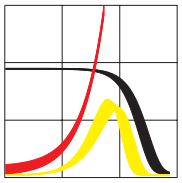

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Transition to modern contraception in Russia: evidence from the 1996 and 1999 Women's Reproductive Health Surveys

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Transition to Modern Contraception in Russia: Evidence from the 1996 and 1999 Women's Reproductive Health Surveys

Irina Troitskaya and Gunnar Andersson

February 2007

Abstract: During the 1990s in Russia both abortion and fertility rates declined rapidly. In the present paper, we shed some light on the extent to which these developments were related to increased use of modern contraception. Two surveys with retrospective information on contraceptive calendars reveal increasing transitions to modern contraception during the 1990s and show how these transitions were related to basic demographic control variables for women in Russia.

1. Introduction

1.1 Fertility decline since the beginning of the 1990s and parallel decline of abortion levels

During the last decade of the last century, the fertility decline in Russia was a subject of great interest to Russian as well as foreign demographers.[1] Despite of different opinions on reasons and perspectives of the low fertility in Russia, when discussing demographic consequences of decreasing fertility, scholars agree that such a sharp decline might provoke a growth in induced abortion.[2] Moreover, this case scenario would be much more probable in Russia than wherever else, because of (1) easy access to induced abortion, (2) traditionally tolerant attitudes toward this method of fertility regulation[3] and (3) quite poor institutional support in providing family planning services, methods and information.[4]

Despite this concern, since the beginning of the 1990s the indicators of induced abortion fell in tandem with the fertility decline, with about the same speed during the first half of the 1990s, and continued to decline when fertility developments stabilized during the second half of the same decade (Figure 1).

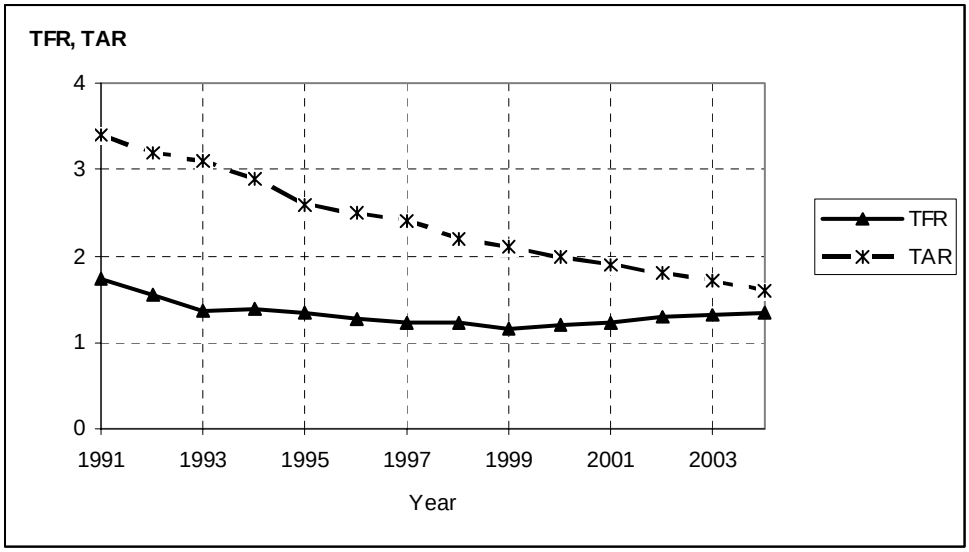
[1] See, for example, A.Avdeev. The extent of the fertility decline in Russia: is the one-child family here to stay? // International Perspectives on Low Fertility: Trends, Theories and Policies / IUSSP working group on low fertility, Tokyo, 21-23 March 2001, fasc. 12; S.Zakharov, E.Ivanova. Fertility decline and recent changes in Russia: On the threshold of the Second Demographic Transition // In: J.DaVanzo and G.Farnsworth (eds.) *Russia's Demographic "Crisis."* 1996. Santa Monica, CA: RAND; H.-P.Kohler, I.Kohler. Fertility decline in Russia in the early and mid 1990s: The role of economic uncertainty and labour market crises // *European Journal of Population*, 18 (3): 233-262.

[2] Population of Russia 1998. Annual Report, Chapter "Nuptiality and Fertility", Center of Demography and Human Ecology, Moscow 1999.

[3] A.Avdeev, A.Blum, I.Troitskaia. L'avortement et la contraception en Russie et dans l'ex-URSS: histoire et présent (Abortion and contraception in Russia and former USSR) // Dossiers et recherches, No.41, Paris 1993 ; Popov A. Family planning and induced abortion in post-Soviet Russia of the early 1990s: Unmet need in information supply // In: J.DaVanzo and G.Farnsworth (eds.) *Russia's Demographic "Crisis."* 1996. Santa Monica, CA: RAND.

[4] The first Russian government program "Family Planning" launched in 1994 and focussing on professional training of public health and social workers as well as on providing information on methods for birth control, was closed in 1998 because of broken funding.

