Describing Repeat Abortions in Eurasia:
A Comparison of Women in Kazakhstan, Uzbekistan, and Kyrgyzstan

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ABSTRACT

We explore the demographic determinants of repeat abortion in Kazakhstan, Uzbekistan, and Kyrgyzstan using data from Demographic Health Surveys. The outcome variable of interest is the number of abortions a woman had up to the date of the interview. To analyze the data, we employ the method of generalized ordered logit regression with multiple covariates. We find that while there are significant factors that differ across these countries, being Muslim is consistently associated with lower odds of repeat abortion. Additional years of sexual exposure, urban residence, employment, and being partnered are all positively associated with repeat abortion in all three countries. Our results suggest that although abortion may have declined in this region of the world over the past two decades, repeat abortion still plays a significant role in fertility control.

BACKGROUND

The Central Asian nations of Kazakhstan, Uzbekistan, and Kyrgyzstan have rich and varied cultural histories, but carry the common burden of the Soviet legacy. Reproductive health was never the strong suit of the Soviet healthcare system (Buckley 2006). Access to and knowledge of family planning and contraception in particular were overlooked and women attempting to control their fertility often used abortion as a substitute for effective modern contraception (David and Skilogianis 1999; Westoff et al. 1998). As a result, many women had numerous or "repeat abortions" over the course of their reproductive years, and this practice was accepted as a cultural norm. This reliance on abortion is often referred to as the Soviet "abortion culture."

Although the communist parties fell in this region more than 15 years ago, these countries have been slow to adapt in several respects and reproductive health in this region still lags behind the West. Although reproductive health campaigns have increased awareness and knowledge of contraception and abortion rates have decreased, it is clear that abortion is still a prominent part of the region's reproductive health norms.

The summary reports on the Demographic and Health Surveys (DHS) data sets for these three countries cover the topic of abortion and provide univariate and bivariate analysis. Unfortunately, these reports consider all women in the sample, rather than those that have ever been pregnant and in possible need of an abortion (ORCMacro 1996, 1997, 1998). Other previous research using the same DHS data has suggested a divide in perspectives on abortion between the more conservative Muslim cultures local to Central Asia and the Russian and European cultures that were transplanted there during Soviet rule, but did not consider repeat abortion (Agadjanian 2002). A very thorough report on the replacement of abortion by

contraception using DHS data from Central Asia by Westoff et al. briefly considered the role of repeat abortion. Unfortunately, they only looked at whether or not a woman had more than one abortion rather than exactly how many repeat abortions a woman had in their multivariate model. They were unable to draw any conclusions beyond the fact that age and urban residence were significant and had a positive effect on the likelihood of ever having multiple abortions in all three countries (Westoff et al. 1998).

It is clear that many questions still remain regarding repeat abortion in Eurasia. The objective of this paper is therefore to better identify which women in the Eurasian context are most likely to have multiple abortions and to see if the results are similar across all three countries.

DATA

The data for this study comes from DHS done in three Eurasian countries: Kazakhstan in 1995, Uzbekistan in 1996, and Kyrgyzstan in 1997. Kazakhstan also has a follow-up survey from 1999, but for the purpose of comparing across these 3 countries we declined to use the second survey in this analysis. There was also an interim survey available from Uzbekistan performed in 2002; however this survey is composed of different questions and did not contain any information about abortions. The DHS datasets are nationally-representative household surveys covering a wide range of health indicators.

For the purpose of this study, each survey is limited to a sample of ever pregnant women since these are the only women with any possible risk of having an abortion. Given this criterion, the final sample sizes are 2736 for Kazakhstan, 3062 for Uzbekistan, and 2824 for Kyrgyzstan.

VARIABLES

The outcome variable of interest is the number of abortions a woman had up to the time of the survey. In all three surveys, the minimum for the abortion variable was 0, but the maximums were considerably more variable at 40, 12, and 25 for Kazakhstan, Uzbekistan, and Kyrgyzstan respectively. We chose to condense this variable so that maximum value in each dataset was 5 or more.

