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Moscow Medical Academy
Health Systems Development Programme



Health Systems Development

**What do we know about the state of
maternal health in Russia?
Report on the situation analysis**

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HSD/WP/03/03

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Disclaimer: The views and research conclusions presented in this report do not necessarily reflect those of the United Kingdom Department for International Development who funded this research through the Health Systems Development programme.

List of Abbreviations

CDC	(US) Center for Disease Control
CEE	Central and Eastern Europe
DFID	(UK) Department for International Development
EU	European Union
FSU	Former Soviet Union
HFA	Health For All (database)
HSD	Health Systems Development (programme)
IUD	Intrauterine Device
JSI	John Snow International
MCH	Maternal and Child Health
MMR	Maternal Mortality Ratio
NIS	Newly Independent States
TB	Tuberculosis
USAID	United States Agency for International Development
WHO	World Health Organization
WIN	Women and Infant Health Project

OBJECTIVES AND METHODS

This paper provides an overview of the existing knowledge and gaps in knowledge of reproductive and maternal health care in the Russian Federation. It is one of a series of country reports being undertaken within the framework of the United Kingdom Department for International Development's (DFID) Health Systems Development Programme (HSD). The HSD programme has identified maternal health as one means by which it can evaluate the response of health systems to the needs of the poor (a probe condition). During the first year of this programme, similar analyses have also been undertaken in three other partner countries (South Africa, Bangladesh, and Uganda). These situational analyses will be followed by further primary research in each country by partners in the HSD programme. This review on Russia was conducted between December 2001 and March 2002.

This review aimed to assess the current state of knowledge on reproductive care in Russia by means of an overview of existing literature on the subject, including grey literature, with a focus on maternal and perinatal mortality, abortion, and barriers to services, especially for vulnerable groups. In addition to the current state of knowledge, the review identifies needs for further research. We expect that some of these will be developed within the programme's research plan for 2002-2003.

The overview sought to identify the scope and focus of existing research conducted by international agencies, Russian academic departments, and individual researchers. While the usual electronic search methods were used, much of the relevant material was less easily accessible than is often the case in health services research. Much published Russian research on public health fails to meet western standards for systematic presentation of information and is not easily available internationally (Tkatchenko *et al*, 2000).

Consequently, snowball sampling was used, beginning with key informants, to identify institutions active in the field. The process was continued until saturation (i.e. when no more sources were emerging). Telephone enquiries, informal interviews and meetings seeking to establish activities in the area of maternal health were then undertaken (especially recent research). In the process, useful contacts were established with key actors.

Sources were extremely diverse - including background papers, project documentation, consultancy reports, and specific studies commissioned by international agencies - yet there was very little material found in the international scientific literature. Russian studies have been difficult to find due to poor dissemination, both within Russia and internationally. PhD theses and other unpublished material were identified. There are several extensive surveys and qualitative studies that have been conducted in this field in Russia, but in most cases analysis is limited to immediate needs of the funding agency, thus narrowing the scope of analysis. Research on socio-economic determinants of maternal health and access to care in the former Soviet Union (FSU) was not published before 1990, precluding comparisons. Study design and data validity is often difficult to judge due to lack of uniform standards and limited use of effective peer review.

The review so far has identified considerable gaps in understanding maternal health and maternal health services even after a decade of transition in Russia. The vast majority of work focuses on reproductive health issues. Research initiated by international agencies predominates as national research funding in Russia fell throughout the 1990s following successive economic shocks.

We are aware that this review is only a first step in mapping the maternal health situation in Russia. The issues identified in the report are not an exhaustive list, and further questions will be raised in the course of future HSD research.

On 14 March 2002, a workshop was organised in Moscow to provide a forum for discussion of maternal health issues among interested stakeholders and to seek support for further research in 2002-3. This permitted confirmation of the remaining gaps in knowledge and thus identification of key research questions.

MATERNAL HEALTH OUTCOMES

Maternal mortality

LEVELS AND VARIATION OF MATERNAL MORTALITY

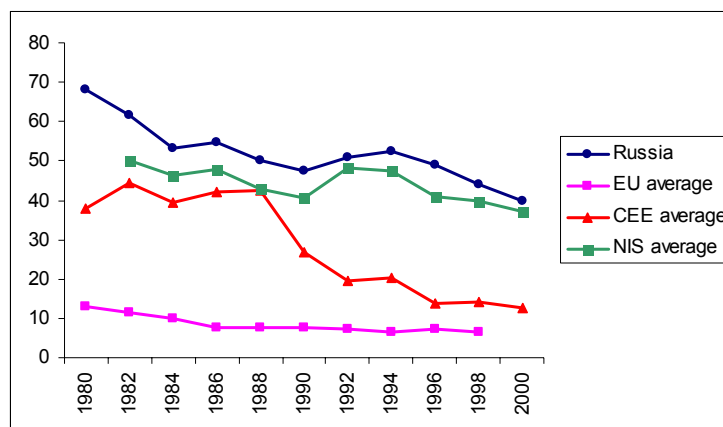
The most common measure used to assess the state of maternal health in a country is the maternal mortality ratio (MMR), commonly expressed as maternal deaths per 100,000 live births. The MMR can also be an important general indicator of health system performance in terms of quality and accessibility of appropriate care, as reducing maternal mortality relies on a fully functioning health system.

It is generally believed that maternal mortality in Russia has declined rapidly in the past two decades, although the rate of decline lagged below Central and Eastern European levels. It also is thought to remain more than six times the EU average, and 3 times higher than in central and eastern Europe (CEE). The following presents the official government estimates of MMR in Russia, with comparisons to other areas:

Table 1 – Maternal Mortality Ratio (deaths per 100,000 live births), Russian Federation (data from WHO HFA database 2002; and Goskomstat –the State Statistic Committee of the Russian Federation)

1980	1982	1984	1986	1988	1990	1992	1994	1996	1998	2000
68.01	61.64	53.16	54.71	50.03	47.41	50.77	52.34	48.9	44.03	39.71

Figure 1. Maternal mortality ratio per 100,000 live births, WHO Health For All database, 2002

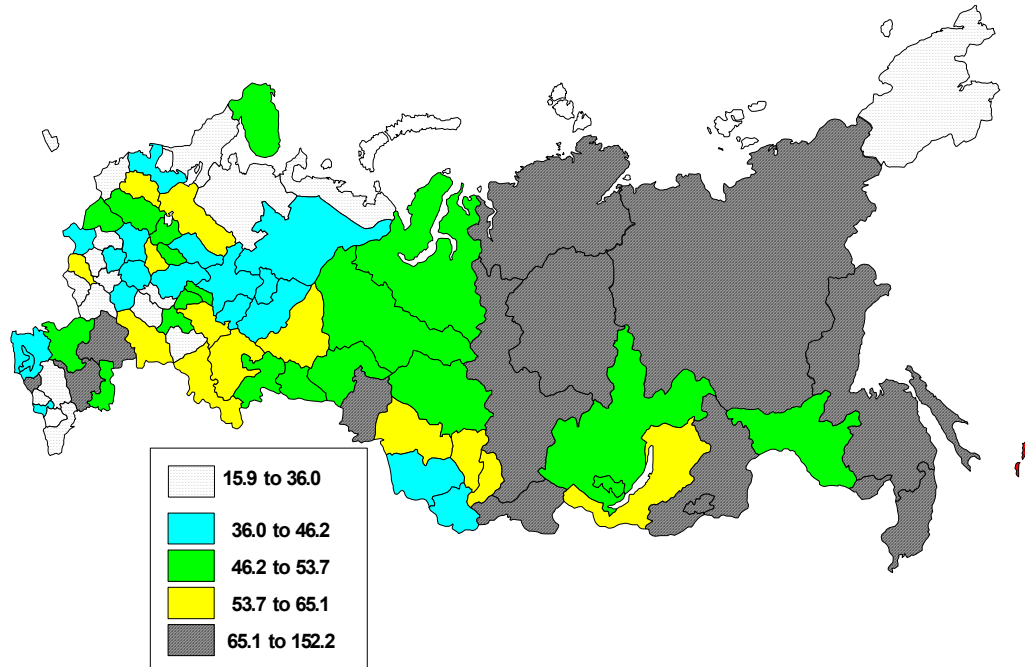


The MMR in Russia has remained higher than that of the average for the Newly Independent States (NIS) of the former Soviet Union (Figure 1), but these figures should be treated with caution given known problems with data in some central Asian countries.

However, review of literature illustrates the difficulties in accepting any one set of data on Russian maternal mortality. Maternal mortality as an outcome has been a focus of a wide range of Russian studies, in particular a number of doctoral theses studying causes and determinants of maternal mortality, with some variation in findings. Most often, though, it is the official government figures from Goskomstat (the State Statistic Committee) that are typically used as a starting point.

Even within the variation in estimates, however, Russian MMR estimates are considerably higher than in the West, indicating the need for an effective policy response. Furthermore, there are considerable regional differences in maternal mortality ratios across the Russian Federation, according to Goskomstat figures (Figure 2).

Figure 2 Regional variation in maternal mortality ratios (deaths per 100,000 live births) in Russia (1995-1999)



The highest ratios are reported in Siberia and the Russian Far East, although there are also high ratios in some regions in Southern Russia. The very low ratios recorded in, for example, the north of European Russia and the north Caucasus, may raise questions of data accuracy as there might not be reason to expect much lower mortality in some of these areas.

Another specific study of maternal mortality in Russia (by Frolova *et al.*) defined three groups of regions depending on their MMR, further illustrating a wide variation in ratios across the Russian Federation.

Table 2 Maternal mortality ratios by groups of territories of the Russian Federation, 1999 data (Frolova *et al.*, 2001)

Maternal mortality per 100,000 live births	Number of Oblasts	Average value of MM ± mean error	Standard deviation	Most typical territories with stable MM indices
MMR < 29	26	13.91 ± 2.02	10.51	Samara region(16.2 – 1999), the Altai Territory (21.5 – 1999)
MMR = 29 – 99	56	51.83 ± 2.18	16.34	Tatarstan (54.2 – 1999)
MMR > 100	6	211.38 ± 47.94	117.45	the Republic of Tuva (1999, 122.6)

Unfortunately, the studies identifying these variations do not explore the reasons why they exist.

MATERNAL MORTALITY BY CAUSE

There is an abundant supply of reports attempting to list the direct causes of maternal mortality. However, as with MMR estimates, results seem to vary widely. In some cases, it is not known how different conditions are accounted for – for example, abortion related complications may be classified simply as ‘abortion related’ – or may be divided between legal and illegal abortion (or facility and out of facility abortions). Furthermore, it is possible that some accounting methods disaggregate complications of abortion into categories such as ‘sepsis’ and ‘haemorrhage’, which may be confused with sepsis or haemorrhage related to complications from delivery.

