European Journal of Population **20:** 95–117, 2004.

Induced Abortion in Russia: Recent Trends and Underreporting in Surveys

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Received 14 March 2003; accepted in final form 22 October 2003

Philipov, D., Andreev, E., Kharkova, T. and Shkolnikov, V., 2004, Induced Abortion in Russia: Recent Trends and Underreporting in Surveys, European Journal of Population, **20**: 95–117.

Abstract. The abortion level in Russia has been exceptionally high for several decades, yet during the last ten years it experienced a considerable decline. There is a concern that this favourable change could be largely due to a deterioration of statistical registration in the 1990s. In this paper, we use three reproductive and health surveys for a crosscheck with provider statistics, and analyse patterns and determinants of abortions. Each survey includes questions about the history of abortions. Our data indicate that survey estimates of the crude, total, and age-specific abortion rates emerge to be very close to respective figures from provider statistics for about two years preceding each survey. Survey estimates progressively deviate downwards from provider statistics when moving further back in time due to growing underreporting. This finding suggests 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, and that analyses of survey data on abortions are justified for up to two years preceding the survey. Logistic regression using the data from the survey carried out in 2000 for the period of 1998–2000 reveals that the odds for an induced abortion are lower in case of a higher educational degree, that the odds increase with the number of children and decrease with the use of more reliable contraceptive methods, and that married women are more likely to have an abortion than never-married ones but less likely when compared to cohabiting women.

Key words: abortion, decline, statistics, surveys, underreporting

Philipov, D., Andreev, E., Kharkova, T. et Shkolnikov, V., 2004, Avortements provoqués en Russie: tendances récentes et problèmes de sous-enregistrement, Revue Européenne de Démographie, **20**: 95–117.

Résumé. Les niveaux d'avortement en Russie, très élevés pendant plusieurs décennies, ont considérablement décru dans les dix dernières années. Ce changement favorable pourrait toutefois être dû à une détérioration de l'enregistrement statistique dans les années 1990. Dans cet article, nous croisons les données de 3 enquêtes sur la reproduction et la santé avec les statistiques officielles pour analyser les caractéristiques et les facteurs des avortements. Chaque enquête comprend des questions sur l'histoire des avortements. Les estimations du taux brut, du nombre moyen d'avortements par femme et des taux par âge tirées des enquêtes sont très proches des valeurs

des mêmes indicateurs calculés à partir de la statistique courante pour les deux ans qui précèdent chaque enquête. Ces estimations s'éloignent progressivement de la statistique courante au fur et à mesure que l'on recule dans le temps du fait d'un sous-enregistrement croissant. Ce résultat tend à prouver que la statistique courante reflète correctement la situation et que la tendance à la baisse observée est réelle. Il montre aussi que l'analyse des données d'enquête portant sur les deux années précédant celle-ci est justifiée. Une régression logistique appliquée aux données 1998–2000 de l'enquête réalisée en 2000 montre que les risques d'avortement provoqué sont moins élevés chez les femmes ayant un niveau d'instruction élevé, qu'ils augmentent avec le nombre d'enfants déjà nés et diminuent en cas d'emploi d'une méthode contraceptive fiable. Les femmes mariées sont davantage soumises au risque d'avortement que les célibataires mais le sont moins que les cohabitantes.

Mots clés: avortement, réduction, statistique, enquêtes, sous-enregistrement

1. Introduction

Abortion levels in Russia have been among the highest in the world for decades. The re-legalization of induced abortions upon demand in 1955 caused an abrupt increase in their number, and in the middle of the 1960s abortions outnumbered births. This high level of abortion has been observed ever since. Abortion became a major instrument of family planning (e.g. Remennick, 1991 and the discussion on "abortion culture" in Popov and David, 1999, p. 241). Induced abortion was the main method of contraception, particularly during Soviet times when modern contraceptives were rarely available and generally not acceptable to the public (Visser et al., 1993). During the 1980s, the state organs became increasingly concerned about abortion prophylaxis: for example, women who had an abortion were advised to use intra-uterine devices. After the collapse of the USSR, the level of abortion remained high compared to international standards. WHO data (2002) reveal that in 1998 among all European countries the highest number of abortions per thousand live births (1722) was observed in Russia.

The dynamics of abortion as officially registered by health statistics[1] reveal a declining trend during the 1990s. The number of abortions was 4103 thousand in 1990 and it dropped down to 2139 thousand, ten years later. The abortion rate (the number of abortions per 1000 women aged 15–44) decreased considerably along the same pattern (Figure 1).

Detailed descriptive analyses of trends in abortion, as reflected by official statistics, can be found in annual demographic reports *Naseleniye Rossii* (Population of Russia) (Zakharov et al., 2001, 2002).

The decline in abortion may be an indication of the diffusion of a new contraceptive behaviour in Russia as a result of the wider spread of modern contraceptives during the 1990s as well as the widening activities of family planning organizations. Such inference is of primary significance to family planning and policy making but it is subject to the quality of the data upon which it is based. The abortion registration system experienced two significant changes: the year 1988 witnessed the registration of early abortions (known as mini-abortions in Russia),

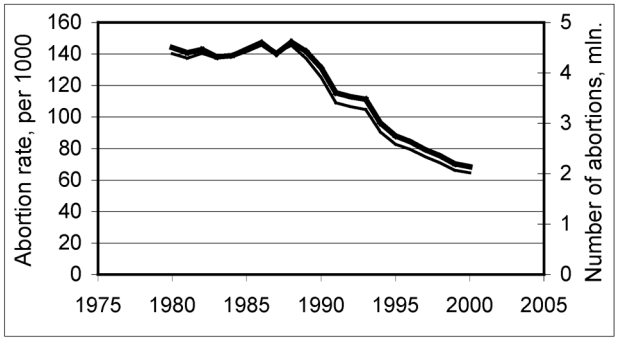


Figure 1. Number of abortions (right axis and thick line) and the crude abortion rate per 1000 women aged 15–44 (left axis and thin line) in 1980–2000.

and in 1991/1992 an additional category was introduced, viz. abortion without clearly stated grounds. Popov and David (1999) view the latter change as a main reason for the decline in the number of abortions until 1997 (p. 244). In addition, private medical services that were allowed to perform mini-abortions expanded during the 1990s. One could conjecture that the statistical reports of private clinics could be incomplete. Therefore, the decline may be the consequence of the under-registration of abortions and hence be a statistical artifact.

