

Free Markets and Dead Mothers: The Social Ecology of Maternal Mortality in Post-Socialist Mongolia

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Abstract (Document Summary)

Beginning in 1990, Mongolia, a former client state of what was then the Soviet Union, undertook liberal economic reforms. These came as a great shock to Mongolia and Mongolians, and resulted in food shortages, reports of famine, widespread unemployment, and a collapse of public health and health care. Although economic conditions have stabilized in recent years, unemployment and poverty are still at disturbingly high levels. One important consequence of the transition has been the transformation of the rural, primarily pastoral, economy. With de-collectivization, herding households have been thrown into a highly insecure subsistence mode of production, and, as a consequence, many have become vulnerable to local fluctuations in rainfall and availability and quality of forage, and many now lack access to traded staples and essential commodities. Household food insecurity, malnutrition, and migration of impoverished households to provincial centers and the capital of Ulaanbaatar are one result. Reductions to investments in the health sector have also eroded the quality of services in rural areas, and restricted access to those services still functioning. Evidence suggests that women are particularly vulnerable to these political-ecological changes, and that this vulnerability is manifested in increasing rates of poor reproductive health and maternal mortality. Drawing on case-study ethnographic and epidemiological data, this article explores the links between neoliberal economic reform and maternal mortality in Mongolia. [Mongolia, maternal mortality, neoliberal reform, post-socialist societies, political ecology of pastoralism] [PUBLICATION ABSTRACT]

Full Text (12310 words)

Beginning in 1990, Mongolia, a former client state of what was then the Soviet Union, undertook liberal economic reforms. These came as a great shock to Mongolia and Mongolians, and resulted in food shortages, reports of famine, widespread unemployment, and a collapse of public health and health care. Although economic conditions have stabilized in recent years, unemployment and poverty are still at disturbingly high levels. One important consequence of the transition has been the transformation of the rural, primarily pastoral, economy. With de-collectivization, herding households have been thrown into a highly insecure subsistence mode of production, and, as a consequence, many have become vulnerable to local fluctuations in rainfall and availability and quality of forage, and many now lack access to traded staples and essential commodities. Household food insecurity, malnutrition, and migration of impoverished households to provincial centers and the capital of Ulaanbaatar are one result. Reductions to investments in the health sector have also eroded the quality of services in rural areas, and restricted access to those services still functioning. Evidence suggests that women are particularly vulnerable to these political-ecological changes, and that this vulnerability is manifested in increasing rates of poor reproductive health and maternal mortality. Drawing on case-study ethnographic and epidemiological data, this article explores the links between neoliberal economic reform and maternal mortality in Mongolia.

Introduction

Maternal mortality, morbidity, and, by extension, perinatal mortality and the health experience of surviving children, are the results of a complex interaction of biological, medical, and social factors (Abouzahr et al. 1996; Figa-Falamanca 1996; Stokoe 1991). Although the proximal causes of maternal mortality, pregnancy complications, and the impact on the fetus and neonate have been the

subject of substantial biomedical research, the association between individual-level factors and those operating at the level of society and community-political-economic factors, social behaviors, cultural beliefs, and accessibility (perceived and actual) of appropriate health care services are as yet poorly understood (Miller et al. 2003; Okonofua et al. 1992; Okotocha et al. 1998; PMMN 1992).

The purpose of this article is to assess the impact of Mongolia's transition from a socialist to a capitalist market economy on the multi-level "causal assemblages" that affect women's health (Dunn and Jones 1986). In this analysis, we use an analytic strategy that draws on the social ecological models employed increasingly in public health and biocultural anthropological research (e.g., Krieger 1994, 2000; Stokols 1996; Thomas 1998). These models assess how events, processes, and factors occurring across the social scale "get into" the body (Krieger 1994). Like Krieger and others (e.g., Farmer 1997, 2003; Thomas 1998), we attempt to identify the "spider" in the web of causation, focusing here primarily on the links between neoliberal economic reform, consequent transformations to the rural economic system, and the differential impact of this transformation on certain groups of poor, rural women.