One government report suggested a recent deterioration in maternal health, with 41% of pregnant women suffering from anaemia in 1999, compared to 12% in 1990 (Goskomstat 2001), although this might be considered inconsistent with trends of falling maternal mortality.

Abortion-related complications are almost always cited as the most important cause of maternal mortality, usually said to account for a quarter of total maternal mortality (24.2% abortion related maternal deaths in 1999 according to Goskomstat).

The abortion-related maternal deaths are of particular concern because they seem to be such a large contributor to overall maternal mortality, to an extent not seen in other countries.

The following presents some of the different findings on the causes of maternal mortality:

Table 3. The structure of maternal mortality (%) (Zabolotnaja, 2000)

Cause	1995	1996	1997	1998	1998 (study by Burduli, 1998)	1999
Complication of pregnancy, delivery and postpartum	56	57.1	46.7	73.1	56.8	53.3
Abortion	36	38.1	46.7	23.1	31.1	40
Ectopic pregnancy	8	4.8	6.6	-	7.2	-
Other	-	-	-	3.8	4.9	6.7

Table 4. Maternal mortality ratio by cause (deaths per 100,000 live birth) (Goskomstat)

Cause	1985	1990	1993	1995	1997	1999 (with% of total)
Ectopic pregnancy	3.20	3.22	3.84	3.89	4.29	3.95 (9%)
Abortion (in facility)	1.81	0.85	1.74	1.54	1.90	1.32 (4%)
Out of facility abortion	19.70	12.77	13.05	10.85	10.32	9.39 (21%)
Haemorrhage	5.30	6.39	7.11	6.67	5.71	8.1 (11%)
Toxicosis	5.60	5.73	6.24	5.28	5.32	5.7 (11%)
Sepsis	1.77	1.71	1.74	2.42	2.38	1.89 (5%)
Other	16.59	16.74	17.91	22.66	20.32	13.9 (39%)
Total MMR, all causes	53.98	47.41	51.63	53.31	50.24	44.21 (100%)

As shown, the range of values for each cause can be large, with 46.7% of maternal mortality said to be due to abortion in 1997 by Zabolotnaja. This can be compared to Table 4, which represents official government data on the percentage contribution of each

factor. These data indicate that around 25% of deaths are due to abortion in 1999, with a very large contribution from the ‘other’ category at 39%.

The extremely high abortion rates in Russia have resulted in a great deal of research on reproductive health focusing on this issue. However, with non-abortion related complications making up an estimated 75% of maternal deaths, a number of areas of inquiry seeking to understand the reasons for such high non-abortion mortality rates seem relevant as well.

REGIONAL VARIATION IN CAUSE OF MATERNAL DEATHS

A study on women’s health in the republic of Krasnodarskiy Kray (where the MMR is 45.9 per 100,000 live births) explored differences in the structure of maternal deaths by cause in urban and rural locations (Reznikova 1999). One possible explanation for any such difference could be the lower accessibility of in-patient facilities in rural areas. The report found the following causes of mortality in different areas over time:

Table 5. The structure of maternal mortality causes (Reznikova, 1999) (column percentages)

	1986-1987		1990-1991		1994-1995	
	Urban	Rural	Urban	Rural	Urban	Rural
Haemorrhage	14.3	14.3	20	38.9	23.8	11.5
Toxaemia	32.1	23.8	15	33.3	28.6	19.2
Sepsis	3.6	14.3	5	0	19.0	46.3
Metrorrhaxis	3.6	9.5	15	11.1	4.8	3.8
Puerperal embolism	3.6	-	5	11.1	9.5	7.7
Other		4.8	15	5.6	4.8	3.8
Extragenital	39.2	33.3	25	-	9.5	7.7

Unfortunately it is not possible to be certain that the differences are statistically significant, and the instability over time suggests possible random fluctuation. The differences over time between rural and urban areas might also be due to changing disease patterns, particularly in times of transition. In any case, the findings indicate that there may be some scope to investigate whether different factors act in different areas. Such an investigation might shed light on barriers to effective care in each area, or possible targeted improvements needed.

Frolova *et al.* (2001) also found that the case fatality rate following abortion could vary by as much as 20 times across separate territories in Russia. The report used government statistics to examine the causes of death in regions with overall low, medium, or high maternal mortality rates, with the following results:

Table 6. Causes of maternal mortality (%) by MMR for different regions of the Russian Federation, 1999 data (Frolova *et al.* 2001)

Causes	For regions with MMR <29 (%)	MMR 29-99 (%)	MMR >100 (%)
Abortion	22.4	24.6	20
Haemorrhage in pregnancy, in labour, and during the postpartum period	20.5	17.6	33.3
Extrauterine pregnancy	16.3	8.0	13.3
Gestosis (hypertension)	14.3	12.9	6.7
Indirect obstetrical causes	4.1	7.2	13.3
Other causes of obstetrical death	12.6	12.4	6.7
Other complications of gestation and delivery	6.1	4.0	
Obstetrical embolism	2	6.6	
Sepsis during delivery	2	4.4	6.7
Complications of anaesthesia		2.3	

While it is not appropriate to read too much into these figures, they suggest that haemorrhage may be especially important in high mortality regions, which might indicate problems with blood supply or delays in referral to centres with adequate supplies. The variations in mortality from extrauterine pregnancy may also indicate variable quality with regards to emergency referral and specialist care. In contrast, the higher percentage of sepsis and hypertension related mortality in these areas could also indicate problems with quality of care in general service provision, as they can be addressed with relatively simple interventions. However, the total number of maternal deaths is quite low in Russia, which could indicate some random variation in numbers or problems with attribution of cause.

ABORTION RELATED MORTALITY

As shown, a large proportion of maternal deaths in Russia is due to abortion complications, and there have been a number of studies looking at this specific issue. This section will, therefore, focus on this cause of maternal death. One of the most in-depth studies looking at abortion in the country was conducted by Frolova *et al.*, who investigated 113 deaths following pregnancy termination, attempting to understand a number of explanatory factors. 27 of the cases were from abortions undertaken within a medical institution, while 86 were abortions outside facilities (of which 10 were thought to be due to ‘spontaneous miscarriage’).

The authors found that the share of deaths due to abortions from women living in rural areas was higher than in urban areas. More than 90% of abortion related deaths investigated in the study died in medical institutions, with more than two thirds dying at the first stage of hospitalisation. A quarter of deaths resulting from abortions conducted outside a medical institution died within 12 hours after hospital admission. The main cause of death after induced abortion or spontaneous miscarriage was infection, which may indicate scope for more effective management of women after termination of pregnancy.

The study further reported that the main factors contributing to death after termination of pregnancy inside a health facility were misdiagnosis and inappropriate treatment (see Table 7 below). However, with the main cause of death identified as infection, it is unclear if poor infection control might be more important than misdiagnosis. In cases of out of facility abortion, it is also unclear if the infections developed before women were admitted to the health facility, which would indicate a failure to diagnose infection, or if

they were infected within the facility, which would indicate poor infection control. The authors do mention some facility shortfalls preventing proper treatment, including lacking modern antibiotic drugs. However, Frolova *et al.* give data to show that infection related mortality was much higher for women who had out of facility abortions (84.2% of mortality) than for those who had in-facility abortions (26% of mortality).

Table 7 - Contributing factors to deaths from facility abortions (Frolova *et al.* 2001)

Misdiagnosis	Maltreatment	Defect during the procedure	Other factors
66.7%	57.3%	40.7%	48.1%

Unfortunately, it is not made clear what ‘other factors’ include, and the study was not conducted using a method such as confidential enquiry that would have yielded further information, but the fact that the authors identified misdiagnosis, and maltreatment as contributing to so many abortion related deaths suggests a need to develop and implement standards and protocols for diagnosis and treatment of patients with complications of abortion. The authors of the study suggest that content and method of training of obstetrician-gynaecologists should be revised to this end. However, the usefulness of such a recommendation is not known, as there may be a number of system-wide factors that shape provider behaviour and quality of care beyond training received.

Regarding the site of abortions, Frolova *et al.* found that of the deaths reviewed, 74% were attributed to out of facility abortions. Another study estimated that 90% of abortion-related maternal deaths in Russia resulted from unsafe abortions performed outside medical facilities (Kingkade 1997).

These estimates appear to correspond to government statistics presented above in Table 4 which saw 21% of maternal deaths due to out of facility abortions in 1999, compared to only 4% from legal abortions (indicating over 80% of abortion deaths due to out of facility abortions). Yet it is also worth noting that the one cause of maternal death that has seen the largest decline since the mid 1980s has been out of facility abortion related deaths. In particular, deaths dropped from 19.70 deaths per 100,000 live births due to this cause in 1985 (during the Soviet period) to 12.77 in 1990, further declining to 10.32 by 1997.

However, despite the decline seen, illegal abortions still represent a large proportion of maternal deaths, and with abortions legal and widely available in health facilities, it is surprising that Russian women would seek them illegally. These statistics, if accurate, pose important questions regarding access to services and/or health seeking behaviour. Understanding why women would undertake abortions outside health facilities would be a crucial point of investigation. Some believe that the reason that abortions occur outside hospitals is related to wish for privacy or secrecy (‘abortion’ is written on the sick leave note) and concerns over confidentiality (Strachan *et al* 2000). Frolova *et al.* also found that 2/3 of rural residents who died after in-facility abortions had those abortions done in an urban centre, which they see as symptomatic of possible unavailability of abortions to rural women. The share of rural women dying after abortions was higher than urban women as well, although this could also be a result of the longer time to reach emergency care when complications arise. However, there may be other social (stigma) or financial barriers to seeking legal abortions. These may also contribute to delay in seeking care when illegal abortions lead to life-threatening complications. Unfortunately, no in-depth investigation was found covering these issues.

Outside a medical institution, Frolova *et al.* found the main factor contributing to death after abortion was ‘delay in seeking medical help’ (93.4% of cases). Yet this remains a rather vague explanation, with little insight into direct pathological causes of mortality, or even the causes of time delay.

It was also reported that 78.6 % of women who died after abortion outside a medical institution had legitimate ‘social reasons’ for terminating their pregnancy. This included termination before 12 weeks gestation, or for women between 13-21 weeks, reasons such as having 3 or more children already, not having a registered marriage, or being unemployed. The authors argue that these women could have terminated the pregnancy in medical institutions easily, but did not do so, possibly due to socio-economic factors (which were not explained or explored).