The first row in Table 1 provides the frequency and percent of women that have ever had an abortion in each country. More than half (53.8%) of Kazak women have had at least one abortion. In Uzbekistan the percent of women was substantially smaller with only 27% of women ever having an abortion. Kyrgyzstan falls between the other two countries at 42.3%.

Table 1: Descriptive Abortion Statistics

	Kazakhstan n=2736		Uzbekistan n=3062		Kyrgyzstan n=2824	
	Freq.	*(%)*	*Freq.*	*(%)*	*Freq.*	*(%)*
Has had at least one induced abortion	*1473*	*(53.8)*	*829*	*(27.1)*	*1195*	*(42.3)*
Number of induced abortions among women who have had at least one	**n=1473**		**n=829**		**n=1195**	
1	*466*	*(31.6)*	*403*	*(48.6)*	*468*	*(39.2)*
2	*383*	*(26.0)*	*223*	*(26.9)*	*345*	*(28.9)*
3	*224*	*(15.2)*	*83*	*(10.0)*	*199*	*(16.7)*
4	*150*	*(10.2)*	*65*	*(7.8)*	*81*	*(6.8)*
5+	*250*	*(17.0)*	*55*	*(6.6)*	*102*	*(8.5)*

The lower rows in Table1 only include women who have had at least one abortion and provide the distribution of the number of abortions among those women. In Kazakhstan nearly 70% of women who have had an abortion have had more than one. The distribution is positively skewed with the majority of women having either one (31.6%) or two (26.0%) abortions. There is, however, a significant portion of women who have three (15.2%) and four (10.2%). The percentage of women who have five or more abortions is 17%. This final group includes women

who have had anywhere between 5 and 40 abortions. In Uzbekistan more than half of the women who have had an abortion have had a repeat abortion. The distribution is even more positively skewed with almost half (48.9%) of the women only having one abortion and more than a quarter (26.9%) having two abortions. The remaining Uzbek women are fairly evenly spread across the higher order abortion categories. In Kyrgyzstan almost 60% of women have had a repeat abortion. The distribution in Kyrgyzstan is more similar to that of Kazakhstan although there are slightly more women who had only one abortion (39.2%) or two abortions (28.9%). More Kyrgyz women have had three abortions (16.7) but fewer have had four (6.8%) or five or more (8.5%).

It is clear from this table that although the majority of women in these countries who have had an abortion have only one or two abortions, there is still a sizeable percentage of women who have higher order abortions. This appears to be more common in Kyrgyzstan and especially Kazakhstan compared to Uzbekistan.

Other independent variables in this analysis include age, years of exposure to sex, educational attainment, living in an urban area, marital/partner status, and work status. The age range for the women in all of the samples was between 17 and 49. In addition, we constructed a variable for years of sexual exposure by subtracting age at sexual debut from current age at time of the interview. The mean of years of sexual exposure was relatively close across all three countries with 14.2 years for Kazak women, 13.2 years for Uzbek women and 13.6 years for the Kyrgyz.

Table 2: Descriptive Statistics for Other Variables

	Kazakhstan n=2736		Uzbekistan n=3062		Kyrgyzstan n=2824	
	Freq.	*(%)*	*Freq.*	*(%)*	*Freq.*	*(%)*
Greater than secondary level of education	*563*	*(20.6)*	*456*	*(14.9)*	*541*	*(19.2)*
Is Muslim	*1442*	*(52.7)*	*2795*	*(91.3)*	*2363*	*(83.7)*
Lives in an urban area	*1532*	*(56.0)*	*1606*	*(52.4)*	*1073*	*(38.0)*
Is married or lives with a partner	*2324*	*(84.9)*	*2842*	*(92.8)*	*2514*	*(89.0)*
Currently working	*1610*	*(58.8)*	*1607*	*(52.5)*	*1382*	*(48.9)*

Table 2 provides descriptive statistics for the dichotomous independent variables. In Kazakhstan, 20.6% of women have attained a level of education higher than secondary school. Just over half of the sample is Muslim (52.7%) and live in an urban area (56.0%). Most women are married or live with a partner (84.9%). The majority (58.8%) of women were employed or working at the time of the survey.