One of the contributions that medical anthropology can make to research on critical global health problems such as this is our ability to work ethnographically across multiple levels of analysis, moving from the tragic experiences of a single family to the perspectives of health officials and development experts. Like other researchers who work ethnographically on the problem of maternal mortality (e.g., Barnes-Josiah et al. 1998; Hay 1999; Makhlouf-Obermayer 1999; Wall 1998), we have found that each case is a unique tragedy, resulting from a particular constellation of "cascade" of factors and events. Assembled, these cases suggest a pattern, and this pattern points to the causal salience of social, political, and economic forces not in the control of victims, their families, or their children. Yet it is important to our understanding of the problem, particularly to understanding how death and disability ramify well beyond the individual victims to affect the lives and life chances of surviving family and children, that the individual stories, and the suffering they articulate, be told (Kleitman and Kleiman 1997). We draw on the model provided to us in the work of Joan Ablon (e.g., 1971, 1999, 2002; Shurtleworth and Kasnitz this issue). A consummate fieldworker, Ablon contributed greatly to our understanding of the consequences of stigma, disability, and economic distress for individuals, their families, and their community. Inspired by Ablon's exemplary ethnographic skills, we endeavor here to illuminate the social suffering of Mongolian women.

Determinants of Maternal Mortality

Maternal deaths' comprise about 25 percent of the deaths of women between the ages of 20 and 30 years worldwide (Walsh et al. 1994). In 1990, the World Health Organization estimated that 585,000 women died of complications related to pregnancy and delivery (WHO/UNICEF 1996).² With 99 percent of these deaths occurring in developing countries (Walraven et al. 2000). Furthermore, death and disability from obstetric causes comprise 18 percent of the total disease burden (in terms of "disability-adjusted life years" or DALYs) among women aged 15-44 in poor economies (World Bank 1993), although these figures undoubtedly underestimate the depth and extent of suffering among affected families and kin groups. Maternal mortality ratios (MMRs) thus vary widely between poor and middle-high-income countries. The MMRs for many countries in Africa and South Asia are as much as 200 times (1,000/100,000) those of the industrialized countries of North America, Europe, and East Asia (4-10/100,000) (Kobalinsky 1995; WHO/UNICEF 1996). The lifetime risk of maternal mortality is many times greater insofar as each pregnancy adds to the total lifetime risk. In poor countries where fertility is high, the average woman faces a lifetime risk of one in 33 that a pregnancy will result in her death (Walsh et al. 1994).

The number of obstetric deaths represents only a small fraction of the total burden of disease associated with pregnancy and childbirth. WHO estimates that there are as many as 20 million

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pregnancy- and childbirth-related morbidities and disabilities each year; some one-third of all women in the developing world have suffered from injuries such as obstetric fistula to chronic conditions such as severe anemia, reproductive tract infections, and uterine prolapse (WHO/UNICEF 1996). Some researchers have indicated that this number may be a vast undercount of the true burden of disease (Kobinsky 1995; Kwast 1998). Studies suggest that between 3 and 15 percent of pregnant women will experience an obstetric complication resulting from pregnancy (e.g., Prual et al. 2000; Stewart et al. 1996).

Although there is a documented relationship between maternal health and underlying risk factors such as maternal age, parity, socioeconomic status, education, women's social status, and general level of health (Maine and Rosenfield 1999), maternal mortality and morbidity have not been subject to careful sociodemographic or contextual analyses. As a result, the global public health response to maternal mortality and morbidity has been seriously impaired. Write Miller and colleagues (2003:10):

the most common approach to reduce maternal mortality has been the identification of hypothetically useful "good ideas" program interventions, with advocacy for their large scale implementation. . . . Since 1987, international agencies and government working together have dedicated time and funds [to interventions] without producing documented reductions in maternal mortality.