Overall, it is generally assumed that out of facility abortions are rare events (1-2% of abortions). Recent government estimates report 0.13% of abortions to definitely be illegal, and another 4.3% to be possible or probable out of facility abortions (See Appendix A). These numbers appear to be estimates based on complicated cases traced, in which case they may greatly underestimate the total number of illegal abortions. Still, if these numbers are approximately correct, and if out of facility abortions do, in fact, make up 70-90% of abortion related deaths, this would indicate a dramatically high risk of death compared to in-facility abortions. But this is perhaps not surprising when seen in the light of the methods of illegal abortion described by Frolova *et al.*, who explain that methods included “inserting into the uterine cavity a rubber catheter, tip of an enema, handle of a toothbrush. In some cases, these objects had previously been treated either by vodka, eau de Cologne, or merely washed with water and soap” (Frolova *et al.*, 2001: 17). The danger of such methods again emphasises the need to investigate what factors would lead to women seeking out such services.

Despite the lack of investigation into reasons for seeking illegal abortions, it is well recognised that expansion of family planning provision in Russia is needed, which could reduce abortions and their complications. Family planning has been the primary focus of many interventions in Russia that have attempted to reduce maternal mortality. However, Frolova *et al.*’s study concludes that abortion and subsequent mortality in Russia is not only a medical, but a social problem. That some abortions still occur outside medical institutions testifies to the existence of barriers to seeking abortion services for some women.

CONCLUSIONS ON MATERNAL MORTALITY

Variations seen in Russian data between various sources raise concerns about data reliability, and the use of national statistics as a benchmark. In the 1990s, the Russian Federation became much more decentralised, and the information flows from individual Oblasts to the federal level are no longer tightly controlled as they once were. Some authors have expressed concern over the research approaches used in Russia compared to international standards of practice (Tkatchenko & McKee 2000).

Despite these challenges relating to existing data, the current review of literature has highlighted a number of issues around maternal mortality in Russia. Generally, it is believed that:

- Maternal mortality in Russia is 5-10 times higher than in the West and higher than in Eastern Europe
- Provision of family planning services is inadequate as evidenced by the very high abortion rates in Russia, with an estimated 25% of maternal mortality related to abortion.
- Most abortion related deaths occur among abortions undertaken outside medical facilities (estimates between 73% and 90%). Despite this, no quantitative assessment of the incidence of outside facility abortions was found. Assuming they are a relatively rare event, the fact that they contribute a high proportion of all abortion-related deaths indicates a high-risk for these procedures.
- Health system-related factors (maldagnosis and inappropriate treatment) contributed significantly to deaths after termination of pregnancy, although infection control problems may also have been a factor.

There are still, however, a number of gaps in knowledge that our investigation has highlighted. Questions raised include:

- What are the determinants (social and clinical) of the regional variation in maternal mortality in Russia?
- How does maternal mortality vary according to different types of facility
- How do clinical practices vary, and how might these be related to outcomes?
- Why do Russian women still seek illegal abortions?
- What policies would bring these illegal abortions into the health sector?
- What are the determinants of the high rate of maternal death that are not abortion related?
- What are the barriers to providing evidence-based obstetric care?

Perinatal and infant mortality

Perinatal mortality can provide another important indicator of reproductive health status, and be used as an indicator of maternal health system performance. Figure 3 indicates that infant mortality has improved only slightly in the 1990s in Russia, and it is higher than in Central and Eastern Europe and the EU. While the perinatal mortality rate has shown some improvements, it is still more than 10 times higher than in the EU (Figure 4). The incidence of stillbirths per 1,000 births, however, is dramatically higher than in CEE and EU, suggesting failures in antenatal monitoring and delivery care, or possible differences in case definitions (Figure 4). Furthermore, according to official statistics, there was a dramatic jump in the number of stillbirths in 1990.

Figure 3 Infant mortality: comparisons (WHO Health for All (HfA) database, 2002)

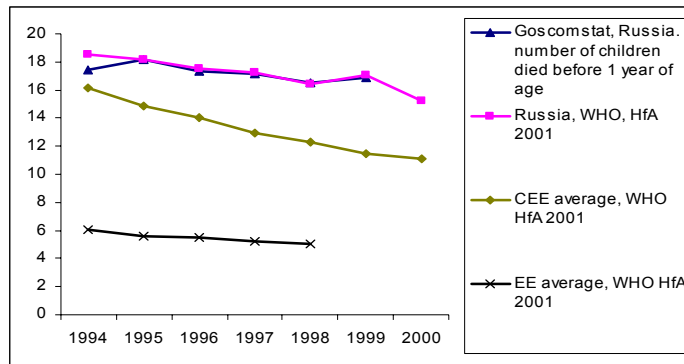
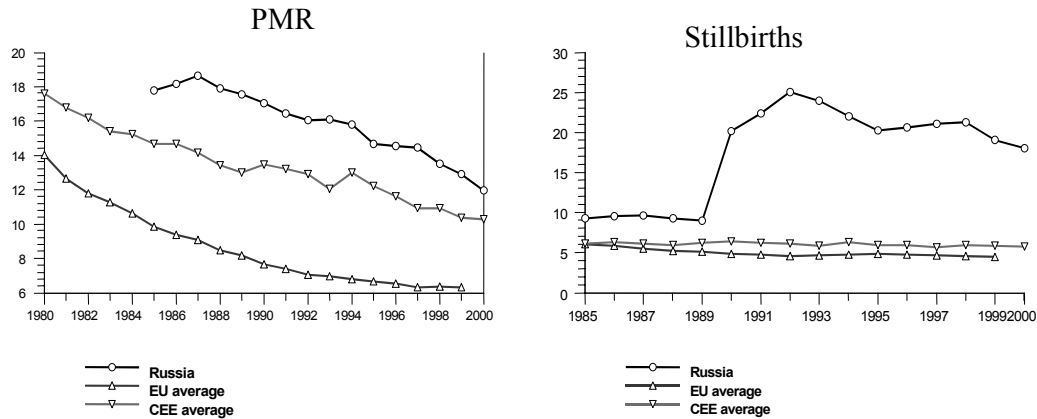


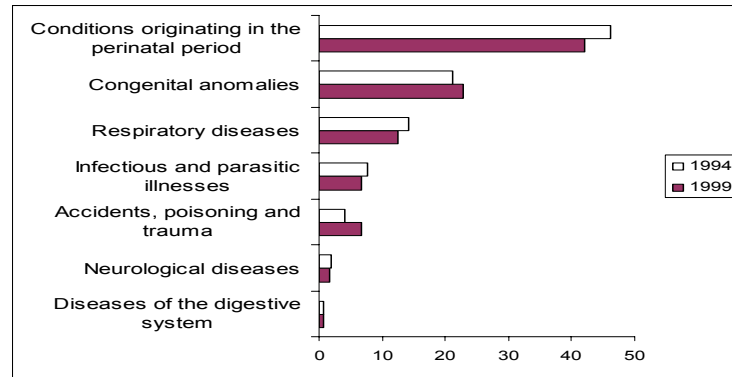
Figure 4 Perinatal mortality rate, per 1,000 births & still-born foetuses per 1,000 births (WHO, HfA, 2002)



It is unclear why the number of stillbirths recorded in Russia jumped so dramatically after 1989. Changes in recording and definitions of live births could be to blame, with removal of possible state pressure to keep rates artificially low, but this is mere speculation. Unfortunately, these data, like those on maternal mortality, are subject to the same questions of reliability and lack of transparency in collection mechanisms.

Other information exists on infant mortality, however, with official statistics estimating the causes of infant mortality in some years as follows:

Figure 5 - Changes in infant mortality (1994 & 1999) (Goskomstat, 2001)



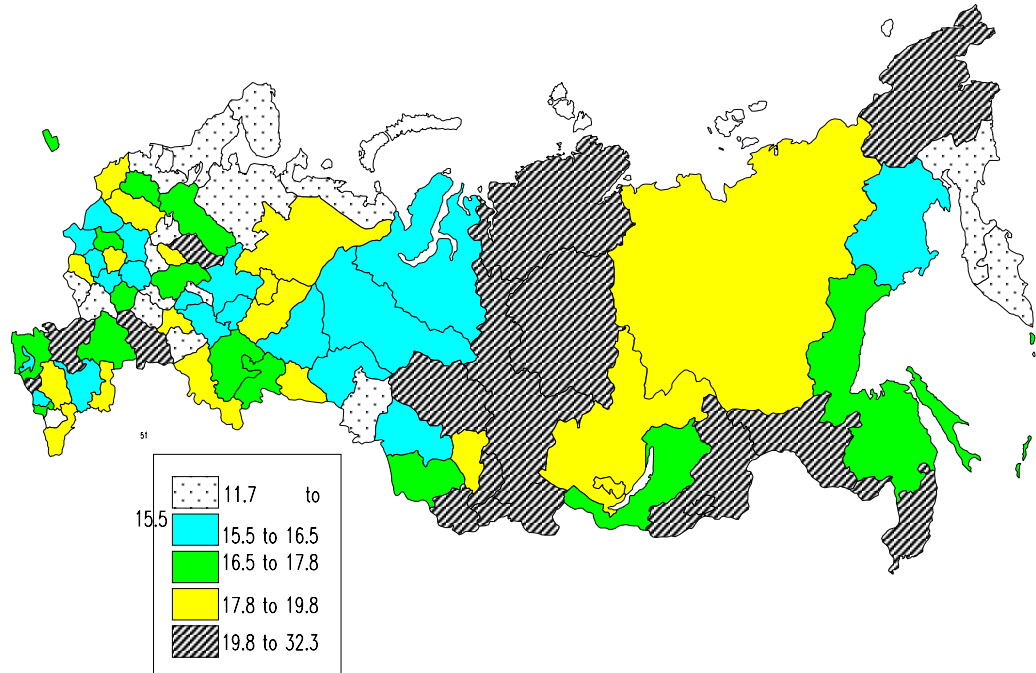
As indicated, many infant deaths are attributed to conditions originating in the perinatal period, although this percentage appears to be declining – as is the total number of perinatal deaths. It is unclear what may cause these perinatal related deaths, but there is scope to investigate further where individual data are available, by separating neonatal from post-neonatal deaths and by exploring the impact of birthweight distribution (reflecting mainly social factors) and birthweight specific survival (reflecting mainly medical care) (Koupilova *et al.*, 1998).

A preliminary analysis of determinants of low birthweight in Tula region has also been conducted using an existing dataset comprising all birth and maternal and perinatal deaths in 2000 in Tula oblast. The analysis showed wide variations in birthweight and ponderal index¹ by mothers' socio-economic indicators, particularly education, nationality and marital status. Survival in both low birthweight categories (under 2500 gram) and higher birthweight categories was found to be lower than in a developed country comparison (Sweden), indicating potential health system deficiencies and health inequalities linked to socioeconomic status in Russia.

