REPORTS

Inequality and Changes in Women's Use of Maternal Health-care Services in Tajikistan

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Using recently available survey data for Tajikistan, this study explores changes in the pattern of maternal health care during the last decade and the extent to which inequalities in access to that care have emerged. In particular, the links between poverty and women's educational status and the use of maternal health-care services are investigated. The survey findings demonstrate a significant decline in the use of maternal health-care services in Tajikistan since the country gained independence from the Soviet Union in 1991. They show changes in the location of delivery and the person providing assistance, with a clear shift away from giving birth in a medical facility toward giving birth at home. More than two-fifths of all women who gave birth in the year prior to the survey delivered their baby at home. Women from the poorest quintile are three times more likely than women from the richest quintile to undergo a home delivery without a trained assistant.
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In 1991, when it gained independence from the Soviet Union, Tajikistan—in the southeastern corner of Central Asia, just north of Afghanistan—was the poorest of all the Soviet republics, with a gross domestic product (GDP) per capita of slightly more than US$2,000. Nevertheless, the country had relatively high human development indicators, reflecting the legacy of social development achieved during the Soviet period. Life expectancy at birth averaged 70 years, and adult literacy was almost universal (UNDP 1994). In common with those of the other republics of the Soviet Union, the health-care system of Tajikistan was characterized by universal entitlement to comprehensive and free, but inefficient, health-care services with excess human and physical infrastructure. Use rates for health care were high, and differences across groups in terms of access to health services were negligible (World Bank 2000).

Since independence, Tajikistan has experienced a major reversal in economic and social development. The economic upheaval accompanying transition from a planned to a market-driven economy, the disruption of traditional trading partnerships, and the withdrawal of subsidies from Moscow following the breakup of the Soviet Union have resulted in a dramatic decrease in GDP and central government expenditures. Moreover, the country also experienced a civil war in 1992–93, followed by a long period of civil unrest that ended with the signing of a peace agreement in 1997. During that period, extensive damage was inflicted upon the country's economy and infrastructure. In 1996, real GDP constituted less than 40 percent of its value in 1989, and by 1998, GDP per capita was estimated to be only US$1,041 PPP (in terms of purchasing power parity), making Tajikistan one of the poorest countries in the world (UNDP 2000). Recent estimates suggest that more than 95 percent of the population are living below the official minimum subsistence level, four out of five are "poor," a third are "very poor," and nearly 20 percent "extremely poor" (living on less than $1 PPP a day) (Falkingham 2000).

Health-care services have deteriorated rapidly as the result of severe financial constraints, exacerbated by extensive damage to infrastructure during the civil war. Health-care expenditure as a proportion of GDP in Tajikistan dropped from 6.4 percent in 1994 to 1.5 percent in 1999, and real spending on health care is now less than a tenth of its pre-independence level (WHO 2000). The precipitous decline in real government expenditures has eroded the capacity of the health-care system to provide effective and accessible medical care to the public. After salaries have been met, few resources are left over

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for drugs and food, let alone maintenance and reconstruction. A facility survey in two raions (districts) in the spring of 1999 found that half of all physician assistant/midwife posts and rural physician clinics did not have adequate functioning cold-chain equipment (such as refrigerators used for storing vaccines), two-thirds were unable to conduct growth monitoring because they lacked the necessary equipment, and more than half had no oral rehydration salts in stock at the time of the survey. Two-thirds of maternity homes now lack heating and running water (World Bank 1999). The widening gap between the health-care budget and the actual costs of care has resulted in an increased financial burden for households in terms of official charges and, more commonly, under-the-counter or informal payments (Falkingham 2002).

The decline in the quality of services, the deterioration in the infrastructure, and the increased cost to the patient may all be expected to have a negative impact on the rates of health-care service use. Virtually nothing is known, however, about how the use of health-care services has changed over time and whether subgroups of the population have been differentially affected. This study uses recently available data from the Tajikistan Living Standard Survey (TLSS) to investigate patterns of maternal health-care service use during the last ten years. The extent to which such use varies by region, household income, and women's educational status sheds light on whether and to what extent inequalities in the use of health-care services are emerging in Tajikistan.

A greater understanding of the factors affecting the use of maternal health care is also of importance for improving women's reproductive health status and reducing infant and maternal mortality rates. According to official data, Tajikistan has the highest rate of maternal mortality among the Central Asian Republics at 65.5 maternal deaths per 100,000 live births in 1998 (see Table 1). Most likely, this figure is an underestimate. Although no accurate data are available for infant mortality trends or total fertility rate over time, recent research by the World Bank that uses survey data to estimate levels of infant and child mortality suggests that the real levels of infant mortality currently are more than three times the official rate, pointing to deficiencies within the vital registration system. This finding is confirmed by analysis of the recent Tajikistan Multiple Indicator Cluster Survey (UNICEF 2002), which estimated infant mortality to be in the region of 89 deaths per 1,000 and under-five mortality to be 126 deaths per 1,000. If similar levels of underreporting apply to maternal mortality, then the true level of maternal mortality in Tajikistan of around 200 deaths per 100,000 live births is akin to rates found in parts of Latin America and North Africa.

Most maternal deaths in Tajikistan are directly related to pregnancy: 38 percent to hemorrhages, 27 percent to toxemia, 11 percent to sepsis, and 8 percent to unsafe abortion (UNFPA 1999). Many of the maternal deaths from these causes are preventable with ready access to skilled birth attendants working in a clean environment. Therefore, understanding what has happened to the use of maternal health services since independence and which groups of women have been differentially affected is important.