In Uzbekistan fewer women have continued past a secondary level of education (14.9%). The vast majority of women are Muslim (91.3%) and are married or live with a partner (92.8%). As in Kazakhstan close to half live in an urban area (52.4%) and are working (52.5%).

In Kyrgyzstan, similar to Kazakhstan, 19.2% of women have attained a level of education higher than secondary school. A large majority of women are Muslim (83.7%) and most are married or partnered (89.0%). Compared to the other two countries, fewer women in Kyrgyzstan live in urban areas (38.0%) and slightly fewer women were working (48.9%).

Ethnic and religion variables were explored in depth. In this region of the world it is often difficult to disaggregate the effects of ethnicity and religion (Westoff et al. 1998). More specifically, it not always clear whether the difference between being Russian versus the local ethnicity matters (Kazak, Uzbek, or Kyrgyz), or if the real differences are due to being Muslim versus other religions. Initially we included both ethnicity and religion in our models, but colinearity was a concern. We also tried constructing a variable that combined ethnicity and

religion (ex. Russian Muslims, Russian Christians, Kazak Muslims, Kazak Christians etc.) and found that being Muslim, regardless of ethnicity, consistently had a significant effect. Russian Muslims did not differ significantly from local ethnicity Muslims. In all three countries being of the indigenous ethnicity was virtually synonymous (more than 95%) with being Muslim. Therefore, it was determined that being Muslim was the primary religious and ethnic predictor that should be used in our analysis and other religious and ethnic identifiers were dropped from our models.

METHODS

Given the ordinal outcome variable of number of abortions, initially an ordinal logistic model was considered. An ordinal logit model depends upon the assumption of proportional odds. This means that across different levels of the outcome, the coefficient on a covariate is estimated to be a constant and is not allowed to vary. This assumption is often violated, and it is common for one or more covariates to differ across outcome values (Williams 2006). To test this assumption Brant Tests (both global and individual covariate tests) were conducted, and in each country at least a one of the covariates did vary across the number of abortions.

The failure to meet this assumption forced the consideration of other models. A multinomial logistic model, while possible, estimates more parameters than necessary, leading to a less parsimonious model that is more difficult to interpret. Instead, a generalized ordered logit model was chosen. The actual analysis was performed by specifying a partial proportional odds model using a user-written STATA program, "gologit2" (Williams 2006). This allowed the estimation of models that are less restrictive than a traditional proportional odds model by choosing which covariates to hold constant and which to let vary across outcomes based on

previous Brant Tests. The results of the generalized ordinal logistic model are only slightly more complicated than the regular ordinal logit model, but have the benefit of elucidating relationships and trends across outcome values that would have been obscured otherwise (Williams 2006).

RESULTS

The results of the final multivariate model for each country are provided in Table 3. In the model for Kazakhstan, the coefficients for education, Muslim, urban, partnered, and working all have proportionate odds across the abortion categories. The odds ratio for being Muslim is 0.26 and is highly statistically significant. This tells us that Muslim women are 74% less likely to have an abortion than women of other religions and they are also less likely to have a subsequent abortion regardless of previous abortions. Living in an urban area, being partnered, and working are also statistically significantly but are positively associated with having an abortion as well as having a repeat abortion. Women who live in Kazakhstan in an urban area are 1.72 times more likely to have an abortion or repeat abortion. Married or partnered women are 1.75 times more likely to abort or have a subsequent abortion. In addition, working is associated with 1.43 times the odds of having each additional abortion. The results show that while higher educational attainment has a mildly positive effect on the number of abortions, it is not significant.