As with maternal mortality, there appear to be considerable regional variations across the Russian federation for infant mortality, again with the highest rates in Siberia, according to Goskomstat data.

¹ A vital measure at birth that may indicate risk of diabetes and cardiovascular disease in later years – calculated as the cube root of body weight times 100 divided by height.

Figure 6 - Regional variation in infant mortality rates (per 1000) in Russia (1995-1999)



CONCLUSIONS ON PERINATAL AND INFANT MORTALITY

Our brief review of information on perinatal (and infant) mortality illustrates that perinatal and infant mortality rates appear to be declining, although this is more pronounced for perinatal rates, with the main cause of infant mortality claimed to be due to complications arising from perinatal period. There are also large regional variations in infant mortality.

However, there are still a number of questions that linger, such as:

- Why are infant mortality rates not falling faster?
- What explains the persistently high rate of perinatal death: social, medical or other factors?
- How do birth outcomes vary by facility?
- Why did stillbirths rise so dramatically during the transition period?

Reproductive health

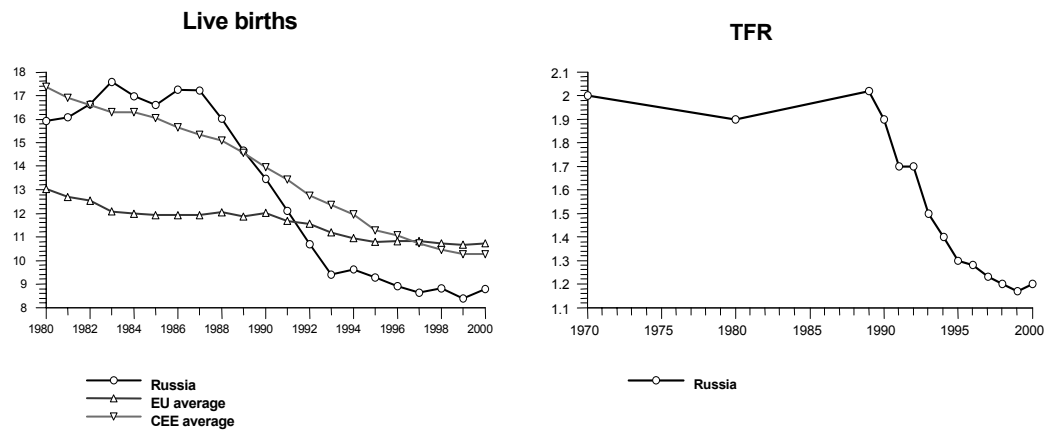
Some of the key indicators used for assessing maternal health revolve around assessment of reproductive health status and services. This is one area in Russia where a fairly large amount of work has been done, in part due to the increased concern with abortion practices, but also due to state interest in population statistics. The key studies on reproductive health care were conducted by:

- i) the Women and Infant Health Project (WIN) 2000-2001, undertaken by John Snow International (JSI) and USAID in cooperation with Russian Centre for Public Opinion and Market Research;

- ii) The US Centre for Disease Control (CDC) jointly with the Russia Women's Reproductive Health Survey 1996-1999; and
- iii) the Maternal Mortality After-Abortion Survey of the Research Centre of Obstetrics, Gynaecology and Perinatology of the Russian Academy of Medical Sciences and the Open Society Institute (noted above as Frolova *et al.* 2001).

In the 1990s Russia experienced a rapid decline in birth rates with the fertility rate falling from 2.02 births per women in 1989 to only 1.2 in 2000. Traditionally it has been found that most Russian families aspire to have two children (Strachan *et al.* 2000), although during transition having one child has become more acceptable. These trends became the focus of federal government and media attention as they were considered to have significant geopolitical and strategic implications for Russia in terms of population decline (Goldberg & Serbanescu 2001).

Figure 7 - Number of live births per 1000 population and total fertility rate (WHO, 2002)



According to surveys, the use of some form of contraceptive is common, although many women use methods of low effectiveness and access to the contraceptive pill is clearly a problem. According to the 1996 and 1999 CDC study of three regions of Russia, the highest reported rate of contraceptive pill use among women in sexual relationships was 10%, with condoms and IUDs more popular choices in all three sites.

Knowledge of contraceptive methods was high, and most women knew where they could obtain information about these methods (David 2001). Many women combined modern and traditional methods of contraception or switched between different methods and on average have tried over 4 methods. The main mentioned reason not to use family planning methods was perceived lack of need for contraception. However, women had been exposed to family planning information in the framework of reproductive health projects (Russia Women's Reproductive Health Survey 1999).

Statistics on contraception were not collected before 1988, but female and male sterilisation methods were illegal until the early 1990s (Strahan 2000). During the communist era, individuals had little say in reproductive decisions (hence the widespread use of abortions and IUDs). Some authors attribute this to a need of governmental planners to control the supply of labour, with fertility seen as a matter of state policy. In the 1990s, modern and effective methods began to become available contributing to falls

in abortion rates. The current pattern of childbearing suggests that intended fertility is low and most unintended pregnancies are unwanted and terminated (Goldberg & Serbanescu 2001).

Abortion rates do, however, remain high, although they have declined in the 1990s, but rates are still higher than in Eastern Europe (Figure 8). A recent shift has been to so-called ‘mini-abortions’ - abortions performed before 7 weeks gestation (24% of all abortions). Finally, some commentators suggest that access to contraception may be threatened by concerns among certain groups that contraceptive use has contributed to the decline of the Russian population (Strahan 2000). The following rates of contraceptive use were measured in three regions of Russia:

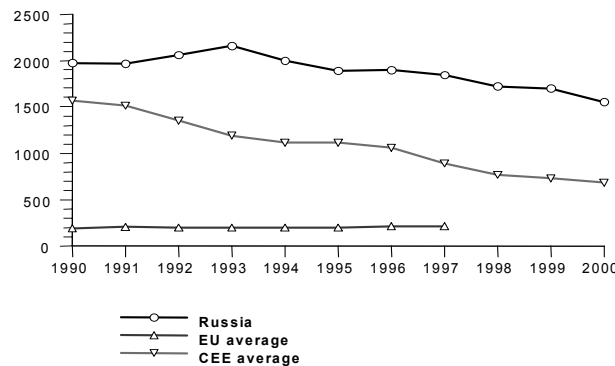
Table 8 – Percentage use of contraceptive methods, women in sexual relationships 1996 and 1999 (Russian Centre for Public Opinion and Market Research et al., March 2000)

	Ivanovo		Yekaterinburg		Perm	
	1996	1999	1996	1999	1996	1999
Using Any Method	77.2	72.8	69.7	75.4	68.6	70.2
Using a modern method	58.9	52.9	55.4	57.7	50.7	49.3
IUD	35.4	28.5	27.6	23.7	28.0	23.3
Condoms	12.6	13.5	11.4	16.9	12.9	16.4
Oral contraceptives	7.2	7.4	10.0	9.5	5.2	5.3
Female Sterilisation	2.1	2.4	2.2	2.5	1.7	1.4
Vaginal methods	1.3	0.2	0.6	1.8	1.0	1.8
Morning-after pills	0.7	0.5	0.1	0.5	0.7	0.6
Combination of methods	1.5	0.1	2.4	1.5	0.7	0.4
Other methods	0.1	0.4	1.2	1.3	0.6	0.2
Using a Traditional method	18.3	19.9	14.3	17.7	17.9	20.9
Periodic abstinence	9.2	9.1	11.9	14.2	14.4	14.2
Withdrawal	9.0	10.8	2.4	3.5	3.5	6.7
Using no method	22.8	27.2	30.3	24.6	31.4	29.8
Number of women	1,381	1,295	1,298	1253	1344	1255

A range of studies have attempted to assess knowledge of contraceptive practices and behaviour. While in the West the birth rate is regulated through wide use of modern contraception, in Russia, induced abortion still plays a major role in birth control, with approximately 60% of pregnancies terminated through induced abortion. Between 84 and 97% of unwanted pregnancies are terminated in this way according to surveys by the CDC. The 1999 DHS survey reported a total abortion rate of 2.5 abortions per woman (compared to 2.1 in official statistics (Goldberg & Serbanescu 2001)). Late stage pregnancies are often terminated.

The following presents comparative estimates for abortion rates in Russia, the EU and CEE – as shown, only recently has the Russian figure dropped below two abortions for every live birth.

Figure 8 - Number of abortions per 1000 live births (WHO, 2002)



As with other health indicators, there are considerable regional variations in abortion rates. Analysis of maternal health statistics for 1999 shows that the largest number of abortions per 1,000 women in the fertile age group was performed in the Far East Federal District, with the lowest number in the Southern Federal District. Table 9 illustrates some regional variations in measures and outcomes.

There is a discrepancy between an almost universal knowledge of modern methods for contraception (such as oral contraceptives, IUD, or condoms), and behaviour. The fact that the abortion rate is declining would indicate knowledge of other birth control methods, although the high rate would indicate that there are remaining barriers affecting uptake of other sources. However, the precise balance of socio-economic factors and circumstances in the health system motivating decisions is unclear.

Another argument is that women now may have wider range of choices than in the past, but have insufficient knowledge to make informed decisions. It could be hypothesised that in many cases women are informed about the existence of new methods, but not about the possible drawbacks of abortion, explaining the mixing of methods and still high abortion levels. Most studies suggest strengthening quality of family planning programmes. For this reason, a range of international agencies have focused on reproductive health interventions attempting to replace abortion due to their potential high impact and cost-effectiveness.

Although there is a growing shift from reliance on abortion to contraception, the picture in Russia since 1990 is complex. 73% of women in sexual relationships use some form of contraception, which is similar to that seen in other developed countries. However, access to modern methods is limited, almost certainly contributing to the high rates of abortion (Goldberg & Serbanescu 2001). Goldberg & Serbanescu (2001) argue that increased access to modern contraception, greater individual choice of method, improved effectiveness, and improved sexual education are all needed to reduce abortion rates.

As a final note, a number of authors have discussed the spread of HIV/AIDS into the non-injecting heterosexual population in Russia. Consequently, the acceptability, availability, and use of condoms as a family planning method may be an appropriate topic for investigation.