Data

This study is based upon preliminary analysis of the Tajikistan Living Standards Survey. The survey was funded by the World Bank and the United Nations Development Programme and conducted by the Tajik State Statistical Agency in collaboration with the Centre for Strategic Research under the Office of the President. International technical assistance was provided by a team from the London School of Economics, led by the author. It is the first survey conducted in Tajikistan to collect nationally representative data at the household level using internationally recognized sampling techniques.[1]

The TLSS was carried out between May–June 1999. A total of 2,000 households containing 14,142 individuals were interviewed. Households were selected by two-stage probability random sampling, with 125 primary sampling units stratified across urban and rural areas

Table 1 Indicators of reproductive health, Central Asia, 1998

Indicators	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Infant mortality rate[a]	21.6	26.2	23.4[b]	31.7	22.3
Maternal mortality rate	54.9	35.5	65.5	16.3	9.6
Total fertility rate	2.01	2.80	2.90	2.50	2.82
Mean age at birth of first child	22.6	22.3	21.8	23.6	23.0
Abortion rate (abortions per 100 live births)	67.1	27.0	19.1	25.7	13.5
Low-birth-weight rate (births of infants weighing less than 2,500 grams as percent of total live births)	5.5	na	5.1	3.9	5.1

na = Not available. [a] Infant mortality rates are calculated according to the quota-based Soviet concept. [b] This figure refers to official data published by the state statistical agency and is based on vital registration data; recent survey data suggest that the number is more than three times higher: 82 deaths per 1,000 live births.
Source: UNICEF MONEE Project database (2002).

within oblasts to ensure a nationally representative sample. Detailed information on the sample design and fieldwork operations is presented in Namazie (2000).

The questionnaire for the TLSS was based on the Living Standard Measurement Survey for the countries of the former Soviet Union (Oliver 1997) adapted for Tajikistan. In particular, the health section was extended, and a specific questionnaire focusing on women's reproductive histories and health-care service use was administered to all ever-married women aged 15–49 (N = 2,339). The women's health module included questions about the number of children ever born and surviving, use of health services in relation to the women's last pregnancy and, if currently pregnant, to the current pregnancy. A community questionnaire was also administered to key respondents at the community level to gather information about the community. Questions included the availability of various health facilities within the locality. Table 2 presents a description of the subsample of women who answered the women's health module, including their distribution by educational attainment, household economic status, and place of residence.

The Living Standard Measurement Surveys are multipurpose surveys that collect detailed information about a range of topics, including income, expenditures, and consumption as well as education, health, and employment. The strength of such surveys is that they allow detailed analysis of the determinants of various outcomes as well as the measurement of living standards (Grosh and Glewwe 1995). This study explores the links between poverty and women's educational status and the use of maternal health services in Tajikistan. Although the TLSS is a cross-sectional survey, a temporal dimension can be introduced into the analysis by employing the retrospective information regarding the use of health services at a woman's last pregnancy. Analyzing maternal health-care service use according to the year of the last birth allows us to build a detailed picture of use of such services in Tajikistan during the last ten years. Reports of use of maternity care may be affected, however, by recall bias associated with the time that has passed since the event described took place. Three main questions are investigated: (1) How do patterns of maternal health-care use vary across the population? (2) Has use of these services deteriorated over time? and (3) If so, has this trend been accompanied by widening inequality in access to services?

Two dimensions of maternal health services are examined: whether a women consulted a doctor in connection with her last pregnancy (taken to be an indicator of antenatal service use) and the place where the last child was delivered, that is, whether the woman gave birth in a medical facility or at home, and if at home,

Table 2 Percentage distribution of ever-married women aged 15–49 and of those who have ever given birth, by individual, household, and community characteristics, women's health module of the Tajikistan Living Standards Survey, 1999

Characteristic	Percent	(N)
(N)	100.0	(2,339)
Age		
15–19	4.2	(98)
20–24	18.2	(426)
25–29	20.0	(468)
30–34	17.4	(406)
35–39	18.2	(426)
40–44	11.9	(277)
45+	10.2	(238)
Children ever born		
0	8.1	(189)
1	13.0	(303)
2	16.2	(378)
3	15.7	(368)
4	14.7	(343)
5	10.3	(242)
6	8.4	(196)
7+	13.9	(320)
Education		
None	1.3	(28)
Eighth/ninth grade	15.4	(345)
Secondary	66.9	(1,499)
Technical	12.1	(271)
Higher	4.3	(96)
Economic status[a]		
Poorest quintile	21.7	(507)
Second quintile	21.1	(494)
Third quintile	20.3	(474)
Fourth quintile	19.4	(453)
Richest quintile	17.6	(411)
Region		
Dushanbe	7.4	(173)
Gorno-Badakhshan Autonomous Oblast (GBAO)	3.7	(86)
Region of Republican Subordination (RRS)	23.5	(549)
Leninabad	30.0	(701)
Khatlon	35.5	(830)
Residence		
Urban	24.3	(569)
Rural	75.7	(1,770)
Women's health facility in community?		
Yes	58.2	(1,362)
No	41.8	(977)
Polyclinic in community?		
Yes	53.6	(1,253)
No	46.4	(1,086)
Of those who have ever given birth		
Subsample (N)	91.2	(2,144)
Consulted a health professional during last pregnancy		
Yes	84.7	(1,815)
No	15.3	(329)
Site of last birth		
City hospital	9.3	(199)
SUB/SVA[b]	6.3	(136)
Maternity home	50.5	(1,078)
At home	29.0	(619)
Other (including midwife's home)	4.7	(101)
Type of assistance at birth		
Doctor	37.8	(718)
Nurse	7.6	(144)
Midwife/ feldscher[c]	43.9	(835)
Unskilled other	10.6	(202)
Time of last birth		
Within last year	22.2	(462)
13–24 months	17.2	(358)
2–5 years	25.2	(526)
5–10 years	20.7	(432)
10 years +	14.7	(307)

[a] Status based on quintile group of household expenditure per capita. [b] Rural health clinics. [c] Physician's assistant.