The covariates for an additional year of age and an additional year of sexual exposure do not have proportional odds. The effect of age is insignificant comparing the difference in outcome of no abortions to one abortion and none or one abortion to 2 abortions. This suggests that there is no meaningful effect of age on the delineation of women who have none, one, or two

abortions. There is, however, a significant odds ratio when comparing women who have had two or fewer abortions to 3 abortions, an additional year of age decreases the odds of having that third abortion by 6%. This relationship grows slightly stronger for increasing numbers of abortions – each additional year of age decreases the odds of a fourth abortion by 10%, and each additional year of age decreases the odds of a fifth or higher order abortion by 10% as well. Using the generalized ordered logit model also shows that while age has a small negative effect on the number of abortions a woman has had, the negative effect of age is stronger for greater values of the outcome. In contrast, each additional year of sexual exposure is significantly associated with an increase in a woman's propensity to have more abortions. Comparing the zero category to having at least one abortion each additional year of sexual exposure makes a woman 1.09 times more likely to have that first abortion. This relationship grows stronger with each successive abortion category so that when comparing the likelihood of having four or fewer abortions to having five or more abortions an additional year of sexual exposure makes a woman 1.27 times more likely to have that additional abortion. Here the generalized ordered logit model reveals that the positive effect of sexual exposure is stronger for higher numbers of abortions. In other words, women who have had higher numbers of abortions are especially likely to have had longer lengths of sexual exposure.

Table 3: Multivariate Results for Generalized Ordinal Logistic Regression

Kazakhstan 1995 n=2736	**Odds Ratios (se)**				
Abortion Categories	***0 vs. 1***	***0, 1 vs. 2***	***0-2 vs. 3***	***0-3 vs. 4+***	***0-4 vs. 5+***
Age	0.99	0.98	0.94**	0.90***	0.90**
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Number of years respondent has been sexually active	1.09***	1.13***	1.19***	1.26***	1.27***
	(0.02)	(0.02)	(0.03)	(0.04)	(0.04)
Highest level of education = greater than secondary	1.08	1.08	1.08	1.08	1.08
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Religion = Muslim	0.26***	0.26***	0.26***	0.26***	0.26***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Lives in an urban area	1.72***	1.72***	1.72***	1.72***	1.72***
	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)
Partnered - married or living together	1.75***	1.75***	1.75***	1.75***	1.75***
	(0.27)	(0.27)	(0.27)	(0.27)	(0.27)
Employed or working	1.43***	1.43***	1.43***	1.43***	1.43***
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
Uzbekistan 1996 n=3062	**Odds Ratios (se)**				
Abortion Categories	***0 vs. 1+***	***0, 1 vs. 2+***	***0-2 vs. 3+***	***0-3 vs. 4+***	***0-4 vs. 5+***
Age	1.03	1.03	1.03	1.03	1.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Number of years respondent has been sexually active	1.05**	1.05**	1.05**	1.05**	1.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Highest level of education = greater than secondary	1.54***	1.54***	1.54***	1.54***	1.54***
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Religion = Muslim	0.35***	0.35***	0.35***	0.35***	0.35***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Lives in an urban area	2.41***	2.41***	2.41***	2.41***	2.41***
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Partnered - married or living together	1.82***	2.20***	2.22**	1.27	0.92
	(0.41)	(0.52)	(0.73)	(0.44)	(0.43)
Employed or working	1.38***	1.38***	1.38***	1.38***	1.38***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
Kyrgyzstan 1997 n=2824	**Odds Ratios (se)**				
Abortion Categories	***0 vs. 1+***	***0, 1 vs. 2+***	***0-2 vs. 3+***	***0-3 vs. 4+***	***0-4 vs. 5+***
Age	1.05***	1.05***	1.05***	1.05***	1.05***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Number of years respondent has been sexually active	1.04**	1.04**	1.04**	1.04**	1.04**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Highest level of education = greater than secondary	1.03	1.03	1.03	1.03	1.03
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Religion = Muslim	0.24***	0.24***	0.24***	0.24***	0.24***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Lives in an urban area	2.15***	2.15***	2.15***	2.15***	2.15***
	(0.33)	(0.33)	(0.33)	(0.33)	(0.33)
Partnered - married or living together	1.77***	1.77***	1.77***	1.77***	1.77***
	(0.28)	(0.28)	(0.28)	(0.28)	(0.28)
Employed or working	1.56***	1.34*	1.21	1.16	1.68*
	(0.19)	(0.19)	(0.18)	(0.23)	(0.42)