**Table 9 - Characterising the Incidence Rate of Abortions and Maternal Mortality along the Federal Districts of the Russian Federation in 1999
(State Statistical Committee data)**

Federal District	Total population	Female population aged 15-49	Total live births	Pregnancy terminations (abortions and spontaneous miscarriages)	Incidence rate (abortions per 1000 women aged 15-49)	Incidence ratio (abortions per 100 live births)	Abortion-related deaths	Mortality ratio (deaths due to abortion per 100 000 live births)	Total maternal deaths	Maternal mortality ratio (deaths per 100 000 live births)	% maternal deaths due to abortion	Case fatality rate (after abortion)
	A	B	C	D	F	G	H	I	J	K	L	M
Source of information	Goskomstat	Goskomstat	Goskomstat	Goskomstat	(D/B) per 1000	(D/C) per 100	Goskomstat	(Y/C) per 100,000	Goskomstat	(J/C) per 100,000	(H/J) ×100 %	
North-West	14612178	3972301	103872	204800	51.6	197.2	14	13.5	42	40.4	33.3	0.0068
Central	37172955	9679723	268210	487029	50.3	181.6	20	7.5	88	32.8	22.7	0.0041
Southern	21615726	5655043	204863	244872	43.3	119.5	12	5.9	76	37.9	15.8	0.0049
Volga	32111282	8506302	272642	547630	64.4	200.9	31	11.4	118	43.3	26.3	0.0057
Urals	12654773	3485575	111119	223969	64.3	201.6	15	13.5	60	54.0	25.0	0.0067
Siberian	20900094	5741352	189490	340093	59.2	179.5	31	16.4	114	60.2	27.2	0.0091
Far-Eastern	7260597	2006530	64493	132760	66.2	205.9	7	10.9	39	60.5	17.9	0.0053
Total	146327605	39046826	1214689	2181153	55.9	179.6	130	10.7	537	44.2	24.2	0.0059

CONCLUSIONS ON REPRODUCTIVE HEALTH

It is well established that high levels of abortion coincide with low fertility in Russia. Furthermore, although contraception is widely used, access to modern methods appears limited, and there may be a high contraceptive failure rate. A number of questions can be raised, however, about the reproductive health status and services in the country. These include:

- What is the extent of unmet need for modern methods of contraception?
- What are the barriers to meeting that need?
- How much do high abortion rates reflect failure of contraception? What are the implications?
- What will be the impact of Russian demographic policy for reproductive health services?
- How can use of condoms be promoted, given the need to enhance prevention of sexually transmitted infections?

Maternal health: additional Russian literature

In addition to the material presented above, this situational analysis identified a number of other (mostly Russian language) studies addressing the determinants of maternal and child health in Russia. The following review describes the literature that we have been able to identify and obtain, with a focus on its implications for the health system.

Unfortunately, many studies identified here simply look for statistical correlation between adverse outcomes and any of a wide number of measured variables, with no clear underlying causal model. Some studies do not discuss statistical significance of findings, while others test for findings that are already well established and known (such as finding the risk of perinatal mortality to be related to alcoholism, smoking, young or old age of the mother, etc.). As a result, the usefulness of these studies may be limited, but they are included here as they represent some of the only information on the subject in Russia.

SOCIO-ECONOMIC DETERMINANTS OF REPRODUCTIVE HEALTH ISSUES

Some authors have theorised that a reason for the declining birth rate observed in Russia may be seen in an overall decrease in living standards and quality of life (Brui and Dmitriev, 1998). In one study, 22% of the included population reported income lower than the minimum living standard and 23% were said to live in extreme poverty, a situation that led many families to decide against having children. The number of registered marriages also was seen to fall significantly in the 1990s, some of these being replaced by unregistered marriages. It is reported that instability of marital union was correlated with a higher probability of an abortion (David 2001).

Given the current increase in cohabitation outside marriage, a recent study looked at medical and social characteristics of women who gave birth out of wedlock (Kostin *et al.*, 1999). In this study 114 unmarried women (cases) and 104 married women (as a control group)

completed a postal survey. Unmarried women had lower educational attainment and were more likely to give birth under 18 or after 30. Interestingly, data on contraception methods used differed considerably from the figures discussed in the previous sections (Filippov 1997). Both among married and unmarried women, withdrawal was the most commonly used contraception method (19.47 and 24.4% respectively) and about a third of unmarried women did not use any contraception at all (against 12,5% in the control group). In almost 50% of all women in both groups the last pregnancy was unplanned, indicating a low level of contraceptive practice.

ENVIRONMENTAL DETERMINANT STUDIES

The largest proportion of published work on maternal health in the Russian language examines the influence of environmental factors on women's reproductive health (Tsallagova 1999, Ailamazyan *et al* 1997; Korsak *et al* 2000 etc.). This preoccupation is also seen in much of the literature on the determinants of mortality in general, despite contrary findings in work published in the international literature. It may partly reflect the emphasis on environmental issues within the public health system in Russia. Thus, Tsallagova (1999) analysing 12,840 medical birth histories of women living in Vladikavkaz, detected a relationship between the prevalence of foetal and newborn pathology perinatal mortality rate and environmental pollution. A direct correlation of pregnancy pathologies and the degree of pollution with metals (lead, zinc, copper, cadmium) was also found, although its statistical significance is not indicated.

Ailamazyan *et al.* (1997) similarly identified a set of outcomes that differed significantly based on pollution levels in different regions, including: the risk of pregnancy termination, gestosis, toxemia of pregnancy, premature of rupture of amniotic fluid sac, anomalies of delivery, intrauterine hypoxia, asphyxia, and the perinatal mortality rate. The authors considered these indicators useful as criteria for environmental evaluation because of the sensitivity of the reproductive system to environmental factors.

Korsak *et al.* (2000) investigated the reproductive health of women living in the north and south of Tumen region. The north is characterised by permafrost, very low temperatures during most of the year, strong winds, in addition to oil and gas industry waste worsening the environmental conditions. The south has more favourable continental climate, with no oil and gas industries. The study showed that the prevalence of miscarriages, premature labour, toxemia, the mean perinatal mortality rate and prevalence of congenital abnormalities were significantly higher in the north than in the south. The study concluded that natural and technological factors can have a negative influence on women's health.

STUDIES OF THE DETERMINANTS OF PERINATAL MORTALITY

A third group of studies identified sought to identify determinants of perinatal or infant mortality specifically. Sharapova *et al.* (1999) carried out study of biological and social risk factors for women residing in the north industrial region of Chuvashiya. In the study, perinatal mortality was strongly correlated with the age of mother, heavy manual labour undertaken, intrauterine hypoxia, proteinuria during pregnancy, and with a quality of care composite index. The probability of perinatal death was highest in cases of prolonged labour, premature rupture of amniotic sac, nephropathy, and proteinuria. However, the analysis had no underlying causal framework, as authors also, somewhat confusingly, attributed the risk of perinatal death to low quality of medical care, irregular antenatal care,

late registration, incorrect hospital treatment, and several environmental factors such as levels of ozone, carbon monoxide, and nitrogen and sulphur oxides.

Gerjugova A. (2000) and Toporova I. (2000) reported that the risk of perinatal mortality is connected with the following medical factors in women: early and late age of pregnancy, smoking and alcoholism, endocrinological conditions, problems with physical development (stunting, obesity) risk of abortion, premature placental separation, as well as social and environmental factors, conflict, poor medical observation, irregular antenatal visits due to women's low motivation, harmful industrial factors (mainly chemical industry), and the low educational level of women. Unfortunately there are major weaknesses in definitions of exposure in the study.

Analysing data from 102 families, Purtov *et al.* (2001) found the following factors significant for infant mortality rate: pregnancy complications (toxicosis, polyhydramnion, anaemia, risk of abortion), delivery complications (rapid labour, powerless labour, caesarean section), long interval between current and previous pregnancy, preceding infertility, miscarriages, and social factors (living conditions, incomplete family, alcoholism of father, etc). Once again, there were major problems of conceptualisation and study design, highlighting the poor quality unfortunately common in the unpublished local public health research.

CONCLUSIONS ON ADDITIONAL RUSSIAN LITERATURE

In summary, there are significant gaps in existing Russian research and little causal explanation of the determinants of adverse reproductive outcomes. The existing Russian literature has had a very narrow focus. Most studies look at determinants of poor infant or perinatal outcomes, often in relation to environmental factors. Studying such factors might have been perceived as less politically sensitive than tracing the impact of medical care and the health system in general. Usually there is very little description of the methodology used and the significance of the results. Each study appears isolated and does not contribute to a coherent body of research.

PROCESS INDICATORS

It is widely believed in the maternal health literature that outcome measures such as the maternal or perinatal mortality rate have limitations in evaluating health programmes. Mortality is a rare event (in Russia as a whole there are only a few hundred maternal deaths per year), which can lead to random fluctuations by year. As a result, measuring outcomes such as the MMR can prove costly and time consuming, requiring a large sample size. As an alternative, international organisations often recommend measuring ‘process indicators’: measures of the use of interventions and services which are assumed to be closely related to improved maternal health outcomes.

Closely linked to these process indicators are the common international recommendations on what is needed to ensure or improve maternal health. The Safe Motherhood Initiative (which includes WHO, the World Bank, UNICEF and others) suggests a comprehensive package of services for safe motherhood, as well as suggested process indicators.

Table 10 summarises many common process indicators and recommended interventions, alongside what we have found to be the case in the Russian context. Appendix A lists additional Russian data obtained from official sources.

Table 10. Recommended process indicators, services, and Russian experiences

Process Indicators (Safe Motherhood 2001, Wardlaw and Maine 1999b)	Safe Motherhood Initiative Recommendations (Safe Motherhood, 2001)	In Russian context
Percentage of births with skilled attendant	During Childbirth – Skilled care during labour and delivery	Most births in facilities/high physician to midwife ratio; 95% of births in hospitals (David, 2001)
Percentage of women attending antenatal care at least once	During Pregnancy – Antenatal care and counselling	Many visits at all levels; quality issues with treatment
Percentage of women immunised with tetanus toxoid		N/A
Percentage of women receiving postnatal care	After Delivery – Postpartum care	Nearly all (specific percentage not given in official statistics) ²
Time interval from onset of complication (or arrival at facility) to treatment at referral site		N/A
Ratio of complicated obstetric admissions to all deliveries		N/A
Case fatality rate (for complications)		Not known
Percentage of adults knowledgeable about complications of pregnancy and childbirth (Starrs, 1997).		Not known
Availability of Emergency Obstetric Care		High
	Before and After Pregnancy – Family Planning	Poor: Fewer than half (23-40%) of women who delivered were counselled in the post-partum period in a three city study (David <i>et al.</i> 2000)
	Throughout the Reproductive Life Span – Abortion-related care	Poor (David, 2001)
	During Adolescence – Reproductive health education and services	Poor (Berlin SI, SANAM)
	For Women and Families – Community Education	N/A

Monitoring process indicators and improvements in health care along the lines of Safe Motherhood recommendations may be an effective way to address high maternal mortality rates in countries where there is limited access to or uptake of services. In Russia, despite relatively broad coverage, the continued MMR rates above those of the West require more complex explanations. In many cases, there is a lack of information or regular monitoring of many process indicators that may be particularly useful.

