International maternal health indicators and middle-income countries: Russia

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Maternal health outcomes for the countries of the former Soviet Union are poorer than for the rest of Europe. Russia in particular is a problem. What measures are suitable for guiding the country's policy on improving this area of health care?

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Maternal mortality is a key indicator of a country's progress in improving health, forming the basis for one of the United Nations' millennium development goals. It is an area where, despite substantial gains in the post-war period, the countries of the former Soviet Union have made only limited progress since gaining their independence in the early 1990s. Yet a failure to reduce maternal mortality does not indicate what action is needed for improvement. Interest is focusing on other measures, many of which examine the provision of the various elements of delivery of care.[1 2] But in the post-Soviet context, how useful are these process indicators in guiding policy development?

Background

Russia's overall maternal mortality ratio was estimated to be 34 deaths per 100 000 live births in 2002. This is significantly higher than the ratio in western Europe, where ratios of 10 or lower are common.[3 4] This figure is also higher than in the other former communist countries of central and eastern Europe.[4] Yet, despite the international focus on maternal mortality as one of the millennium development goals, little analysis has been done on what action is needed in the former Soviet Union to tackle this problem, still less on the quality of services provided, or the access to care by different groups in the population.

This paper reviews the maternal health situation in Russia, looking at commonly used measures of maternal care. We draw on a range of information sources (table 1), as well as using primary data collection in one Russian oblast (an administrative region or province of the Russian Federation with its own government).[5]

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What lies behind Russia's high maternal mortality?

The international community has not agreed a set of indicators of the process of maternal care, but table 2 lists a series of indicators identified by four international bodies. On the basis of Ronsmans' classifications,[11] we have grouped these indicators into measures of service provision, service use, use by groups in need, quality, and "other measures."

International indicators in Russia

Outcome indicators

Although the maternal mortality ratio is the most widely used indicator of maternal health outcomes, the very high rates of induced abortion in Russia can undermine the use of the ratio as it is expressed as number of deaths per 100 000 live births. Abortion related deaths are included in the numerator, but aborted pregnancies are not counted in the denominator. This could inflate the ratio by up to 60% compared with a hypothetical country in which there were very few abortions. Even though abortion is legal and easily available, abortion complications account for about a quarter of maternal deaths,[4] with two thirds of these reportedly resulting from illegal abortions.[12–14]

National figures say nothing about the distribution of outcomes among population groups. Key informants (see table 1) identified migrants and young mothers as especially at risk, but whether more general socioeconomic inequalities exist is not known. There are certain methodological problems in tracking health outcomes by socioeconomic status, but Diamond and colleagues have suggested ways of circumventing some of these problems, including ecological analyses combining census and health survey data.[15] This may be one way forward in Russia.

Access to and availability of care

Russia has an extensive, though underfunded, network of antenatal and emergency maternal care facilities, with high staffing levels.[16] As table 2 shows, unlike in low income countries, in Russia virtually all women give birth in institutions, with a trained attendant. The infrastructure that permits this near universal access was established before the recent decline in fertility (now 1.2 children per woman[4]), so there is considerable overprovision.

There are, however, grounds for concern. Although Russia has a compulsory health insurance system, in practice about 10% of the population fall outside it.[17] Key informants identify certain groups as being at particular risk. Mothers aged under 18 remain under the

Table 1 Sources of information in review of maternal health in Russia

Source	Numbers and types	Selection procedure
Publications or international reports	170 (70% published in Russian language journals)	Review of online databases (PubMed/Medline); archives of Russian central medical library; library of National Research Institute of Obstetrics; websites of international organisations
Russian grey literature	35	Suggested by key informants including government officials
Secondary analysis of existing data	Government statistics; national reproductive health surveys; Tula oblast pregnancy outcomes dataset	Contacts in Russia
Key informants (via interviews)	National government; regional governments; non-governmental organisations; health workers; international agencies; academics	Snowball sampling; internet search of agencies; authors of reports and publications reviewed
Empirical study of maternal care practice in Tula, 2002-3	Interviews in all 19 functional maternity facilities (freestanding and part of general hospitals) in Tula region	Head of maternity department; deputy or head of facility in all facilities

care of paediatric services, which have poor links to sexually transmitted infections services and to maternal and reproductive services. Migrants and those who lack registration documents with local addresses face barriers in accessing care in some places owing to bureaucratic obstacles and informal pressure to pay for care.[5] Modern contraception is, in practice, not always accessible, reflected by high levels of awareness of different contraception methods but low contraception use and high rates of abortion.[18]

The widespread use of indicators of service provision in international comparisons appropriately reflects the situation in developing countries faced with severe shortages of health professionals. In contrast, most countries of the former Soviet Union have extensive health infrastructures, with Russia reporting twice as many midwives per 100 000 population than many Western countries.[4] A study in the Tula region, however, showed that the official number of budgeted posts often substantially exceeds the number of individuals employed.