Figure 1. Total Fertility and Total Abortion Rate dynamics in Russia, 1991-2004



1.2 Possible explanation: changes in contraceptive behavior?

There could be two possible explanations of such a parallel decline in fertility and abortion rates: statistical artifact or changes in contraceptive and sexual behavior. Recently, Philipov et al. (2004) showed that "provider statistics on abortion in Russia are a true reflection of the situation they monitor, that the observed declining trend in abortion is a real one".[5] Therefore, the most credible explanation is that over the last decade contraceptive behavior of Russian women has indeed changed. This change could have materialized through two types of adjustments in women's family planning practices: (1) growth of contraceptive prevalence and (2) increase in average effectiveness of methods used. In other words, we could expect various combinations of increases in women at reproductive ages who practice birth control, a partial replacement of traditional low-effective contraceptive methods by modern ones, and a change in the number of women who want to stop or postpone childbearing. [6]

Russian provider statistics do not dispose any information that could help us in differentiate between these hypotheses. All one can derive from official sources is the annual number of IUDs inserted (nothing is known about discontinuation of IUD use) as well as the annual number of women who asked for consultation about and prescription for contraceptive pills (nothing is known about the number of women who buy pills without prescription). That is, we need to turn to better sources of

[5] D.Philipov, E.Andreev, T.Kharkova and V.Shkolnikov. Induced abortion in Russia: recent trends and underreporting in surveys // *European Journal of Population,* vol.20 (2004), p. 95.
[6] For the relationship between induced abortion and contraception see numerous publications concerning J. Bongaart's model of proximate determinants of fertility.

information. The survey data we have at hand for the present study allow us to attempt estimating patterns of change in the various components of contraceptive behavior in Russia. In this paper we focus on the transition from non-use or use of traditional low-effective contraceptive methods of Russian women to their use of modern contraception.

2. Data

2.1 Survey description

The data we use in this study are derived from the two follow-up sample surveys named "Russia Women's Reproductive Health" (WRH). The surveys were sponsored by the United States Agency for International Development (USAID) and carried out by the All-Russian Centre for Public Opinion (VCIOM) and the Division of Reproductive Health of the U.S. Centers for Disease Control and Prevention (DRH/CDC) in February-May 1996 and February-May 1999. The surveys took place in the same three locations in Russia and each survey obtained information on almost 6,000 women of reproductive age; the samples were however not the same. The main findings of the first survey were published in 1998;[7] for lack of detailed information on family planning in Russia the results of this survey are often quoted by Russian and foreign demographers when discussing issues of this kind.[8] As some recent publications have shown, these data can also be used as an indicator of the quality of provider statistics on abortion in Russia.[9]

2.2 Contraceptive calendar

In addition, the surveys obtained information that so far has not been widely used but could shed light on different aspects of the decision making regarding women's entry into contraceptive use or their transition from traditional methods to modern ones. The surveys both collected a five-year contraceptive calendar of female respondents containing monthly information about method used (or non-use of

[7] *1996 Russia Women's Reproductive Health Survey: A Study of the Three Sites (Final Report: May 1998).* Centers for Disease Control and Prevention, All-Russian Centre for Public Opinion and Market Research, United States Agency for International Development. CDC, 1998.
[8] See, for example, the annual reports of the Russian Centre of Demography and Human Ecology named "Population of Russia".
[9] D.Philipov, E.Andreev, T.Kharkova and V.Shkolnikov. Induced abortion in Russia: Recent trends and underreporting in surveys // *European Journal of Population* 20: 95-117, 2004.

method) similar to the one used in the DHS (Demography and Health Survey) program.[10] In the first survey the calendar covers the period from January 1991 to the moment of the interview that took place some time between February and April 1996; the second calendar contains information for the period starting in January 1994 and ending in February to May 1999. In addition to the information on method used, respondents were asked about (1) monthly pregnancy status and pregnancy outcome and (2) reasons for stopping using a method.

