997 Kyrgyzstan Demographic and Health Survey (DHS) and the 2006 Multiple Indicator Cluster Survey (MICS), which were nationally representative household surveys. While sampling strategies differed, both survey designs were structured around census population data.

The DHS questionnaires were developed using model surveys from the DHS program and altered following consultations with Kyrgyz reproductive health and child health specialists. Translated into Russian and Kyrgyz, the survey was pretested on 120 women over a two-week period in both urban and rural settings. Eight female interviewers were trained for two weeks before conducting the pretest. An additional 32 female interviewers were recruited, primarily from the Kyrgyz Institute of Obstetrics and Pediatrics. They included medical doctors, nurses and researchers. Interviewers received an orientation in survey interviewing techniques over a three-week period and then began data collection

Table 2.2: Percent Distribution of Married Female Respondents by Selected Characteristics			
1997 Kyrgyzstan Demographic & Health Survey & 2006 Multiple Indicator Cluster Survey			
Characteristic	1997	2006	X ²
	(N=2456)	(N=4200)	
Woman's Age at Interview			
25-29	21.60	24.1	0.803
30-34	25.70	20.8	0.000
35-39	23.60	19	0.000
40-44	16.70	19.3	0.187
45-49	12.50	16.7	0.003
Highest Level of Education			
Secondary	80.60	77.80	0.000
Higher	18.90	22.00	0.000
Residence Location			
Urban	35.40	58.20	0.000
Rural	64.60	41.80	0.000
Region of Residence			
Bishkek	14.5	13.3	0.000
North	31.3	37.6	0.000
East	5.4	10.1	0.000
South	48.8	39.1	0.000
Ethnicity			
Kyrgyz	61.3	69.5	0.001
Russian	11.7	11.6	0.000
Uzbek	17.0	13.9	0.000
Other	10	5.3	0.000
Religion			
Muslim	85.4	88.1	0.000
Christian	11.5	11.4	0.003
Other	.2	0.1	0.672
None	2.9	0.2	0.000

in Bishkek city. After a two-week period of data collection, they were assigned to regions outside the capital city. Interviews were completed in November.

The DHS was administered to 3,848 women, aged 15-49 and utilized a representative probability sample of women from four regions of the country. Primary sampling units in rural districts were identified with probabilities proportionate to census population data. The sampling units in urban districts were defined using health district information. All women in the household of eligible age were surveyed. Informed consent was secured from every household respondent, including eligible women.

For this study, DHS data were restricted to eligible women aged 25-49. Women younger than 25 were excluded as their cohort was believed to be currently transitioning into marriage. This yielded a sample of 2,456 women.

The MICS survey was structured around the MICS3 model questionnaire and was translated into Kyrgyz and Russian before pretesting. Following pretesting, the survey was modified and re-translated. Approximately 75 interviewers were recruited from northern and southern regions and trained in data collection techniques. Survey data collection was conducted between November 2005 and early February 2006. A two-stage sampling design was employed. In selected households, all women aged 15-49 were surveyed producing a sample of 6,973 women. Informed consent was obtained from each household member answering survey questions. As with the DHS, MICS data were restricted to women age 25-49, yielding a total sample of 4,200 women.

In both data sets, cases were categorized into five-year age cohorts and the region of residence variable was recoded to allow for comparison. This required consolidation of the MICS data from eight regional designations to four, as reflected in the DHS.

Further comparisons of the distributions of the data sets were conducted using a X^2 test of independence. This test assessed whether the two samples differed in their distribution across specific variables. As noted in Table 2.2, significant differences in the distribution of the 1997 and 2006 samples were found across nearly all demographic characteristics of interest. Consequently, the 2006 data were used only to validate patterns visible in the 1997 data.

Methods

To begin, a descriptive analysis of marriage timing was performed to compare birth cohorts and the proportions ever-married by age. An ANOVA test assessed the statistical significance of observed cohort differences.

Life table analysis was used to evaluate the likelihood of marriage and specific ages at which the probability of marriage increased or declined. Individual cohort results were assessed and then compared.

Marriage timing trends were further explored by observing the proportions of women who married by age, stratified by residence, ethnicity and educational level.

We then used Cox regression to assess how individual factors influenced marriage risk for the full sample and individual birth cohorts. In this analysis, the period between a woman's fifteenth birthday and the year of her reported marriage was calculated to determine each respondent's, "time-to-marriage". Since specific marriage dates were not provided, we created a proxy date of 31 June for all ever-married women. This allowed for a more sensitive measurement of the time-to-marriage variable. However, marriage data are both retrospective and self-reported. Our analyses are purposefully conservative in light of this limitation.

Covariates of known importance to marriage timing were used in the regression analysis. These included location of residence, ethnicity, educational and employment history and partner educational attainment. Additionally, we investigated how the hazard of first marriage varied for specific cohorts across a given interval of calendar years. This allowed for consideration of how shifts in structural factors and specific policies may have stimulated change in marriage timing.

Finally, a regional comparison was conducted to explore the patterns of marriage among cohorts elsewhere in Central Asia. A descriptive analysis was performed using nationally representative data from Kazakhstan and Uzbekistan to determine the proportions married by age and whether the timing patterns of Kyrgyzstan are reflected by neighboring populations.

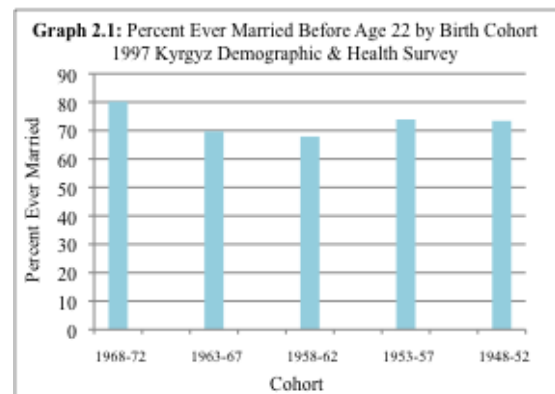
Results

Age of First Marriage by Birth Cohort

Table 2.3 shows the percent of women ever married by age, stratified by birth cohort. These values reflect the proportion of women ever married by or before the stated age. Table 2.3 shows adolescent marriage was

Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.2	0.6	1.7	1.2	3.3
16	2.8	2.3	2.7	3.6	8.2
17	11.7	10.3	10.6	15.6	18.0
18	25.1	25.1	23.4	30.2	33.6
19	45.1	40.1	38.1	46.5	52.8
20	64.7	56.0	56.1	62.1	62.9
21	77.7	68.0	70.6	73.6	72.9
22	85.00	76.9	78.9	85.0	80.4

more common among older cohorts. As shown, 14-16% fewer women of the 1958-67 cohorts have married by age 19 than those in the oldest generation. This differential persists among the youngest cohort, but its size has lessened. By 19, the proportion of women married in the 1968-72 cohort is just 3-8% lower than that of women born 1948-57. This is an unusual fluctuation in marriage timing. While the median age of marriage has increased across Asia and the globe, in Kyrgyzstan it appears to have actually declined for women born between 1968-72. While the median age of first union falls near 19 for the oldest cohorts, it is notably closer to age 20 for women in the middle generations. Interestingly, this pattern appears to shift among the youngest women surveyed. Among those born 1968-72, the median age of first marriage declines to between 19 and 20. Women of the youngest cohort continue to enter marriage in greater proportions through age 21 and 22 than women born 1958-67.



In fact, women of the middle cohorts enter marriage more slowly than all other groups.

As marriage is a near universal experience in Kyrgyzstan, differences between generations may be expected to narrow as women age. This phenomenon is illustrated in Graph 2.1 where signs of marital delay have dampened among the middle cohorts. While

women of the 1958-67 cohorts report fewer marriages into their early 20s, the difference in proportions ever-married among the 1958-67 cohorts and older women has narrowed. Instead, a greater contrast has emerged between middle cohorts and younger women. A greater than 10% gap is evidenced between these groups in the percent ever-married by age 22.

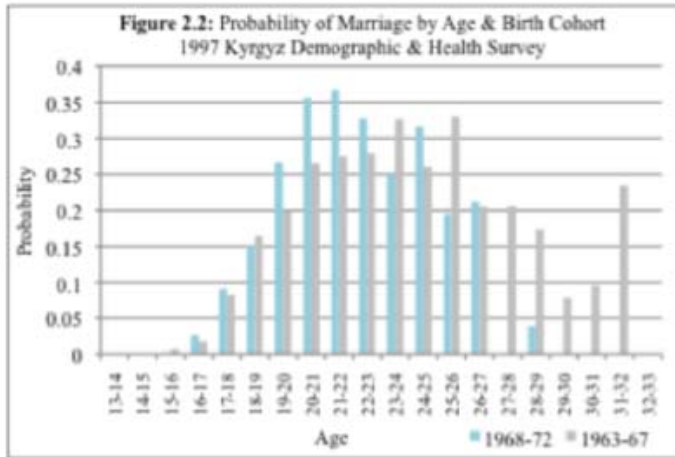
Subsequent analysis of near identical cohorts surveyed in 2006 affirms this unusual fluctuation in the proportions ever-married by age. Table 2.4 shows the median age of first union falls between 20-21 for women born 1957-66. This is similar to the median age observed in the 1997 data among women born 1958-67 and reflects a pattern of delay when compared to the marriage timing of older generations. However, the 2006 data also reveals a decline in the median age of marriage and an apparent reversal of marriage delay among women in the 1967-72 cohort. In fact, a shift toward earlier entry into marriage persists among women born 1972-76. More than a third of these women have entered unions by age 19. This pattern confirms a trend of earlier entry into marriage among women born 1968-72 that was first observed in the 1997 data.

To further test these observed differences in median age of marriage, a one-way analysis of variance test (ANOVA) and Tukey's Honestly Significant Difference post-hoc test were conducted. Differences in mean marriage age were statistically significant ($p < 0.05$) between several cohorts. Confirming earlier findings, differences in mean age were significant between the youngest cohort and women born 1958-67. Statistically significant differences were also found between the 1958-62 and 1948-52 cohorts.

Table 2.4: Cumulative Percent Distribution of Age at First Marriage by Birth Cohort
2006 Kyrgyz Multiple Indicator Cluster Survey

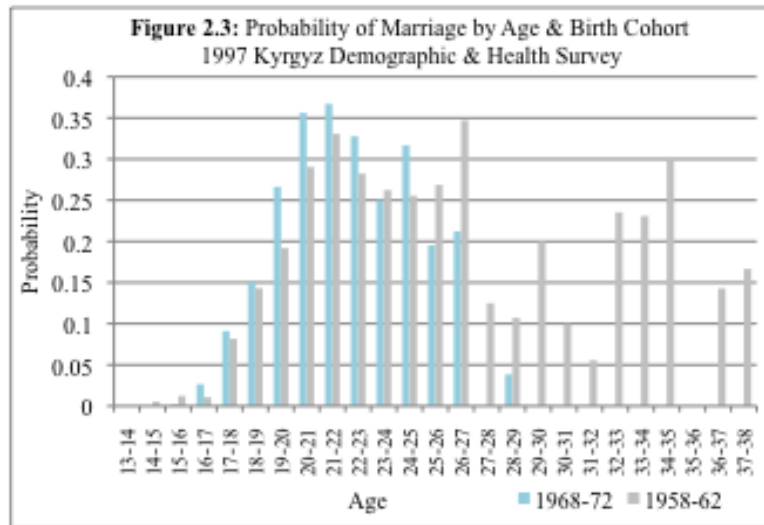
Age	Birth Cohort				
	1977-81	1972-76	1967-71	1962-66	1957-61
15	1.8	1.1	1.0	1.0	1.4
16	4.2	3.8	2.3	1.9	3.4
17	10.4	10.6	5.3	5.3	8.8
18	23.3	27.0	16.4	13.6	20.5
19	35.7	41.9	31.9	30.8	33.8
20	48.8	56.3	49.7	46.2	48.6
21	58.7	67.4	61.8	60.2	62.54
22	66.60	73.6	70.7	70.7	71.94

Life tables were constructed to explore age-specific variations in the probability of marriage between cohorts. Figure 2.2 shows a considerable increase in the probability of marriage among the youngest cohort beginning after age 19 and peaking between age 21-22. A more gradual increase is observed among the 1963-67 cohort whose peak probability occurs nearly two years later. Figure 2.3 shows the age-specific probability of



marriage rises more incrementally for the 1958-62 cohort when compared to the youngest generation. As in Figure 2.2, the peak probability for the 1958-62 cohort occurs quite late in the interval between age 26-27.

These findings show that in contrast to much of the world, a pattern of increasing age of marriage is not sustained in Kyrgyzstan. Marriage age does rise gradually across four cohorts, but declines among the youngest study population. To further explore this unusual pattern, we analyzed demographic differences among these populations.