Note: With respect to those who have ever given birth, some questions were not answered by all women. For site of last birth, 11 cases are missing data; for type of assistance at last birth, 245 cases are missing, and for time of last birth, 59 cases are missing.

whether the woman was assisted by a doctor or nurse, a midwife, or an unskilled person such as a relative, friend, or neighbor.

Three dimensions of inequality are investigated: region, educational attainment, and economic status. Place of residence may be expected to be important because areas of the country were differentially affected during the civil war between 1992 and 1997. Spatial differences in the use of maternal health-care services are explored according to administrative region. Educational differentials in the use of obstetric services have been shown to be significant in a large number of studies (Elo 1992; Pebley et al. 1996; Raghupathy 1996). The present study examines whether this is also the case in Tajikistan and whether these differentials have widened over time. The measure of educational status used is the highest educational level attained.

One of the main macroeconomic consequences of the movement from a planned to a market economy has been an increase in inequality in material resources. Therefore, investigating whether rising income inequality is associated with inequality in maternal health-care service use is important. The measure of economic status used is household expenditure per capita, which includes the imputed value of the consumption of home-produced goods. Individuals are assigned to quintile groups based on the ranking of their households. Thus, women in the bottom quintile are those living in the poorest 20 percent of households and women in the top quintile are those living in the richest 20 percent of households. Household expenditure is used in preference to household income, because expenditure is thought to be a better indicator of living standards, being less prone to underreporting.

Table 3 Among ever-married women aged 15–49, percentage of those who reported consulting a physician for antenatal care for their last pregnancy, and percentage distribution according to place of delivery, by selected characteristics, Tajikistan, 1999

Characteristic	Consulted a doctor	Place of delivery: Medical facility	Place of delivery: At home with skilled assistance	Place of delivery: At home with unskilled assistance	(N)
All women	84.7	74.3	15.2	10.6	(2,144)
Region					
Dushanbe	85.8	85.4	11.5	3.2	(162)
GBAO	98.8	76.3	22.5	1.3	(83)
RRS	78.3	70.0	13.4	16.6	(508)
Leninabad	96.8	92.3	5.4	2.3	(620)
Khatlon	77.3	57.1	25.7	17.2	(771)
Residence					
Urban	91.3	88.9	8.3	2.8	(517)
Rural	82.5	69.1	17.6	13.3	(1,627)
Education					
Eighth/ninth grade	80.6	72.2	13.2	14.7	(304)
Secondary	83.9	71.3	17.2	11.4	(1,378)
Technical	94.0	86.3	10.7	2.5	(252)
Higher	97.8	87.8	10.0	2.2	(92)
Economic status					
Poorest quintile	79.9	68.0	16.8	15.3	(467)
Second quintile	86.9	72.5	17.2	10.3	(465)
Third quintile	86.4	76.5	11.5	12.0	(441)
Fourth quintile	84.6	73.5	17.6	8.9	(415)
Richest quintile	86.0	82.4	12.3	5.2	(356)
Women's health facility in community?					
Yes	89.6	80.4	10.8	8.8	(1,242)
No	77.8	65.0	21.8	13.2	(902)
Polyclinic in community?					
Yes	90.3	82.6	10.2	7.3	(1,139)
No	78.3	64.4	21.1	14.5	(1,005)

Note: Chi-square is statistically significant at $p<0.001$ for all characteristics for both consultation and place of delivery.

Results

Significant differences exist in the use of maternal health services among various subgroups of the population within Tajikistan, as shown in Table 3. Administratively, Tajikistan is divided into four regions: Gorno-Badakhshan Autonomous Oblast (GBAO) in the east, Khatlon Oblast in the south, Leninabad Oblast in the north and the Region of Republican Subordination (RRS) in the center. The capital, Dushanbe, is also an administrative district. The regions are geographically isolated from each other and from the capital city (see Figure 1). Women in the regions of Khatlon and RRS have significantly lower consultation rates than elsewhere in the country. Marked differences are seen between urban and rural areas: Women living in urban areas are much more likely than rural women to report having received antenatal care (91 percent versus 83 percent) and to have given birth in a medical facility (89 percent versus 69 percent).

Women's educational status is recognized widely as being positively associated with good health and health-care service use (WHO 1998). Tajikistan is no exception; a clear gradient is evident for both antenatal consultations and for place of delivery by educational attainment. The economic status of a woman's household is also significant: Twenty percent of women living in the poorest fifth of households report no use of antenatal care during their last pregnancy, compared with 14 percent of those in the richest fifth (not shown). Finally, rates of use and home deliveries are, as expected, related to the presence or absence of a women's health facility or polyclinic within the community. Of course, the data in Table 3 are complicated by the possibility that respondents may have given birth to their last child some considerable time before the survey was conducted. These effects are examined below.