Individual-level data from surveys possibly provide new insights into the phenomenon of an extremely high abortion level in Russia and the reasons for its recent decline. Surveys with detailed information on abortions were rare in the Soviet era. However, the situation has changed during the 1990s and several surveys provided detailed information on abortions. A comparison of provider statistics and survey data may contribute to the assessment of the real level of abortions and its temporal changes. Unfortunately, surveys focusing on abortions are not free of problems, particularly with respect to the underreporting of abortions (Entwisle and Kozyreva, 1997; Anderson et al., 1994; Fu et al., 1998; Jones and Forrest, 1992; Notkola, 1993; Udry et al., 1996). Hence, a comparison of the two data sets should consider both the problems of under-registration and underreporting. This is the topic of discussion in the present paper, with a particular emphasis on underreporting.

The paper begins with a description of abortion statistics and survey data in Russia. The following analysis is based on data from provider statistics and three surveys carried out in 1988/89, 1996, and 2000. These surveys include retrospective questions about pregnancies and their outcomes. We find that provider statistics agree with the survey data where reports on abortions refer to the last two years preceding the survey, and we observed this in all three surveys. However, when going back in time, survey estimates decrease rapidly downwards in each one of the survey data sets when compared to estimates of provider statistics. This downward trend is due to under-reporting in surveys. Thus, we observe a particular

pattern of underreporting, that is, the more backward in time from the survey year we go, the higher the underreporting is.

Since survey data are valid when the last two years preceding the survey are considered, we can study the personal characteristics of women who perform an abortion. Logistic regression using the data from the 2000 survey for the period of 1998–2000 reveals that the odds for an induced abortion are lower in case of a higher educational degree, that they increase with the number of children, decrease with the use of more reliable contraceptive methods, that married women are more likely to have an abortion than never-married ones but less likely than cohabiting women.

2. Abortion statistics

Legal aspects of abortion and abortion statistics in Russia have a long history (Sadvokasova, 1969; Avdeev et al., 1995; Popov and David, 1999 provide reviews). Popov and David (1999), for example, note that in 1920 the USSR was the first country to legalize abortion on request. During the 1930s, restrictions led to the prohibition of abortion in 1936, except for medical reasons. Re-legalization was enacted in 1955.

Until 1988, statistical registration of abortions remained nearly unchanged. It comprised the following categories: spontaneous abortion, induced abortion upon request, therapeutically induced abortion, and out-of-clinic induced abortion. The last group included all officially registered induced abortions performed outside a clinic. Women who sought medical help arising from medical complications following an out-of-clinic abortion provided information on these abortions. In cases of serious complications, the abortion was classified as being clandestine. In 1988 the registration of early abortion, known in Russia as mini-abortion, was introduced. In mini-abortions, a vacuum-aspiration method is applied that can be performed during the first three weeks of pregnancy. In 1991 and 1992 important statistical changes were introduced: the classification of data by age and an out-of-clinic abortion now could be registered either as spontaneous, clandestine, or without clearly stated grounds. The personnel at the hospital to which the patient turned for help made the proper categorization. The classification as clandestine mostly requires the agreement of the patient. Without such an agreement, the case is usually put into the new category “abortion without clearly stated ground”, except for cases with serious medical complications, which are classified as clandestine, too. Abortions entered into the category “without clearly stated grounds” are not classified as induced.

Legally induced abortions can be performed in hospitals only. Hospital records create primary statistics, which are then collected by the Ministry of Health and published as health statistics. Similar statistics are collected and published by other ministries which have their own hospitals; their share is some 5% of all abortions. Polyclinics and other clinics may not execute induced abortions, but they may

perform mini-abortions. State hospitals may carry out paid abortions and mini-abortions. According to the law, a woman who had an induced abortion must stay for three days in the hospital but she may go home immediately after a mini-abortion. Following the fall of the USSR there appeared commercial clinics that perform mini-abortions.

Contemporary statistics on abortions in Russia are being questioned along several lines. Below, we mention the basic ones. Popov (1996) and Popov and David (1999) provide a detailed review on the organization of statistics on abortions and of its deficiencies.

The registration of abortions is held to have worsened as a result both of the changes introduced in 1991–1992 and the introduction of commercial practices. In the former case, the registration of abortions may have been subject to inaccuracies because some abortions without clearly stated grounds were possibly classified as spontaneous or clandestine (Popov and David, 1999, p. 243). Considering commercial practices, under-registration of abortion has allegedly been made in order to save on tax. This is believed to apply mainly to commercial mini-abortions, whether they are executed in hospitals or outpatient clinics. Allegations are being made also that commercial clinics execute induced abortions that remain unregistered because they are illegal, and that the number of induced abortions executed out of hospitals has grown because doctors get paid privately to do so in the house of the patient. Inversely, provider statistics may wrongly classify some cases as induced abortions. For example, mini-abortions could have been performed for a false pregnancy. This could apply also in the case when a spontaneous abortion that has begun before taking to hospital and that has been completed there is wrongly classified as induced. Generalizing all these cases, Popov and David (1999) describe provider statistics as "... an incomplete reflection of actual trends that fails to inspire confidence" (p. 245).

Researchers' opinions on the quality of data are divided. CDC (2003, pp. 11, 36–37) briefly writes about problems related to provider statistics in the former Soviet countries. These are similar to the problems discussed above. Entwisle and Kozyreva (1997) comment that miscarriages could have been registered as induced abortions in hospitals and that provider statistics thus possibly over-state the real number of induced abortions. Henshaw et al. (1999a, b), in their worldwide review of abortion trends, put Russia into the group of countries with "incomplete or unknown completeness of data" on induced abortion. On the other hand, various studies consider the observed trend as a true reflection of reality. They attribute the decline in registered abortions to the widening spread of modern contraceptive methods during the 1990s and the implementation of family planning programs (the studies cited above discuss this argument, as well as Shears, 2002; Sherwood-Fabre et al., 2002; Katkova et al., 1996; Bannikova and Sannikov, 1998; Zakharov et al., 2002) and the effect of governmental programs (Karelova, 1999). Thus, data quality is of crucial importance for the authentication of the effect family planning has in Russia.