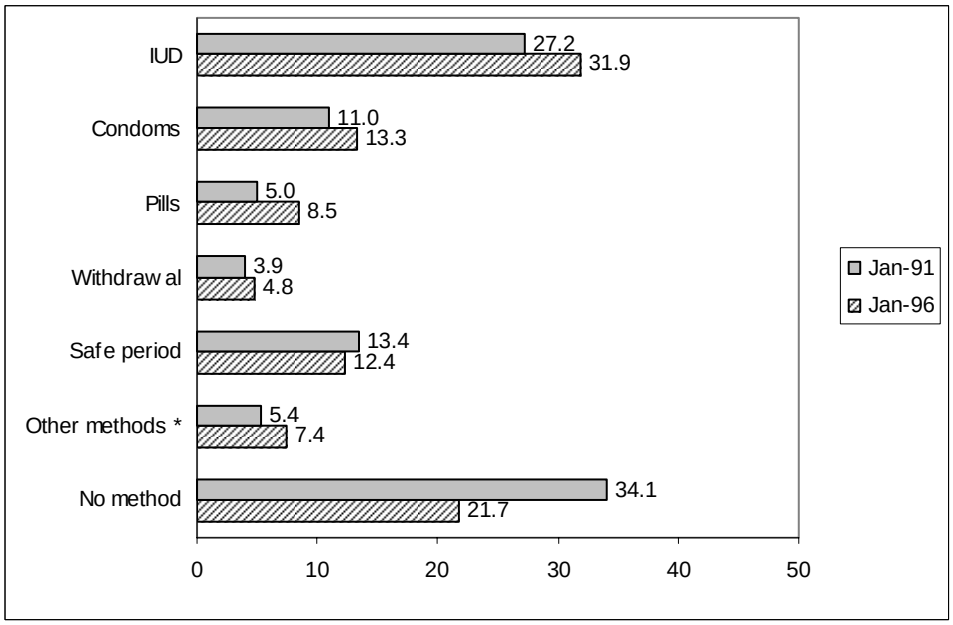
An initial crude description based on the contraceptive calendars shows that during the periods of observation (1991-1996 and 1994-1999, respectively) respondents demonstrated certain changes in contraceptive behavior. Figure 2 shows the distribution of respondents aged 20 and above at the time of interview, by method used in the beginning and end of the observation windows of the two surveys. This means that this representation is based on respondents who were at least 15 years at the beginning of the contraceptive calendar; in this case we eliminate the influence on these statistics of young respondents who turned 15 during the observation period.

When interpreting these summary statistics, one still has to take into account that the apparent changes in contraceptive prevalence from the beginning to the end of each period at least partly is due to the specificities of our samples. To a large extent, the remarkable changes in the proportion of respondents who use no contraception from the beginning to the end of observation periods is due to the ageing of young respondents so that each sample increasingly involves women in different types of partnerships and sexual unions. Consequently, the various percentages in Figure 2 are not directly comparable across overlapping calendar years of the two surveys.

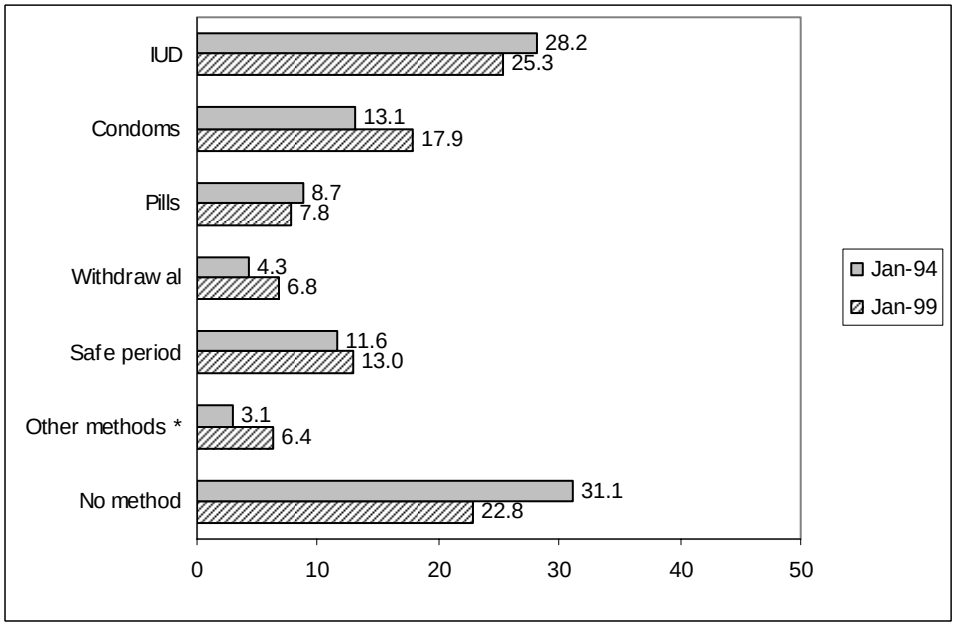
[10] See Chapter "Contraceptive failure/Discontinuation" in *1996 Russia Women's…*, pp. 92-94.

Figure 2. Distribution of respondents aged 20+ at the time of interview, by method used in the beginning and end of contraceptive calendar

a) 1996 WRH Survey



b) 1999 WRH Survey



* this group includes users of a non-specified contraceptive method as well as the small groups of women who declared using barrier methods or who had experienced contraceptive sterilization. In the remaining analyses, the latter two groups belong to the category of modern contraception.