These interventions have been promoted: the training of traditional birth attendants; the implementation of antenatal "risk screening"; and, more recently, promotion of skilled emergency obstetric care at delivery (Liljestrand 1996; Maine and Rosenfield 1999; Miller et al. 2003). Although large amounts of money and effort have been put into these initiatives, none has yet been demonstrated to affect maternal mortality. It is likely that this failure is due to the fact that these "good ideas" approaches do not consider the fact that maternal mortality, "occurs in a specific social, cultural and political context . . . [that] greatly affects maternal individual and community health, even within developed countries" (Miller et al. 2003:12).

Women who are poorer, less educated, who have lower social status, and are of poorer overall health are more likely to die than those who are more fortunate. It is also the case that such women are less likely to have access to appropriate and effective health care (Abou-Zahr and Royston 1991; AbouZahr et al. 1996; Barnes-Josiah et al. 1998; Israr 2000; Miller et al. 2003; Rizvi et al. 1999; Shen and Williamson 1999; Stokoe 1991; Sundari 1992; Thaddeus and Maine 1994; Tushnet 1999; Wall 1998).

Indeed, maternal mortality is considered by many global health scholars to be an extremely sensitive indicator of social inequality insofar as it offers a "litmus test of the status of women, their access to health care and the adequacy of the health care system in responding to their needs" (AbouZahr et al. 1996:77). As such, the economic conditions of a country and its commitment to health and social welfare, particularly of women, are important structural determinants of maternal mortality (e.g., Okonofua et al. 1992; Sundari 1992; Tushnet 1999; Wall 1998). Attention to the causes and effective prevention of maternal mortality requires a multiple-level focus on the social, economic, and political determinants of women's social, economic, and health status, and access to effective health services. In the pages that follow, we examine the multiple relationships between the collapse of the Soviet-style, socialist "command" economy, the introduction of liberal economic reforms, and patterns of poor pregnancy outcome in rural Mongolia.

Mongolia is a particularly useful context for conducting such an analysis. Prior to the dismantling of the socialist system, which began in 1990, Mongolia had built a rationally distributed and accessible health care system and focused considerable attention on women's health and education—particularly given the demands of delivering services to a largely rural and sparsely distributed population. Mongolia had established maternity waiting homes in nearly all of its counties by the 1980s; 3 girls

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were provided free education, and, as a result, rates of female enrollment in secondary and post-secondary education equaled or exceeded those of men (UNDP 2000). The collective nature of the socialist economy, particularly in the rural countryside, ensured that women's labor in the household could be replaced so that they could seek health care, including lengthy residence in a maternity waiting home; thus nearly all births were attended by skilled professionals. Essential commodities were generally available through the local collectives, and rural families were protected from the vagaries of weather and markets that plague pastoral production elsewhere in central Asia (Humphrey and Speath 1999). As we discuss in the following pages, much of this changed after 1990, providing, in effect, a natural experiment of the impact of capitalist reform on women's health.

We do not wish to overly romanticize the heavy-handed Soviet-style socialism that characterized the Mongolian political economy prior to 1990. In the 1930s and 1940s, the processes of collectivization resulted initially in the widespread disruption of the traditional pastoral economy, leading to social instability and economic hardship. Suppression of Mongolian religious and cultural traditions was extreme (Baabar 1999). Finally, and most importantly, the development of social and health institutions in Mongolia depended heavily on considerable financial inputs from the Soviet Union. One of the first challenges faced by the political elite in post-transition Mongolia was how to ensure adequate levels of investment in an expensive and unsustainable health care system. However, as most Mongolians now recognize, it is clear that the social protections afforded by the old socialist regime provided households and individuals far more health, economic, and social security than are now afforded under the new capitalist system.