3. The survey data

In this analysis we use data on induced abortions from three surveys carried out in 1988/89, 1996, and 2000. The first survey was organized by the Laboratory of Medical Demography at the Ministry of Health and the Demographic Division of the Research Institute of Statistics, State Committee of the USSR on Statistics. The survey contains unique data describing abortion and reproductive health at the end of the Soviet era. The sample includes 1800 women aged 18–49 from the cities of St. Petersburg and Kaluga, 1656 of them aged 18–44.

The second survey, performed during the first quarter of 1996, was organized by the Centers for Disease Control and Prevention USA (CDC) with the support of the All-Russian Centre for Public Opinion and Market Research (VCIOM) and the United States Agency for International Development (USAID). The CDC (1998) describes the survey in detail. It was carried out in three sites: the cities of Ekaterinburg and Perm (situated in the Ural economic region[2]) and in Ivanovo oblast (an administrative region situated in the Central economic region of Russia). The sample size is 5997 women aged 15–44, with approximately 2000 women having been interviewed in each one of the three sites.

The third survey was organized under the leadership of the Women and Infant Health Project (WIN) together with VCIOM and USAID. It was carried out in 2000, with 3648 observations in January and 252 in February (David et al., 2000), and had virtually the same questionnaire as the survey of 1996. The 2000 survey also was carried out in three sites: the cities of Novgorod (in the North-West region), Perm (Ural economic region), and Berezniki (a smaller-sized city in the Perm administrative region). Its sample size is 3900 women aged 15–44, with 1300 women having been interviewed in each city. Goldberg et al. (2001) provide descriptive analyses of the 1996 and 2000 surveys.

The three surveys originated from different research teams and were performed independently from one another.

Survey data on abortion depend heavily on the design of the relevant questions. The initial filter question is the following one: "*Have you ever been pregnant, including pregnancies that resulted in an abortion, mini-abortion, miscarriage or which resulted in a live birth*?" Respondents that answered with "yes" were further asked about their pregnancy histories and their outcomes. The question applies to the survey 2000 (David et al., 2000) and the survey 1996 (CDC, 1998) and it is nearly the same in the survey 1987/88 (unpublished). Huntington et al. (1993, 1996) describe this question as a "direct" one and discuss the implementation of indirect questions. Considering results about Rumania, they state that direct questions may be adequate where abortion is a wide practice and socially accepted. The 1988/89 survey includes the history of the last ten pregnancies; each pregnancy was classified as either a "live birth" or an "induced abortion" or "other". The other two surveys collected information on pregnancy histories over the ten-year period preceding the survey. In the 1996 survey the outcomes are classified as live birth, abortion, mini-abortion, stillbirth, and miscarriage. In the 2000 survey two

more categories were included: self-induced termination and abortion that was not performed in a medical facility. The length of pregnancy was not measured in the 1988/89 survey; it was measured in months in the 1996 survey, and in days, weeks, and months in the 2000 one.

In analogy to other researchers (Entwisle and Kozyreva, 1997; Anderson et al., 1994) we grouped together induced abortions and mini-abortions. In the case of the 2000 survey we added to this group self-induced terminations and abortions outside a medical facility (altogether the trifle number of 16 cases during the last six years). Anderson et al. (1994) added also miscarriages to the group of abortions: a comparison of response data with medical data revealed that some respondents may have intentionally reported medically registered abortions as miscarriages during the survey, because of the stigma that is attached to abortions. In the 2000 survey miscarriages were reported to amount to around 8–9% of all pregnancies. Health statistics of 1999 data show that the number of spontaneous abortions plus abortions without clearly stated ground is around 8% of all pregnancies. Hence, we decided not to add miscarriages to abortions in our study.

Surveys carried out in a sub-region of a country can hardly be statistically representative for the whole country. Experts chose the regions in such a way that their populations could be expected to describe as close as possible the whole country's population where the topic of the study is considered. Survey samples are usually checked for the statistical representativeness of the corresponding regions. CDC (1998), for example, describes checks in the case of the 1996 survey. Since the quality of data is of primary importance in this paper, we had to check whether the survey data collected in several regions were representative for the whole of Russia.

We compared age distributions, distributions by marital status and education, and levels of fertility. Comparisons of distributions by marital status and education were made using data from the 1989 all-Russia population census and the 1994 micro-census, hence no comparisons were possible for these two items for the 2000 survey.

Table 1(a) illustrates comparisons of the age structure as well as of fertility. Comparisons on marital status and education refer to ages 20–44. Table 1(b) provides distributions by marital status and education from the population census held in 1989 and from the micro-census in 1994, compared with the samples from the 1988/89 and 1996 surveys, respectively. We used the weights provided in the 1996 survey (CDC, 1998) and our estimates of weights for the 2000 survey.

Table 1(a) shows that the population age structures and the total fertility rates in the three surveys are very similar to those of the general female population of Russia. Existing differences are small and will not have an effect on our analysis, especially where it rests on age-specific rates.