Age of First Marriage by Region, Ethnicity & Education

Table 2.5 shows the percent of women ever married by age stratified by cohort and current region of residence. In the capital city of Bishkek, mean age of marriage is later across all groups. In the north, a region adjacent to Bishkek, median age of marriage shows an expected pattern of gradual increase. Yet, this trend is not as considerable in the north as in the east. In the east, national timing trends appear magnified as median age

risers dramatically across cohorts. A resumption of earlier entry into marriage is also observed among the youngest cohort in the east. Unlike all other regions, an increase in median age occurs earlier and is sustained longer in the south. Again, a resurgence of early marriage is denoted in the south among the youngest generation.

A two-way ANOVA revealed statistically significant ($p < 0.05$) differences between the mean age of marriage in Bishkek when compared to all other regions. No other pairwise comparisons were significant. However, significant differences were observed between cohorts of the same region.

Table 2.6 displays the percent of women ever married by age stratified by the two main ethnicities in Kyrgyzstan: Kyrgyz and Uzbek. As shown, ethnic Kyrgyz women reflect a pattern of entry into marriage that conforms with cohort patterns observed in national-level data. This trend is characterized by early marriage entry among the oldest cohorts followed by an increase in median marriage age among women in the 1958-67 generations. Median age then decreases for women in the youngest cohort. Among ethnic Uzbeks in Kyrgyzstan, the pattern is less variable. While the oldest cohorts enter marriage earlier than all others, the median age stabilizes among those born 1958-72. Interestingly, a resumption of early marriage among the youngest women is absent among ethnic Uzbeks.

Pairwise comparisons of ethnic differentials in mean age of marriage were not statistically significant. When evaluated by generation, significant differences were only

Table 2.5: Percent Ever Married by Region of Residence and Birth Cohort (Cumulative Percent)
1997 Kyrgyz Demographic & Health Survey

Bishkek Region					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	0.94	0.00	1.85	4.65
16	0.96	2.83	0.00	5.56	4.65
17	7.69	5.66	7.25	12.96	9.30
18	13.46	13.21	21.74	22.22	23.26
19	25.96	21.70	27.54	37.04	39.53
20	47.12	40.57	44.93	53.70	48.84
21	62.50	58.49	56.52	64.81	60.47
Northern Region					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	0.00	4.03	2.17	2.90
16	2.40	2.03	4.03	4.35	11.59
17	12.00	9.46	15.32	16.30	23.19
18	26.40	20.27	28.23	35.87	31.88
19	41.60	37.84	40.32	54.35	47.83
20	59.20	53.38	57.26	67.39	62.32
21	75.20	62.16	75.00	78.26	72.46
Eastern Region					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	1.68	0.85	0.00	1.79
16	2.94	2.52	1.71	3.70	7.14
17	15.69	15.13	11.11	22.22	19.64
18	33.33	21.85	22.22	44.44	55.36
19	52.94	39.50	39.32	55.56	69.64
20	72.55	57.14	52.99	62.96	73.21
21	83.33	73.11	62.39	79.01	83.93
Southern Region					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	0.54	0.55	0.00	5.13
16	2.78	2.16	1.10	3.39	8.97
17	10.42	11.89	8.29	16.95	20.51
18	22.92	30.81	22.65	29.66	41.03
19	49.31	44.86	41.99	44.92	64.10
20	70.14	60.54	60.77	63.56	73.08
21	81.94	72.97	74.59	73.73	79.49

Table 2.6: Percent Ever Married by Ethnicity and Birth Cohort (Cumulative Percent)
1997 Kyrgyz Demographic & Health Survey

Ethnic Kyrgyz					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	0.68	1.61	0.76	2.17
16	1.93	2.05	2.15	3.79	7.61
17	9.94	10.50	11.56	17.42	19.57
18	22.93	22.15	25.27	34.85	38.59
19	41.71	36.76	40.59	50.00	57.07
20	62.71	54.34	55.91	64.02	64.67
21	76.24	68.26	69.09	75.38	72.83
22	83.15	77.17	77.15	84.09	80.98
Ethnic Uzbek					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	0.00	0.00	0.00	6.45
16	0.00	2.94	0.00	5.00	6.45
17	8.93	13.24	7.14	17.50	19.35
18	21.43	26.47	18.57	27.50	48.39
19	44.64	44.12	37.14	47.50	64.52
20	60.71	58.82	61.43	57.50	74.19
21	78.57	70.59	75.71	70.00	83.87
22	85.71	79.41	91.43	87.50	90.32

observed between ethnic Kyrgyz and Uzbek women born 1948-52. Ethnic differentials in the mean age of marriage within the middle cohort born 1958-62 were not significant confirming that average marriage age was similar across these ethnic groups.

Table 2.7 shows the percent ever married by age stratified by birth cohort and highest educational level. As very few women had less than an incomplete secondary education, our analysis focused on those who had at least finished secondary school. Not surprisingly, the median age of

marriage increased with education. Higher educated women in all cohorts married an average of at least two years later than the less educated. Yet, generational shifts in marriage age persist across both educational levels. Women born 1958-67 entered unions later than previous generations and higher educated women in these cohorts delayed the longest. However, women in the youngest cohort continued to enter marriage earlier than older, similarly educated women. In fact, young women with advanced schooling demonstrate this shift most dramatically, entering marriage earlier than all other cohorts with equivalent schooling.

Table 2.7: Percent Ever Married by Highest Educational Level Attained and Birth Cohort (Cumulative Percent)
1997 Kyrgyz Demographic & Health Survey

Secondary Education					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.51	0.70	1.78	1.72	1.62
16	3.32	2.09	2.54	4.12	5.95
17	14.03	12.06	11.70	18.56	15.68
18	29.34	26.68	27.48	36.77	35.68
19	51.28	44.55	44.27	52.92	56.22
20	71.17	63.11	63.61	68.04	66.49
21	82.40	73.78	75.32	78.35	77.30
22	87.24	81.90	82.95	88.32	83.24
Higher Education					
Age	Birth Cohort				
	1968-72	1963-67	1958-62	1953-57	1948-52
15	0.00	0.00	0.00	0.00	0.00
16	0.93	1.52	0.80	1.04	0.00
17	3.70	2.27	4.00	4.17	5.13
18	11.11	6.82	6.40	10.42	10.26
19	17.59	12.12	10.40	22.92	21.79
20	37.96	23.48	20.80	34.38	30.77
21	55.56	40.91	41.60	52.08	47.44
22	71.30	53.03	57.60	62.50	58.97

Hazard of Early Marriage

A cox hazard regression was performed to analyse the risk of first marriage. Table 2.8 shows entry into marriage was strongly predicted by the full model of eight covariates as $\chi^2 = 252.08$. This decline in the likelihood of the null model was statistically significant at $p < .001$.

Our previous findings concerning the importance of birth cohort are further validated by the odds ratios. We find that the hazard of first marriage is lower for women in older cohorts than those born 1968-72. These differences are most statistically significant when comparing this youngest cohort to those born 1958-67. In fact, the odds of marriage are 20% lower for women in the 1963-67 cohort than women just five years younger. The odds of first marriage decline still further for women born 1958-62. This indicates the risk of early marriage is higher for the youngest women in the sample.

The analysis shows that controlling for all other variables, a woman's educational attainment is an important factor in early marriage. Women with lower levels of education have the highest odds of marriage. Those who never completed secondary school have a 1.89 times ($p < .001$) greater risk of entering a union than women with post-secondary education. The odds of marriage for women with secondary education are slightly lower (1.65, $p < .001$) but still greater than the risk of marriage for highly educated women.

Similarly, a woman's occupation had notable influence on her odds of marriage. Women working in a professional or managerial role had 14% lower odds of marrying

Table 2.8: Cox Regression Covariates Related to Age of First Marriage
1997 Kyrgyz Demographic & Health Survey

* p < 0.05, ** p < 0.01	Odds Ratios
Birth Cohort	
1968-72	--
1963-67	0.8**
1958-62	0.7**
1953-57	0.85*
1948-52	0.89
<i>joint significance</i>	**
Region of Residence	
Bishkek	--
North	1.07
East	1.18*
South	1.18*
<i>joint significance</i>	*
Type of Residence	1.03
Ethnicity	
Kyrgyz	--
Uzbek	0.94
<i>joint significance</i>	n.s.
Religion	
Muslim	--
Christian	1.12
<i>joint significance</i>	n.s.
Educational Attainment	
< Secondary	1.89**
Secondary	1.65**
Higher	--
<i>joint significance</i>	**
Occupation	
None	--
Professional	0.86**
Clerical/Service	0.92
<i>joint significance</i>	**
Chi Square	252.08**
N	2402

than their non-working peers ($p < .001$). Women in clerical and service occupations also reflected lower odds of marriage, but the outcome was not statistically significant.

While women in all regions outside of the capital city boasted a higher hazard of marriage, it was only statistically significant at the $p < .01$ level for women in the east and south. Women in these regions have a 1.18 times greater hazard of entering marriage than their peers in Bishkek. This is not a surprising outcome given the demographic and cultural differences between these regions and the capital city.

What is unexpected are the odds for religion and ethnicity. Despite important cultural differences between ethnic and religious groups in Kyrgyzstan, these covariates do not contribute significantly to the overall model. Similarly, the educational attainment of a spouse does not appear to have significant bearing on risk of marriage. Potential explanations for these non-significant odds are addressed in the section that follows.

In conclusion, covariates of birth cohort, region of residence, educational attainment and occupation are statistically significant and contribute to the full model.

Review of the survival curve for each birth cohort reveals interesting contrasts in the calendar intervals in which risk of marriage was greatest. At every interval between age 16 to 21, the risk of marriage was greater for the 1968-72 cohort than those born 1958-67. A decline in cumulative survival from .9 to .7 is visible between the years 1985 to 1991, the period when those in the youngest cohort transitioned from age 17 to 19. However, a steeper decline in survival is evidenced in the next two intervals. Between 1987 and 1993 when women in the youngest cohort aged from 19 to 21, cumulative survival in an unmarried state slipped from .7 to around .3. This period corresponds well to the time immediately preceding and following Kyrgyz independence in 1991. The decline in cumulative survival for women born 1958-67 is more gradual by comparison.

Age of Marriage Across Central Asia

Table 2.9 shows the percent ever married by age of women residing in Kazakhstan and Uzbekistan. These are nationally representative samples of the populations of Kazakhstan and Uzbekistan and as such, contain a diversity of ethnicities. In contrast to women residing in Kyrgyzstan, the median age of marriage is older across all cohorts in Kazakhstan. The median age increases very gradually across the three oldest cohorts and

risers more dramatically among women born 1961-70. However, the characteristic decline in median age that was observed among women born 1968-72 in Kyrgyzstan is absent.

Among women residing in Uzbekistan, an unusual fluctuation in median age of marriage is visible across the three oldest cohorts. Rather than steadily increasing, median age decreases for the 1952-56 cohort and then rises among women born 1957-61 and continues to rise through the 1962-66 cohort. As in Kyrgyzstan, a subsequent drop in median age is observed among the youngest cohort. This decline is rather dramatic in Uzbekistan, slipping from a median age of 20 to just barely 19.

Discussion & Conclusion

Women in Kyrgyzstan have witnessed tremendous societal change over the past half-century and their shifts in marriage timing exemplify the dynamic conditions of this period. However, fluctuations in marriage timing cannot be easily attributed to a single factor. Rather, a number of conditions and changing policies may underscore these shifts. Changing educational and social development policies, weakening economic conditions and evolving cultural values are among the factors explored below.

Education policies and new schooling opportunities under the Soviets may explain some shifts in marriage age. Early Soviet modernization policies focused heavily on promoting women’s education and employment in an effort to undermine traditional values and religious ties (Ishkanian 2003). Beginning in 1930, primary education was made obligatory for both boys and girls (Akiner 1997). This policy significantly raised literacy levels, brought schools to remote communities and enabled students to conceive new aspirations for work and life (Jones & Grupp 1987; Akiner 1997). While few women

Table 2.9: Percent Ever Married by Country of Residence and Birth Cohort (Cumulative Percent)
1995 Kazakh Demographic & Health Survey
1996 Uzbek Demographic & Health Survey

Kazakhstan					
Age	Birth Cohort				
	1966-70	1961-65	1956-60	1951-55	1946-50
15	1.32	0.90	0.53	1.19	3.24
16	4.15	3.23	2.85	4.16	6.22
17	6.42	8.42	7.65	9.90	13.78
18	13.96	18.64	17.97	20.99	22.70
19	26.60	30.65	30.43	34.65	38.11
20	43.21	44.44	46.80	50.69	51.62
21	57.17	59.50	61.03	63.56	62.97
22	69.60	70.60	69.00	71.90	71.90
Uzbekistan					
Age	Birth Cohort				
	1967-71	1962-66	1957-61	1952-56	1947-51
15	1.14	0.97	1.56	1.83	3.09
16	4.00	3.72	5.73	6.86	9.57
17	14.29	12.92	14.41	16.25	19.14
18	31.00	26.98	29.86	32.72	33.02
19	48.29	39.90	45.83	51.49	43.52
20	64.00	56.87	59.90	63.39	56.48
21	76.86	70.11	73.44	73.23	67.28
22	83.90	79.60	82.10	80.30	75.90

pursued schooling beyond required levels, we believe attending school likely had a delaying effect on the timing of marriage. This effect was strengthened in 1966 when compulsory schooling was extended through grade ten (Darsky & Scherbov 1995). Women born in 1953 were the first likely impacted. They would have been too young in 1966 to have completed schooling under previous requirements. This policy could explain the rise in median age of marriage among cohorts born after 1952, particularly the decline in marriage between ages 15 and 18 when compared to the 1948-52 cohort.