Our approach joins ethnographic and epidemiologic methods in placing maternal health in a broader social, political, ecological, and economic context. We organize our discussion around three topics: (1) a modern social and economic history of pastoralism in Mongolian Inner Asia; (2) economic reform policy and its impact on Mongolian pastoralism at the level of community and household; and (3) a discussion of the potential causal relationships between economic and health reforms and maternal health as mediated by household and community-level institutions. We focus on the impact of economic reform on rural women for three reasons. First, for reasons we discuss below, rates of maternal mortality are far higher in the countryside than they are in the towns and cities; second, the political-economic transition has had a particularly profound impact on the organization of pastoralism, which remains the largest sector of the Mongolian economy and occupies a substantial number of its people. Third, the impact of neoliberal macroeconomic reform—particularly through privatization and government disinvestment in public goods—on the traditional cooperative structures essential to effective pastoral production in the Mongolian environment is particularly evident. As we argue, these affect women by raising the level of economic risk borne by individual households, increasing rural poverty, escalating the labor demands placed on women, and impairing the quality and accessibility of health care.

Methods

Our discussion is based on analysis of the following kinds and quantities of data: surveys of household economies and health care utilization in rural northern Mongolia (Jones 2003); structured, qualitative interviews with 15 high-level officials in the Mongolia Ministry of Health; collection of records on all recorded (n = 217) maternal deaths occurring in rural Mongolia between 1996 and 1998; interviews of doctors and midwives in seven counties and three townships in the western provinces (aimag) of Arhangai and Hovsgol (see Figure 1); and case studies of maternal mortality based on records and interviews with physicians and family members.

Economic Reform and Poverty in Post-Socialist Mongolia

Between 1989 and 1999 government expenditures declined from 50.2 percent of GDP to 26.9 percent, substantially outpacing the decline in GDP. This sharp decrease reflects a widespread disinvestment in public goods-social services, health care, and education. Health care expenditures fell from 6 percent of GDP in 1989 to 3.3 percent of GDP in 1999. Investment in education declined from 11.5 percent of GDP to 5.5 percent of GDP over the same period. School enrollment of children aged 8-15 years fell from nearly 100 percent in 1990 to 87 percent by 1998 (UNDP 2000). Today, the government's ability to provide social services such as education and health care and to combat poverty has been seriously weakened.

Because of the loss of Soviet subsidies and declining public investment, the health care system disintegrated rapidly after transition. Stocks of essential drugs and medical supplies were exhausted. Without heat and electricity, many hospitals and clinics were forced to close or curtail operations (WHO 1999). Most of the maternity waiting homes were closed after 1992, many physicians left the health service, particularly in rural areas, and shortages of fuel in rural areas impaired the ability of county and township medical facilities to respond to emergencies (WHO 1999). In response to this crisis in the health sector, and following the World Bank's prescription for health development (World Bank 1993), the Government of Mongolia endeavored to shift from a focus on hospital-based secondary and tertiary care to essential primary care (ADB 2002; James 2003). A compulsory national health insurance system was initiated in 1994, and the ADB has provided sizable development loans in support of a series of health sector reforms (ADB 2002). By 2000, many of the maternity waiting homes had reopened; however, changing economic conditions in the countryside, as we will discuss below, impede universal access to these facilities. Rural health care continues to suffer from shortages of staff, equipment, drugs, and funds for capital investments in infrastructure (James 2003; UNDP 2000).

The Political Ecology of Mongolian Pastoralism

Until the Soviet-supported Mongolian revolution of 1921, cooperating groups of herding households (hot ail, or ail) were invariably part of, and supported by, large institutional forms that controlled access to pasture and animals. These included Buddhist monasteries, princely "banners" (territories), and smaller units controlled by landed nobility. The larger institutions functioned economically as organizers of redistribution, instruments of specialization, and managers of collective labor and produce. These institutions also controlled and managed the seasonal migration of herders and animals to maximize availability of desirable grasses and minimize the effects of a harsh climate (Humphrey and Sneath 1999).