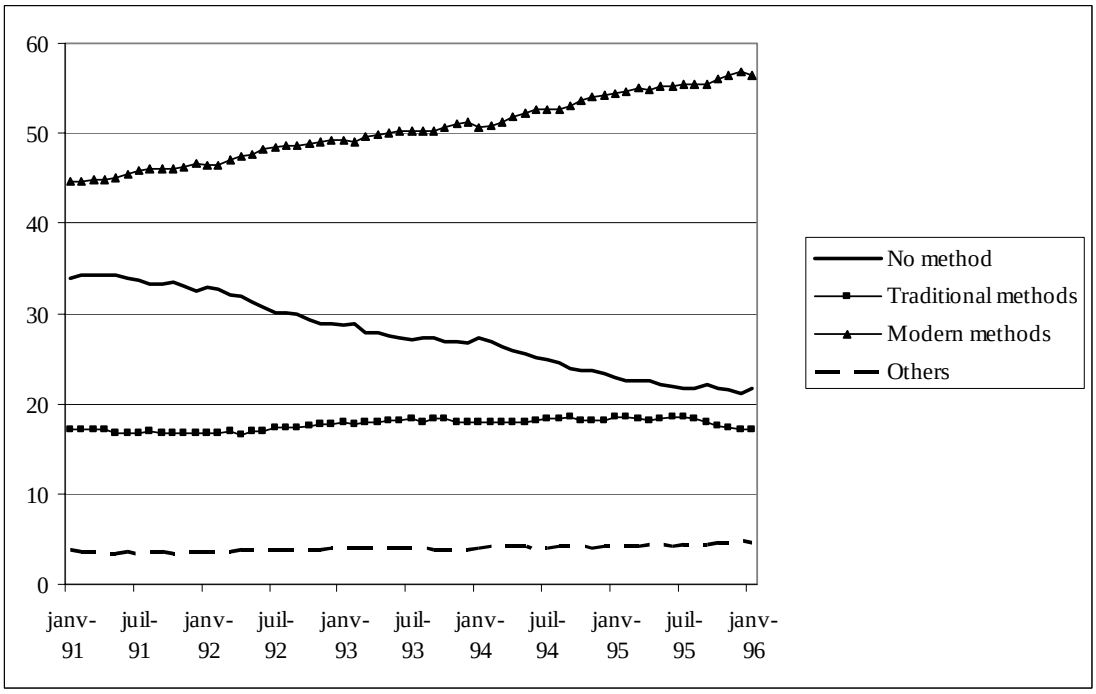
Another finding is that we cannot directly confirm the above-mentioned hypothesis about increasing effectiveness of contraceptive methods used by respondents. We do not merely observe the replacement of traditional methods by

modern ones; in both surveys, the proportion of traditional methods in the method-mix was rather stable during the period of observation.

Therefore, the starting of contraceptive practice with a modern method should be the most important factor behind decreasing abortion levels during the period of observation[11]. If we group all respondents into four large categories: non-users, users of traditional methods, users of modern methods, and others[12], we see that the most significant changes took place for the users of modern methods and non-users (Figure 3). Both changes are positive in terms of their possible effect on abortion levels, even though we have already mentioned that the decline of non-users to a large extent also is caused by the entering of the younger respondents into a first sexual and marital union.

Figure 3. Monthly dynamics of respondents aged 20+ at the time of interview, by aggregate categories of contraceptive use

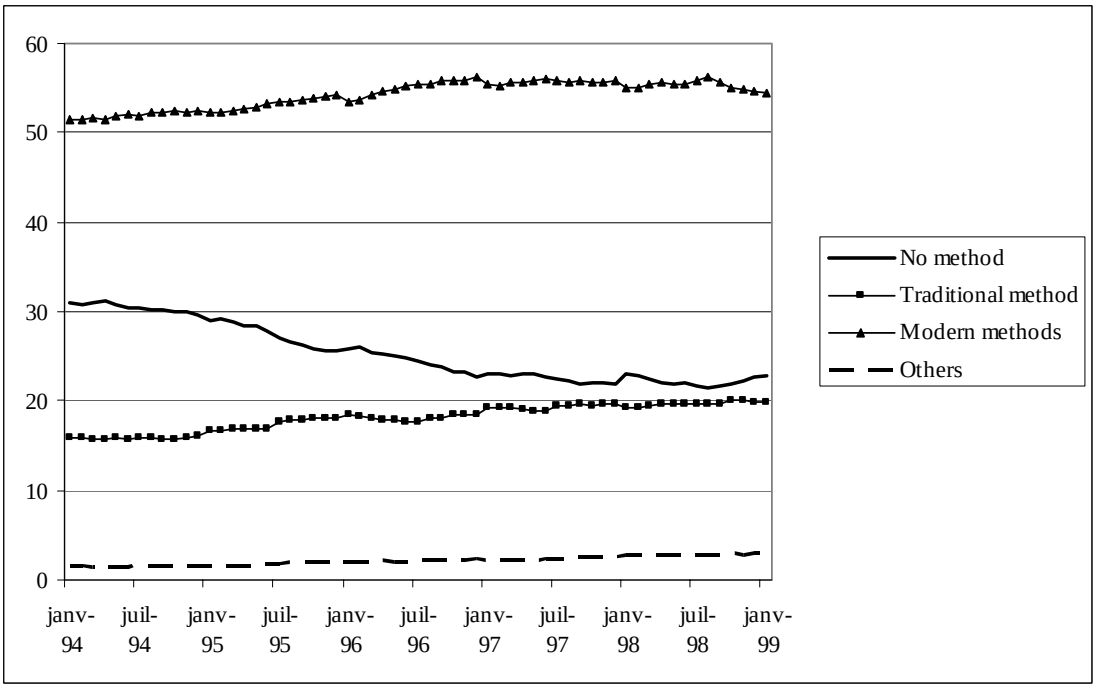
a) 1996 WRH Survey



[11] We do not consider the possibility that decreasing sexual activity may have caused these trends. Studies on union formation in Russia and other post-Soviet successor states indicate a continuation during the 1990s of the previous pattern of early and universal family formation. See, e.g., B.Pirelli-Harris, The path to lowest-low fertility in Ukraine, *Population Studies* 59: 55-70.