Yet, schooling provides only a partial explanation for marriage shifts. Among secondary educated cohorts born 1948-67, the median age of marriage falls one to three years after the conclusion of schooling. This interval indicates factors such as paid employment may have also played a role. Many Central Asian women engaged in work outside the home for at least brief periods (Akiner 1997). Owing to labor shortages, the demand for female labor actually intensified through the 1960s (Buckley 1981). Women were actively recruited for training and employment and the proportion working outside the home grew (Corcoran-Nantes 2005). Some 64% of working aged women were employed in 1959, a proportion that expanded to 80% by 1970 (Jones & Grupp 1987). Women born 1948-52 were an important segment of this labor pool. The increased demand and their actual participation in the workforce could explain why greater numbers of the 1948-52 cohort did not marry earlier than the median age of 19.

While economic decline was evidenced through the 1970s, Central Asian women's participation in the workforce persisted (Corcoran-Nantes 2005). Women heavily dominated manual and low-skill positions and made in-roads into white-collar fields of education and health over this period (Lubin 1981; Corcoran-Nantes 2005). Some estimates indicate female workforce participation in the USSR actually exceeded that of western women at the time (Lane 1990). This change was visible in the growth of social classes in the region. Between 1970-79, the proportion of Kyrgyz participating in blue-collar occupations grew from 41 to 56% of the population; white-collar employment participation increased from 15 to 20% (Jones & Grupp 1987). We believe female employment in combination with educational requirements explain marriage delays among secondary educated women born between 1953-67.

For women of the 1953-67 generations who pursued higher education, pressure to enter marriage may have precluded pre-marital workforce participation. As illustrated in Table 6, the median age of marriage for higher educated women is four to five years after secondary school: approximately the duration of a university degree. The pressure to marry shortly after graduation was likely more intense for the highly educated who had already delayed marriage in favor of schooling. Yet, their near-universal transition into a married status also indicates the marriage market in Kyrgyzstan was not so narrow as to hinder the partnering of highly educated women, as has been observed in other settings (Singh & Samara 1996).

For women born 1968-72, this trend in marriage timing notably reverses. This generation represents a unique cohort as their personal transitions into marriage coincided with massive societal and economic shifts. Women in the 1968-72 were adolescents in the last years of the USSR, a period of tumult when policies of *Perestroika* and *Glasnost* were introduced in an effort to revive the national economy and spur greater civic dialogue (Lane 1990).

Among early reforms, policies in 1984 extended compulsory schooling to an eleventh grade and sought to expand the number of vocationally trained students while conversely reducing those approved for advanced degrees (Lane 1990). Changes in access to higher education may have dampened the aspirations of some women in this cohort and diminished incentives to delay marriage. However, increasing economic stagnation during the decade may have also played a role. Unemployment and housing shortages grew so intense through the 1980s they led young adults to protest in the capital of Kyrgyzstan in 1989 (Anderson 1999). Financial considerations and limited employment opportunities could have rendered marriage among the only post-graduate options available to young women.

There is equal evidence that amidst economic fluctuations and governmental uncertainties, families felt increasing pressure to see daughters marry. Some have suggested that marriage was a rare source of stability during this period of flux, particularly in rural communities (Dommaraju & Agadjanian 2008). These regions suffered disproportionately during economic stagnation of the 1980s and received less financial investment from the central government (Lane 1990). These conditions could

explain the sharp rise of early marriage among young women in the east of Kyrgyzstan, which is a predominately rural region. Among women born 1968-72, the proportion married by age 20 is 23% higher among women in the east than in Bishkek.

Additionally, new family policies made marriage among young adults a more lucrative arrangement. In 1981, policies to improve social welfare and increase population growth across the USSR were introduced. These included a new, one-time allowance for the first through third child, state housing assistance for young families and up to 12 months of partial-paid leave for new mothers (Jones & Grupp 1987; Barkalov 2005). Unlike previous family policies, these focused benefits on young couples rather than large, existing families. Given the economic uncertainty and housing shortages of this period (Darsky & Scherbov 1995), such incentives could have been quite attractive to young adults.

Separately, the size of wedding ceremonies had grown since the 1970s and required large investments by families of both the bride and groom (Darsky & Scherbov 1995; Werner 2004). In Uzbekistan, *Perestroika* policies of the 1980s actually had a magnifying effect on these traditions. As policies enabled families to spend more freely on weddings, marriage ceremonies became an important indicator of a family's wealth and status (Agadjanian & Makarova 2003). As financial conditions shifted, families may have encountered increasing pressure to transition their daughters into marriage earlier before the costs grew too great (Agadjanian & Makarova 2003).

Alternatively, the economic strains in late Soviet Kyrgyzstan may have led to a decline in marriage age as a result of a rise in bride kidnapping. While records detailing these incidents are not available, anthropological research indicates kidnapping is not an uncommon in Kyrgyzstan (Werner 2004). While the degree to which female victims consent to the kidnapping varies, there is little question that kidnapping is a more affordable method of marriage for grooms. Consequently, economic strains are believed to have heightened its appeal in the post-independence period (Werner 2004). The families of kidnapped brides cannot demand as high a bride price nor do they have the ability to reject less desirable suitors, including those of lower economic or social status (Werner 2004). In this manner, economic pressures and the re-emergence of traditional ideals

may be converging to further legitimize kidnapping. Such conditions could result in earlier marriages for kidnapped women.

The marriage patterns of Kyrgyzstan's women, while not unlike fluctuations witnessed in other locations, are distinctly unique for the complex and richly textured context from which they emerge. Conflicting and evolving societal norms, empowering policies as well as challenging economic realities may separately or in combination prove powerful forces behind patterns of entry into marriage.

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Chapter III

Contraceptive Use in Post-Soviet Kyrgyzstan

Introduction

Poor reproductive health constitutes a considerable proportion of overall ill health suffered by women worldwide. It's estimated that one third of the burden of disease among women of reproductive age is attributable to illnesses of a reproductive nature (Gutmacher 2003). These can include abortion-related complications, the spread of sexually transmitted infections and complications stemming from insufficiently spaced pregnancies or deliveries early or late in the reproductive health life cycle (Singh, Darroch, Vlassoff & Nadeau 2003). Worldwide, more than 500,000 women die annually due to delivery or pregnancy-related complications (UNFPA 2009).

These issues are of particular salience to women in the Central Asian nation of Kyrgyzstan whose maternal mortality rate has soared in the post-Soviet period. A 2006 UNICEF survey revealed maternal mortality had reached 104 per 100,000 live births, a more than doubling of the MMR since 1985 (Bauer, Green & Kuehnast 1997). Unplanned pregnancies, ineffective birth spacing and delivery complications are among the factors blamed for the MMR increase (Bauer et al. 1997; Veenema 2000). In 2003, it was estimated that 60% of births in Kyrgyzstan involved delivery complications (United Nations 2003). Widespread iron deficiencies that affect more than 60% of the female population magnify the danger of difficult deliveries by raising the risk of fatal hemorrhaging (Research Institute of Obstetrics & Pediatrics 1998). There is also evidence that the number of illegal abortions is increasing, potentially contributing to maternal mortality (United Nations 2003). Wider use of contraceptive methods would enable women to prevent undesired and high parity pregnancies, ensure adequate recovery time

between deliveries and avoid dangerous periods of childbearing either early or late in life (Lule et al. 2007; Singh et al. 2003).

Contraceptive use patterns have been the focus of few studies in Central Asia. Since factors impacting use often vary by culture and context, this raises the importance of research that explicates the relationships between values, attitudes, fertility preferences and contraceptive behaviors (Kar & Cumberland 1984). Such research endeavors are of particular significance in Kyrgyzstan where a confluence of evolving societal factors may be directly impacting fertility and contraceptive behaviors. These include a resurgence of traditional, conservative ideals around gender roles, wider exposure to foreign media and values, as well as persistent economic and employment constraints that have disproportionately affected women (Ishkanian 2003; Akiner 1997). Scholars have called for more fertility research on the Kyrgyz Republic (Nedoluzhko & Andersson 2007; Gentile 2007). Nonetheless, the literature remains sparse.

We propose to address this gap by exploring contraceptive attitudes, fertility control and the prevalence of specific methods in Kyrgyzstan. Using nationally representative data we seek to identify the dominant attitudes around contraceptive use across the population. What is the association between various individual demographic characteristics and the likelihood of fertility control in this setting? Does the age at which women marry have bearing on their odds of employing fertility control? Are age and educational differences between spouses associated with greater or lesser odds of fertility control? Finally, are couples who co-reside with older, female adults less likely to employ fertility control than those in nuclear households?

As a volitional health behavior, fertility control occurs within a context framed by the characteristics of the individuals involved and the communities in which they live (Wong & Mason 1985). The availability of contraceptive resources is essential in facilitating their use. However, preferences and norms supportive of lower fertility can also be critical to the wider adoption of reliable methods (Caldwell, Khuda, Caldwell et al. 1999). Since patterns of use can vary across whole communities and cultures this lends importance to research that explores both macro- and micro-level factors (Wong & Mason 1985; Bernstein & Juul Hansen 2006).

Given the variability with which contraceptive use patterns can develop across populations, it's imperative that meaningful demographic characteristics be incorporated into predictive analysis (Kar & Cumberland 1984). Numerous studies have examined the relationship between contraceptive use and various demographic variables, partner and relationship qualities and resource accessibility (Ford, Pence, Miller & Resnick 2005; Manlove 2004; Lam 2006). An equally rich literature exists probing the interplay between contraceptive use, norms and characteristics such as age, region of residence and parity (Wyatt, Carmona, Loeb et al. 2000; Kamal & Islam 2010; Withers, Kano & Pinatih 2010).

Demographics

Age is an important characteristic to consider in delineating the dynamics behind contraceptive use attitudes, practice and preferences. Previous research has demonstrated variability in patterns of use and method type that appears to change with age (Glei 1999; Sueyoshi, Al-Khozah & Ohtsuka 2006). Among Muslim populations, age had a strong positive association with contraceptive use in some settings. In Jordan, increasing age was associated with increased use of any method, but withdrawal (Sueyoshi et al. 2006). In Turkey, older women had higher odds of using modern methods when compared to younger generations. In fact, the use of traditional methods was 2.3 times more likely among young women in Turkey than older cohorts (Alpu & Fidan 2006).

Similar relationships between birth cohort and likelihood of use have been documented among women in Indonesia and Bangladesh as well as the U.S. (Kamal & Islam 2010; Withers et al. 2010; Wyatt et al. 2000). Glei et al. (1999) found that U.S. women in their early 20s were more likely to be inconsistent users of less reliable methods than women age 25-34. These findings were further reinforced by HIV prevention studies that have shown the likelihood of contraceptive use to be higher among older women, who are also more likely to use methods that protect against disease as well as pregnancy (Wyatt 2000). Of course, method selection and availability have bearing on useage patterns as do cultural values and norms. In communities where contraceptive use is less accepted or only permissable among high parity couples, the fear of stigma or sanction may dissuade younger women from seeking contraceptive

resources. This may particularly be the case in pronatalist settings where contraceptive use may not be employed until women have reached an ideal family size (Alpu & Fidan 2006). This could also serve to explain age-based differences in fertility control practices.

However, the likelihood of use does not consistently rise with age in all settings. In Bangladesh, the odds of contraceptive use were actually lower for women age 35 and older than those age 24-34 (Kamal & Islam 2010). This shift may indicate a gap in knowledge between generations if older women perceive themselves to be at lower risk of pregnancy (Withers et al. 2010). Recent contraceptive research in Iran revealed the odds of modern contraceptive use actually declined across older populations. In contrast to the patterns found in other Muslim populations, younger Iranian women had a greater likelihood of using modern methods than older peers (Sadat-Hashemi, Ghorbani, Majdabadi & Farahani 2007). This pattern of use directly conflicts with trends observed in Turkey, Jordan, Indonesia and Bangladesh.