Figure 1 Tajikistan

Deteriorating Use and Widening Inequalities

During the Soviet period, comprehensive antenatal care included at least 15 visits to a health facility, and 90 percent of deliveries took place in maternity wards (World Bank 1999). As Table 4 illustrates, however, clear evidence is seen of a significant decline in the use of maternity services during the ten-year period since independence. Only 77 percent of women who gave birth in the 12 months prior to the survey (June 1998–May 1999) reported that they had consulted a doctor in relation to their pregnancy, compared with 95 percent who gave birth more than ten years before the survey, that is, prior to May 1989, when Tajikistan was still part of the Soviet Union. This trend is confirmed by analysis of the 2000 Multiple Indicator Cluster survey, for which 25 percent of women aged 15–49 giving birth in the last year reported receiving no antenatal care (UNICEF 2002).

Significant changes have also occurred in the place of delivery over time: A clear shift is seen from giving birth in a medical facility toward giving birth at home. More than two-fifths of the women who gave birth in the year immediately prior to the survey had given birth at home, compared with just one in 20 ten years earlier. More worryingly, a dramatic increase is evident in the proportion of women delivering at home with no skilled assistance, from less than 2 percent ten years prior to the survey (before May of 1989) to one in six in the two years prior to the survey (June 1997–May 1999). Although the point estimates of use rates may be affected by recall bias, such biases are unlikely to be of sufficient magnitude to account for the clear trends in use during the last ten years.

These trends represent a significant break from past practices and have direct implications for maternal and child health. Antenatal care is known to be an important determinant of improved health outcomes among infants (Ahmad et al. 1991; Panis and Lillard 1994 and 1995), and assistance at delivery provided by a person who is trained and well-equipped is an important determinant of reduced maternal mortality (Maine and Rosenfeld 1999; Shiffman 2000; Sloan et al. 2001).

A key question is whether some groups have suffered disproportionate declines in their use of maternal health-care services relative to others. Tables 5 and 6 present differentials in use according to the timing of the woman's last birth. Reading across the rows shows how use within any particular group has changed over time; reading down the columns shows how use varies across groups at any one time period.

Regional and Rural–Urban Changes

A strong regional dimension is found in the decline in use of antenatal care, as shown in Table 5. Consultation rates have remained high in GBAO and Leninabad, but have fallen elsewhere in the Republic. The most significant declines have occurred among women living in Khatlon and Dushanbe, whereas consultation rates in RRS appear to have been low historically. These regional pat-

Table 4 Percentage of all survey respondents who have ever given birth who consulted a physician for antenatal care for their last birth and percentage distribution, by place of delivery, according to time of last birth in relation to May 1999 survey, Tajikistan

	Time of last birth in relation to survey					
Antenatal care	Within last 12 months (1998–99)	13–24 months (1997–98)	2–5 years ago (1994–97)	5–10 years ago (1989–94)	10+ years ago (to 1989)	All last births
Consulted a doctor	77	82	84	88	95	85
Place of delivery						
Medical facility	58	63	72	86	94	74
At home with skilled assistance	26	19	17	8	3	15
At home with unskilled assistance	15	17	11	7	2	11
(N)	(461)	(356)	(522)	(430)	(307)	(2,076)

Note: Chi-square is statistically significant at $p<0.001$ for both consultation and place of delivery.

Table 5 Differentials in percentage of women surveyed who consulted a physician for antenatal care for their last birth, by selected characteristics, according to time of last birth in relation to May 1999 survey, Tajikistan

Characteristic	Time of last birth in relation to survey										Significance level of trend over time within group
	Within last 12 months (1998–99)		13–24 months (1997–98)		2–5 years ago (1994–97)		5–10 years ago (1989–94)		10+ years ago (to 1989)		
Region											
Dushanbe	71	(17)	72	(18)	91	(31)	93	(37)	94	(33)	**
GBAO	100	(16)	100	(8)	100	(21)	100	(15)	95	(19)	ns
RRS	72	(89)	73	(61)	83	(105)	81	(86)	85	(45)	ns
Leninabad	96	(89)	95	(98)	95	(137)	98	(122)	99	(136)	ns
Khatlon	71	(146)	79	(107)	74	(144)	81	(117)	97	(59)	***
(Significance level of group variation within time period)	***		***		***		***		***		ns
Residence											
Urban	85	(69)	86	(53)	91	(117)	93	(100)	97	(114)	**
Rural	76	(288)	81	(239)	82	(321)	86	(277)	94	(178)	***
(Significance level of group variation within time period)	*		ns		**		*		ns		ns
Education											
Eighth/ninth grade	72	(52)	81	(30)	77	(49)	87	(65)	90	(45)	*
Secondary	77	(243)	82	(207)	84	(277)	87	(231)	96	(165)	***
Technical	88	(30)	91	(40)	94	(67)	98	(43)	98	(45)	ns
Higher	100	(11)	100	(9)	94	(30)	100	(18)	100	(19)	ns
(Significance level of group variation within time period)	ns		**		*		ns		*		ns
Economic status											
Poorest quintile	77	(84)	76	(59)	78	(95)	84	(79)	90	(44)	ns
Second quintile	81	(93)	84	(64)	87	(102)	91	(76)	98	(58)	*
Third quintile	80	(74)	85	(71)	85	(88)	87	(70)	97	(63)	*
Fourth quintile	78	(71)	80	(52)	84	(87)	89	(72)	94	(59)	*
Richest quintile	66	(35)	87	(46)	87	(66)	88	(80)	96	(68)	***
(Significance level of group variation within time period)	ns		ns		ns		ns		ns		ns

*Significant at p<0.05; **p<0.01; ***p<0.001. ns = Not significant.
Note: Numbers of cases are shown in parentheses.

terns coincide with the areas that were most affected during the civil conflict between 1992 and 1997.