[12] This group includes users of both some traditional (like douching) and modern (like implants or injections) methods. The question was asked in such a way that we could not categorize them properly as being either "Traditional" or "Modern". The category contains other non-specified cases as well and does not exceed 5% of the total number of respondents.

b) 1999 WRH Survey



In this paper we will go beyond these simple statistics and focus on respondents' transition from the category of non-user or user of traditional method to the category of user of modern contraception. With the help of event history techniques we apply multivariate modeling to estimate more accurately the influence of different demographic factors on the "risk"[13] of transition to modern contraceptive use.

2.3 Selection of women under "risk" of transition

To estimate the propensity of transition to modern contraceptive use, we included into our study all non-pregnant women who used traditional or no method of contraception in the beginning of the contraceptive calendar, i.e., in January 1991 (3,654 respondents) and in January 1994 (3,477 respondents), respectively. Afterwards we omitted those who had more than 5 pregnancies during the periods covered by the calendars (7 and 5 cases respectively), in order to avoid too many interval censoring procedures. A few further cases were excluded because of too poor data quality (9 cases in the 1996 and 3 cases in the 1999 survey). Eventually, our data

[13] Note that "risk" is a statistical term that refers to the intensity of the transition we study. In contrast to common language, it does thus not refer to any behavior that is to be considered "risky". On the contrary, in this case it rather refers to a "risk reducing" mode of behavior.

sets consist of 3,638 records for the 1996 survey and 3,469 records for the 1999 survey.

2.4 Distribution of women under risk of transition, by region, age, and parity

Table 1 shows the distribution of our study sample, by the key demographic characteristics that we use in our further analysis.

Table 1. Distribution of respondents, by region, age, and parity

a) 1996 WRH Survey

Variable	Method used in January 1991				Total	
	No method		Traditional method			
	N of cases*	%	N of cases	%	N of cases	%
Region						
Yekaterinburg	997 (256)	82.4	213	17.6	*1210*	*100*
Perm	984 (266)	79.9	248	20.1	*1232*	*100*
Ivanovo	951 (274)	79.5	245	20.5	*1196*	*100*
Age in January 1991						
< 24	1976 (796)	91.4	185	8.6	*2161*	*100*
25-34	598	62.8	354	37.2	*952*	*100*
35-44	358	68.2	167	31.8	*525*	*100*
N of children in January 1991						
0	2090 (791)	93.6	142	6.4	*2232*	*100*
1	489 (5)	64.3	271	35.7	*760*	*100*
2	297	54.4	249	45.6	*546*	*100*
3 +	56	56.0	44	44.0	*100*	*100*
Total	***2932***	***80.6***	***706***	***19.4***	***3638***	***100***

* numbers in parentheses refer to subpopulation aged less than 15 years in January 1991, who subsequently entered the study population during the study period

b) 1999 WRH Survey

Variable	Method used in January 1994				Total	
	No method		Traditional method			
	N of cases*	%	N of cases	%	N of cases	%
Region						
Yekaterinburg	874 (233)	80.6	211	19.4	*1085*	*100*
Perm	986 (280)	82.1	215	17.9	*1201*	*100*
Ivanovo	927 (275)	78.4	256	21.6	*1183*	*100*
Age in January 1994						
< 24	1935 (788)	90.8	196	9.2	*2131*	*100*
25-34	524	61.3	331	38.7	*855*	*100*
35-44	328	67.9	155	32.1	*483*	*100*
N of children in January 1994						
0	1968 (785)	93.1	146	6.9	*2114*	*100*
1	526 (3)	66.8	261	33.2	*787*	*100*
2	247	49.7	250	50.3	*497*	*100*
3 +	46	64.8	25	35.2	*71*	*100*
Total	***2787***	***80.3***	***682***	***19.7***	***3469***	***100***

* numbers in parentheses refer to subpopulation aged less than 15 years in January 1994, who subsequently entered the study population during the study period

3. Method

3.1 Dependent variable

The event of interest is the transition to modern method of contraception. We consider the first observed use of any modern method as an event occurrence, i.e., as a transition. This definition allows us to circumvent the problem of unknown histories of contraceptive behavior of respondents before the beginning of our observation. We use time since the beginning of observation (January 1991 or January 1994) as our process time (with the accuracy of single months). Woman's age is used as a time-varying covariate.