The marital status data were grouped to achieve a better comparability among the different data sets. The marital statuses included in the table correspond to those in the 1989 census, when only the legal marital status was registered. The 1988/89

Table 1(a). Age distributions (in percent) and total fertility rates(*) in the all-Russia female population and in the three survey samples

	Russia			Survey data		
	1989	1.1.1996	1.1.1999	1988	1996	2000
15–19	—	16.1	17.5	—	15.9	18.2
20–24	17.7	15.2	16.0	15.3	16.1	17.9
25–29	22.8	13.9	15.0	24.6	15.7	15.7
30–34	23.6	17.0	14.1	24.1	17.8	13.7
35–39	21.6	19.5	18.0	22.5	18.7	16.7
40–44	14.3	18.3	19.3	13.5	15.8	17.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
TFR	2.1	1.5	1.3	1.9	1.4	1.3

(*)The total fertility rate is averaged over the 5-year period ending with the indicated year.

survey and the 1994 micro-census included additionally the state "unregistered marriage" which is the same as "cohabiting", while the 1996 survey included the following six categories: married, in unregistered marriage, divorced, separated, widowed, and single (never married). In the case of the 1988/89 survey the state "cohabiting" was united with the state of "never married" in order to enable a comparison with the census data. In the case of the micro-census, it was united with the state of "married" to enable comparison with the 1996 survey where the state of "never married" was formed by adding together the states of "single" and "separated", and the state of "married" put together the married and the cohabiting respondents.

Table 1(b) indicates a perfect closeness between the survey 1996 and the micro-census 1994 data as far as the marital status is concerned. The proportion of married persons is slightly higher in the 1988 survey compared to the 1989 census.

The table provides similar comparisons for three educational levels: low, medium, and high. It became necessary to regroup the levels of education, as was the case with the marital status. The regrouping makes the data in the table incomparable when the two periods are considered. Thus, the level denoted as "high" in the table comprises completed or incomplete university level education in 1988/89 while it comprises additionally other levels beyond secondary education in the 1994/96 data. The medium level is affected correspondingly, and the lower level is the same for both periods.

The 1988/89 survey reveals a smaller share of respondents with a lower education background in the sample as compared to the census population. The bias is due to the prevalence of the St. Petersburg population in the sample. The 1996 sample contains a slightly higher share of women with lower education.

Table 1(b). Distributions by marital status and education level of the all-Russia female population according to the 1989 census, the 1994 micro-census and the surveys of 1988–89 and 1996 (in percent)

	1989 Russia	1988–89 Survey	1994 Russia	1996 Survey
Marital statuses*				
Married	76.9	79.8	74.1	74.1
Never married	12.1	9.5	13.3	13.0
Widowed	1.7	1.3	2.2	2.2
Divorced	9.0	9.5	10.4	10.7
Educational levels*				
High	19.4	22.1	56.3	57.1
Medium	69.1	73.6	35.6	32.8
Low	11.4	4.3	7.8	10.1

*See text for an explanation of the categories.

To summarize, the 1988/89 survey is slightly biased compared to the whole of Russia due to the prevalence of the highly urbanized population of St. Petersburg in the sample. The bias is small and is not expected to have an effect on our inferences. The 1996 survey is not biased in its age, marital and educational distribution, and the 2000 survey is not biased in its age distribution.

4. Comparisons of abortions in surveys and provider statistics

In this section, we present comparisons of abortion levels and age distributions of abortions, estimated from survey data and provider statistics.

We base our research on period crude abortion rates (CAR), total abortion rates (TAR), and partially age-specific abortion rates. CAR is usually estimated in Russia as the number of abortions per 1000 women aged 15–49. Since the women in the surveys are aged 15–44, we use CAR estimated for this age range. TAR is defined as the sum of age-specific abortion rates, where age groups are five years wide. The large survey samples allow for a convenient estimation of age-specific rates. We do not use abortion ratios because their estimation from survey data is subject to perfect data accuracy for all other pregnancies besides induced abortion, and this cannot be ascertained. Age-specific abortion rates are available for provider statistics only since 1996. Hence they can be used for comparisons in the case of the third survey only.

Comparisons of abortion levels were made using CAR and TAR. Each one of these indicators has its own deficiencies; the use of both is therefore complementary to the purposes of our research. We first compared CAR. Its use is more common in the literature than that of TAR. The samples in the 1996 and 2000

surveys comprise ages 15 to 44. Hence, we used the CAR for the whole of Russia estimated for this age span, instead of the usual ages 15–49. The CAR for the survey from 1988/89 was estimated using the age span 17–44 completed years in 1987, enlarging it to ages 15–44 by appropriate adjustment. The estimation of the CAR over the six years preceding each survey was made with one and the same denominator, equal to the size of the sample. Thus, we assume that changes in the size of the Russian female population aged 15–44 during the six-year period will not affect our results. For example, in 1999 this size was 33245 thousand, and in 1995 it was 33225 thousand: a difference of 20 thousand will not change the CAR considerably. One way to avoid this is to work with a CAR computed for the age group 15-39 and to move backward the survey population during the preceding five years. We preferred the wider age group because it is commonly used in international statistics and facilitates international comparisons.

Table 2 provides the estimated values for the CAR for the last six years preceding each one of the surveys from 1988/89, 1996 and 2000 with their 95% statistical interval estimates, and the CAR for Russia. Figure 2(a) illustrates the same data without confidence intervals.

CAR is a crude indicator because it depends on the age structure of women in reproductive age. This deficiency is of particular importance in Russia where the age distribution of the population is very uneven. We therefore use TAR also. Estimating the age-specific abortion rates of the age group 40–44 required an adjustment because they will be missing in the survey data when going back in time. We also adjusted the age group 35–39 because six years before the survey the age group 39 will be missing. The number of abortions at these ages is very small and hence the adjustments will not affect the inferences.

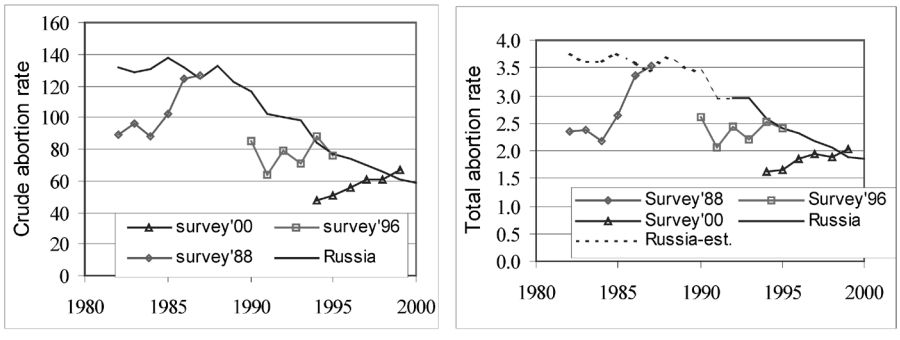
Health statistics in Russia provide data by five-year age groups since 1996. From 1992 until 1995, data were available in the following age groups: less than 15, 15–19, 20–34, and 35 and over. We had to use these 15-year age groups for the approximate calculation of TAR. For the period before 1992, their values were approximated using the age distribution of 1992. The age distribution of health statistics data was extended over the other statistical sources and thus over all provider data. Thus, the TAR before 1996 was estimated using crude age distributions and this is its deficiency. The estimates are displayed in Table 3 and Figure 2(b).