Like age, the location of residence can have important implications for a woman's access and use of contraceptives. While urbanization has expanded many cities in Kyrgyzstan, a majority of the Kyrgyz population continues to reside in rural communities. This is an important characteristic given that knowledge and norms around fertility and contraception can vary dramatically between urban and rural areas. Contraceptive studies of other Muslim populations have demonstrated strong contrasts between urban and rural women and their likelihood of practicing fertility control including the use of modern methods. In Turkey, urban women had 1.24 times greater odds of using modern methods than rural women. The use of any method also varied dramatically by region as Turkish women in the west had five times greater likelihood of using any method when compared to women in the east (Alpu & Fidan 2006). Even the odds of traditional method use were lower in the east than in all other regions. Such findings can reveal much about the diversity of fertility norms and behaviors across a nation. While scholars have uncovered distinct differences in the fertility of Central Asian women in urban and rural districts, little is known whether these variations are reflected in preferences for modern or traditional methods (Buckley 1998; Gentile 2007). The introduction of modern methods is a relatively recent development in Kyrgyzstan

and although government efforts have sought to expand access throughout the country, it's unclear to what extent modern methods have been adopted in rural communities.

Under the Soviets, family planning programs were virtually non-existent (Sherwood-Fabre, Goldberg & Bodrova 2002). Abortion was among the only option available to women who encountered an unplanned or undesired pregnancy (Corcoran-Nantes 2005). Records of terminated pregnancies during the Soviet era indicate more frequent abortions among women in urban areas and in the north of Kyrgyzstan (Corcoran-Nantes 2005). Such differentials could be attributed to variability in access to health services as well as cultural values around fertility and pregnancy termination. Cultural values have also been used to explain contrasting contraceptive use patterns across urban and rural communities throughout Asia (Khan & Raeside 1997; Jayaraman, Mishra & Arnold 2009).

Resource limitations including reduced access to education campaigns and information outreach may similarly underscore urban-rural differences in contraceptive use and potentially, attitudes around family planning. In Bangladesh, location of residence was the strongest determinant of exposure to family planning outreach campaigns. Rural residents had a lower level of exposure to family planning messages than all other groups, including residents of small cities and towns (Islam & Hasan, 2000). Contraceptive use patterns followed a similar trajectory as current users reported higher exposure to health messages than non-users and the probability of using modern contraception increased with exposure to health messages (Islam & Hasan, 2000). For rural residents, geographic isolation can magnify the potential for poor reproductive health as a result of resource limitations both in terms of access to services as well as information and outreach.

Parity & Fertility Preferences

Scholars of Central Asia have noted considerable fertility differential between women of urban and rural residence, varying ethnicity and educational levels (Buckley 1998; Agadjanian 2002; Agadjanian & Makarova 2003). While the existing literature shows a clear relationship between demographics and fertility, family size and stated fertility preferences have not been explored fully as predictors of contraceptive behavior in this

context. Identification of prevalent cultural values and norms and women's own fertility desires can reveal much about the factors potentially inhibiting or facilitating the use of contraception (Kar & Cumberland 1984).

In much previous research, strong associations have been observed between parity and the likelihood of contraceptive use. In many diverse settings, increasing parity generally has a positive effect on the use of contraceptive methods and a negative effect on the desire for additional children (Sadat-Hashemi, Ghorbani et al. 2007; Kamal & Islam 2010; Jayaraman, Mishra & Arnold 2009). However, closer analysis of these relationships suggests greater complexity than these initial associations may indicate, particularly as cultural norms, access and resources are considered. In cultures where son preference remains strong, family composition can be a critical factor in determining the parity at which contraceptive use becomes a feasible option (Jayaraman, Mishra & Arnold 2009). Yet, even in these settings, the prevalence of contraceptive behaviors can fluctuate with increasing family size. In India and Nepal, the likelihood of modern method use was greatest among women with two sons, but declined for women with three or more male children (Jayaraman, Mishra & Arnold 2009). A similar pattern in the odds of contraceptive use was also observed in Bangladesh as women with up to two children had the highest likelihood of modern method use. By contrast, those with five or more offspring had lower odds of contraceptive use (Kamal & Islam 2010). Although not fully explored in these analyses, higher parity may be as much a function of fertility preference as limited access to contraceptives in these environments.

However, research has also demonstrated that the behavior of individuals is not always consistent with their reported preferences (Ajzen 1988; Sadat-Hashemi, Ghorbani et al. 2007). In Iran, nearly 40% of women surveyed were not active users of contraceptives, despite expressing a desire for no more children (Sadat-Hashemi et al. 2007). Complicating these associations between preferences and behavior are cultural values and norms that may stem from societal as well as religious sources. Although not explored in the Iranian study, research in Jordan reveals that in some Muslim cultures women perceive strong religious opposition to the use of contraception (Sueyoshi et al. 2006). Such interpretations may lead women to avoid or postpone contraceptive use despite personal desires to limit fertility (Sueyoshi et al. 2006).

As fertility is the outcome of a couple's shared behavior, it is also indelibly influenced by the politics of gender and power. In patriarchal cultures and communities where male decision-making is paramount, parity concerns and fertility preferences of women may be less evidenced in contraceptive use behaviors. Studies of fertility preferences in rural Kenya indicate higher odds of contraceptive use among couples in which male support for fertility control is greatest. However, the highest odds are visible among couples who share a preference to prevent any further pregnancies (Dodoo & Tempeis 2002). A similar phenomenon is visible among urban couples whose fertility preferences agree, but not in cases of discordance. In contrast to rural patterns, when urban couples disagree on whether to stop fertility, the women's preferences are more predictive of actual contraceptive use (Dodoo & Tempeis 2002).

These findings highlight the importance of research that probes fertility preferences as well as cultural values and gender dynamics in deciphering contraceptive use patterns and unmet need.

Age at Marriage & Spousal Age/Education Differences

The intersection of culture, gender dynamics and contraceptive use can be similarly explored through analysis of a woman's age at first marriage and differences between spouses. These include contrasting age or schooling achievements between spouses, which can provide insights into normative family structures and prevalent values in a community. Prior research has shown some correspondence between these characteristics and women's status as reflected in marriage traditions, household power and access to education (Casterline, Williams & McDonald 1986). More specifically, settings in which women married at young ages and had large negative age or education differentials with a spouse were frequently also settings characterized by polygyny, patrilocal traditions and lower social status for women (Casterline, Williams & McDonald 1986). Women in these communities spend a longer period of their adult lives in marriage, limiting opportunities for education and employment and raising potential parity, and can be subordinate to their spouses both in age and status (Barbieri & Hertrich 2005). All such factors have important implications for contraceptive use and methods preference decision-making.

Across Africa, spousal age differences were highly significant in predicting modern contraceptive use, though to differing degrees (Barbieri & Hertrich 2005). When viewed in aggregate, small age differences (-4 to 4 years) raised the likelihood couples had used a modern method by 2.4 times compared to couples with large (15+ years) differences in age. Although socioeconomic characteristics such as education, residence location and marriage type also proved important, when tested together large age differences persisted in significance. This indicated spousal age differences had an independent effect on the likelihood of contraceptive use (Barbieri & Hertrich 2005).

A similar relationship has been observed between age and risk of unintended pregnancies among couples in Vietnam and the U.S. Vietnamese women with older spouses (4+ years) had 1.7 times greater likelihood of reporting unintended pregnancies than peers with younger or similarly aged husbands (Le, Magnani, Rice, Speizer & Bertrand 2004). Among American women, the likelihood of experiencing an unplanned pregnancy was greatest for those under 30 whose partners were three years or older (Darroch, Landry & Oslak 1999). Adolescents were particularly at risk. Nearly 70% of those under the age of 18 who had the greatest age differentials with partners (6+ years) reported unplanned pregnancies, compared to just 23% of women three to five years younger and 17% of women two years younger than partners. Not surprisingly, adolescents with much older partners also had very low odds of using contraceptives (Darroch, Landry & Oslak 1999).

Among Vietnamese populations, age of marriage was also found to be an important predictor of unintended pregnancy. Specifically, women who married at age 20 or older had 33% lower odds of encountering an unplanned pregnancy than women who married as adolescents (Le et al. 2004).

While many studies have demonstrated the positive effect education can have on contraceptive use, fewer have investigated the impact educational differentials have on behavior (Gubhaju 2009). Interestingly, equivalent educational levels do not ensure contraceptive use between couples. In Nepal, use of any method was greatest for couples in which husbands had six or more years of education than their wives (Gubhaju 2009). Furthermore, a smaller proportion of women with more education than their husbands

reported use of any method in 2006 (49.6%) as compared to women with no education (52.6%).

Intriguing methods preferences were also evidenced across educational differentials. Couples in which the husband's education far exceeded that of his wife were 1.6 times more likely to rely on male sterilization than couples with equivalent schooling. By contrast, female sterilization proved far less common. In fact, the relative risk of reliance on female sterilization actually decreased as a woman's educational level rose (Gubhaju 2009).

Co-residency of Older Adults

Like age, parity and age at marriage, the composition of a woman's household can have bearing on her use of fertility control (Singh 1998; Kamal & Islam 2010; Barbieri & Hertrich 2005; Saikia & Singh 2009). Autonomy has been investigated in several Asian settings and has been found to be positively associated with an increased likelihood a woman currently used contraceptives and received other reproductive health care (Saleem & Bobak 2005; Mistry, Galal & Lu 2009; Bloom, Wypij & Das Gupta 2001). However, the autonomy of women and their ability to exercise independent decision-making widely varies by culture and region (Gage 1998). Although the presence of an older female relative does not automatically depress the decision-making power of younger women, exploring the influence older female relatives do have on contraceptive behaviors remains an important focus of research (Mumtaz & Salway 2007; Fikree, Khan, Kadir, Sajan & Rahbar 2001). Just as spousal preferences and attitudes can impact the likelihood of contraceptive use, so too can senior household members exert pressure in support or opposition to fertility control (Casterline, Sathar, ul Haque 2001; Kadir, Fikree, Khan & Sajan 2003). The process through which women act on their preferences to exercise fertility control can be complicated by the norms and values of older relatives, especially if they hold positions of authority within the household.

The presence of older female relatives in a household can be especially important in cultures in which female health and fertility are seen as falling within the domain of older women. In these settings, cultural norms dictate that decision-making around pregnancy, antenatal care, delivery assistance and other reproductive health services be

exercised by older women who presumably have more experience and knowledge of these matters (Mumtaz & Salway 2007). Yet as alluded, co-residency does not ensure young women will receive health care or access to contraceptive resources. In some settings, co-residency is associated with a reduced likelihood of contraceptive use. In India, women in nuclear households were found to have greater odds of using modern contraception and receiving prenatal care than women in households with older female relatives (Saikia & Singh 2009). Among women co-residing with in-laws, their odds of practicing permanent contraception declined by a factor of .5 when compared to women who lived with just their spouse and children.

Within research on co-residency, communication about family planning has been found to occur more commonly between mothers-in-law and daughters-in-law than between mothers and their sons (Kadir, Fikree, Khan & Sajan 2003). In Pakistan, over a third of mother- and daughter-in-law pairs reported discussing family planning with one another. While more than a fifth of these older women used family planning discussions to state their opposition to fertility control, other research in Pakistan revealed cross-generational communication to be positively associated with contraceptive use (Fikree et al. 2001). Among women who discussed family planning with an older female relative, their odds of employing a modern method were nearly four times greater than women who did not. Additionally, the support older relatives expressed for family planning was deemed significant. Young women whose use of fertility control was not strictly forbidden by a mother-in-law had 1.7 times greater odds of actually employing a modern method than peers whose relatives disapproved.

Yet, the opposition to contraceptive use by mothers-in-law does not absolutely obstruct young women from exercising their preferences. Kadir et al. (2003) found that nearly twice as many young mothers desired no more male children as compared to the preferences expressed by senior female relatives (Kadir et al. 2003). Close to half of these young women persisted in adopting contraceptive methods despite the stated opposition of their mothers-in-law. This finding suggests that even in households in which young women and older relatives hold contrasting fertility preferences, young women can negotiate these differences. Other studies in Pakistan have shown that educated women may not directly challenge household decision-making hierarchies, but have accessed

reproductive health services and resources in spite of opposition from older relatives (Mumtaz & Salway 2007). These results show the dynamics of cross-generational relationships may be more complex than what select literature would suggest.