Use of services

Indicators of service use are widely used in policy documents. Their value is greatest, however, where the concern is with low use. With nearly all births in Russia attended by skilled staff, aggregate measures provide little insight into health system failures. Instead, researchers need to identify the few women within populations who do not receive skilled care, as well as explore the issue of over-medicalisation.

Antenatal care provides an example of over-medicalisation. In Russia almost all mothers receive a highly intensive package of antenatal care, involving 15 to 19 visits according to one study.[19] Admission to hospital during pregnancy is increasingly common (38-50% of mothers are admitted at some stage in their pregnancy), in part to compensate for reduced need for postnatal beds. Of those admitted, about 40% remain for 30 nights or longer.[20]

Met and unmet need

Rather less information is available for generating indicators that relate use to specific needs, although some indicators, such as access to care by mothers with complications, are less appropriate because of the over-medicalisation.

In seeking to identify those in greatest need, it is necessary to take account of certain definition issues.[21] The traditional Soviet medical paradigm was quite different from that in the West. The reasons for this difference are complex and go beyond the scope of this paper, but they encompass differences in ideology, incentives, and adaptations to circumstances (such as a large pool of health professionals with few drugs or modern equipment).[16 22] For example, many deliveries are recorded as "imperfection of labour activity," yet there is no clear definition of what this means. Interviews with obstetricians in the Tula and Moscow regions suggest that this terminology is popular for three reasons: physicians can obtain gratuities or informal payments for managing "complicated" cases; the risk of litigation or complaints by patents is reduced; and length of stay can be extended, leading to higher reimbursement for the facility.

Quality and variability of care

Table 2 shows that few quality based indicators are regularly collected in Russia. As with other types of indicator, however, their potential use is limited by Russian contextual factors, with variation among facilities in the way different conditions are treated. For example, in the Tula region even quite basic practices such as episiotomy or amniocentesis show marked differences. Whereas variations in obstetric practices have been well documented in many countries,[23] the extent of variation in Russia appears much larger than might be expected for some procedures, possibly reflecting the lack of any national consensus.

A way forward?

Given the many problems with quantitative measures in Russia, is there an alternative? Many countries already do regular audits of maternal deaths.[11] Russia has such a system, but it is largely an administrative formality. It is hampered by lack of transparency, investigative expertise, and established procedures, and there is little evidence of tangible improvements in practice.[24] A detailed investigation of nine maternal deaths in the Tula region between 2001 and 2003 identified errors in anaesthesia as a contributing factor in four cases, thus identifying an area in need of attention. This would have been missed in inspection of routine data, which focus on specific complications such as haemorrhage, sepsis, or eclampsia.

Discussion

A problem in trying to identify useful indicators for guiding policies for reducing Russia's unduly high level of maternal mortality is that systems for data collection

Table 2 Maternal health indicators and the Russian experience

Suggested indicators and targets (and source)	Equivalent or related data for Russia
Service provision	
Amount of EOC[6 8] (recommendation: four basic and one comprehensive EOC facility for every 500 000 population)	23.3 maternal care beds per 10 000 women; all facilities claim to provide comprehensive care; underused capacity common; 5.5 trained obstetricians/gynaecologists per 10 000 women
Percentage of communities and health centres with referral links to facilities that provide emergency obstetric services[7]	Assumed high (based on high percentage of deliveries in general hospitals)
Geographical distribution of EOC facilities[6 8] (recommendation: minimum levels to be met in subnational areas)	Most regions have access to health facilities; possible gaps in very low population density areas (such as eastern Siberia); ambulance services reach most remote communities
Percentage of health staff trained and facilities equipped to manage obstetric complications[7]	Assumed adequate due to large proportion of institutional deliveries and high rate of doctors per capita.
Service use	
Antenatal care	
Percentage of women attending antenatal care at least once[6]	Estimated 94-100% use of antenatal care; multiple visits are common[17]; national reports of 96.9% of pregnant women consulting an internal medicine specialist
Percentage of pregnant women attending prenatal care who are diagnosed and treated for anaemia, malaria, and STIs[7]	Assumed that all women attending antenatal care are tested for STIs and anaemia; malaria is endemic in Russia. Of those tested (according to Goskomstat in 2000), 18.6% are positive for STIs and 43.9% have anaemia (rise from 12.1% in 1990). One study found 52-73% of women treated with iron tablets depending on location[14]
Percentage of pregnant women delivering in health facilities who had a prenatal contact in the last trimester[7]	High (linked to large number of antenatal visits); in Tula only 76/11 100 children were born outside facilities in 2000
Percentage of women of reproductive age using contraceptives[7]	Intrauterine device 16.3%; and oral contraception 7.3%. However, many more women may be using modern methods obtained through local pharmacies. One study reports condom use by 75% of all sexually active respondents.[10] High rates of abortion indicate its use as family planning method
Delivery of care	
Percentage of births with skilled attendant and by place[6 9]	Not given nationally, assumed very high; in Tula region 95%
Percentage of all births in basic and comprehensive EOC facilities[6 8] (recommendation: at least 15%)	Not published nationally, assumed very high; 95% in a three city study[19]; 95% in health facilities in Tula region
Caesarean section rate[6 8 9] (recommendation: 5-15%)	14.3% in 2000, has been rising steadily from below 7% in 1990. National rate may mask wide variations
Postnatal care	
Percentage of women receiving postnatal care[6]	Unclear—high rates of infant check-ups may obscure lower maternal postnatal care; postnatal visit needed for official registration of children; >90% of children vaccinated for many diseases, indicating high percentage of visits for children
	One study found between 32.2 and 51.8% of women surveyed had postpartum check-ups for their own health[19]
Service use by groups in need	
Met needs—proportion of women with complications who are treated in EOC facilities)[8 9] (recommendation: 100%)	Not known. Assumed near 100%
Unmet obstetric needs—women needing an intervention who did not have access[9]	Not known
Ratio of complicated obstetric admissions to all deliveries[6 7]	Not known
Quality of care	
Case fatality rate[6 8 9] (recommendation: <1% for women with complications in EOC facilities	Not known
Percentage of appropriately treated complications among all complications (by type)[7]	Not known
Time interval from onset of complication (or arrival at facility) to treatment at referral site[6 7]	Not known
Referral rates[9]	Not known, but high proportion of births in hospitals
Other measures	
Percentage of women immunised with tetanus toxoid[6 7]	Not applicable—most women give birth in hospital conditions considered sterile, over 95% of infants immunised for tetanus
Percentage of adults knowledgeable about complications of pregnancy and childbirth[6]	Not known