Figure 2 reveals the same patterns of change in the level of abortion as measured by CAR and by TAR in provider statistics and in the three surveys. The following observations are straightforward:

– Both the CAR and the TAR for the two years preceding each survey (1998–99 for the 2000 survey, 1994–95 for the 1996 survey, and 1986–87 for the 1988/89 survey) are very close to the CAR and TAR observed from provider statistics for the same years in Russia. The CAR is within the surveys' 95% confidence limits (Table 2).

Table 2. Crude abortion rates per thousand women aged 15–44 estimated from provider statistics and the surveys of 1988–89, 1996, and 2000 for the six years preceding each survey

Year	Provider statistics	Survey 1988			Survey 1996			Survey 2000		
	CAR	CAR	95% low	95% high	CAR	95% low	95% high	CAR	95% low	95% high
1982	131.2	87.7	74.5	100.9						
1983	128.3	94.3	80.5	108.1						
1984	130.9	86.6	73.5	99.7						
1985	137.5	100.4	86.3	114.5						
1986	131.8	121.9	106.5	137.3						
1987	124.9	124.1	107.9	140.3						
1988	132.2									
1989	122.8									
1990	116.9				85.2	77.8	92.7			
1991	102.0				63.3	56.7	69.9			
1992	99.8				78.9	71.7	86.1			
1993	97.9				71.1	64.2	77.9			
1994	84.2				87.8	79.4	96.1	47.7	40.6	54.8
1995	77.3				75.6	68.4	82.9	50.4	43.4	57.5
1996	74.1							56.1	48.5	63.7
1997	69.6							60.6	52.6	68.6
1998	65.8							60.8	53.0	68.6
1999	60.6							66.4	58.0	74.8



(a) **(b)**

Figure 2. (a): Crude abortion rate (CAR) per 1000 women aged 15–44 according to provider statistics and estimated from the surveys of 1988–89, 1996, and 2000 for the six years preceding each survey (b): Total abortion rate (TAR) among women aged 15–44 according to provider statistics and the three surveys for the six years preceding each survey.

Table 3. Total abortion rate (TAR*) for the age range 15–44 estimated from provider statistics and the three surveys for the six years preceding each survey

Year	Survey'88	Survey'96	Survey'00	Russia
1982	2.4	—	—	*3.8*
1983	2.4	—	—	*3.6*
1984	2.2	—	—	*3.6*
1985	2.6	—	—	*3.8*
1986	3.3	—	—	*3.6*
1987	3.5	—	—	*3.4*
1988	—	—	—	*3.7*
1989	—	—	—	*3.5*
1990	—	2.6	—	*3.4*
1991	—	2.0	—	*3.0*
1992	—	2.4	—	3.0
1993	—	2.2	—	3.0
1994	—	2.5	1.6	2.6
1995	—	2.4	1.7	2.4
1996	—	—	1.9	2.3
1997	—	—	1.9	2.2
1998	—	—	1.9	2.1
1999	—	—	2.0	1.9
2000	—	—	—	1.8

(*)TAR values from 1980 to 1991 are estimates based on the age distribution observed in 1992.

- Going back in time, the survey-based CAR and TAR deviate from the CAR and TAR for Russia. The latter CAR remains outside the 95% confidence limits (Table 2).
- The CAR and the TAR estimated from the 2000 survey for 1994 and 1995 are considerably lower than those estimated from the 1996 survey for the same years.

Age-specific abortion rates (ASAR) support the first and the second inferences made with CAR and TAR. Health statistics data are available by five-year age groups since 1996 and hence we can compare only the data from the 2000 survey (assuming that data in provider statistics have the same age distribution as in health statistics). Figure 3 gives the age-specific abortion rates estimated for 1996–1999 from provider statistics and the 2000 survey.

The figure illustrates that the age-specific schedule from provider statistics moves gradually higher above the survey schedule with each successive year when going back in time. The increasing differences between the areas under the two schedules correspond to the differences between the TAR estimated with the two

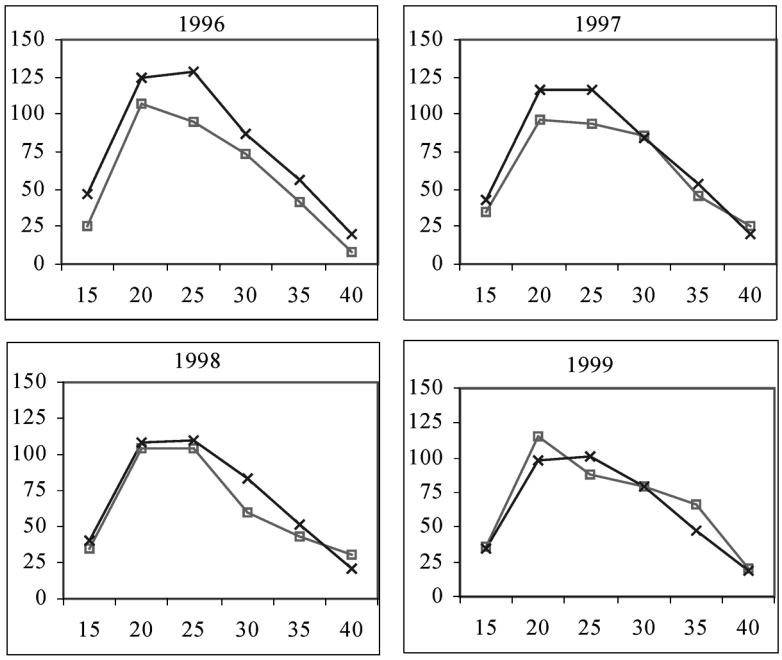


Figure 3. Age-specific abortion rates, per thousand, in 1996–1999, estimated from provider statistics (lines marked with x's) and from the 2000 survey (lines marked with squares).

types of data: –0.1 in 1999, 0.2 in 1998, 0.3 in 1997, and 0.4 in 1996 (see Table 3). The figure does not reveal any systematic age-specific difference between the two schedules. We can conclude that during the 1–2 years preceding the survey the age distribution of the reported abortions in the survey is around the same as the observed one.