Indeed, research on the influence of co-residency on contraceptive behavior has not produced consistent results across all settings. In northern India, co-residency was not found to be a statistically significant factor in a woman's likelihood of receiving prenatal care (Bloom, Wypij & Das Gupta 2001). Rather, her connections with natal relations were deemed more critical. This finding complicates the interpretation of other national-level research in India that has shown a reduced likelihood of antenatal care and contraceptive use among young women in joint households. More specifically, it suggests regional variations may be an important focus for future research (Saikia & Singh 2009). Interestingly, northern India has been distinguished in prior research as reflecting lower levels of female education, autonomy and higher fertility when compared to other regions (Jayaraman, Mishra & Arnold 2009).

Understanding the dynamics of co-residency will be of particular importance in analyzing fertility control behavior in the Central Asian context. As explored below, co-residency is not uncommon in this region and among some groups, can characterize households in which traditional gender roles and pronatalist values are more dominant (Barbieri, Blum, Dolkigh & Ergashev 1996).

Background: History, Population & Culture of Kyrgyzstan

A landlocked nation in the heart of Central Asia, Kyrgyzstan is a highly mountainous country with a population of 5.3 million people (WHO 2011). Once a critical artery on the Silk Road, the Central Asian region was annexed by Russia in 1876 (Anderson 1999). In 1936, the Kyrgyz Soviet Socialist Republic was formally designated a republic of the USSR. Under the Soviets, Kyrgyzstan's physical infrastructure and economic state evolved rapidly. New trade was facilitated with fellow republics, expansive health and educational systems were constructed and infrastructure was modernized (Anderson 1999; Corcoran-Nantes 2005). These advances notwithstanding, Kyrgyzstan remained one of the poorest republics of the USSR and as much as 25% of its republican income came in the form of subsidies from Moscow (Falkingham, Klugman, Marnie &

Micklewright 1997; Meimanaliev, Ibraimova, Elebesov & Rechel 2005). Following its sudden independence from the USSR in 1991, Kyrgyzstan suffered a shocking economic decline and hyperinflation. Between 1990-95, Kyrgyzstan's GDP fell 50%, agricultural production slipped some 33% and industrial production declined almost two-thirds (Ackland & Falkingham 1997; Anderson 1999). Inflation spiraled from 200% to over 900% between 1991-92 as price controls were lifted (Anderson 1999). Estimates of household poverty vary, but it's widely agreed that levels increased, particularly in southern and rural communities. As recently as 2007, 65% of the population was living below the poverty line (USAID 2007). There is evidence that women have suffered disproportionately, as well. The loss of central-government support necessitated the elimination of many social programs that supported families and enabled women to more easily balance motherhood and employment (Akiner 1997). Austerity measures introduced in 1993 ended nearly all government-funded preschool programs, raising the cost of employment for working mothers (Anderson 1999). Such changes likely contributed to rising joblessness among women. In 1991, it was estimated that women constituted nearly 70% of the unemployed (Akiner 1997). Since independence, the incidence of severe poverty has been much higher for female-headed households particularly in urban areas (Ackland & Falkingham 1997).

The Kyrgyz population is predominately rural and spread across seven regions. Only 36% of the population resides in urban areas (WHO 2011). Among regions, those in the north and south are bifurcated geographically by a mountain range and socially by contrasting ethnic, religious, cultural and historic experiences (Anderson 1999). While ethnic Kyrgyz dominate the northern regions, ethnic Uzbeks reside in large numbers in the south and constitute the second largest ethnicity in Kyrgyzstan (Schmidt & Sagynbekova 2008). Historically, the Kyrgyz were distinguished for their nomadic heritage and residence in yurt communities where egalitarian gender roles were common. Uzbeks, by contrast, were distinguished as oasis populations who settled early into sedentary communities (Corcoran-Nantes 2005). These conditions informed Uzbek gender roles; sex-segregated traditions are more common among these groups (Jones & Grupp 1987).

Although Islam is the dominant religion in Kyrgyzstan and Central Asia, its practice and traditions are complex and vary across the region. In the south of Kyrgyzstan, Muslim women generally marry earlier and practice customs of seclusion and veiling. Northern populations converted more recently to Islam and customs of female seclusion and veiling are less common in this region.

In their effort to dominate Central Asia, early Soviet leaders employed strategies intended to accentuate class identities and weaken traditional belief systems. Redistribution of land and the forcible settlement of nomadic groups were important components of these strategies, however they mainly succeeded in solidifying mistrust of Soviet initiatives among indigenous groups (Northrop 2004). When these early strategies proved ineffective, Soviet leadership focused reforms on Central Asian women who were characterized as victims of oppression and a “Surrogate proletariat” (Northrop 2004; Massell 1974). Political proponents maintained that by altering regional norms of femininity, the Communist doctrine could gain critical proponents and do so at the expense of traditional culture and religious principles (Northrop 2004; Massell 1974; Lubin 1981). Thus, programs to build greater equality and draw women into the public sphere through education, employment and political involvement were not conceived purely as attempts to improve the lives of women but as a means for securing popular political support (Agadjanian & Makarova 2003; Corcoran-Nantes 2005). Many of the earliest laws sought to reform traditional customs around marriage. These included prohibitions against marriage before the age of 16, arranged and polygamous unions and the payment of bride price. New laws expanded women’s rights regarding divorce, family inheritance and child custody in a manner that challenged traditional Islamic law (Heyat 2000; Werner 2004). Schooling laws passed in 1930, 1950 and 1966 similarly expanded educational requirements. These policies spurred significant shifts in the average level of education attained (Jones & Grupp 1987).

Labor pressures inspired many pronatalist and employment policies to raise fertility and increase women’s involvement in the labor force. Beginning in the 1930s, these included restrictions on abortion and divorce, the taxation of childless couples as well as new benefits for mothers such as free childcare, state-funded family allowances and maternity leave (Goldman 1993; Akiner 1997). Support for working mothers was

further extended in the 1950s and through the 1970s as Soviet policy-makers targeted women to fill an increasing gap in the labor pool as workers and mothers to the next generation of laborers (Buckley 1989). Debate around the “double burden” carried by working mothers who balanced both employment and family duties intensified in the 1970s. This led to further growth of childcare services, maternity leave and higher monthly allowances for expanding families. At this time, working mothers were awarded greater financial incentives than full-time mothers for their second and third births (Jones & Grupp 1987). Some scholars credit this benefit with spurring a baby boom between 1981-90 across the USSR, although the benefit was not offered in Central Asia until 1983 (Jones & Grupp, 1987; Zakharov 2008).

In 1991, dissolution of the USSR eliminated funding support critical to maintaining many of these health and education programs. Between 1995 and 2003, government investment in health declined from 4% to 1.8% of GDP (USAID 2007). Aggressive market reform efforts and restructuring of public enterprises, banking and agriculture have improved conditions in the interim, but the pace of economic recovery has been slow. Kyrgyzstan relied heavily on international loans to finance reforms and it now carries the largest debt-to-income ratio in the region (Olcott 2005). Despite these challenges, the Kyrgyz government began comprehensive reform of its health care system in 1993 with international support. By late 1996, Kyrgyzstan was estimated to have received upwards of \$680 million in assistance from international organizations and foreign nations (Abazov 1999). This effort has included the creation of mandatory health insurance, strengthening of primary health care, the expansion of local health and family planning services, the creation of contraceptive resource distribution systems and updated health educational programs for medical professionals (USAID 2007).

The improvement of reproductive health services and resources was a main aim of the reform effort. As part of its strategy, access to a diversity of modern contraceptives has been increased, nationwide. Citizens with mandatory health insurance are eligible to purchase a range of oral contraceptives and an injectable at reduced cost (USAID 2007). However, the UNFPA, USAID and Global Fund, among others have also been actively donating contraceptive supplies for distribution through health facilities since the early 1990s (Corcoran-Nantes 2007; USAID 2007). In 2006 alone, funding for contraceptive

supplies from UNFPA, USAID and the Global Fund totalled \$638,000 (Armand, O'Hanlon, Seligman et al. 2006). These donated supplies have included oral contraceptives, condoms, intrauterine devices and injectables (USAID 2007).

Advances have been made in birth delivery services and the accessibility of contraception in Kyrgyzstan. In 2006, between 92-99% of pregnant women received antenatal care at least once prior to delivery (UNICEF 2006). UNICEF estimates that nearly 97% of new births were delivered in formal health care facilities over the same period. Yet, maternal mortality rates remain at elevated levels. Between 2006-2008, the number of women who died while pregnant or following the termination of a pregnancy ranged from 81 to 104 per 100,000 live births (WHO 2011; UNICEF 2006). Under-five mortality rates in Kyrgyzstan are slightly higher than those of neighboring countries at 37 per 1000 live births (WHO, 2011). In 2010, Kazakhstan and Uzbekistan reported under-five mortality rates of 29 and 36, respectively.

Fertility rates have significantly declined in Kyrgyzstan over the past several decades. Today, fertility rates in Kyrgyzstan are slightly higher than those of its nearest neighbors. In 2009, the total fertility rate for Kyrgyzstan was 2.5 as compared to 2.3 in Kazakhstan and 2.2 in Uzbekistan (WHO, 2011). However, the adolescent pregnancy rate in Kyrgyzstan is neither the highest nor lowest in the region. According to the WHO's most recent figures (2011), 29 per 1000 women age 15-19 were pregnant in Kyrgyzstan as compared to 31 in Kazakhstan and 26 per 1000 in Uzbekistan.

Kyrgyzstan's steady fertility decline has led some demographers to propose that its population has entered a second demographic transition (Gentile, 2007). However, qualitative research conducted in the post-Soviet period also suggests that economic considerations may be driving fertility preferences more so than shifting norms (Storey, Ilkhamov & Saksvig 1997). The analysis of fertility control attitudes as well as patterns of use could illuminate whether contemporary fertility declines are likely to be sustained. Has increased access to more diverse modern methods spurred wider adoption of contraceptive methods or has the use of modern methods been limited to specific populations? How well are patterns of contraceptive use in Kyrgyzstan predicted by factors known to be influential in other contexts? To better understand the dynamics of fertility control in Kyrgyzstan, we propose to address the following research questions:

RQ1: What are the dominant attitudes around contraceptive use in Kyrgyzstan? How broadly do they vary across the population?

RQ2: How well do demographic characteristics and fertility preferences predict fertility control among married couples?

RQ3: How well do marriage timing and spousal characteristics predict fertility control among married couples?

RQ4: How well does household structure predict the likelihood of fertility control? Are married couples who co-reside with older, female adults employing contraceptives as widely as couples who live in nuclear households?

To address these questions we employ national-level data from Kyrgyzstan that were collected in 1997.

Data & Methods

This study uses nationally representative data from the 1997 Kyrgyzstan Demographic and Health Survey (KRDHS). The sampling design was structured around census population data.

The KRDHS questionnaires were developed using model surveys from the DHS program and altered following consultations with Kyrgyz reproductive health and child health specialists. Translated into Russian and Kyrgyz, the survey was pretested on 120 women over a two-week period in both urban and rural settings. Eight female interviewers were trained for two weeks before conducting the pretest. An additional 32 female interviewers were recruited, primarily from the Kyrgyz Institute of Obstetrics and Pediatrics. They included medical doctors, nurses and researchers. Interviewers received an orientation in survey interviewing techniques over a three-week period and then began data collection in Bishkek city. After a two-week period of data collection, they were assigned to regions outside the capital city. Interviews were completed in November.

The survey was administered to respondents in a total of 3,672 households. The individual KRDHS survey collected data on the demographic characteristics of 3,848 women of reproductive age (15-49) nationwide, including detailed marital and pregnancy

histories as well as knowledge and use of contraception. Data for husbands and other household members were included in a household survey that was subsequently merged with the women's dataset. The women's sample was restricted to include only those age 15-39 who were not pregnant but were currently married or cohabitating with a partner or husband who was physically residing in the household. This produced a sample of 1,743 total cases.

The dependent variables in our analyses distinguished between users and non-users of various contraceptive methods as well as women and their spouses who reported attitudes of approval or disapproval of family planning. Current contraceptive use has been re-categorized and coded into four dichotomous variables: Any Method, Modern Reversible Method, Event-based Method and Traditional Method. Modern reversible methods were the intrauterine device (IUD), injectables, and the oral contraceptive pill. Sterilization was also included in this category, despite its permanent nature, as less than 1% of women in the sample reported its use. Methods included as event-based methods were the condom, diaphragm and foam. Traditional methods included withdrawal, periodic abstinence (calendar method) and douching. Women were categorized as non-users if they reported no use of *any* method, modern or traditional. Among attitudes, women and their spouses were reported as either approving, disapproving or ambivalent about family planning.