Notes:

1) Standard errors are in parentheses

2) *** p<0.01, ** p<0.05, * p<0.1

3) All three country models control for survey design and clustering.

4) Because the maximum number of abortions reported was so high in Kazakhstan (40 abotions), though not biologically impossible, there was some concern that the highest outliers would affect the results. Systematic removal of the highest values showed that our model and results were completely robust even when limiting the sample to women who had 6 or fewer abortions.

For the Uzbekistan data from 1996, all of the covariates in the model pass the Brant Test for proportional odds with the exception of the variable for being partnered. An additional year of age has no significant effect on the odds of having more abortions. The effect of an additional year of sexual exposure is significant and shows that each additional year of sexual exposure makes a woman 1.05 times more likely to have her first abortion as well as each additional abortion. In contrast to the Kazakhstan results, attaining a higher level of education was highly significant. Women that had higher than secondary schooling were 1.54 times more likely to have a first abortion and 1.54 times more likely to have each subsequent abortion. As in Kazakhstan, being Muslim significantly lowers the odds of having each abortion. Muslim women in Uzbekistan are 65% less likely than women of other religions to have an abortion and they are also 65% less likely to have a subsequent abortion regardless of previous abortions. Living in an urban area and working are also statistically significantly but are positively associated with having an abortion as well as having a repeat abortion. Women who live in Uzbekistan in an urban area are 2.41 times more likely to have an abortion or repeat abortion and if a woman works she has 1.38 times the odds of having an abortion or repeat abortion.

In Uzbekistan the variable for being partnered does not have proportional odds. For the first three abortion comparison groups the effect of being partnered is positively and significantly associated with having a first or higher order abortion. Women that are partnered are 1.82 times more likely to have their first abortion, 2.20 time more likely to have a second abortion and 2.22 times more likely to have a third abortion. For the higher order abortion categories, the odds actually decrease, however, the coefficients for being partnered are no longer significant.

In Kyrgyzstan there are proportional odds for every covariate except for work status. . The effect of an additional year of age is highly statistically significant, but not very large in

magnitude. Each additional year of age increases the odds of a first or repeat abortion by 5% (OR=1.05). The effect of an additional year of sexual exposure is also positive and significant and shows that each additional year of sexual exposure makes a woman 1.04 times more likely to have her first abortion as well as each additional abortion. Being Muslim, as in the other countries, is strongly associated with lower odds of having more abortions. Muslim women are 76% less likely to have a first or repeat abortion regardless of prior abortion behavior. Living in an urban area and being partnered are statistically significant and positively associated with the number of abortion women have in Kyrgyzstan. Women who live in urban areas are 2.15 times more likely to have an abortion or repeat abortion, and married or partnered women are 1.77 times more likely to abort or have a subsequent abortion. Similar to Kazakhstan, the results show that education has a small positive and insignificant affect on the number of abortions.

Considering the non-proportional odds for working from the generalized ordinal logit model shows that working only has a significant effect in the first two and last of the abortion outcome categories. In general working is associated with an increase in the propensity to have more abortions, but the effect of working decreases in strength as the number of abortions increases. Women who are working are 1.56 times more likely to have a first abortion and are 1.34 times more likely to have a second abortion, though for the second category the coefficient is only marginally significant. The middle abortion categories do not have significant coefficient results but continue to decrease in magnitude. The final category is significant, but breaks the pattern of decreasing magnitude. Women that are working are 1.68 times more likely to have a fifth or higher order abortion. This suggests that working women are especially likely to have one or two abortions compared to their non-working peers.