5. Discussion

Underreporting of abortions in surveys often has been the subject of discussion in abortion studies. According to Notkola (1993), abortions reported in a 1989 survey in Finland were only about 30–50% of the abortion register maintained in that country. Analogous high levels of underreporting have been found in the United States (Jones and Forrest, 1992; Fu et al., 1998; Udry et al., 1996).

However, a former Soviet country has witnessed a considerably lower level of underreporting. Anderson et al. (1994) compared medical records for abortions in 1991 with interview responses in a survey carried out in 1992 in Estonia. Their results showed that more than 80% of the abortions were reported. This share was even higher for the Russian-speaking minority residing in the country: 89.6%. The study by Anderson et al. (1994) is the only one that checks the level of underreporting among Russian women using medical records. Entwisle and Kozyreva

(1997) used the Russian Longitudinal monitoring Survey (RLMS), Round 5 from 1994, for a comparison of the survey abortion rate with that of health statistics. They found that the survey-based rate is lower than the health statistics rate (56 versus 81 per thousand, respectively). They attribute the difference both to underreporting in the survey due to the exclusion of miscarriages, and to possible over-reporting in health statistics as a result of, for example, the registration of miscarriages that have been treated in a hospital as induced abortions.

Our findings suggest that the level of abortions as measured in the survey data either by CAR or by TAR is close to the one estimated from provider statistics data for the whole of Russia for not more than two years preceding the survey. A plausible explanation for this matching is one of the following two hypotheses:

(1) the data from both sources do not contain significant errors;
(2) the data contain the same systematic bias in both the provider statistics and surveys.

The first hypothesis agrees with the 89.6% match between medical records and self-reports found by Anderson et al. (1994) for Russian women in Estonia. The level of unreported abortions in their work, namely 10.4%, is maybe smaller in the Russian cultural context. The second hypothesis most likely refers to clandestine abortions that are neither registered in provider statistics nor reported in surveys. For example, an abortion may have remained unreported by a clinic in order to save on tax; and the woman who had the abortion may decide not to report the abortion because she is aware that it would remain unregistered and therefore illegal. Another example is provided by an out-of-clinic clandestine abortion that the woman involved will not report during the survey because she knows it is a clandestine abortion. There is no information about the prevalence of these abortions, and only a guess can be made: it is small because abortion is free of charge and hospitals keep their records confidential. It thus seems implausible that the number of cases in which both the provider and the woman in question would not report one and the same abortion would cause a significant bias.[3] The second hypothesis seems therefore quite complicated. Parsimony gives preference to the first one.

Thus, we assume that *the observed matching supports the validity of provider statistics data as well as survey data for the two years preceding the survey*.

This inference states that provider statistics data can be considered as being correct in the years 1986, 1987, 1994, 1995, 1998, and 1999. It is unlikely to assume that it would be incorrect in the years not covered by this discontinuous time series. There is hence little ground to believe that there is any large-scale under-registration of induced or mini-abortions. The trend of declining abortions in Russia as depicted by provider statistics is therefore valid.

The prolongation of the survey TAR time series by up to six years backwards from the survey year reveals three trends that largely differ from the general trend in the level of abortion. The only common feature of the three trends is that they reveal one and the same pattern of divergence from provider statistics data. The

Table 4. Difference between crude abortion rates in provider statistics and the three surveys per 1000 women aged 15–44

Number of years preceding the survey year:	1	2	3	4	5	6
Survey 1988/89	1	10	37	44	34	43
Survey 1996	2	–4	27	21	39	32
Survey 2000	–6	5	9	18	27	37
Survey 2000 (odds unreported to reported, %)		8	15	32	54	77

divergence increases when going back in time, starting from the year of the surveys. A reasonable explanation for this diversity is *underreporting* in the surveys of abortions that took place some time before the survey.

Udry et al. (1996) observed in the USA the same pattern of underreporting that we noticed in Russia. They compared medical records with the self-reported abortions of 104 American women aged 27–30 and found that "... women became somewhat more likely to underreport as the time since their first recorded abortion grew; for each year that had elapsed, the odds for underreporting were raised by 26%" (Udry et al., 1996, p. 230). They suggest that forgetting to report is one of the important reasons for underreporting.

We recall that the three surveys were organized independently from one another and therefore survey design would hardly have one and the same effect on responses. In addition, the earliest survey was carried out at a time when commercial practices did not exist and mini-abortions were not a regular practice in the USSR, and therefore provider statistics and survey responses were not subject to irregularities that could eventually arise from these two aspects of abortion registration during the 1990s.

6. The level of underreporting

The age structure of the 2000 survey sample within the age range 20–44 is similar to that of the overall Russian population (Table 1(a)); therefore CAR can be used for the estimation of the level of unreported events. Since it is the number of abortions per 1000 women aged 15–44, the difference between the observed CAR for Russia and the survey CAR gives the number of unreported abortions per 1000 women of the same age span. We estimated this difference for the three surveys for the six years before each survey (Table 4).

During the first 1–2 years before the survey, the difference is very small: as discussed above, it is statistically insignificant. It increases to more than 30 unreported abortions per 1000 respondents for the sixth year before the survey. The

increase of the odds ratio of unreported to reported abortions in the 2000 survey is steep and nearly doubles with each subsequent year. Udry et al. (1996) reported that the odds of underreported abortions in the USA rose by 26% with each subsequent year. Hence, underreporting in Russia is considerably steeper than in the USA. The difference may be attributed to the considerably higher level of induced abortion in Russia: there is a larger number of abortions that can be forgotten, where forgetting is a significant reason for misreporting (see the discussion in the conclusions section below).