The increase in the proportion of women giving birth at home and the concomitant rise in the proportion who receive unskilled assistance during delivery (usually from a relative, neighbor, or friend) is of great concern. As Table 6 shows, the rise in home births has been most marked in Khatlon, where two-thirds of women who gave birth in the 12 months prior to the survey did so at home. In contrast, home births accounted for 15 percent of all births in Leninabad during the same 12 months. Although not shown here, a distinct regional pattern to home deliveries without skilled assistance is evident as well. In the period since 1997, only 2 to 3 percent of deliveries in Dushanbe and Leninabad have been of this type, compared with 14 percent Khatlon and 15 percent in RRS. Such deliveries are more common in Khatlon and RRS today than during the civil conflict (1992–97), when they accounted for 10 percent of all deliveries, and than they were prior to 1992, when they accounted for only 3 to 4 percent of deliveries.

Rural women appear to have been disproportionately affected by the deterioration of health services and increasing barriers to access. As might be expected, consultation rates are generally higher among women living in urban areas than among those living in rural locations, and the proportion consulting a doctor has fallen proportionately less in urban areas (see Table 5). The proportion of women delivering at home has increased significantly over time among both urban and rural women: from 4 percent and 13 percent, respectively, prior to 1989 to 24 percent and 57 percent in the 12 months immediately prior to the survey in 1998–99 (see Table 6).

Educational Attainment

The differentials in consultation rates by women's education appear to have become stronger over time, largely as a result of the decline in consultation rates among women with secondary or primary education only. For example, of those women who gave birth in the 12 months prior to the survey, only 72 percent of those having an eighth- or ninth-grade education (primary only) consulted a doctor, compared with 77 percent of women having a secondary education, 88 percent with technical training, and 100 percent with higher education, as shown in Table 5.

Differentials in place of delivery by educational status, illustrated in Table 6, were virtually nonexistent dur-

Table 6 Differentials in percentage of women surveyed who gave birth at home, by selected characteristics, according to time of last birth in relation to May 1999 survey, Tajikistan

Characteristic	Time of last birth in relation to survey										Significance level of trend over time within group
	Within last 12 months (1998–99)		13–24 months (1997–98)		2–5 years ago (1994–97)		5–10 years ago (1989–94)		10+ years ago (to 1989)		
Region											
Dushanbe	38	(9)	32	(3)	20	(4)	8	(3)	ns		***
GBAO	40	(6)	25	(2)	14	(2)	21	(3)	25	(5)	ns
RRS	57	(59)	52	(36)	34	(30)	30	(27)	15	(8)	***
Leninabad	15	(14)	16	(17)	13	(17)	7	(8)	4	(5)	*
Khatlon	66	(199)	66	(79)	58	(99)	34	(39)	15	(9)	***
(Significance level of group variation within time period)	***		***		***		***		***		ns
Residence											
Urban	24	(19)	24	(9)	19	(18)	6	(6)	4	(4)	***
Rural	57	(188)	50	(128)	41	(134)	28	(74)	13	(23)	***
(Significance level of group variation within time period)	***		***		***		***		*		ns
Education											
Eighth/ninth grade	47	(29)	65	(19)	43	(20)	23	(15)	10	(4)	***
Secondary	56	(158)	46	(103)	38	(110)	25	(54)	10	(17)	***
Technical	21	(7)	27	(10)	18	(10)	9	(4)	4	(1)	*
Higher	36	(4)	11	(1)	16	(3)	ns		ns		ns
(Significance level of group variation within time period)	**		**		**		**		ns		ns
Economic status											
Poorest quintile	57	(54)	55	(38)	39	(39)	29	(20)	20	(9)	***
Second quintile	51	(53)	46	(32)	36	(35)	20	(13)	7	(3)	***
Third quintile	43	(33)	45	(33)	36	(33)	19	(14)	8	(5)	***
Fourth quintile	51	(45)	42	(21)	38	(32)	24	(16)	8	(5)	***
Richest quintile	51	(22)	32	(13)	26	(13)	20	(17)	7	(5)	***
(Significance level of group variation within time period)	ns		ns		ns		ns		ns		ns

*Significant at p<0.05; **p<0.01; ***p<0.001. ns = Not significant.
Note: Numbers of cases are shown in parentheses.

ing the Soviet period. Over time, the likelihood of giving birth at home has increased rapidly among women with lower educational status. A large increase is seen in the proportion of women having a higher education who "chose" to have a home delivery in the year prior to the survey. In the period from June 1998 to May 1999, more than a third of women with higher education delivered at home, compared with none prior to May 1994. This increase is likely associated with economic changes and the decline in quality of the health-care infrastructure. Two-thirds of maternity homes in 1999 are estimated to have had no heat or running water, and qualitative evidence suggests that many women with higher education now consider giving birth at home safer than doing so in an unheated maternity house lacking running water. As the quality of maternal health services continues to deteriorate, home births may become the norm for all groups of women, and the distinguishing factor will not be place of birth but rather the type of assistance the mother receives during delivery.

Unsurprisingly, the likelihood of a home delivery without skilled assistance was found to be inversely related to women's educational status. Of women giving birth after 1997, only about 2 percent of those with some technical or higher education gave birth at home without skilled assistance, compared with 15 percent of those with only a primary education (see Table 3).