The simplest type of transition is a sole and direct transition from non-use (code 0 in Table 2) or use of traditional method (code 1) to some modern method (code 2 in Table 2); more than 80% of women who made a transition experienced this type of transition. We also included into our model more indirect transitions to modern contraception (see Table 2). If the respondent changed traditional methods more than 5 times during the period of observation, we consider that she was still in the process

of making her decision on adoption of modern method,[14] but these respondents were censored after the 5th change of contraceptive method.

Table 2. Different patterns of transition to modern contraception

Start state	Method 1	Method 2	1996 WRH		1999 WRH	
			N of occurences	%	N of occurences	%
0 or 1	2 (modern use)		*1061*	*85*	*1525*	*96*
0 (non-use)	1 (traditional)	2 (modern use)	*96*	*8*	*0*	*0*
1 (traditional)	0 (pregnancy)	2 (modern use)	*84*	*7*	*70*	*4*
		Total:	***1241***	***100***	***1595***	***100***

3.2 Independent variables

Unfortunately, we cannot include into our model any "traditional" socio-demographic variables like marital status, educational level, or employment status, because this information only refers to the date of the interview and cannot be anchored properly to the time when a woman is under risk of transition.

We included two time-constant and two time-varying covariates into our model:

Time-constant covariates:

- **R**egion (3 levels corresponding to respondent's region of residence)
- Contraceptive **S**tatus at the beginning of observation (2 levels corresponding to non-use and use of traditional method)

Time-varying covariates:

- **P**arity (4 levels corresponding to childlessness, 1 child, 2 children, and 3 or more children)
- **A**ge (3 levels corresponding to the age groups < 25, 25-35 and 35 +)

Basic survival analysis of the transition to modern contraception gives us some ideas about proportions of women who experienced such a transition during the period of observation (see Table 3). According to our estimated Kaplan-Meier survival curves, women of the age group 35-45 have a significantly lower propensity of transition to modern contraception in comparison with the younger age groups. In both surveys around a fifth of women of this age category changed their traditional method or non-use to modern contraception until the end of observation, whereas in

[14] About innovation-decision processes see, for example, E.M.Rogers. *Diffusion of Innovations.* New York: Free Press, 1995.

the group aged less than 25 this level amounted to 47% in the 1996 and 60% in the 1999 survey. Among women aged 25-34 around 45% experienced transition to modern contraception.

Parity appears an important factor in influencing the transition to modern contraception. Women with one child have the highest transition rate in both surveys: 48% and 54%, respectively. The other parity groups show about the same risk of transition: one third of respondents experienced such a transition in both surveys, except for childless women in the 1999 survey who had a transition rate of 50%.

As regards the influence of previous contraceptive status, the propensity of transition to modern contraception is higher if a woman does not use any method at all. The 1996 survey gives us closer survival curves by the contraceptive status at the beginning of the observation than does the 1999 survey; this means that the non-use or use of traditional method became increasingly important during the 1990s as the propensity for non-users to switch to modern contraception increased from the early to the late 1990s.

Table 3. Proportion of women under risk who made a transition to modern contraception, by age, parity and method used in the beginning of observation. Estimation by means of Kaplan-Meier survivor techniques.

	1996 Survey	1999 Survey
Age group		
> 24	47%	60%
25-34	46%	45%
35 +	21%	20%
Parity		
Childless	37%	50%
One child	48%	54%
Two children	35%	36%
Three and more children	37%	29%
Contraceptive status in the beginning of observation		
Non-use	41%	52%
Traditional method	33%	30%

3.3 Censoring

In our modeling, we need to account for several kinds of censoring:

- *Right censoring*: in case of decrement in the form of transition to modern contraception (event occurrence) or at the moment of the interview if the transition had then not yet taken place. Other reasons for right censoring are when (a) a transition to "other" method occurs; as we have already mentioned above, we do not know exactly whether this method is traditional or modern, and (b) when a woman has experienced five changes in traditional method;
- *Left censoring* happens for the youngest respondents who enter age 15 under the observation period after January 1991 or January 1994;
- *Interval censoring* is applied in order to exclude pregnant women from the population at risk of transition to modern method during the period of their pregnancy.

3.4 Model

We apply an event-history analysis to our data to estimate the risks of transition to modern contraception, using the following multiplicative model:

$$h(t) = r_i\, a_j\, s_k\, p_l$$

where h(t) is the intensity of transition to modern contraception, which depends on region of residence (r_i, i=1…3), age (a_j, j=1…3), contraceptive status in the beginning of observation (s_k, k=1, 2), and parity (p_l, l=1…4).

4. Results

4.1 Main effects models

The results of the application of the model to our data are shown in Table 4.

First, the model for the 1996 Survey data set demonstrates quite constant transition intensity during its whole period of observation (see also Figure 4). The lack of increase in the propensity to change into modern contraception might partly be caused by the economic situation in Russia during that period. The 1996 survey covered the most difficult post-transition years, so some respondents even being oriented to modern contraception could perhaps not cover necessary medical costs. Nevertheless, a constant transition intensity may very well produce increased fractions of women using modern contraception, as we demonstrated in Figures 2-3 for respondents aged 20 and above at the time of the interview.