DISCUSSION

The covariate for age yields inconsistent results across countries. In Kazakhstan, the odds ratios for age are not proportional and the effect is negative, in Uzbekistan it is not a significant affect, and in Kyrgyzstan the effect is significant and positive. Previous research using these DHS datasets has shown that the effect of age on having one or more abortions is significant and positive (Westoff et al. 1998). These inconsistencies in our results may be partially due to our inclusion of a variable that controls for sexual exposure which is naturally correlated with age. The effect of years of sexual exposure is consistently significant and positive across all three countries although Kazakhstan does not have proportional odds. The positive effect of sexual exposure is intuitive since the longer a woman has been having intercourse the longer she has been at risk for an unwanted or mistimed pregnancy that may end in abortion.

The effect of women having a level of education greater than secondary school is also somewhat inconsistent. Kazakhstan and Kyrgyzstan both return insignificant results, where as Uzbekistan has a large and highly statistically significant odds ratio for higher educational attainment. This suggests that attaining higher levels of education in Uzbekistan means something different in Uzbekistan than in the other two countries. It may be a strong proxy for income or socio-economic status in Uzbekistan.

Being Muslim is consistently a highly significant predictor of having fewer abortions or none at all across all three countries. The strongest negative effect occurs in Kazakhstan, where the percent of women who are Muslim is the lowest (near 50%). In comparison, in Uzbekistan where over 90% of women in our sample are Muslim, the effect of being Muslim is the weakest of the three countries (though the effect is still quite strong). The negative effect of being

Muslim is expected as religious and cultural norms are more conservative and less likely to tolerate induced abortion as a norm of fertility control. In addition, the indigenous Muslim cultures in Eurasia also have higher fertility preferences than their Anglo-Christian counterparts (Agadjanian 1999, 2002).

Living in an urban area was consistently significant with a strong positive affect on the number of abortions a woman had for all three countries. This is also consistent with the prior findings of Westoff et al. that living in an urban area had a positive affect on propensity of a woman to have more than one abortion (Westoff et al. 1998). Women in urban areas are more likely to have access to healthcare facilities that will perform legal abortions.

Across all three countries being married or partnered also had a consistent significant and large positive affect on the likelihood of first abortions and repeat abortions, although there were not proportional odds for this variable in Uzbekistan. It is possible that this positive affect arises from the fact that a woman that is married or partnered is more consistently exposed to sex and may therefore be more at risk for unwanted or mistimed pregnancies.

Finally, we find that the affect of women working also has a significant positive affect for all three countries. Kyrgyzstan did not have proportional odds for this variable, and significance varied across the abortion categories, but the effect was consistently positive. Based on the theory of opportunity costs, working and stable employment may create a disincentive to have a child or additional children if childbearing and childrearing will interfere with work and income generating priorities.

STRENGTHS & LIMITATIONS

One of the primary strengths of this research is the comparative use of demographic and health surveys. Not only are the samples of women nationally representative, but all three surveys in the three different countries were virtually identical. There is confidence in the fact that the same questions were asked and coding was done the same way such that the responses are directly comparable. Consequently, the same multivariate model can be used for all three countries and the results can be examined for direct contrasts between the populations without worrying that differences may be due to the varying quality of data or questionnaires. Another important strength is that due to the Soviet legacy, abortion is normative enough that it is less stigmatized and underreporting is not a major concern.

One limitation in this research is the fact that many of the women interviewed have not completed their fertile years of life at the time of the survey, thus women in this sample have the potential to have more abortions in their lifetime than the ones counted here. Because most of our covariates have proportional odds, this issue is more likely to affect our results if younger women who have never aborted a pregnancy will have subsequent abortions to limit fertility once their childbearing is done.