The independent variables of interest in our analyses were individual-level variables specific to the women respondents and their partners. These included birth cohort, age of first marriage, residence location (urban or rural), parity, fertility preference, age and educational differences between partners and the presence of a co-residing female adult (age 59 or older) in the household.

The parity variable is a self-reported record of the total number of children a woman has delivered so far in her life. Thus, children who live outside of the household and those that died in infancy are included in this value.

The fertility preference variable captures if women desired additional children, were undecided or desired no more. Differences in age and education were calculated between women and their husbands. Positive values indicate a spouse is older or more educated than their wife. Finally, a variable measuring the presence of an older female

adult was created. This value was further adjusted to capture only women age 59 and older in the household.

Our analyses were performed in three stages. In the first stage, we conducted a descriptive analysis of the sample of women 15-39 to determine common individual characteristics, household characteristics and the distribution of these qualities across the sample. At the second stage, we performed bivariate analyses to explore the associations between different methods users and non-users, women who approved or disapproved of family planning and individual characteristics. Finally, logistic regression was used to explore potential predictors of family planning attitudes and use of fertility control.

Results

Descriptive Analysis

The sample used for these analyses was composed of 1,743 women between the ages of 15 and 39, nearly 25% of whom were under the age of 25. Concurrent with Kyrgyzstan's national demographics, 70% of respondents were rural dwellers, 62% were of Kyrgyz ethnicity and almost 90% identified as Muslim. Kyrgyzstan is a highly educated country where both boys and girls have an opportunity to receive schooling up to and beyond the secondary level. As illustrated in Table 3.1, over 70% of respondents and their spouses completed secondary education (up to grade 11) and around a fifth of men pursued post-secondary schooling. A slightly smaller proportion of women sought education beyond the secondary level. Just over half of all women were employed outside the home. Of those who were

Table 3.1: Percent Distribution of Female Respondents by Select Characteristics
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Percent (N=1743)
Age at Interview	
15-19	3.6
20-24	20.5
25-29	21.3
30-34	27.9
35-39	26.7
Region	
Bishkek	11.5
North	31.5
East	6.1
South	50.9
Type of Residence	
Urban	30
Rural	70
Ethnicity	
Kyrgyz	62.1
Uzbek	20.1
Russian	9
Other	8.8
Religion	
Muslim	88.8
Other	8.7
Not Religious	2.5
Education	
Incomplete Secondary	10.5
Secondary	72.4
Higher	17.1
Husband's Education	
Incomplete Secondary	8.1
Secondary	71.7
Higher	20.1
Occupation	
None	43.4
Professional/Managerial	20.6
Clerical/Service/Sales	12.2
Manual/Agricultural	23.9
Relation to Household Head	
Head of Household	3.8
Wife	60.6
Daughter-in-Law	25.9
Other	9.7
Older Female in Household	
Yes	20.2
No	79.8

employed, about a third worked in white-collar professions or the service sector. Over a fifth were manual laborers in agriculture or industry.

In terms of household structure, 60% of respondents were in households headed by their spouse or partner. However, one fourth were residing in the home of their husband’s parents. A full 20% of respondents lived in households that included at least one woman of an older generation.

Marriage during adolescence is not uncommon. As illustrated in Table 3.2, over half of women surveyed were married in their teens and approximately 95% were married by age 24. Just under 30% of women became

Table 3.3: Percent Distribution of Female Respondents by Contraceptive History 1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Percent (N=1743)
Current Contraceptive Use by Type	
None	32.1
Modern Reversible	50.2
Event-Based	5.8
Traditional Method	12
Ever Terminated Pregnancy	
No	51.3
Yes	48.7
Ever Use of Any Method	
Never Used	15.1
Only Traditional	6.8
Modern Method	78.1
Approves of Family Planning	
Disapproves	1.4
Approves	97.5
Don't Know	1.1
Husband Approves of Family Planning	
Disapproves	8.7
Approves	86.9
Don't Know	4.4
Contraceptive Use & Intention	
Using Modern	56
Using Traditional	12
Non-User with Intention	25
Non-User with No Intention	7

mothers as adolescents.

However, most

began childbearing in their early 20s. In Kyrgyzstan, marriage and childbearing are near universal experiences.

Only 5.3% of the women in this sample were childless. In fact, large families are not uncommon. Almost 30% of women had four or more children and almost half had two to three children. In terms of fertility preferences, the majority of women desired another child, while just under half wished to cease childbearing. Less than 10% were ambivalent about a potential pregnancy.

Support for family planning was quite strong in Kyrgyzstan among both women and their spouses. As delineated in Table 3.3, over 90% of women approved of family planning and 87% described their spouse as similarly supportive. Some

Table 3.2: Percent Distribution of Female Respondents by Fertility Characteristics 1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Percent (N=1743)
Age at First Marriage	
14-19	52.1
20-24	42.6
25-29	4.5
30+	0.8
Age at First Birth	
<20	29.9
20-22	43.1
23-25	15.1
25+	6.5
Total Children Ever Born	
0	5.3
1	17
2	25.3
3	22.5
3+	29.9
Fertility Preference	
Have Another	49.4
No More	42.4
Undecided	8.1

Table 3.4: Distribution of Women by Family Planning Attitudes & Select Characteristics
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Women's Attitudes		
	Disapproves	Approves	Don't Know
	N=24	N=1699	N=20
Birth Cohort			
15-19	3.2	93.5	3.2
20-24	1.4	97.8	0.8
25-29	1.3	97	1.6
30-34	0.8	98.8	0.4
35-39	1.7	96.8	1.5
Residence			
Urban	1.1	98.3	0.6
Rural	1.6	97.1	1.3
Region			
Bishkek	1	98	1
North	1.8	97.4	0.7
East	1.9	91.5	6.6
South	1.1	98.2	0.7
Ethnicity			
Kyrgyz	1.8	96.9	1.3
Uzbek	0.6	98.9	0.6
Russian	0	100	0
Other	1.9	95.4	2.5
Parity			
0	3.2	93.5	3.2
1	2.7	95.6	1.7
2	1.6	97.3	1.1
3	0.3	99.5	0.3
4-13	1.1	97.5	1.3
Current Use			
None	3.2	95	1.8
Modern Reversible	1	98	1
Event-Based	0	100	0
Traditional	1	98	1

variation in support among women was observed across birth cohorts, regions of residence, levels of parity and contraceptive use history. As Table 3.4 shows, younger women were slightly less supportive of contraceptive use as were childless women and those who had never employed a method of contraception in the past. By comparison, there was more diversity in perceived spousal support for family planning. Women of the youngest cohort reported the greatest proportion of spouses opposed to family planning. Over 20% of women age 15-19 believed their husbands disapproved of contraceptive use. Women who lived

in the north and those who married late in adolescence also reported higher proportions of disapproving spouses. But overall, levels of approval were quite high in both groups.

Despite the strong level of support for family planning, reports of undesired pregnancies were not uncommon. Almost half of the women surveyed have had at least one abortion in the past. This is not surprising as over half of the sample came of age during the Soviet era when abortions were more readily available than contraception (Corcoran-Nantes 2005). As illustrated in Table 3.5, a greater proportion of women in the older cohorts have experienced at least one terminated pregnancy than women in the youngest cohorts. The proportion of women over the age of 25 who have had an abortion is approximately twice that of women in their early twenties, who came of age around the time of transition. Cohort contrasts are even sharper when multiple abortions are considered. Over 30% of women age 35-39 have had two or more terminated pregnancies as compared to barely 4% of women age 20-24.

Abortion is slightly more common among women in urban areas. A much greater proportion of urban women have had multiple terminations than rural women. This differential is also reflected in regional reports. Women in the capital city of Bishkek and the surrounding region have a far greater proportion of women who have experienced at least one abortion than in the south or the rural east. Relatively similar proportions of women across all ethnic categories have a history of terminated pregnancies, however multiple terminations are far more common among Russian women than other groups.

The proportion of women who had experienced abortion generally grew with parity, but some interesting fluctuations were evidenced. Women with two children had the greatest proportion of multiple terminated pregnancies than all other groups, even those with larger families. Nearly a fifth of all women with three children had experienced a terminated pregnancy, a larger proportion than women with four or more children.

Women who desired no more children reported a history of abortion in greater proportions than those who wished for more children or were ambivalent about pregnancy. However, differentials between women of different fertility preferences were surprisingly slight. Similar proportions of women had a history of one pregnancy termination across all fertility preference categories.

As reflected in Table 3.3, over two-thirds of women had experience using a modern method of contraception and 50% were currently employing a highly reliable,

Table 3.5: Distribution of Women by Abortion History & Select Characteristics
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Abortion History		
	0 N=1142	1 N=294	2+ N=308
Birth Cohort			
15-19	96.8	3.2	0
20-24	86.6	9.5	3.9
25-29	69.7	17.8	12.4
30-34	58.7	20.1	21.1
35-39	48.7	20.2	31.1
Residence			
Urban	49	19.1	31.9
Rural	72.5	15.9	11.6
Region			
Bishkek	41.3	19.9	38.8
North	59.9	19.5	20.6
East	78.3	13.2	8.5
South	72.8	15	12.2
Ethnicity			
Kyrgyz	69.8	15.3	14.9
Uzbek	65.8	20.2	14
Russian	41.8	16.5	41.8
Other	58	12	12
Fertility Preference			
Have Another	73.5	14.4	12.1
No More	55.7	20	24.3
Undecided	67.6	15.5	16.9
Total Children Ever Born			
0	96.7	1.1	2.2
1	77.7	11.8	10.5
2	60.1	18.8	21.1
3	59.7	19.9	20.4
4+	62	18.4	19.6

modern reversible method. A much smaller proportion (6%) reported use of condoms or the diaphragm. Almost one-third of women were not using any method of contraception, though 25% planned to use a method in the future. Only 12% were currently relying on less effective, traditional methods and 7% had no plans of using any methods in the future.

Bivariate Analysis

A large proportion of the sample, some 1,183 women reported use of any method of contraception, including traditional methods such as withdrawal or periodic abstinence. Across birth cohorts it appears that use of any method generally increases with a woman's age. As presented in Table 3.6, adolescent women reported the lowest proportion of use (37%), while two-thirds of women age 30-34 were currently using some method of contraception. This

Table 3.6: Percent Distribution of Women by Contraceptive Method in Use & Selected Characteristics
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Any Use	Constant	Single	Traditional
	N=1183	N=875	N=101	N=208
Birth Cohort				
15-19	37.1	22.6	3	11.3
20-24	58.1	39.9	7	11.5
25-29	65.5	48.5	5	11.9
30-34	75.2	55.4	6.2	13.6
35-39	73.8	57.5	5.4	10.9
Residence				
Urban	73.8	52.3	10	11.3
Rural	65.4	49.3	3.9	12.2
Region				
Bishkek	76.1	50.7	15.4	10
North	64.7	51.9	3.8	8.9
East	60.4	55.2	1.9	2.8
South	69	48.4	5.3	15.3
Education				
Incomplete Second	58.7	41.8	4.9	12
Secondary	68.9	52.4	4.6	11.9
Higher	69.7	45.8	11.4	12.4
Husband's Education				
Incomplete Second	63.8	39	6.4	18.4
Secondary	66.3	50.7	4.5	11.1
Higher	75.1	52.3	10.3	12.6
Occupation				
None	62.2	44.7	7.3	10.3
Professional/Managerial	70.7	53.2	4.5	12.8
Clerical/Service/Sales	75.1	53.8	8.9	12.7
Manual/Agricultural	72.2	55.5	2.6	13.9
Older Female in Household				
Yes	67.1	50.3	5.4	11.6
No	68.1	50.1	6	12

preference for contraceptive use was greatest in urban areas, but a majority of women in both rural and urban regions reported current use of some method. Approximately 65% of rural and 74% of urban respondents were employing a method to prevent pregnancy. Even in the highly rural east of Kyrgyzstan, contraceptive use was reported by 60% of the women.

Not surprisingly, contraceptive method use increased with the level of educational attainment achieved by either the respondent or her partner. The spouses of men with

post-secondary education reported using contraceptives in greater numbers than all other groups, including post-secondary educated women. While 70% of women with advanced schooling reported use of a method, two-thirds of those with highly educated partners were current users.

Unusual patterns of fertility control emerge with respect to women's employment. Larger proportions of women are using any method than no method across all work categories, including among the unemployed. Yet in contrast to education, use of any method does not increase with occupation status. A larger proportion of women in service industries and agriculture reported use than did women in professional, white-collar positions. In fact, some 30% of women in white-collar jobs were currently not using any method to control their fertility.

Interestingly, usage patterns do not vary much across different household structures. As reflected in Table 3.6, nearly equivalent proportions of women were using any method whether they share a household with an older female relative or not.