After 1921, the Mongolian government broke up these "feudal" institutions and redistributed animals to household groups. The old estate boundaries were redrawn and organized into districts and subdistricts. Within these units, state officials organized production and essential social services, and managed the exchange of animal products for consumer goods and nonanimal food staples. Radical collectivization began in earnest after World War II and was largely completed by the mid-1950s. Herding households were stripped of most of their privately owned animals. Families were settled in semi-sedentary towns and district centers and organized into state-controlled cooperative enterprises (negdel). Negdel members provided labor for the collective in return for necessities as well as social and health services. Education and health care were well developed in most regions; high literacy levels and favorable health indicators suggest that such services were of reasonably high quality and accessible to the rural population (Griffin et al. 2001; UNDP 2000).

The negdel functioned to regulate access to the critical resources of water, fodder and shelters for winter use, and pasturage (Griffin et al. 2001). The negdel also provided veterinary care for animals and ensured that there were adequate supplies of food, shelters, and transport to protect herders and their animals from the severe winter disasters (dzud) that periodically affect the central Asian steppe. 6

After 70 years of Soviet-style socialism, in 1990 Mongolia began sweeping political and economic reforms. In response to pressure from global economic reformers, Mongolia chose a transition strategy that is popularly and infamously known as "shock therapy" (UNDP 2000). In Mongolia, shock therapy consisted of the following elements: price liberalization; removal of restrictions on international trade and foreign investment; privatization of state-owned enterprises, initially by a free distribution of vouchers to the entire population and later through auction to domestic and foreign buyers; and a marked reduction in the size of government (Griffin et al. 2001). 4 As several documents and reports now make clear, Mongolia undertook reforms championed by the most extreme of liberal economic reformers (e.g., UNDP 2000:28-31). In an insightful evaluation of neoliberal reform in Mongolia, Griffin and colleagues observed that:

At the beginning of the transition Mongolia's economic reforms were widely applauded: they were expected to lead to a swift transformation of the economy, an acceleration in the rate of growth of output and a substantial improvement in the standard of living of the population. Even as late as 1999, Mongolia was described as "the darling of ultra-liberals in the West," and "the star pupil of liberal development economics." Yet an analysis of the results of a decade of economic reform shows that the transition has been highly disappointing.... The transition to a market-oriented economy has been accompanied by a decline in the average standard of living, a dramatic increase in poverty, greater economic insecurity and a rise in inequality in the distribution of income and productive assets. [Griffin et al. 2001: 1]

Put simply, economic reform resulted in widespread social chaos and economic collapse (Griffin et al. 2001; UNDP 2000). Aid to Mongolia from the former Soviet Union and other socialist countries was immediately eliminated, contributing to a sudden 30 percent drop in GDP. Industrial production, which up to 1989 had been a growing sector of the economy, employing large numbers of urban and town dwellers, declined sharply. Price liberalization, overdependence on imported energy resources, shortage of skilled technicians, and the collapse of the Soviet trade bloc (the Council for Mutual Economic Assistance, or COMECON) contributed to the downfall of the industrial sector. As a result, the value of industrial production as a percentage of GDP declined from 35 percent to 20 percent between 1990 and 1996 (Griffin et al. 2001; UNDP 2000). There was a rapid increase in unemployment in urban areas, leading to widespread poverty, homelessness, crime, and alcohol abuse.

The shock of poverty in urban areas led to widespread emigration from the cities to the countryside to take up herding, resulting in a transfer of population from urban to rural areas that is perhaps unprecedented (Humphrey and Sneath 1999). Between 1989 and 1998, the proportion of the population living in urban areas declined by 13 percent, and the rural population grew by an astonishing 17 percent (Griffin et al. 2001). Since 1998, due to a string of severe winters, which may have led to the failure of many inexperienced herders, and by a stabilizing of the urban economy, population has begun to return to the towns and cities.