However, the most common process indicators are not always applicable to Russia due to differences in clinical practices and scope of coverage, suggesting a need to delve deeper

² In Russia, routine postnatal care often is centred on the health of the child, with no institutionalised maternal postnatal care. The information is also not recorded in statistical data.

into the underlying institutional practices and system-wide factors that influence these practices.

For instance, it is widely believed that nearly 100% of women deliver their children in facilities with trained attendants, mostly physicians (David 2001). We are not aware of studies examining the clinical mix of staff, but it appears to be heavily skewed towards more specialised clinical staff rather than midwives. Abortions are, in theory, free and widely available as already discussed, but still there is evidence for highly dangerous out of facility abortions taking place.

Antenatal care is almost universal in Russia, even potentially overused. Compared with accepted practice in the west, Russian women make more antenatal visits than medically necessary (see results from the WIN study, below). However, it is unclear if women actually attend so many antenatal visits, or if anything substantial happens during them – some informants suggested these recorded rates may be merely an attempt to satisfy administrative requirements (up to 21 visits officially recommended)³.

The WIN survey (David, 2001) showed that antenatal visits do not significantly improve health knowledge. Despite high antenatal attendance in their population (all women received antenatal care from the first trimester, with an average of 15-19 visits during a pregnancy), less than half of all women in Perm and Novgorod reported receiving any information about postpartum contraception during antenatal visits. While the high number of visits recorded during the WIN project might at first seem to confirm the official statistics of the Russian Federation, the WIN study actively improved the quality of antenatal care in specific areas of Russia, and recorded increases in uptake of antenatal services. Given that such improvements did not take place elsewhere in Russia, the official attendance figures may be somewhat exaggerated.

A study undertaken by the CDC found that only between 4 and 6% of women surveyed did not receive any antenatal care, although there are concerns about the content of visits at primary health care level. It was also found that hospitalisation during pregnancy was common, with between 38 and 50% of women admitted at some stage in their pregnancy. These were commonly very long stays. Of those hospitalised, around 40% remained for 30 nights or longer (Russian Centre for Public Opinion and Market Research *et al.*, May 1998). We have been unable to identify any evaluations of the reasons for antenatal hospitalisations, benefits derived, or the costs incurred (both direct fees paid and opportunity costs for time lost) by the women for such long hospitalisations.

Finally, DFID, in association with JSI previously reviewed some of the literature on maternal health in the FSU. They found that many aspects of antenatal care in Russia and in the UK are similar, but in the FSU there was poor communication between those working in gynaecology clinics, where ante-natal care is provided, and hospital obstetric and midwifery staff. Pregnant women were found to visit the clinic monthly from 12-32 weeks, fortnightly to 36 weeks, and weekly thereafter (typically totalling 14 or more visits). The DFID/JSI report identifies the need to promote continuity of care, and, in particular, improved transfer of information between relevant parties (Health and Population Department DFID, June 2001).

³ The official antenatal practices in Moscow require consultations at least once a month in the first trimester (3 visits), once every two weeks in the second trimester (6), and once a week in the last trimester (12-16 visits). However, practices are likely to vary by region.

It is also reported that morbidity among pregnant women is high, with 41% of pregnant women suffering from anaemia in 1999 compared to 12% in 1990 (Goscomstat 2001), although providing iron tablets and folic acid has not officially been advised. The rates of anaemia have been recommended as a possible process indicator applicable to Russia to indicate quality of maternal care (Kaluga Safe Motherhood project, project material, 2002).

CONCLUSIONS ON PROCESS INDICATORS

There are a number of conclusions that can be drawn when looking at internationally recommended process indicators and interventions for safe motherhood. Review of literature indicates:

- Existing common process indicators such as percentage of births in institutions or with trained attendants are very high in Russia
- Antenatal care is more intense than in the west, with possible overuse.
- There is a high rate of hospitalisation during pregnancy, with mothers remaining in hospital for long periods. Few women receive no antenatal care. Most attend during the first 6 months.
- The low fertility rate in Russia seems to counter the need for extending family planning – although the high use of abortion and its consequences, as mentioned, illustrates a potential need to shift to other contraceptive practices
- Overall, commonly measured process indicators and international safe motherhood recommendations prove limited in their usefulness to evaluate the Russian maternal health system.
- There is a need to increase the recording and measuring of different process indicators that can indicate aspects of quality of care and problematic practice within facilities.

Again, however, this review has identified a number of gaps in knowledge and questions that can be raised about the Russian maternal care system. These include:

- Why are there such high levels of antenatal visits and hospitalisation – are they medically necessary?
- What are the costs to women and the health system of unnecessary medicalisation of pregnancy?
- Does the pattern of antenatal care vary, by: socio-economic status of women, facility, facility level, etc?
- What mechanisms exist to monitor and change the system of antenatal care?

THE MATERNAL HEALTH SYSTEM IN RUSSIA

Delivery of maternal health care

The Soviet model of maternal care involved universal access to hospital delivery, although ante- and postnatal services were located at polyclinics (so called ‘women consultations’).

Since the collapse of the Soviet Union a number of changes have been made, but one finding has been that the fall in health care funding has not been translated into large reductions in facilities through closures or lay-offs. Thus, staff numbers remained constant, and showed little variation during transition, with the numbers of physicians and nurses remaining virtually unchanged, with the exception of paediatricians, whose numbers slightly declined. The reason for much of the retention in numbers of staff and facility capacity is in part linked to the persisting Soviet system of funding. Regional budgets are derived from formulas based on historical norms requiring fixed numbers of beds and staff for facilities, rather than actual activity or need.

However, numbers of auxiliary staff - chiefly midwives - has declined, due to lower prestige and low financial and professional incentives driving them out of the system. Overall, the predominant medicalised model of maternal care has remained unchallenged.

Box 1 highlights some of the historical programmes undertaken in the Russian system to address maternal health care.

Box 1. Main maternal and child policies and programmes

- 1950s Extension of network of obstetric care facilities (maternal homes), setting up gynecological cabinets in polyclinics and specialized obstetric care units (for pregnant women with heart disease, premature labour, etc.)
- 1960s Multi-stage integrated care introduced in obstetric and paediatric care units in rural areas.
- 1970s Reorganization of obstetric and gynecological care in rural regions including reduction of rural maternal homes. Specialized aid concentrated in interregional centers and hospitals

Post-transition policies included:

- Measures to improve reproductive health were conducted through dedicated federal programs “Safe maternity” and “Family planning”. A national strategy “The concept of reproductive health protection (2000-2004)” was developed.
- Policies to address health care organisations (mainly equipment purchasing and capital investment) and other government organisation. The falling fertility rate (and potential population reduction) framed as a ‘reproductive health crisis’, and considered a national problem related to demographic and economic crisis of transition.
- In 1998-2000 in accordance with “Safe maternity” programme, medical equipment for 260 maternity homes was purchased (78 Ultrasound apparatus, 99 fetal cardio-monitors, 77 hysteroscopes and 3 laparoscopes). The Federal Fund of Compulsory Medical insurance has financed 38 regions of Russia. 70 peri-natal centers for obstetric and pediatric care having good diagnostic equipment were established.

The following tables present information on the structure of maternal health services in the country since 1990:

Table 11. The number of maternity home and women's consultations in Russia (Burduli, 1998)

	1991	1992	1993	1994	1995
Maternity homes	297	299	293	282	279
Women's consultations	N/a	1804	1938	1977	1979

Table 12. Distribution of health facilities involved in maternal care (end of year)

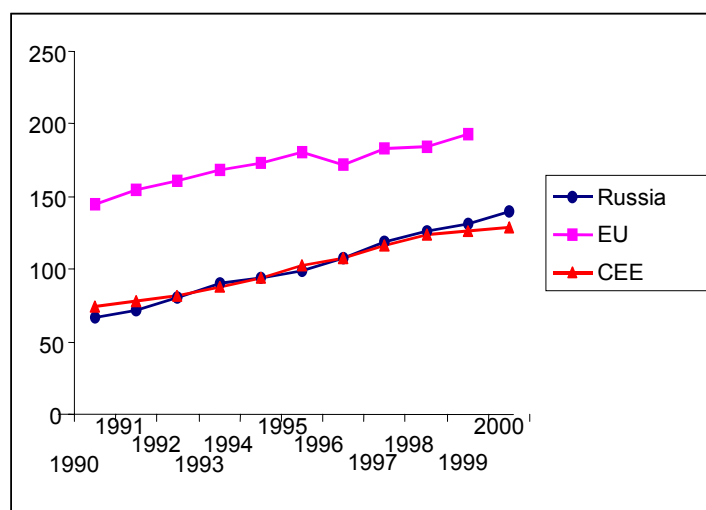
	1990	1995	1996	1997	1998	1999
Number of hospital facilities	128,000	121,000	118,000	115,000	111,000	109,000
Number of hospital beds(x 1000)	2037.6	1850.5	1812.7	1766.0	1716.5	1672.4
per 10,000 population	137.5	126.1	123.9	121.0	117.9	115.5
Children's beds (% of total)	15.2	14.5	14.4	14.3	14.6	14.1
per 10,000 children (0-14)	91.4	86.5	87.4	80.1	90.7	89.7
Beds for pregnant women and giving birth (% of total)	6.0	5.7	5.6	5.6	5.6	5.5
per 10,000 women (15-49)	34.1	27.5	26.5	26.3	24.5	23.6
Obstetrics/gynaecological beds (% of total)	6.0	6.0	6.0	6.0	5.6	5.8
per 10,000 women	15.6	14.2	14.1	13.5	13.1	12.7
Number of ambulatory/polyclinic facilities	215,000	211,000	221,000	217,000	211,000	211,000
Ambulatory visits per 10,000 population	217.4	235.6	237.1	238.1	239.0	241.4
Women's consulting facilities, children policlinic and ambulatories (% of total)	63.7	73.9	70.1	71.4	73.9	74.9
The number of feldscher/midwife centres (x 1000)	47.7	45.8	45.7	45.2	44.8	44.7

Table 13. Distribution of health staff (end of year)

	1990	1995	1996	1997	1998	1999
Number of physicians, (x 1000) (per 10,000 population)	667,3 45,0	653,7 44,5	669,2 45,7	673,7 46,2	679,8 46,7	682,5 47,1
Paediatricians (per 10,000 children)	12,4 24,5	11,6 24,6	11,4 25,6	11,1 25,5	10,3 25,5	10,2 26,3
Obstetricians-gynaecologists: (Per 10,000 women)	6,2 5,2	6,2 5,2	6,2 5,4	6,3 5,4	6,1 5,3	6,1 5,4
Number of nurses and auxiliary staff (x 1000). (per 10,000 population)	1844,0 124,5	1628,8 111,0	1648,6 112,7	1626,6 111,5	1620,9 111,4	1611,7 111,3
Midwives (% of auxiliary medical staff) (per 10,000 women)	160,0 20,3	112,8 14,4	107,1 13,8	104,4 13,5	93,8 12,1	91,7 11,9

Appendix A contains additional data on current health system resources. Despite a commonly recognised reduction in funding and deterioration of infrastructure in recent years (Webster, 2003) the maternal health system has maintained a high volume of activities and high staffing levels. For example the number of some medical procedures (e.g. Caesarean sections) have continued to increase, although the rate remains lower than the average for the EU. However, the WHO has recommended that rates should not be above 15%, with other evidence showing little justification for rates over 5% (Buekens, 2001). The higher levels of this procedure in the EU may, in fact, reflect overuse, and should not be seen here as a goal for Russia to achieve.