Economic Status

During the Soviet period, the distribution of household income was relatively flat, having a Gini coefficient of 0.308[2] (Atkinson and Micklewright 1992). In 1989, the richest 10 percent of households had an income of just over three times that of the poorest 10 percent. One of the most significant changes since independence has been a dramatic increase in the level of inequality. By 1999, the richest 10 percent of households had an income greater than ten times that of the poorest 10 percent, and the Gini coefficient had risen to 0.47 (Falkingham 2000). A priori, one might expect that those women living in households that had suffered the greatest loss in real income would be among those most affected in terms of use of health-care services, particularly if out-of-pocket payments for health-care services increased over time (Falkingham 2002).

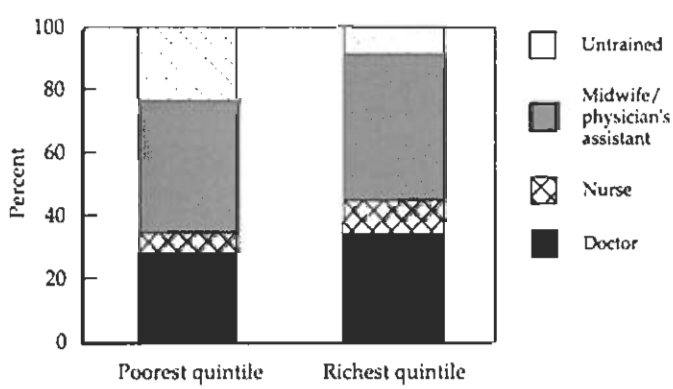
Table 5 shows consultation rates for women by the current economic status of their households as measured by quintile of household expenditure per capita. These

data clearly show that the likelihood of consulting a doctor during pregnancy has fallen for all women, regardless of their economic status. Contrary to expectations, the change over time is not more marked among women living in the poorest households than among those in other groups, although the decline in consultation rates appears to have taken place slightly earlier among the poorest women.

Little difference is found as well among economic groups in the place of birth in the last year, although a gradient is evident in earlier periods. Among women giving birth 13–24 months before the survey, those living in the poorest households were more than one and a half times more likely to give birth at home than were women from the richest households (65 percent and 32 percent, respectively). Thus, Table 6 appears to show that services worsened considerably in the 12–24 month period prior to the survey, and that by 1998–99 a substantial proportion of women in even the richest fifth of households gave birth at home in the last year (51 percent).[3] This finding is consistent with the previous one that a greater proportion of women with higher education are now giving birth at home.

A strong association exists between economic status and kind of assistance a women received at delivery (see Figure 2). Among women giving birth in the two years prior to the survey, women from the richest households were more likely to be attended by a doctor or a nurse (45 percent) than were women from the poorest households (35 percent). Conversely, women from poorer households were much more likely to give birth without skilled help (24 percent) than were women from the richest households (9 percent). Qualitative evidence suggests that the level of unofficial fees imposed rises as the level of providers' specialization increases: Surgeons and hospitals charge more than midwives and feldschers (physicians' assistants) who receive only nominal payments or gifts (World Bank 1999), whereas unskilled relatives, neighbors, and friends represent the least expensive option. Economic status (and the ability to pay for services) may, therefore, be an important factor in explaining some patterns of use of maternal health services, particularly the likelihood of giving birth at home without skilled assistance from a midwife or other health professional. Among all births in the period since 1997, such deliveries have made up 18 percent of all deliveries to women from the poorest fifth of households, compared with 4 percent of those to women from the richest households. Although slight differences existed among groups categorized by economic status prior to 1997, these differences were not significant.

Figure 2 Assistance at birth, by women's economic status, Tajikistan, 1997–99



This analysis has focused on bivariate relationships to this point. Many of these characteristics are correlated with one another, that is, women living in rural areas are also more likely to be less educated, to live in poorer households, and to have inadequate access to medical facilities. Multivariate analysis is employed below to distinguish the determinants of use of maternal health-care services in Tajikistan.

Determinants of Use

One of the major factors likely to influence a woman's decision to consult a doctor is the presence or absence of medical facilities in her locality. The TLSS collected data concerning the respondents' communities, including the types of services available, such as hospitals, polyclinics, feldscher points, first-aid points, and women's health services. Table 7 presents the results of a forward stepwise logistic regression that includes these supply-side variables along with the sociodemographic characteristics investigated above.

The dependent variable here is the likelihood of not consulting a doctor during the last pregnancy. Variables were entered stepwise into the model according to their level of significance. Region was the most important explanatory factor. Women in RRS were two times more likely than women in Dushanbe not to consult a doctor for antenatal care, whereas women in Leninabad and GBAO were significantly less likely not to have done so. Interestingly, living in Khatlon—the region with the lowest consultation rates in the bivariate analysis illustrated in Table 3—is not a significant predictor after other factors are controlled. Perhaps not surprisingly, the variable for the availability of women's health services in the community was the second to be entered into the stepwise conditional model. The results confirm that women living in areas without a polyclinic or without accessible

Table 7 Odds ratios that a woman did not consult a doctor for antenatal care during her last pregnancy, by selected sociodemographic characteristics, Tajikistan, 1999