Given the pronatalist values of Kyrgyzstan, it's not surprising to find that women who marry or begin childbearing later in life are practicing fertility control less than all others. As displayed in Table 3.7, only 36% of women who marry at age 30 or older reported use of contraception. Because of late entry into marriage, these women were likely still expanding their families. Similarly, women who waited the longest to become mothers reported the lowest proportions of any method use. It's also interesting to note that women married in their teens and early twenties were practicing fertility control in greater proportions than women who married between ages 23-24.

Patterns of any method use generally increase with rising parity as childless women (16%) reported use in lower proportions than all other groups. Just over half of women with one child were employing a method of contraception. Yet, analysis of fertility preferences indicates the relationship between any use and ideal family size may be more complex. Of women who desired an additional child, over 60% reported that they were currently using a method. Although the proportion was still higher for women who wished to have no more children (73%), those who were ambivalent about pregnancy reported the highest proportion of all. Over 80% of women who were unsure whether they desired another child were currently using a method.

Women with a history of undesired pregnancies also reflected a strong pattern of contraceptive use. Over three-fourths of women who had an abortion reported current use of some method of fertility control.

Among women surveyed, 50% reported currently using a modern reversible method. By comparison, 12% were using traditional methods and just 6% were

employing event-based methods. Older women were the dominant users of modern reversible methods. Women who marry and enter motherhood in their early twenties and those with a history of terminated pregnancies also reported high rates of use of modern reversible methods. The proportion of users employing these highly reliable methods also

Table 3.7: Percent Distribution of Women by Contraceptive Method in Use & Fertility-Related Characteristics
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	Any	Constant	Single	Traditional
	N=1183	N=875	N=101	N=208
Age at First Marriage				
14-19	68.5	51.4	5.3	11.9
20-24	67.7	49.7	6.2	12
25-29	69.2	46.2	7.7	14.1
30+	35.7	21.4	7.7	7.1
Age at First Birth				
<20	70.8	52.9	5.4	12.7
20-22	72.2	54.1	6.3	11.7
23-25	70.1	51.7	5.3	12.9
25+	68.4	43.9	8.8	15.9
Total Children Ever Born				
0	15.6	7.3	3.2	1.1
1	56.4	36.9	7.5	12.5
2	73.4	54.3	7.2	13.1
3	75.5	58.3	6.4	14.5
4+	72.6	60.9	3.6	10.7
Fertility Preference				
Have Another	61.2	44.4	4.5	12.3
No More	73.1	55.8	5.7	11.6
Undecided	81.7	55.3	14.2	12.1
Ever Terminated Pregnancy				
Yes	76.2	54.9	7.1	14.2
No	60.1	45.6	4.6	9.8

increases with parity. Over half of all women with two children were relying on modern reversible methods. Over 60% of mothers with four or more children were current users.

Women who desired no more children or were ambivalent about pregnancy were also dominant users of modern reversible methods. Over half of these women were current users as compared to 44% of women who desired another child. The proportion of women currently relying on these methods was nearly equivalent across households in which an older female relative resided or did not reside.

Patterns of use did vary across regions, educational levels and employment categories. The greatest proportion of users were women in the rural east, 55% of whom reported current use of a modern reversible method. By contrast, these methods were far less common in the south where just 48% of women were current users.

Interestingly, use of these highly reliable methods does not progressively increase with education. While highly educated women were more likely to use any method, 52% of secondary-educated women were users of modern reversible methods as compared to just 45% of women with post-secondary educations. A similar pattern was also evidenced across spousal education levels. Women whose husbands had completed secondary school used modern reversible methods in greater proportion than all other groups, including the wives of post-secondary-educated men.

Another surprising pattern of use among modern reversible methods users is evidenced across work categories. Specifically, use of modern reversible methods was reported more frequently by women in lower status occupations than those in white-collar roles. Some 56% of women working in agriculture or manual fields relied upon these methods as compared to 53% of women in professional, white-collar jobs. A similar differential in patterns of use was also evidenced between agricultural/manual workers and those in clerical positions or service industries.

Far smaller proportions of women reported use of event-based methods or traditional methods, by comparison. Among the notable patterns we observed, event-based methods users were predominately located in the capital city of Bishkek and were highly educated women or the wives of highly educated men. By contrast, traditional methods users were located largely in the south of Kyrgyzstan and were women who never completed secondary school or married to men with below-average educational levels. However, it is interesting to note that nearly equivalent proportions of white-collar workers and agricultural or manual laborers reported using traditional methods.

Logistic Regression

Prior to performing logistic regression, Spearman rho correlations were calculated to identify if there was any evidence of multicollinearity between independent variables. None of the predictor variables were found to be collinear with one another.

Logistic regression was performed to evaluate the impact of several individual-level factors on the likelihood respondents reported using any measures to control their fertility. Regressions were also conducted to assess how factors influenced the odds that respondents were employing a reversible modern method (IUD, pill, injectibles,

sterilization), an event-based method (condom, diaphragm) or traditional method (withdrawal, periodic abstinence, douching).

To begin, the full model was tested to assess how well it predicted the use of any method of contraception. We found the full model was statistically significant, $X^2 = 125.106$, $p < .001$. This indicates that the model was successful in distinguishing between women who reported use of any method and those who reported no use. The model as a whole explained between 7-10% of the variance in use of any method and correctly classified 72% of cases.

Table 3.8: Regression Coefficients, Parameter Estimates, Odds Ratios & 95% Confidence Intervals for Use of Any Method, by Selected Variables
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	<i>B</i>	S.E.	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Birth Cohort			10.47	4	0.033			
15-19	-0.929	0.37	6.44	1	0.011	0.01	0.19	0.81
20-24	-0.244	0.23	1.17	1	0.279	0.78	0.50	1.22
25-29	-0.122	0.19	0.41	1	0.521	0.89	0.61	1.28
30-34	0.151	0.16	0.90	1	0.343	1.16	0.85	1.59
35-39 (ref)								
Residence								
Rural	-0.540	0.13	18.21	1	0.000	0.58	0.46	0.75
Urban (ref)								
Age at Marriage	-0.043	0.03	3.09	1	0.079	0.96	0.91	1.01
Parity	0.233	0.05	21.22	1	0.000	1.26	1.14	1.39
Fertility Preference			10.58	2	0.005			
No More	0.015	0.14	0.01	1	0.910	1.01	1.34	3.37
Undecided	0.753	0.24	10.22	1	0.001	2.12	0.78	1.33
One More (ref)								
Age Difference	-0.006	0.02	0.11	1	0.741	0.99	0.96	1.03
Education Difference	0.018	0.03	0.45	1	0.500	1.02	0.97	1.07
Older Female Adult	0.133	0.13	1.01	1	0.316	1.14	0.88	1.48
Constant	1.384	0.64	4.64	1	0.031	3.99		

As illustrated in Table 3.8, four of the independent variables made a distinct and statistically significant contribution to the model. These variables were birth cohort, residence location, fertility preference and parity.

When compared to women in the oldest cohort (age 35-39), the odds of contraceptive use were less for all groups except women in their early thirties. The odds of contraceptive use did increase across aging cohorts. However, these results were only significant for the youngest cohort.

Residence was also a key variable in the model. Women in rural regions had decreased odds of reporting any contraceptive use. The likelihood rural women were using a method decreased by a factor of .6 when compared to urban dwellers.

Increasing parity raised the likelihood a woman was using a method to control her fertility. For each additional child born, the odds a woman reported any use increased 1.3 times.

Fertility preference was also an important factor in reports of current contraceptive use. Compared to women who desired another child, those who were ambivalent about pregnancy had higher odds of reporting contraceptive use. Women ambivalent about pregnancy were more than twice as likely to report use any method than women who wished for additional children. While women who desired no more children also had slightly higher odds of reporting use than women who wished to further expand their families, the outcome was not statistically significant.

The full model was subsequently tested to assess its ability to specifically predict use of modern reversible methods, event-based methods and traditional methods. With respect to modern reversible methods, the full model was statistically significant, $X^2 = 105.443$, $p < .001$. The model was effective in distinguishing between women who reported employing modern reversible methods from those using event-based methods, traditional methods or none at all. The full model explained between 6-8% of the variance in the employment of modern reversible methods and correctly classified 59% of cases.

As illustrated in Table 3.9, four of the independent variables made a statistically significant contribution to the model. These included birth cohort, residence location, age at marriage and parity. It is interesting to note that in contrast to the model evaluating use of any method, fertility preference was not a significant predictor of modern reversible method use.

Women in the youngest cohort were again distinguished from those age 35-39 for displaying reduced odds of employing a modern reversible method. The odds a woman age 15-19 was using one of these methods declined by a factor of .4 when compared to women 35-39. Similarly, the odds of using a modern reversible method also decreased with rural residency. Compared to urban women, rural dwellers had lower odds of using a

modern reversible method. Similarly, women who married late also demonstrated a lower likelihood of use. For each additional year a woman waited to marry, her odds of exercising a modern reversible method declined by a factor of .95.

Table 3.9: Regression Coefficients, Parameter Estimates, Odds Ratios and 95% Confidence Intervals for Use of Modern Reversible Method, by Selected Variables
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	B	S.E.	Wald	df	p	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Birth Cohort			9.09	4	0.059			
15-19	-1.036	0.38	7.34	1	0.007	0.36	0.17	0.75
20-24	-0.325	0.21	2.39	1	0.122	0.72	0.48	1.09
25-29	-0.094	0.17	0.29	1	0.590	0.91	0.65	1.28
30-34	0.004	0.14	0.00	1	0.977	1.00	0.76	1.32
35-39 (ref)								
Residence								
Rural	-0.275	0.11	5.80	1	0.016	0.76	0.61	0.95
Urban (ref)								
Age at Marriage	-0.047	0.02	4.04	1	0.044	0.95	0.91	1.00
Parity	0.218	0.05	23.18	1	0.000	1.24	1.14	1.36
Fertility Preference			0.97	2	0.617			
No More	-0.041	0.13	0.10	1	0.747	0.96	0.80	1.69
Undecided	0.153	0.19	0.64	1	0.423	1.17	0.75	1.23
One More (ref)								
Age Difference	-0.006	0.02	0.15	1	0.699	0.99	0.96	1.03
Education Difference	0.045	0.03	3.09	1	0.079	1.05	1.00	1.10
Older Female Adult	0.153	0.12	1.56	1	0.212	1.17	0.92	1.48
Constant	0.627	0.60	1.096	1	0.295	1.87		

Among the strongest predictors was that of parity. For each additional child a woman delivered, her odds of reporting the use of a modern reversible method increased 1.24 times.

The full model was further tested to assess its ability to predict a woman's employment of event-based methods, such as the condom or diaphragm. Following regression analysis, the model was found to be statistically significant, ($X^2 = 47.95$, $p < .001$) but explained just 3-8% of the variance in use of these methods. With regard to event-based method users, the model was highly successful in predicting use. It correctly classified 94% of users. However, far fewer of the independent variables contributed in a statistically significant way to the overall model. As illustrated in Table 3.10, only a woman's location of residence and fertility preference were significant predictor variables in this model. As noted in previous results, rural women displayed lower odds

of employing event-based methods. Their use of condoms or diaphragms declined by a factor of almost .4 when compared to urban women.

Table 3.10: Regression Coefficients, Parameter Estimates, Odds Ratios & 95% Confidence Intervals for Use of Event-based Method, by Selected Variables
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	<i>B</i>	S.E.	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Birth Cohort			3.32	4	0.504			
15-19	0.003	0.81	0.00	1	0.997	1.00	0.21	4.91
20-24	0.558	0.42	1.73	1	0.188	1.75	0.76	4.02
25-29	-0.002	0.37	0.00	1	0.996	1.00	0.48	2.06
30-34	0.157	0.30	0.28	1	0.596	1.17	0.66	2.09
35-39 (ref)								
Residence								
Rural	-0.933	0.22	17.30	1	0.000	0.39	0.25	0.61
Urban (ref)								
Age at Marriage	0.008	0.05	0.03	1	0.859	1.01	0.92	1.11
Parity	-0.096	0.10	1.00	1	0.319	0.91	0.75	1.10
Fertility Preference								
No More	0.473	0.27	3.03	1	0.082	1.60	0.94	2.73
Undecided	1.374	0.31	19.79	1	0.000	3.95	2.16	7.24
One More (ref)								
Age Difference	-0.047	0.04	1.73	1	0.188	0.95	0.89	1.02
Education Difference	-0.052	0.05	0.96	1	0.327	0.95	0.86	1.05
Older Female Adult	-0.057	0.27	0.05	1	0.833	0.95	0.56	1.60
Constant	-2.526	1.21	4.37	1	0.037	0.80		

As observed in prior results, differences in the likelihood of contraceptive use persisted between women who desired an additional child and those who were ambivalent about pregnancy. However in this model, the difference in likelihood was more considerable. When compared to women who desired more children, those who were ambivalent had almost 4 times greater odds of employing an event-based method. This is the largest differential we've observed across all regression analyses.