Figure 9. Caesarean section per 1,000 live births (WHO 2002)



Organisational structure of maternal and child health services

At the national level, the Department of Medical Issues related to Maternity and Childhood is the leading institution in the area of MCH. The Department is part of the Ministry of Health of Russia, supervised by a deputy minister, with a separate head of department. Its officially stated activities include the following (according to its website:

www.minzdrav-rf.ru):

- ⇒ Development and improvement of medical care to mothers, children and adolescents
- ⇒ Intensifying the preventive orientation of activities in maternal and child health establishments
- ⇒ Introduction of modern perinatal technologies
- ⇒ Ensuring provision of medical care to children suffering from serious chronic diseases and disabled children
- ⇒ Protection of reproductive health
- ⇒ Decreasing maternal and child morbidity and mortality
- ⇒ Organisation of medical services for children in educational establishments of the ministry of education
- ⇒ Medical-social security of children in orphanages
- ⇒ Medical support of summer health-improving camps
- ⇒ Development of the sanatorium services to children

The Department operates in collaboration with the Ministry of Education, Ministry of Labour, Ministry of Defence, the General Prosecutor's Office, youth organisations and specialised research and educational institutions. It produces the annual State report on the status of children in the Russian Federation, and contributes every 4 years, jointly with the Ministry of Labour, to the Russian Federation's report to the UN committee on children's rights according to the UN Convention.

Below the national level are the territorial regional health authorities (health departments in Oblasts and ministries in autonomous republics), each one of these having a sector for maternal and childhood issues. This sector can be represented by the health authorities' deputy director or by the chief of a department.

There are further MCH sectors in municipal health authorities (they can be represented by paediatricians and obstetrician-gynaecologists).

There are also a number of other structures providing maternal and child health services in Russia, including:

- Obstetrics and paediatrics regional hospitals, which lead in maternal and child health care provision in a region, and are financed from the regional budget.
- Municipal public health facilities with regional functions.
- Networks of obstetrics, gynaecology and paediatric medical facilities which may also exist at the municipal level
- Paediatric faculties of medical institutes and teaching hospitals.

- Paediatric and obstetric-gynaecological research institutes of the Ministry of Health of Russia and Russian Academy of Medical Science
- Other facilities with more local remit, including - children's polyclinics and women's consultation rooms (maternity clinics), perinatal centres, maternity hospitals, centres for family planning and reproduction, genetic counselling centres, children's regional, urban, rayon hospitals, children's sanatoriums, and houses of the child (orphanages).

There is also a large range of international agencies working in the area of maternal health, such as the World Bank, USAID and WHO. These international organisations will often collaborate with the Russian authorities, but also act more independently on projects of their own. This study draws on several publications and reports prepared by these organisations. In many cases, donor-supported health care reform projects at national and regional level included a component on structural reorganisation of the maternal health care system and shifting priorities to primary medical care. In other cases, projects were stand-alone in nature, targeting particular vulnerable groups.

Some general issues in the organisation of the Russian health care system are relevant to maternal health services. Decentralisation during Russia's socio-political transition, has been mainly in the form of devolving control over the regulation of the health system to regional governments, while ownership and facility management has remained the responsibility of the municipalities. There have been concerns with building up sufficient levels of human and financial resources locally (Twigg, 1998). At the same time this process has weakened the control knobs, which would allow the Federal Ministry of Health to implement national priorities or to regulate as effectively as in the past.

However, where vertical Maternal and Child Health (MCH) programmes of the Oblast health authorities exist, the regional authorities have some control to monitor quality of care in the municipal maternity health facilities. Also the regional authorities own a number of Oblast-level maternity referral facilities where the most complicated cases are treated. Thus, one way regional authorities can influence municipal level hospitals is through the setting of referral quotas, although the effectiveness of such a strategy would depend on how closely quotas are met, and if the quotas led to those cases most in need receiving referral. Overall, it appears that the maternal health and obstetric care services have been somewhat less influenced by the decentralisation trends in the wider health system, and this may create opportunities for dissemination of good practice, and monitoring of quality of care at regional level.

Financing of maternal health care

Maternal and child health care is financed from local (province / Oblast) budgets and from compulsory medical insurance (via the Territorial Medical Insurance Funds), combining to around 75% of the total funding. The Federal budget of Russia contributes around 20%, and official out-of-pocket payments up to 5% in most maternity homes (Prof. Frolova, deputy director the Federal Research Institute of Obstetrics and Gynaecology – personal communication). It is widely believed, however, that patients are often subject to informal payments for service at the point of treatment, although there is little evidence on this practice specifically for maternal health services. (ibid.; Boykov *et al.* 2000, Freely *et al.* undated)

The Government has retained responsibility to finance key maternal and child interventions and infrastructure through programmes designed and approved at federal level. A summary of the different key steps in the development of maternal and child policies and programmes in Russia can be seen above in Box 1.

The contribution of the various sources differs in each territory according to an annual agreement between the local health authorities and the mandatory medical insurance fund. The federal budget funds mainly new equipment and high-cost medicines and treatment in the Oblast level hospitals, while the local budget covers purchase and maintenance of equipment and infrastructure, supplies, and capital investment, but can co-finance salaries and pharmaceuticals. Insurance funds (federal and local) finance recurrent costs: salary, taxes related to salary, food for patients and pharmaceuticals. The method of payment to providers also varies significantly: it may be per treated patient or per bed or volume of work throughout the year.

Table 14 below overviews the basic levels of maternal care in Russia, with descriptions of activities performed. However, it should be noted that there will be significant regional variation, particularly within the now decentralised system.

Table 14. Description of organisation of the maternal care in Russia, human resources and type of activities performed

Level of care⁴	Lead professional	Location of care	Name of medical institution	Users	Care delivered
1. <u>Primary</u>	Midwife	Village	Midwife and medical assistant office	Women with normal pregnancy	Booking, health screening, supportive education, general antenatal care, recognition of abnormal pregnancy and referral for treatment, counselling or additional screening
(a)	Therapist, midwife	Village	Doctor's ambulance station	Women with normal pregnancy	Booking, health screening, supportive education, general antenatal care, recognition of abnormal pregnancy and referral for treatment, counselling or additional screening
(b)	Obstetrician-gynaecologist	Town, city	Antenatal (maternity welfare) clinic	Women with normal or low risk pregnancy	Booking, health screening (laboratory tests, ultrasound scan, counselling), supportive education, routine antenatal care, recognition of abnormal pregnancy and referral for treatment, counselling or additional screening
(c)	Therapist	Village	Rural District Hospital	Women with normal or low risk pregnancy and delivery	Routine antenatal care, care for normal or low risk pregnancy, delivery of normal or low risk pregnancy, discussion regarding ongoing care and referral for treatment or counselling
(d)	Obstetrician-gynaecologist	Town, city	Regional Hospital, Central Regional Hospital, Maternity House, Municipal Hospital	Women with normal or low risk pregnancy and delivery	Biophysical assessment of foetal growth and well-being Ultrasound scanning Maternity unit care with monitoring facilities, access to anaesthetic and paediatric, but transferring out as required to special care baby unit or neonatal intensive care in a larger maternity unit and also access to adult intensive care Emergency obstetric care
2. <u>Secondary</u>	Obstetrician-gynaecologist	Town, city	Specialised Antenatal (maternity welfare) clinic	Women with complicated or high risk pregnancy	Specialist antenatal care, care for complex or high risk pregnancy, discussion regarding ongoing care and referral for treatment or counselling Maternal foetal assessment including ultrasound scanning and biophysical assessment
(a)	Obstetrician-gynaecologist	Town, city	Regional Hospital, Central Regional Hospital, Maternity House, Municipal Hospital	Women with complicated or high risk pregnancy and delivery	Specialist antenatal care, care for complex or high risk pregnancy, delivery of complicated and high risk pregnancy, discussion regarding ongoing care and referral for treatment or counselling Maternal foetal assessment including ultrasound scanning and biophysical assessment Full maternity unit and support services with easy access to special care baby unit/neonatal intensive care and access to adult high dependency care and adult intensive care Emergency obstetric care
(b)	Obstetrician-gynaecologist	City	Perinatal Centre, Oblast Hospital, Republic Hospital, Research Institution	Women with complicated or very high risk pregnancy and delivery	Highly specialist and intensive antenatal care and surveillance of mother and fetus, delivery of complicated and high risk pregnancy Complex ultrasonography, foetal therapy, maternal biophysical assessment As for level Secondary (b), but with on site neonatal intensive care and access to neonatal surgery and adult intensive care Emergency obstetric care
3. <u>Tertiary</u>	Obstetrician-gynaecologist	City	Perinatal Centre, Oblast Hospital, Republic Hospital, Research Institution	Women with complicated or very high risk pregnancy and delivery	Highly specialist and intensive antenatal care and surveillance of mother and fetus, delivery of complicated and high risk pregnancy Complex ultrasonography, foetal therapy, maternal biophysical assessment As for level Secondary (b), but with on site neonatal intensive care and access to neonatal surgery and adult intensive care Emergency obstetric care

⁴ *Primary* - first point of access for the general population, includes free standing facilities (polyclinics, rural health centres, rural hospitals) or outpatient departments of hospitals.

Secondary - access is through referral from primary care specialists, includes hospitals

Tertiary - highly specialised or teaching hospitals at regional centres

DISCUSSION AND CONCLUSIONS

In the 1990s Russia experienced significant declines in population health. In particular, the fall in life expectancy and emerging epidemics of HIV and TB have received a great deal of attention internationally. Within Russia, reproductive health, particularly relating to declining birth rates, has been of growing interest mainly due to its implication for the labour market and social security provision, and for depopulation of strategic areas.