EOC=essential obstetric care.
STIs=sexually transmitted infections.

have not changed much since Soviet times, when information was primarily geared towards the needs of central planning, with little attention to quality and accessibility. However, although international bodies have identified a set of indicators that can be used to assess maternal care, these have been designed primarily for low income countries and are not especially helpful in a situation characterised by high use, extensive infrastructure, and evidence of over-medicalisation.

The challenge is to find measures that track quality rather than quantity and to indicate when services are being used appropriately. Some indicators that have been developed elsewhere—though not yet widely used—may prove useful in settings such as Russia. These indicators include the "observed versus expected ratio" (OVER) of complications[25] or ones that overcome the current system of incentives to over-treat, such as monitoring time from admission to treatment. The Russian Federation has the capacity to capture detailed health indicators; the question is therefore to decide what is appropriate. Any improved quantitative indicators should be supplemented, however, with approaches such as maternal death audits.

This analysis shows how, although some existing indicators can be useful for international comparisons, others may be needed for tackling particular regional or country contexts. Only by using measures suited to their specific needs will countries such as Russia be able to improve maternal health.

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Summary points

The countries of the former Soviet Union, and Russia in particular, are lagging behind the rest of Europe in terms of maternal health outcomes

The most common international indicators look at quantity and use of health services

High levels of infrastructure, over-medicalisation, and practice variation in Russia are not captured well by existing indicators

Approaches for looking at quality and differential access to care, as well as maternal death audits, may be more useful for guiding maternal health policy in Russia

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A memorable patient

What a stroke

A 64 year old man, who lived alone, was found collapsed one morning by his daughter. He responded only to painful stimuli and seemed to have weakness of the left side of his body. He was brought by ambulance to the accident and emergency department, the paramedics alerting the department that they were bringing a patient with stroke. On arrival at the department, the patient's Glasgow coma scale was 10/15. He was not moving the left side of his body, although tone was normal in both arm and leg and power could not be assessed because of his low Glasgow coma scale. He had equivocal plantar responses and pinpoint pupils. We diagnosed pontine haemorrhage and arranged for computed tomography as we assumed that he had weakness of the left side of the body.

While waiting for the computed tomography, we thought that the pinpoint pupils could be an indication of an opiate overdose. We therefore gave the patient 400 µg of naloxone intravenously, which improved his Glasgow coma scale. Within 10 minutes he was sitting up and talking to us. He had no weakness of the left side of the body, but he complained of severe abdominal pain. It became clear that he had had sudden onset of abdominal pain nearly 12 hours before being brought to hospital and had taken 25 tablets of co-proxamol to relieve this pain. He was prescribed co-proxamol tablets for pain in his knees from osteoarthritis.

On further examination, he showed guarding in the upper abdomen with some rebound tenderness. To our astonishment, an x ray of his chest and abdomen showed free air under the diaphragm. He confirmed that he had had a duodenal ulcer in the past. A diagnosis of perforated duodenal ulcer was made, and he was successfully treated by surgery.

We learnt to always exclude an overdose of opiates as the cause of pinpoint pupils in all our patients. We were unable to explain the patient's lack of use of the left side of the body on presentation.

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