Table 4. Relative risks of transition to modern contraception

	1996 WRH Survey	**1999 WRH Survey**
Contraceptive Status		
Non-use	1	1
Use of traditional method	0.75	0.47***
Parity		
0	1	1
1	2.98***	2.79***
2	3.28***	2.66***
3 +	3.75***	2.34*
Age		
15-25	1	1
25-35	0.52***	0.69***
35-45	0.16***	0.15***
Region		
Yekaterinburg	1	1
Perm	0.95	0.86
Ivanovo	0.87	0.87
*Baseline intensity of transition to modern contraception**		
Calendar year		
1991	8.33	
1992	10.04	
1993	9.40	
1994	9.77	10.00
1995	10.96	12.97
1996		13.55
1997		14.49
1998		17.09

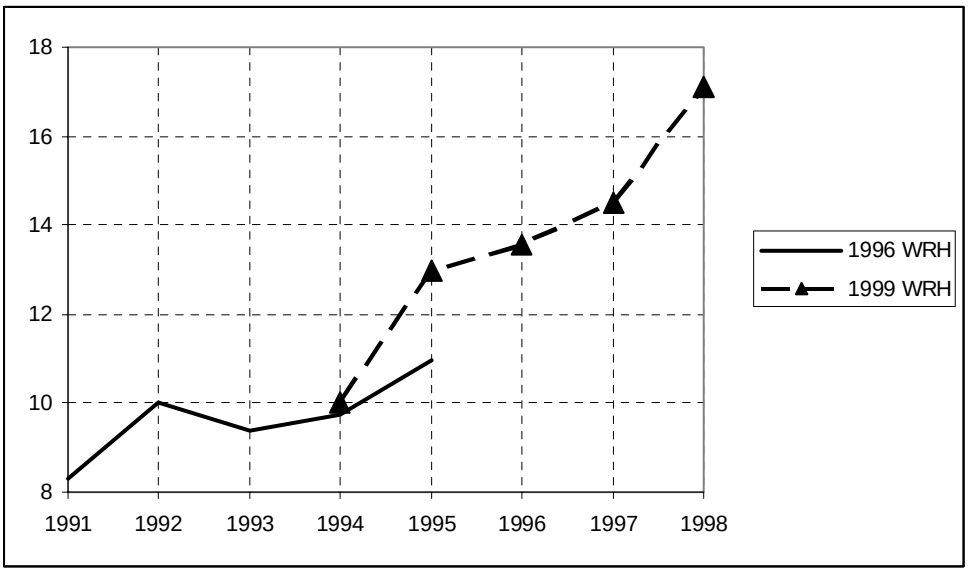
* number of event occurrences per 1000 woman months

Age of woman seems to be a very important factor for the transition to modern contraception. Women aged 25-35 have 50% lower risk of transition to modern contraception than have the youngest women, whereas for age group 35-45 the risk is only a sixth of that of the reference category. Evidently, the behavior of young women is crucial for the development of the general contraceptive trends in Russia.

Contraceptive status at the beginning of observation has a non-significant effect on the risk of transition, but non-users have a transition intensity that is a third higher than that of those who used some traditional method.

The fact of being a mother significantly increases the propensity to start using modern contraception. The higher the parity is, the stronger is the effect of this factor. Finally, region of residence does not have any significant influence on behavior.

Figure 4. Baseline intensity of transition to modern contraception (occurrences per 1000 woman months)



The 1999 Survey gives us slightly different results. First, we observe a clear trend of increasing transition intensities during 1994-98. This fits with our notion that economic developments may matter for contraceptive trends: the stabilization of the economic situation in Russia during this period possibly strengthened the tendency to switch to chargeable contraceptive methods.

Note that the trend of increasing propensities to turn to modern contraception largely is driven by the behavior of the very young respondents: the trend does not appear very clearly in the crude summary statistics based on women who were already 15 at the beginning of our study period (Figures 2 and 3). The strong increases in intensities during the very last years of the two study periods could possibly be related to the phenomenon of "short memory" where respondents better remember events in the most recent past, especially when it concerns a subtle issue like monthly changes

in contraception.[15] Nevertheless, we feel very reassured with the fact that the intensities for overlapping years of the two surveys actually are so close to each other.

Age remains a very important variable, but the difference between age groups 15-25 and 25-35 becomes somewhat less pronounced than in the previous survey.

Contraceptive status in the beginning of observation becomes a more important variable during the second study period. The propensity to turn to modern contraception is twice as high for women who did not use any contraception at all in January 1994 than for those who used a traditional method. Probably the users of traditional methods are somehow in the habit of using them, especially if it has the desired effect, namely pregnancy prevention.

Presence of children in the family increases the propensity to start using modern contraception by 2-3 times, but for mothers the relative risk is now slightly higher for those with a lower number of children than for those with more kids. Region of residence, once again, does not have any significant effect on the transition to modern contraception.