Reproductive health, and maternal health in particular, is being used by the Health Systems Development Programme as a probe to identify areas where the broader health system may need to be improved to meet the needs of the poor. It is believed that understanding those factors that lead to adverse maternal health outcomes in Russia can shed light on the larger systems variables and structures that may need attention.

Several issues have emerged from this situation analysis, including:

- Data quality and reliability – There are numerous questions around Russian data raised by Russian and international experts consulted, but little evidence of the quality of data was found. Estimates of standard values, such as the maternal mortality ratio, can vary widely, although some variation will be expected with this ratio considering the low numbers of maternal deaths. However, there may be difficulties in the transfer of information from regional to national levels and coordination in data gathering between different institutions. Record keeping and coding of maternal deaths by institutions is widely thought to be problematic– for instance, while many women are listed as attending 14 or more antenatal visits, it is unclear if these actually happen or if they are simply ‘ticked off’ regardless of actual attendance.
- Despite the difficulties in assessment, maternal mortality rates still appear to be considerably higher in Russia than in the West. Abortion related mortality appears to make up a large percentage of deaths, with some estimating that up to 90% of these deaths are due to out of facility abortions. This raises a number of questions around issues of access to abortion and other services – such as why women would undertake such high-risk abortions when the procedure is legal and widely available. However, beyond the issue of abortion, the remaining 75% of maternal death is due to non-abortion related factors and needs investigation.
- Overall, maternal mortality in Russia is a rare event. Assuming 8.77 live births per 1,000 population (in year 2000) and maternal mortality rates between 40 and 60, there would be an expected 520-780 deaths per year in Russia from maternal causes. These deaths are spread over a vast territory, and identifying statistically significant determinants at any given location would be very difficult if not impossible. However, qualitative research may prove useful in investigating factors that are likely to contribute to these deaths: e.g. geographical inaccessibility of hospital delivery facilities in extremely remote regions; poor quality care in some facilities, or undersupply of basic drugs or blood supplies. Additionally, there may be scope for investigation of factors leading to maternal morbidities or ‘near-miss’ complications (life threatening complications that did not lead to death), which might be more common and similarly reflect on key factors of the health system.
- Typical common process indicators used in safe motherhood programmes, such as percentage of women delivering with trained attendants, family planning use, and antenatal care measures tend to be of little value in Russia. A vast majority of women do deliver with attendants, there is a low overall fertility rate, and antenatal care is widely used, if not overused. Abortion services are also legal and widely available. Instead of using these indicators to evaluate maternal health services, investigation must focus on those small groups who do not have access to services, and on those

process indicators that are not as commonly recorded which are direct indicators of quality of care within institutions (such as time delays in treatment).

- In parallel to researching this report, the authors elicited the opinions of medical practitioners, government representatives, academics, donor agencies and NGOs involved in maternal health work in Russia through a workshop held in Moscow in March 2002 (Health Systems Development Programme, 2002). Views of stakeholders indicated wide variations in practices of medical staff across institutions. It is not known how much this will affect maternal health outcomes, although some impact can be assumed. There is a need for investigation into these variations in practices and institutional factors shaping practices or hindering change in practice.
- Similarly there appears to be a need to investigate the structural and organisational aspects of the Russian maternal health system, in particular looking at problems of coordination and communication between centres (such as antenatal clinics and delivery institutions or hospitals).
- Despite the wealth of research on reproductive health, it is unclear exactly why women do not use modern contraceptive methods, and what are the health system characteristics that promote desirable behaviour (adequate knowledge, convenience, affordability, choice, quality). There is little information on cost and convenience of access as barriers for uptake of effective contraception.
- It is generally assumed that there are no problems with access to care in Russia. A large majority of women give birth in health care facilities and make numerous antenatal care visits. However, if access is understood as an opportunity to obtain appropriate care of good quality, at an affordable price, then this cannot be assumed. For example, despite the large number of antenatal facilities and user visits, communication and the advice provided has been judged to be unsatisfactory. There are also clearly small groups who do not access formal care – e.g. those who partake in illegal abortions.
- There is evidence that maternal care does not reflect the current state of knowledge internationally. Introduction of evidence-based clinical protocols and cost effective technologies in reproductive and perinatal care are seen as essential to improving maternal care (McIlwaine 2001, David 2001). However, it appears that donor support in this area is diminishing as work on TB and HIV/AIDS epidemics is scaled-up (DFID Strategy, Russia 2001).
- There are questions about inefficiencies in the system given the large number of facilities, the low occupancy rate and staff that are under-funded and poorly motivated. This suggests a need to review budgeting and financing mechanisms of payment to providers or to create appropriate incentives. Current practices and norms will most likely be influenced by such an excess of facilities, which may be related to common lengthy hospital stays by pregnant women.
- Budgets for most regions in Russia are derived using formulas developed under the Ministry of Health of the Soviet Union. Therefore payment of nearly all material health services are carried out based on old norms which are tied to the numbers of hospital beds and staff rather than to levels of activity. This appears to offer incentives for larger infrastructure and staff levels, rather than effective or efficient use of resources.
- Obstetric services are not included in the national compulsory medical insurance scheme, although gynaecological services are. Obstetric services, therefore, rely on financing from local health budgets. These alternative funding mechanisms may lead to pressure for over-medicalisation of maternal care in Russia (as evidenced by long hospital stays for antenatal care), leading both to inefficient use of resources,

unnecessary costs to patients, as well as exposure to potentially harmful practices. Further investigation of these issues is essential.

- Medical education does not sufficiently reflect the paradigm of a shift towards primary and multi-disciplinary health care, which would give larger responsibilities to nurses and midwives where appropriate. Postgraduate and continuing education for personnel involved in maternal care, including midwives has been initiated by donor agencies and national authorities in an attempt to redress this situation. (David 2001; Bratukhina 2002; Prokop'ev and Sadykova 2002)
- Maternal health research tends to rely on aggregate statistics. However, there are enormous regional variations in maternal health outcomes but the underlying determinants of these variations are not well understood. Research in other countries of the former Soviet Union has identified many women who are forced to deliver at home as they cannot afford the expense of a facility birth (Oxfam 2001). In Russia, this is rare except among certain groups (ethnic minorities, remote regions) (Korsak & Kirsanov 2000) and there is little information on why and in what circumstances this occurs. The very high levels of poverty in particular regions indicate problems with access and quality of care that may not apply to the more affluent regions.
- Surprisingly, given the fall in living standards experienced in the 1990s, no studies on cost of access to maternal care, abortion and contraception were identified. As suggested by recent experience from CEE/FSU counties, formal and informal payments to providers for health care are likely to be high, as pregnancy is a planned event usually with a positive outcome. Reproductive health research in Russia found that more than half of deliveries involve full payment (presumably fee-for-service), with many others involving partial payment. However, it is not clear what the costs of obtaining modern contraception are.
- There is only limited research on the role of shared societal values, publicly acceptable behaviour and gender relations in Russia. It seems that reproductive decisions are often taken by women without discussion with their partner. The public and provider attitude towards abortion is much more permissive than in the West, to the point of its being viewed as an “unpleasant, but routine” procedure. Discussion of the hierarchical structures of the medical profession may help to elicit the power relationship between provider and users, and between different types of providers. Reproductive choices are studied by international agencies without taking into account structural factors and the social context of users and providers (Rivkin-Fish 2000).

OPTIONS FOR FURTHER RESEARCH

These represent just a few of the numerous questions that are raised by this preliminary situational analysis of reproductive health in Russia. It is clear that a great deal of information is missing. However, it is hoped that studying the various ways maternal health care can be improved will not only reduce adverse outcomes such as maternal mortality, but also work to identify and overcome some of the larger problems facing the Russian health system as a whole.

Research that the Health Systems Development team believes is particularly needed includes:

- Studies of Quality of Care– which include variations in practices, determinants of good/poor quality, and barriers to quality improvement.

- Studies of Health Seeking Behaviour, Access and Choice – Health seeking behaviour is poorly understood. As a very large majority of women deliver in hospitals and seek antenatal care, such investigations may seem as unnecessary. However, research is needed to determine whether different socio-economic groups attend different facilities and/or face different outcomes.
- Cost studies. Little is known about the direct and indirect costs faced by women and families due to maternal health services, and whether these costs are at all correlated with choices, practices, quality, and outcomes.
- Human Resource Studies – Little is known about what motivates maternal health staff, both in terms of their choice to go into the field, the roles and responsibilities of personnel, and the influences on motivation to provide good quality care.

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APPENDIX A

Table 15. Russian Federation: Maternal Health Process Indicators in 2000 (Goscomstat, 2001)

Total number of births	1,237,345
Proportion of women delivering at institutions	99.2%
Access to Family Planning	
Family Planning and Reproduction Centres	472
Family Planning Centres	31
Total number of abortions	1 961 539
Mini-abortions (abortion up to 6 weeks of pregnancy)	493 932
Certainly induced abortion outside the medical institution (criminal)	2 639 (0.13%)
Possibly and probably induced abortion outside the medical institution (unspecified)	83 900 (4.3%)
Spontaneous miscarriages	173 900 (8.9%)
Contraception prevalence and availability	
Oral contraception	2.8 million women of reproductive age (7.3%)
IUD	6.3 million women of reproductive age (16.3%) (20-35% according to RLMS ⁵)
Condoms	12% (according to RLMS)
Female sterilization	18 500
Male sterilization	2 000
Antenatal Care Coverage	
Proportion of women who did not seek antenatal care	1-3%
Proportion of women receiving whole antenatal care	70%
Proportion of Caesarean section at delivery	14.3%
Urban areas	up to 16%
Rural areas	7-8%
Perinatal centres	25-40%

Table 16. Maternal Health System Statistics, 2000 (Goscomstat, 2001)

Human Resources	
Number of obstetrician/gynaecologists per 10 000 women	5
Number of midwives per 10 000 women	9.5
Number of obstetric beds per 10 000 fertile women	23
Number of maternity service centres	
Outpatient maternal and child health facilities (in 1999)	18 600
Independent maternity hospitals	239
Number of antenatal (maternity welfare) clinics	
In the structure of multipurpose hospitals or polyclinics	2063
Independent antenatal clinics	50
Number of perinatal centres	
In the structure of multipurpose hospitals	70
Independent	16
Sources of findings	
Federal budget	20%
Local budgets and obligatory medical insurance	75%
Services requiring payment	5%

⁵ RLMS – The Russian Longitudinal Monitoring Study