We cannot make claims of causality between our covariates and repeat abortions because the answers used for our explanatory variables were current at the time of the survey, but were not necessarily true at the time of a woman's abortion. Specifically, urban residence, partner status, and employment status could all change over the course of a woman's life, while a characteristic like being Muslim is likely to be constant. Regardless, we are able to make inferences about association between these variables and the number of abortions a woman has had.

Finally, the DHS that are used for this project are all from the mid-1990's, which creates a time lag in the usefulness of what is learned from our results. Any interventions that could arise as a result of this research would inevitably be unlikely to help the women who were interviewed more than a decade ago. That being said, the decline in abortions seen in Central Asia in the 1990's began to stagnate at relatively high levels of abortion by the 2000's. Abortions still play a substantial role in gynecological morbidity and maternal mortality (Rani et al. 2006) suggesting that this research remains relevant despite the time that has passed.

CONCLUSIONS

The DHS data on Kazakhstan, Uzbekistan, and Kyrgyzstan provides a great opportunity to investigate the incidence and determinants of repeat abortion. Although contraception access and prevalence has increased in these countries abortion remains a common method of fertility control. While not all Eurasian women resort to abortion as a form of fertility control, it is clear from the data that the majority of women who have ever terminated a pregnancy have done it multiple times during their reproductive years. It is not apparent that repeat abortions are a detriment to women's health. There is concern, however, that despite the legality of the procedure outdated techniques and problems with sanitation make it a riskier procedure than it should be. When women have multiple abortions these health risks are further compounded.

The results of this study show that women who are partnered, employed, live in urban areas, and are not Muslim are especially likely to have repeat abortions. These are groups that can be targeted in future family planning campaigns. Unmet need for contraception, however, is a problem for all women in Eurasia that have unwanted or mistimed pregnancies, not simply

those that choose to abort. Therefore, contraceptive knowledge, access, and counseling should be improved for women across the varied Eurasian landscape.

Bibliography

Agadjanian, V. 1999. "Ethnic Differences in Demographic Responses to Crisis: Marriage and Fertility in Kazakhstan." Presented at Ethnic Differences in Demographic Responses to Crisis: Marriage and Fertility in Kazakhstan.

—. 2002. "Is "abortion culture" fading in the former Soviet Union? Views about abortion and contraception in Kazakhstan." *Stud Fam Plann* 33(3):237-248.

Buckley, C. 2006. "Challenges to integrating sexual health issues into reproductive health programs in Uzbekistan." *Stud Fam Plann* 37(3):155-168.

David, H.P.and J. Skilogianis. 1999. *From Abortion to Contraception: A Resource to Public Policies and Reproductive Behavior in Central and Eastern Europe from 1917 to the Present*. Santa Barbara, California: Greenwood Publishing.

ORCMacro. 1996. "Kazakhstan Demographic and Health Survey 1995: Key Findings." Calverton, Maryland Calverton, Maryland: Macro International.

—. 1997. "Uzbekistan Demographic and Health Survey, 1996." Calverton, Maryland: Macro International.

—. 1998. "Kyrgyzstan Demographic and Health Survey, 1997." Calverton, Maryland: Macro International.

Rani, M., S. Chao, G. Arystanova, and M. Rakhimova. 2006. "Fertility Regulation in Kazakhstan: The Role of Providers and the Public Financial Cost." *HNP Discussion Paper*. Washington, D.C.: World Bank.

Westoff, C.F., A.T. Sharmanov, J.M. Sullivan, and T. Croft. 1998. "Replacement of Abortion by Contraception in Three Central Asian Republics." Calverton, MD: The Policy Project and ORC Macro International Inc.

Williams, R. 2006. "Generalized ordered logit/partial proportional odds models for ordinal dependent variables." *Stata Journal* 6(1):58-82.