Characteristic	Odds ratio	(95 percent confidence interval)	(N) (Total = 1,989)
Region ***			
Dushanbe (r)	1.00		(150)
GBAO	0.10	(0.13–0.75)	(79)
RRS	2.00	(1.13–3.55)	(469)
Leninabad	0.31	(0.16–0.62)	(588)
Khatlon	1.51	(0.90–2.61)	(703)
Time of last birth ***			
10+ years ago (prior to 1989) (r)	1.00		(294)
5–10 years ago (1989–94)	1.63	(0.87–3.05)	(409)
2–5 years ago (1994–97)	2.38	(1.30–4.36)	(501)
13–24 months ago (1997–98)	2.61	(1.40–4.84)	(348)
Within last year (1998–99)	3.33	(1.84–6.04)	(437)
Education **			
Higher (r)	1.00		(89)
Technical	2.68	(0.58–12.34)	(239)
Secondary	5.20	(1.23–21.89)	(1,339)
Eighth/ninth grade	5.96	(1.38–25.66)	(298)
None	15.7	(2.84–87.47)	(24)
Economic status *			
Richest quintile (r)	1.00		(337)
Fourth quintile	1.02	(0.66–1.59)	(391)
Third quintile	0.89	(0.57–1.40)	(407)
Second quintile	0.75	(0.47–1.19)	(425)
Poorest quintile	1.39	(0.90–2.14)	(429)
Women's health facility in community? ***			
Yes (r)	1.00		(1,148)
No	1.84	(1.32–2.57)	(841)
Polyclinic in community? ***			
Yes (r)	1.00		(1,055)
No	1.69	(1.25–2.31)	(934)

Note: The order in which the variables were entered is: region, availability of women's health facility in community, time of last birth, educational level, availability of polyclinic in community, and economic status. Residence (urban or rural) was not significant once the service-availability variables were included. Women's age was also not significant.
* Significant at p<0.05; **p<0.01; ***p<0.001. (r) = Reference category.

women's health services were significantly less likely to have consulted a doctor during their last pregnancy than were women living in areas where such services were available. Time elapsed since the last birth was also highly significant; women who gave birth in the 12 months prior to the survey (that is, June 1998–May 1999) were more than three times more likely than women who gave birth prior to 1989 not to have consulted a doctor for antenatal care.

Women's educational status also remained significant even after taking into account time period, region, local availability of maternal health services, and household economic status. Women with only a technical education were two times more likely than those having a higher education not to see a doctor, and women with a secondary or primary education were found to be more than five times more likely than more educated women not to consult one. Economic status was significant in the overall fit of the model, but no significant differences were found among categories of comparative wealth. Women's education appears, therefore, to be a more important discriminator than economic status in determining whether a woman is likely to consult a health professional in connection with her pregnancy.

Home Delivery

Although region is the most significant explanatory variable in terms of whether a woman gives birth at home, only women in Khatlon show a significantly higher likelihood of home delivery than those living in Dushanbe (see Table 8). Women living in rural areas are more than two times more likely than those in urban areas to have a home birth. A strong gradient appears in the likelihood of a home delivery by time since last birth, confirming the deterioration in access to medical facilities and services over time. A gradient by educational status is also seen: Women with secondary schooling are only two times more likely than women with higher education to deliver at home, other things being equal. Interestingly, economic status is not significant in the adjusted analyses, suggesting that cost of professional health care

Table 8 Odds ratios that a woman gave birth to her last child at home, by selected sociodemographic characteristics, Tajikistan, 1999

Characteristic	Odds ratio	(95 percent confidence interval)	(N) (Total = 1,982)
Region ***			
Dushanbe (r)	1.00		(151)
GBAO	1.06	(0.46–2.47)	(77)
RRS	1.06	(0.54–2.09)	(467)
Leninabad	0.33	(0.16–0.68)	(584)
Khatlon	2.13	(1.12–4.08)	(703)
Residence ***			
Urban (r)	1.00		(476)
Rural	2.67	(1.76–4.08)	(1,506)
Time of last birth ***			
10+ years ago (prior to 1989) (r)	1.00		(294)
5–10 years ago (1989–94)	1.63	(0.99–2.69)	(405)
2–5 years ago (1994–97)	3.02	(1.89–4.84)	(497)
13–24 months ago (1997–98)	4.54	(2.80–7.37)	(349)
Within last year (1998–99)	5.23	(3.30–8.44)	(437)
Education **			
Higher (r)	1.00		(89)
Technical	1.12	(0.50–2.55)	(237)
Secondary	2.30	(1.11–4.80)	(1,336)
Eighth/ninth grade	2.04	(0.94–4.43)	(297)
None	1.70	(0.48–6.02)	(23)
Polyclinic in community? **			
Yes (r)	1.00		(1,048)
No	1.40	(1.10–1.78)	(934)

Note: The order in which the variables were entered is: region, time of last birth, residence, educational level, and availability of polyclinic in community. Economic status was not significant, nor was availability of women's health facility.
* Significant at p<0.05; **p<0.01; ***p<0.001. (r) = Reference category.

is not a stand-alone factor influencing women's place of delivery.

Home Delivery Without Skilled Assistance

The odds ratios demonstrate the deterioration in maternal health services over time according to findings with regard to assistance at delivery. Women who gave birth in the last two years were two to three times more likely to give birth at home without skilled assistance, compared with women who gave birth at home more than ten years ago, as shown in Table 9. Women in rural areas were found to be more than three times more likely than urban women to give birth at home with no skilled assistance. Importantly, economic status emerges as a significant characteristic: Women in the poorest quintile were nearly three and a half times more likely than those in the richest to give birth at home without a trained assistant's help.