As shown in Table 1, per capita income declined from US\$1,643 in 1989 to US\$374 in 1999 (in constant 1993 dollars; Government of Mongolia 2000). The government now estimates that more than a third of Mongolians are living below the poverty line of approximately US\$16 per person, per month (Asian Development Bank [ADB] 2002; Government of Mongolia 1998). The depth and severity of poverty has increased, indicating a rise in social inequality and in the numbers of the very poor. 5 The GINI index, a measure of income inequality, grew from .31 to .44 between 1995 and 2002 (UNDP 2003).

Advocates of neoliberal economic reform advocate a small and relatively weak state (Turshen 1999). Unfortunately for Mongolia, as Griffin et al. (2001: 11) note wryly, this is exactly what they got.

percent of households were able to be self-sufficient, 40 percent required cash inputs from sources other than herding (e.g., wage labor, trading activities), and only 15 percent were able to produce consumer goods for the market.

Variable environmental conditions, access to markets, and success of household strategies have thus produced a high degree of inequality in the countryside. This inequality compounds what happened at the very beginning of privatization. The initial distribution of animals was not equal among individuals or households, nor was the distribution of animals limited to herders (Griffin et al. 2001). As one would expect, experienced herders and members of prominent households did well, while female-headed households and young herders did less well. "As early as 1992, at the top end of the distribution, roughly 5 percent of households had herds with more than 200 animals whereas at the bottom end of the distribution, 42 percent of households had herds with fewer than 31 animals" (Griffin et al. 2001:21).⁸ The situation has worsened significantly since then. Many younger and inexperienced herders were unable to maintain their herds, particularly through the severe winter disasters of the past decade. Increasingly, non-self-sufficient or asset-less rural households are forced to rely on wage labor opportunities provided by other, wealthier herders, or they are forced to migrate into towns and cities where they join a growing underclass of dependent poor (Janics 2003).⁹ Probably as a result of this increasingly marked inequality, animal theft has emerged as a serious problem in the countryside.

This emergent social inequality has likely impaired the reconstitution of traditional cooperative institutions. As described above, in Mongolia, the primary cooperative institution is the hot ail. The core of a hot ail is commonly a patrilineal extended family, although it is a highly flexible institution (Humphrey and Sneath 1999). Hot ail members pool resources and labor, make joint decisions regarding the movement of animals and people, and thus help buffer the economic risks to which individual households might otherwise be exposed. The hot ail has a long history, although its cooperative functions were superseded by those of the negdel during the collective period.

Although the hot ail has survived, it is not yet clear whether it remains strong enough or stable enough to take over some of the functions it undertook in the past, or were more recently provided by the negdel. In our interviews of rural herders, we found that even within the hot ail, individual households were very careful to differentiate the ownership of livestock, and the social ethic of cooperation was clearly secondary to a new principle of individual and household-based private property. The size and existence of hot ail were also highly variable. We found that economic uncertainty and failure have led to the disintegration or weakening of these groups; in several interviews, households engaged independently in herding activities with no help from neighboring households. Few other cooperative institutions have yet emerged that would help organize production so as to maximize pasturage and protect individual households from disasters and disease (Humphrey and Sneath 1999).

In the absence of strong cooperative institutions, and with the disinvestment by government in rural development, the social and health services that herders were provided during the socialist period, and before, have become less accessible. It is clear that the socialist ethic of social solidarity and justice, where all individuals were provided access to essential services and buffered from the inherent risks of pastoralism in a harsh environment, has been replaced by an ethic of market justice, where services and benefits accrue only to those judged deserving by virtue of economic success. Educational opportunities for rural youth have declined. The quality of health care has been affected by declining public investment, although external inputs from development grants and activities of organizations such as UNICEF, UNFPA, and several bilateral development agencies have protected the rural health sector from complete collapse. However, rural clinics have been clearly affected by lack of funding. Many rural doctors left government service during the transition period when the incentives designed to attract physicians to practice in rural areas were eliminated and clinic funding dried up. Today,

In short, and perhaps ironically, the negdel operated in a fashion somewhat similar to the old feudal institutions, functioning to regulate access to and distribute essential resources and to spread risks among large numbers of households (Griffin et al. 2001; Humphrey and Sneath 1999). The negdel differed, of course, in its organization of production and in its emphasis on the provision of health and social services. Both feudal and socialist institutions, however, operated to provide a measure of security to individual households in this harsh and unpredictable environment.