7. Abortion and personal characteristics of respondents

The results from the previous sections imply that abortions reported 1–2 years preceding the survey are reliable and can therefore be used for scientific research. They thus can be used for the study of relationships between abortions and the various personal characteristics of the respondents. Similar studies on Russia at the individual level are rare. Entwistle and Kozyreva (1997) used RLMS data (round 5, 1994) to study abortions among women classified by living in urban and rural regions, and by three educational levels. Differences by urban and rural regions were found to decrease over time and were within the sampling error for the last data set they used. Differences by education were found to be significant. Women with an education lower than secondary had more abortions than those with a secondary education, and the latter were much more likely to experience an abortion than women with higher (university) education. CDC (2003) provides descriptive analyses of abortions in Russia and other Eastern European and former Soviet states, based on survey data and applying univariate methods. Bannikova and Sannikov (1998) compare two surveys from 1986 and 1996 based on samples of hospital records on induced abortions in one and the same hospital in the city of Arkhangelsk. They find a considerable increase towards 1996 in the proportion of young women, unmarried women, and women with higher education.

We apply multivariate logistic regression for the analysis of women's characteristics, using the 2000 survey. The purpose of this analysis is to provide a concise description of the personal characteristics of women who had an induced abortion. The variables used in the analysis are given in Table 5. The dependent variable designates whether or not a woman has experienced at least one abortion during the two years before the survey. This period comprises abortions reported in 1998, 1999, and very few in 2000. A small number of women (49 in all) have reported more than one abortion. They are placed in one group with the cases where exactly one abortion was reported.

The selected explanatory variables are as follows:

- Age by 5-year age groups towards the middle of the period, i.e. the beginning of 1999. It has 6 categories: 15–19, 20–24, 25–29, 30–34, 35–39, and 40–44.
- Marital status as reported at the time of the interview, with the divorced and separated being placed in one group.

– Number of children at the time of interview.
– Educational status at the time of interview.
– Use of contraceptive methods.

The latter variable has 4 categories listed in descending order of method reliability:

(1) Uses no method because the woman has reported either to be infertile, or to have no sex, or to want to get pregnant, or to be pregnant (named in Table 5 as "none, secure").
(2) Uses modern methods (12 varieties including medical reversible methods, barrier methods, and sterilization).
(3) Uses traditional methods (safe period, withdrawal, douching).
(4) Uses no contraceptive methods and has sex, does not want to get pregnant, is not pregnant, is fertile (named in Table 5 as "none, insecure").

Respondents using more than one method were listed in the category of the more reliable one.

The use of contraceptive methods refers to its application at the time of interview, while abortions are considered during the two years preceding it. The reported method may therefore be the consequence of an abortion rather than its cause. Indeed, we can suppose that after an abortion the woman in question will use a more reliable contraceptive method than the one used before the abortion (a switch to a less reliable method is unlikely). We have no information about the number of such cases and assume that it is not very large. In a logistic regression model such as that designed in this study, a switch to a more reliable method after an abortion will cause a downward bias in the coefficient (odds ratio) of the category corresponding to the less reliable method used before the abortion. This is because the given woman is classified as being in the group of the more reliable method. Analogously, there will be an upward bias in the coefficient to the more reliable method used after the abortion. We are not interested in the magnitude of the odds ratios, but only in the statistical significance of their differences. These switches hence may lead to the loss of statistical significance of the differences between the two method groups (we expect that a more reliable method will be statistically different from a less reliable one). We observe, though, that statistical significance exists in the expected direction (Table 5).

Table 5 shows the results of the logistic regression.[4]

All variables are statistically significant for at least some of their categories.

The odds ratios for age reveal a pattern that is similar to the age schedule shown in Figure 3. The highest odds are observed for the age group 20–24 and the advancement of age leads to their decrease compared to the base category of ages 25–29.

Women in non-marital cohabitation are more likely to have had an abortion compared to their married counterparts (odds ratio 1.57). This finding accords with the common knowledge that a non-marital cohabitation is less stable than a marriage. Divorced or separated women are also more likely to have an abortion

Table 5. Distributions observed in the 2000 survey and logistic regression odds ratios for abortions as a dependent variable in 1998–2000

Variables	Observed (N = 3900)		Odds ratios
	Freq.	Percent	
Abortions:			
0	3444	88.3	
1 or more	456	11.7	
Age:			
15–19	557	14.3	1.04
20–24	711	18.2	1.45**
25–29	685	17.6	1.00 (ref.)
30–34	607	15.6	0.58***
35–39	675	17.3	0.47***
40–44	665	17.1	0.16***
Marital status:			
married	1938	49.7	1.00 (ref.)
cohabiting	497	12.7	1.57***
divorced/separated	531	13.6	1.50***
widowed	84	2.2	0.57
never married or cohabiting	850	21.8	0.46***
Children:			
0	1386	35.5	0.62***
1	1449	37.2	1.00 (ref.)
2	916	23.5	1.50***
3+	149	3.8	1.19
Education:			
below secondary	411	10.5	0.91
secondary	2547	65.3	1.00 (ref.)
beyond secondary	942	24.2	0.55***
Contraceptive methods: #			
none, secure	1287	33.0	0.57***
modern	1336	34.3	1.00 (ref.)
traditional	958	24.6	1.32**
none, insecure	317	8.1	1.35*

Notes: ***stands for $p < 0.01$; **stands for $p < 0.05$; *stands for $p < 0.1$;
See explanation in the text.

compared to married women, and unlike widows. Women that have never lived with a man are least likely to have an abortion. CDC (2003, p. 47) supports this observation for eastern European countries, including Russia, but it contradicts these findings in other countries. In the USA, for example, the abortion rate and ratio were considerably lower among the married women compared to the unmarried ones (Henshaw, 1987; Powel-Griner and Trent, 1987). This difference may be due to the cultural characteristics of the women in question. In Eastern Europe the mean age of first marriage is considerably lower than in Western countries (Hajnal (1965) discusses these two European marriage patterns). Hence, before marriage women are young and may not have had regular sexual intercourse; married women, on the other hand, end childbearing considerably earlier than those in the West and they are therefore exposed for a longer time to the risk of an unintended pregnancy (CDC, 2003, p. 47).