Finally, the model was evaluated on how well it predicted traditional method use among women in the sample. Regression analysis showed this model was not statistically significant and therefore less effective in predicting traditional method use. While it correctly classified 88% of cases, it was successful in explaining just .3-.5% of variance in the use of these methods. As illustrated in Table 3.11, none of the predictors significantly contributed to the overall model.

Table 3.11: Regression Coefficients, Parameter Estimates, Odds Ratios & 95% Confidence Intervals for Use of Traditional Method, by Selected Variables
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	<i>B</i>	S.E.	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Birth Cohort			1.75	4	0.781			
15-19	-0.084	0.54	0.03	1	0.875	0.92	0.32	2.62
20-24	-0.056	0.32	0.03	1	0.861	0.95	0.50	1.77
25-29	0.010	0.27	0.00	1	0.971	1.01	0.60	1.71
30-34	0.208	0.21	0.99	1	0.320	1.23	0.82	1.86
35-39 (ref)								
Residence								
Rural	0.122	0.17	0.50	1	0.480	1.13	0.81	1.59
Urban (ref)								
Age at Marriage	0.007	0.03	0.05	1	0.832	1.01	0.94	1.08
Parity	-0.015	0.07	0.05	1	0.818	0.99	0.86	1.22
Fertility Preference								
No More	-0.078	0.19	0.17	1	0.676	0.93	0.64	1.34
Undecided	-0.004	0.28	0.00	1	0.990	1.00	0.57	1.74
One More (ref)								
Age Difference	0.020	0.02	0.75	1	0.388	1.02	0.98	1.07
Education Difference	-0.038	0.04	1.01	1	0.315	0.96	0.90	1.04
Older Female Adult	-0.072	0.19	0.15	1	0.696	0.93	0.65	1.34
Constant	-2.249	0.892	6.365	1	0.012	0.11		

To assess how well the model predicted a history of terminated pregnancy, we completed a regression analysis using abortion history as the outcome variable. The results of this regression are illustrated in Table 3.12. We find the overall model was statistically significant ($X^2 = 306.61, p < .001$), successfully classified 71% of cases and explained between 16-22% of the variability in abortion history. A number of predictor variables were significant contributors to the model. These included birth cohort, residence location, age of marriage, parity and age difference between spouses.

As illustrated in our descriptive analysis, the likelihood of abortion declines considerably across cohorts. Women age 20-24 are 12 times less likely to have had a pregnancy terminated than women age 35-39. Residence in a rural area reduces the odds a woman has had an abortion by a factor of .4 and for every year a woman waits to marry, the odds she has terminated a pregnancy declines by a factor of .9. Interestingly, increasing parity is associated with a reduced likelihood of abortion. For each additional child a woman bears, her odds of abortion decline by a factor of .8. The likelihood of abortion also decreases as spousal age differences grow. Among couples in which the husband is older than the wife, the odds she has had a terminated pregnancy decrease by a factor of 1 for each year of age that separates them.

Table 3.12: Regression Coefficients, Parameter Estimates, Odds Ratios & 95% Confidence Intervals for Pregnancy Termination, by Selected Variables
1997 Kyrgyzstan Demographic & Health Survey

Characteristic	B	S.E.	Wald	df	p	Odds Ratio	95% C.I. for	
							Lower	Upper
Birth Cohort			113.36	4	0.000			
15-19	-4.569	0.82	31.35	1	0.000	0.01	0.00	0.05
20-24	-2.507	0.25	99.17	1	0.000	0.08	0.05	0.13
25-29	-1.251	0.19	43.30	1	0.000	0.29	0.20	0.42
30-34	-0.534	0.15	13.50	1	0.000	0.59	0.44	0.78
35-39 (ref)								
Residence								
Rural	-0.883	0.12	52.15	1	0.000	0.41	0.33	0.53
Urban (ref)								
Age at Marriage	-0.116	0.03	20.43	1	0.000	0.89	0.85	0.94
Parity	-0.206	0.05	18.55	1	0.000	0.81	0.74	0.89
Fertility Preference			2.11	2	0.349			
No More	0.113	0.14	0.69	1	0.408	1.12	0.86	1.46
Undecided	-0.194	0.22	0.79	1	0.373	0.82	0.54	1.26
One More (ref)								
Age Difference	-0.041	0.02	4.61	1	0.032	0.96	0.93	1.00
Education Difference	0.037	0.03	1.81	1	0.179	1.04	0.98	1.10
Older Female Adult	-0.273	0.15	3.50	1	0.061	0.76	0.57	1.01
Constant	3.913	0.662	34.92	1	0.000	50.05		

Multinomial Logistic Regression

Multinomial logistic regression was planned to test how well the model predicted attitudes of approval or disapproval of family planning among women and their spouses. However, as illustrated in our descriptive analysis, the sample of both women and their partners was heavily skewed in favor of family planning. Upwards of 97% of women surveyed and 87% of their partners were reported as supporting family planning. These distributions provided too few cases in the remaining categories (disapproval or ambivalence about family planning) to permit regression analyses.

Discussion & Conclusion

The study of contraceptive use behavior in Kyrgyzstan provides some valuable points of comparison as well as contrast for assessing fertility trends elsewhere in Asia and the Muslim world. As a moderately developed nation with an aged though evolving health care infrastructure, the delivery of contraceptive resources has been facilitated in ways unrealized in other, less developed nations. While the country has encountered considerable economic challenges in the post-Soviet period, its receipt of international

support for family planning and reproductive health care has only strengthened efforts to expand access to modern contraceptive resources, nationwide.

As confirmed by the literature, increasing age was positively associated with a greater likelihood women reported use of any method. Similar relationships have also been noted in other Muslim settings including Turkey, Jordan and Iran (Alpu & Fidan 2006; Sueyoshi et al. 2006; Sadat-Hashemi et al. 2007). This pattern is also consistent with the pronatalist values of cultures in Kyrgyzstan in which family and childbearing figure centrally (Akiner 1997).

What is distinctive and notable in the pattern of contraceptive use across Kyrgyzstan is the degree to which modern methods have been adopted across generations considering modern methods were unavailable for much of the Soviet period (Sherwood-Fabre, Goldberg & Bodrova 2002). Intrauterine devices were selectively introduced in the 1980s in Central Asia, but oral contraceptive pills, condoms and other methods were either unavailable or their use was discouraged due to low quality or dangerous side effects (Barbieri et al. 1996). Consequently, the use and availability of quality, modern methods is a rather contemporary phenomenon. Yet, more than half of the women surveyed reported use of modern methods. This is more than double the proportion observed in Iran, higher than proportions observed in Bangladesh and nearly equivalent to levels of use in India (Sadat-Hashemi et al. 2007; Jayaraman et al. 2009). Such findings suggest that a significant proportion of women in Kyrgyzstan have adopted modern methods in a relatively short span of time. This finding may be a product of Kyrgyzstan's high level of female education and employment. Women's education and employment have been positively associated with contraceptive use in numerous settings (Alpu & Fidan 2006; Gubhaju 2009; Saleem & Bobak 2005; Saikia & Singh 2009). High levels of educational attainment may also serve to explain patterns of increasing reliance on modern reversible methods that span aging cohorts. In sharp contrast to several other Muslim countries (Sadat-Hashemi et al. 2007; Kamal & Islam 2010), older women in Kyrgyzstan are among the dominant users of these highly reliable methods. Greater knowledge of their continued risk of pregnancy as well as awareness of available modern reversible methods could underscore this interesting generational pattern.

Our analyses also uncovered unexpected methods preferences across geographic regions. While a clear division exists in Kyrgyzstan between urban and rural communities, an interesting pattern emerged when useage trends were explored between regions. Most notably, women in the rural east were among the most dominant users of modern reversible methods even when compared to residents of the capital city. This finding runs contrary to other studies of urban-rural contraceptive use in which rural populations typically lag behind urban groups in their adoption of modern methods (Alpu & Fidan 2006). As our earlier paper articulates, women in eastern Kyrgyzstan also demonstrate more dramatic, generational fluctuations in marriage age as compared to women of other regions. The rise in median marriage age was more considerable, rising from 18 to 20 across just three cohorts of women. However, a characteristic decline in marriage age was also observed among young generations. While regional scholars have focused heavily on evidence of resurging traditional gender norms among some groups in Kyrgyzstan, we speculate that the roles and authority exercised by women in eastern regions may be, in fact, growing. Given the high levels of labor migration both internally and beyond Kyrgyzstan's borders, women in this rural region may be assuming greater responsibilities not only for their households, but across their communities, as well. Such shifts in local influence could be reflected in contraceptive behaviors and choices surrounding marriage timing. Unfortunately, these data do not allow for more in-depth analyses of women's authority within the household or community.

It is also possible that women in the rural east have encountered increasing opportunities to adopt IUDs as methods of fertility control. The IUD is among the leading methods of choice throughout Central Asia and one often inserted post-partum (Barrett & Buckley 2007; Agadjanian 2002). Thus, rural women need only visit local health point centers to receive this modern reversible method. This characteristic of Kyrgyzstan's health system may also help explain the high proportion of modern reversible method users in the east.

Among event-based users, the greatest proportion was found in the capital city of Bishkek. While the number of users was modest compared to other methods, it remains notable as a reflection of the potentially different fertility scenarios facing urban couples. Because of their temporary nature, these methods may be of particular interest to couples

who have not yet reached an ideal family size. These would include women who delayed marriage and childbearing to pursue education and work opportunities. We expect more of these women to be present in urban areas where the presence of delay-supportive norms in combination with plentiful opportunities for schooling and work would provide ample alternatives to marriage and motherhood. Indeed, our analysis of the association between contraceptive use and age of marriage reinforces this proposition. Women who delayed entry into marriage employed modern reversible methods less frequently than other groups. Women who waited longer to become mothers paralleled this pattern of method preference.

As observed in the literature, increasing parity is positively associated with contraceptive use. This has also been noted in several other Asian and Muslim contexts (Jayaraman et al. 2009; Kamal & Islam 2010). However, contraceptive use is also quite high across contrasting fertility preferences. In Kyrgyzstan, over 60% of women who desire another child are practicing some method of fertility control and over 40% are employing modern reversible methods. Not surprisingly, the employment of modern reversible methods is greatest among women who are either ambivalent or desire no more children. In Iran, almost half as many women (24%) were practicing modern methods of contraception despite desiring no further pregnancies (Sadat-Hashemi et al. 2007). Given the difficult economic conditions facing citizens in Kyrgyzstan, one explanation for the high proportion of users among women wishing for larger families could be financial constraints. Previous research has revealed evidence that economic strains may be dampening the fertility intentions of some couples in Kyrgyzstan (Storey et al. 1997).

Our analysis also revealed that common predictors of contraceptive use in other settings are poor predictors of use in Kyrgyzstan. Contrary to what is witnessed in Pakistan, Bangladesh and other Asian contexts, the presence of a senior female relative appeared to have little bearing on whether women in Kyrgyzstan were employing a method of contraception. While the presence of an older woman was associated with a reduction in modern contraceptive use in India, similar relationships were not observed in Kyrgyzstan. Given the high levels of support for family planning among women and their spouses in combination with high levels of educational attainment across generations, it is likely that the acceptance of fertility control may be greater among older generations in

Kyrgyzstan than elsewhere in Asia. In fact, considering the duration of fertility decline in Kyrgyzstan, these women may well have also taken measures to limit their family size, albeit decades earlier. In this manner, Kyrgyzstan may be distinguished from many of its neighbors.

Similarly, spousal education and age differentials were found to be insignificant in predicting contraceptive use behaviors. This also runs contrary to research findings in other settings, but may be a product of Kyrgyzstan's unique history. Nomadic values that emphasized gender equality in combination with Soviet-era policies that expanded opportunities for women may have effectively diminished the importance age and education differentials play in this setting. While lower levels of female education and employment have been associated with lower status and less contraceptive decision-making power elsewhere, this does not appear to be the case in Kyrgyzstan (Gubhaju 2009).

Kyrgyzstan has experienced a steady decline in fertility that has spanned several decades. However, it is only within the last two that access to modern contraceptive methods has truly grown. While the dominance of modern reversible methods indicates that fertility levels in Kyrgyzstan are less likely to rise in the near term, the speed with which modern methods have been adopted in this context merits attention. Kyrgyzstan is distinguished among other Asian, Muslim nations for its high levels of female education, employment and social development. As a case study, Kyrgyzstan may serve to reinforce the importance of social development and gender equality initiatives as factors that are highly influential in shifting contraceptive behaviors and long-term fertility norms.

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