4.2 Models with interaction between factors

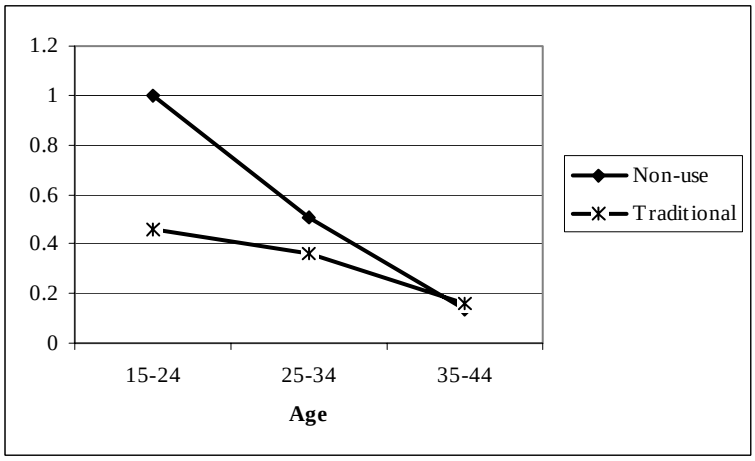
In this section, we test whether the main effects presented in Table 4 describe the dynamics of entry into modern contraception well enough, or if some combination of variables can give further information on such behavior. In particular, we suspected that the effect of age could be interrelated with contraceptive status at the beginning of observation and the parity of respondents. We tried several interactions, but found that only the interaction of age and contraceptive status at the beginning of the period indeed had a significant effect by means of model improvement (χ^2_2 = 15.5 and 14.6 for the model extensions based on the 1996 and 1999 WRHS, respectively).

Figure 5 shows how the effect of previous contraceptive status is much higher for the very young respondents, and that it is the very young women who not yet use any contraception at all that have the far highest transition intensities. Evidently, it is the behavior of these groups that matters most for the general developments in contraceptive behavior in Russia. The relative unimportance of starting method at the higher ages supports our hypothesis about "contraceptive habits" mentioned above.

[15] About reliability of retrospective assessments of contraceptive practice see, for example: *Ch.Westoff et al.* 1961. Some estimates of the reliability of survey data on family planning. *Population Studies* 15: 52-69; *T.Joyce et al.* 2002. On the validity of retrospective assessments of pregnancy intention. *Demography* 39: 199-213.

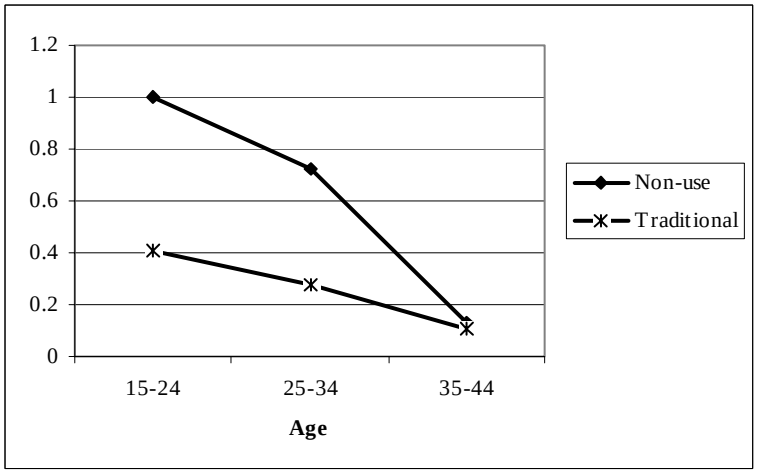
Figure 5. Relative risk of transition to modern contraception, by the combined effect of age and contraceptive status

a) 1996 WRH Survey



*) controlled for parity and time since January 1991

b) 1999 WRH Survey



*) controlled for parity and time since January 1994

5. Conclusions

In this study we had to limit ourselves to consider the effects of age, parity, calendar time, region of residence, and previous method when estimating the associations of various factors with contraceptive dynamics in Russia. The absence of marriage, educational and employment histories of respondents did not allow us to consider the possible role of further important socio-economic factors.

Our estimation reveals that there were no important regional differences across the three cities included in our survey data as regards patterns in transition to modern contraception. In contrast, age of woman is a very important factor for the risk of switching to modern contraception. Younger women, especially those who do not have any contraceptive experience, have much higher transition intensities than other women. As regards previous contraceptive status, we found that non-users are more inclined to start using modern contraception than are women who already use a traditional method. This was particularly the case towards the end of the 1990s. Further, when reaching desired family size, which in Russia is not very big, women are more likely to start using contraception. Finally, we found an increasing tendency to turn to modern contraception towards the end of the 1990s.

However, one important question still needs to be answered: to what extent can we trust the retrospective information on such a subtle issue as monthly contraceptive use? In this respect, we feel reassured by our comparison of similar data from two separate retrospective surveys. Our estimations reveal that levels of transition intensities for overlapping calendar years of the two surveys actually turn out to be quite similar to each other. One contribution of our study thus is that we can show that this retrospective data seem to be fairly reliable. A further conclusion is that it is necessary to take an approach of multivariate event-history modeling if the contraceptive dynamics of a population with continuously changing characteristics is to be properly assessed.

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