The number of children has a significant impact on the occurrence of an abortion. Women with no children are considerably less likely to have an abortion than those with children, and the same applies to women with one child. An interesting finding is that women who have three or more children are as likely to have an abortion as those with one child, and somewhat less likely than their counterparts with two children. Anderson et al. (1994) found that women with three or more children underreport abortions more than others and explain this by the hypothesis that women who have many children have demonstrated their value of children and therefore would prefer to hide contradicting evidence from the interviewer. Our finding provides a support for their hypothesis.

The impact of the education levels is as expected: women with an education higher than secondary are considerably less likely to have an abortion. This finding is in agreement with Entwisle and Kozyreva (1997), Anderson et al. (1994), and the observations in CDC (2003).

Finally, contraceptive methods have an impact on abortion in the expected direction: the weaker the method applied by the woman, the more likely she is to experience an abortion. The statistical significance of the last category, the most insecure method, is weak given the large number of observations. This result is probably the outcome of the bias introduced by unobserved change to a more secure method following an abortion, as discussed above. Where information about these switches is available, the statistical significance is expected to be higher. Another reason may be that respondents may have given wrong answers, as is indicated by the large share of this group. Possibly, some women have not reported the method they in fact use.

8. Summary

Although induced abortions in Russia are among the highest in the world, little is known about their underregistration in provider statistics, their underreporting in surveys, and the individual-level characteristics of the survey respondents. Provider

statistics have been regarded as unreliable and, therefore, the recent decline in abortion trends observed during the 1990s has been seen as uncertain.

Recent surveys facilitate the discussion of these topics. We used three surveys with different organizers and large sample sizes, with the aim to trace common features and find results that are more reliable than the same results derived from one survey only. Our comparison of provider statistics with survey data revealed that both sources indicate one and the same level of induced abortions, when the survey data are restricted to the last two years preceding the time of interview. This overlap of abortion levels measured by different data sources is not occasional. We infer that both provider statistics and survey data (during the last two years) are valid. We further claim that the decrease in abortions during the 1990s is not a statistical artifact but an important change in contraceptive behaviour.

The three surveys indicate that underreporting of abortion histories in Russia is significant. Each one of the three surveys well outlines a specific pattern of underreporting. Using pregnancy histories, we established that this pattern describes an increase in underreporting when going back in time from the survey year. During the 1–2 years immediately preceding the survey, the level of reported abortions was about equal to the one registered by provider statistics. We assess that survey data on induced abortions performed during the last 1–2 years before the survey are a true reflection of reality and therefore can be used for individual-level studies. A multivariate logistic regression establishes that age, marital status, the number of children, education, and contraceptive method have a significant impact on having or not having an abortion. Never-married women have a considerably lower odds-ratio for having an abortion compared to married ones, unlike in some Western countries. The difference is due to age differentials caused by cultural specifics, namely the preponderance of early and universal marriage in Russia and early termination of childbearing.

Our findings give rise to a new range of problems that require further discussion. One problem is the lack of a sound explanation for the pattern of underreporting that we observed. At least two hypotheses seem feasible as solutions. First, people tend to forget a negative personal experience. Udry et al. (1996) suggest that this hypothesis applies to the USA. Forgetting as a cause of abortion underreporting is mentioned in CDC (2003), too, where some Eastern European and former Soviet countries are considered. The value of the TAR towards the end of the 1990s (Table 3) indicates that the average number of lifetime abortions is around two. Forgetting one out of two abortions is hardly the case; possibly the population is heterogeneous and a sub-population experiences a considerably larger number of abortions. This sub-group is yet to be identified. Our individual-level analysis is a step in this direction.

The second feasible hypothesis builds on abortion culture. Abortion in Russia is both relatively stigmatized and relatively accepted by society as a major method of family planning. By "relatively" we mean that too many abortions are not socially accepted, while few abortions are. Hence it is likely that women do not hide a

small number of abortions they have had. They may prefer to report a later abortion and hide an earlier one, for example, when some important members of the closest network of friends and relatives know about the later abortion but do not know about the earlier one. This important member could be the present husband or partner. In such a case, the woman may prefer to hide an abortion that was performed before meeting him.

Acknowledgements

We thank the WIN Project for providing us with the 2000 survey, funded by USAID-Russia, and we are grateful to Patricia David for a helpful exchange of views. We extend our thanks to the CDC for making available the 1996 survey. We would like to thank the Max-Planck Institute for Demographic Research, where most of the work on this paper was carried out. We thank our anonymous referees for their constructive and detailed remarks. Thanks are due to Susann Backer who edited the English language.

Notes

[1] Health statistics refers to abortions registered at the Ministry of Health. Although the Ministry of Health collects data for about 93%–95% of all abortions, other ministries who have their own hospitals maintain separate statistics (Zakharov et al., 2001, p. 55). We refer to all statistical sources combined as provider statistics.

[2] In the 1980s and 1990s the Russian Federation was divided into 11 big economic regions corresponding to geographic clusters of administrative regions (oblasts). In the Soviet era there were 72 oblasts, in 1992 their number increased to 89.

[3] In addition, the category of "abortions without a clearly stated ground" mentioned by Popov and David (1999) as a primary reason for the decline in the registration of abortion during the 1990s (see section 2 above), comprises only 3.5 to 4.4 percent of all abortions in the classification of health statistics.

[4] The survey included also a few questions that referred to the economic situation of the female respondents, such as the employment status and the length of the working day. They turned out to be far from being statistically significant and were thus excluded from the analysis (the p-value for employment versus unemployment was found to be equal to 0.49). Religion, a cultural variable, was excluded for the same reason (p-value = 0.78).

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