The Impact of the Political-Economic Transition on Rural Communities

Subsistence security was the first casualty of economic reform. As a result of privatization, all collectives were completely dissolved, member households divided up the moveable assets (principally livestock), and, sometimes with related households, began to herd on an independent basis. Perhaps for the first time since the origins of the Mongolian state in the 13th century, Mongolian herders became domestic-level subsistence producers, lacking access to cooperative institutions that served to spread economic risks among numbers of households. Access to land and water resources, which had been formerly under the control of feudal, and then socialist institutions, were suddenly available to any who would use them. Rural land in Mongolia is considered public land and is open to use by any citizen. The new Mongolian herder thus has access to what is a large, open commons of productive resources. Unfortunately, this new independence has come at a very high price. Declining public investments in transportation, water resource development, veterinary services, and emergency land and shelter have made herders highly vulnerable to unpredictable weather, disease, and market conditions. In the absence of institutions that would regulate access to essential resources, Mongolian herders may experience the "tragedy of the commons": overgrazing has already been noted in areas closest to markets and veterinary care (cities) and where water sources are reliable (Griffin et al. 2001).⁷ Access by households to markets has become a critical determinant of economic stability. Under the socialist system, the negdel served as a marketing cooperative and bore all responsibility for moving animal products to urban and foreign markets and bringing in essential commodities for sale to negdel households. With the elimination of the collective, individual households now have to devise means to transport their products to market in order to generate the cash now needed not only for basic commodities, clothing, and tools, but for essential services as well: room and board fees for children attending a county or provincial school, health and veterinary care, and transport.

Herders with the easiest access to existing markets—either those living close to urban centers or to Chinese or Russian towns—have an advantage over those in the remote hinterland where market institutions have yet to develop. In their research on the economics of pastoralism in post-socialist Central Asia, Humphrey and Sneath (1999) found in the remote regions of Mongolia that:

general economic conditions render making an adequate living by herding extremely difficult. Herders obtain low prices for their livestock products and are confronted with abruptly rising prices for food, fuel, transport, and clothing. There is a lack of market institutions (banks, shops, trading companies, marketplaces), and those that exist often do not reach to the herders located on distant pastures. The return to an economy of subsistence alone is even more marked in Mongolia than it is in Russia, and one consequence of this may be an increasing number of livestock kept by pastoralists, who do not or cannot sell them. [p. 110]

In this new, higher risk economic context, the social and health impacts of decisions made by individual households loom large. Some households have been relatively successful, and have managed to acquire large herds that enhance their long-term economic security and also permit them to invest greater resources in the education and health of individual members. But the numbers of these self-sufficient households is small. In one study of household economics among pastoralists in Mongolia (Shombodon n. d., quoted in Humphrey and Sneath 1999:275), it was found that about 45

In the past, the organization of the *negdel* would have ensured the receipt of timely health care. Until 1992, all districts had maternity waiting homes that provided accommodation close to medical care. Pregnant women were urged to move to the homes well in advance of expected delivery and provided transportation. The cooperative nature of the collective ensured that a woman's labor in the home was replaced. She had little concern that her children might be unattended or unfed, that the animals might go without milking, or that the young animals might be neglected. In interviews with county-level medical staffs in Arhangai and Huvsgol provinces, we found that maternity waiting homes are not being as heavily or consistently used as they were in the past. We believe this more variable use is one result of the weakening of cooperative institutions above the level of the household. Women may not have access to the social supports they counted on during the days of the collective. Kin and not all are themselves consumed with their own subsistence activities and may not be available to care for a woman's children or replace her labor in the household. In many cases, the chaos of economic transition has led to the dispersal of kin to towns, province centers, and the capital, thus eroding traditional, kin-based social networks. In a highly insecure economy, women and their children are the most vulnerable.