Discussion

The use of maternal health-care services in Tajikistan has fallen significantly since independence. The deterioration in the economy and in quality of services, along with rising costs, is associated with an increase in the number of women giving birth at home and a higher proportion of births that are unattended by a skilled assistant. Although the results of the survey may be affected to some extent by recall bias associated with time since event, the extent of this influence is unknown and is unlikely to account for most of the substantial differences observed. Women are now three times less likely than they were ten years ago to consult a doctor in connection with their last pregnancy, five times more likely to deliver at home, and three to five times more likely to give birth without skilled assistance. These trends have direct implications for maternal and child health. Women and neonates are more likely to die from complications if medical facilities and skilled birth attendants are not readily available.

Significant differences are found among regions. Women living in Khatlon and RRS, the two regions most affected by the civil war, are at a greater disadvantage than those living elsewhere. Moreover, the situation in these regions appears to have deteriorated in the last two years despite the signing of the peace agreement, the subsequent cessation of hostilities, and commencement of rehabilitation of the infrastructure.

Differences in use are observable according to women's educational status. Women with only primary or secondary education are less likely to consult a doctor in connection with their pregnancy, other things being equal. Women with less education are also more likely to deliver at home. Among women giving birth in the year prior to the survey, however, a greater proportion of those with higher education appear to be experiencing a home delivery than did so earlier. Two-thirds of maternity homes are estimated to be operating without heat or running water. Women apparently consider giving birth at home safer, more comfortable, and more affordable than doing so in an unheated maternity house with no running water. This situation suggests that the determining factor in a woman's decision may not be specific place of birth but rather whether a health-care professional will be available to assist in the delivery. In terms of delivery assistance, there appear to be no differences by educational status, but significant differences are found according to the household's economic status. Women from the poorest households are three times more likely than women from the richest households to give birth without skilled assistance.

One explanation for this finding is that these women are the least able to meet the financial costs of such assistance. Although in principle maternal health care was and remains free, evidence is growing that informal user charges are being imposed to augment the minimal salaries of health-care workers (Falkingham 2002). Health workers are among the lowest paid in Tajikistan. In 1998,

Table 9 Odds ratios that a woman gave birth to her last child at home without skilled assistance, Tajikistan, 1999

Characteristic	Odds ratio (95 percent confidence interval)	(N) (Total = 1,840)
Region***		
Dushanbe (r)	1.00	(152)
GBAO	0.47 (0.03–8.52)	(79)
RRS	4.38 (0.51–37.68)	(421)
Leninabad	0.90 (0.10–8.02)	(580)
Khatlon	4.06 (0.48–34.47)	(608)
Residence**		
Urban (r)	1.00	(477)
Rural	3.48 (1.50–8.06)	(1,363)
Time of last birth**		
10+ years ago (prior to 1989) (r)	1.00	(292)
5–10 years ago (1989–94)	1.22 (0.50–3.08)	(387)
2–5 years ago (1994–97)	1.66 (0.71–3.87)	(465)
13–24 months ago (1997–98)	3.24 (1.41–7.48)	(308)
Within last year (1998–99)	2.09 (0.90–4.82)	(388)
Economic status*		
Richest quintile (r)	1.00	(311)
Fourth quintile	2.09 (0.98–4.46)	(360)
Third quintile	2.23 (1.06–4.72)	(378)
Second quintile	2.36 (1.11–5.02)	(406)
Poorest quintile	3.41 (1.58–7.06)	(385)

Note: Comparison group is all other deliveries. The order in which the variables were entered is: region, time of last birth, residence, and economic status. Educational level and health-service availability were not significant, including an additional variable on hospital.
*Significant at p<0.05; **p<0.01; ***p<0.001. (r) = Reference category.

the average monthly salary among employees in the health sector was US$4.80, compared with the workforce average of $11 and with $33 for workers in key enterprises such as the state mining, electricity, and manufacturing companies (WHO 2000). As well as being low, salaries in the public sector are often paid late; arrears of several months are common. In light of this situation, informal payments and in-kind gifts from patients, which some cannot afford, constitute a source of income for many physicians and nurses. Although a direct question on payments relating to maternity care was not included in the TLSS, the results of the analysis point to the costs of such care as deterrents to women who are seeking professional assistance at delivery.

Action is urgently needed if Tajikistan is to reverse the negative trends it is experiencing in maternal health-care services in order to lower infant and maternal mortality rates. The first step should be to determine the cause for declining use of maternity services. The quantitative data from the TLSS and the Multiple Indicator Cluster Survey need to be supplemented with more in-depth information concerning women's decisions to use or not to use maternity services. Such an investigation would help shed light on whether improving the infrastructure (and quality of care) increases use. Ensuring that all maternity homes are well heated and equipped with running water and that they provide sanitary conditions might reverse the trend toward giving birth at home. In the longer term, Tajikistan must address the overall financing of its health-care system.

Notes

1 Although the countries of the former Soviet Union have a long history of conducting sample surveys, their use of quota-based samples meant that surveys such as the Family Budget Survey were not representative. For a discussion on this and related issues, see Falkingham and Micklewright (1997).

2 The Gini coefficient provides a summary measure of inequality. If income is perfectly equally distributed, that is, if everyone in the population enjoys the same income, the Gini coefficient is equal to zero. If income is perfectly unequally distributed, that is, if one person has all the income and everyone else has none, the Gini coefficient is equal to one.

3 Interestingly, although the economic-status variable reflects the women's current status at the time of the survey, differences are found for this variable in the proportion giving birth at home more than ten years ago. One reason for this finding might be that women who gave birth at home during the Soviet period were particularly disadvantaged and among those least able to protect their living standards during the period of political transition—hence the association between their current economic status and past behavior.

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