Regional Socioeconomic Differences

Pastoralism in Mongolia requires the seasonal movement of households to maximize the use of natural resources available in different ecological zones. Generally speaking, Mongolia is divided into four geographical/ecological zones: western high mountains, central mountains, eastern steppe, and Gobi desert regions. The movement pattern varies greatly from west to east. Herders in the western region are the most mobile due to the great variability of seasonal productivity in the higher altitude environment, compared to central provinces where the land productivity permits herders to make less extensive moves. Households in the Gobi desert area migrate short distances depending on the availability of water resources. On the other hand, households in eastern provinces often make significantly longer migrations of 100 kilometers from north to south to avoid the cold northern winters, but take advantage of the productive northern grasslands in summer, with multiple stops in between. The long and frequent movements in eastern and western regions require greater labor investments and distance people from their social ties, local administrative centers and markets, information sources, and health care centers (Humphrey and Sneath 1999). These different environmental pressures on livestock and herders explain in part the variable survival rates of humans and animals across the country. Poverty and unemployment rates are the highest in western provinces, as is the risk of losing the animals during droughts and winter disasters.

Access to markets and cash incomes varies greatly from region to another. Being closer to cities and market centers, herders in the central provinces, near the borders with Russia and China, or along major road or railway lines have a greater opportunity to sell their products (meat, skins, wool, cashmere). But herders from eastern, and especially from the more remote western, provinces do not have such opportunities, unless they have connections through intermediaries (traders, kin who own trucks, etc.), and are thus forced to sell their products in local markets where high supplies and low demand result in very low prices. Conversely, in local, rural markets, manufactured goods are prohibitively expensive. Another important characteristic of the western provinces is that the percentage of minority ethnic groups (mainly Kazakhs) is much higher compared to other three regions (Humphrey and Sneath 1999:26). In these areas, the comparatively lower social status of women, younger age at marriage, higher fertility rates, and language difficulties that impair access to health services contribute to higher risks for complications of pregnancy.

The above review of the impact of the neoliberal economic reform on women in the context of the transformation of pastoral economy suggests that the following factors place women at risk of poor pregnancy outcome. First, rural households are now largely independent, subsistence-oriented productive units, and, as such, are highly vulnerable to region-specific economic risks. These include

rural clinics still suffer from lack of essential equipment and medications and must engage in cash-producing activities to fund salaries and medical services.

In summary, liberal economic reform has radically transformed the structure and organization of the rural economy, exposing individual households to a high level of risk. The collapse of the *negdels* and the privatization of herds have eliminated the formal institutions that buffered this risk and protected the environment by regulating access to and maintaining land, pasture, and water resources; providing veterinary services; and establishing reserves for emergencies. The shift in ethics from social justice to market justice has resulted in a substantial disinvestment in human capital. What rural Mongolians have experienced over the past decade is a process of underdevelopment whereby they find themselves for the first time in hundreds of years practicing a household-based system of subsistence production in the absence of the formal state institutions (feudal and socialist) that spread the risk of that system across social collectives. In the absence of state support, households attempt to manage risk in a number of ways. They diversify sources of income within the household (e.g., combining wage labor with herding activities). Some family members may move away for entire seasons to work in towns or cities. In some households, the elderly are sent to live in county and provincial centers so that they can support grandchildren sent to attend school. Write Griffin et al. (2001:17-18).

Like survival strategies, these [risk management strategies] are largely responses to a reduction in the number of risk reducing institutions. Almost always these informal arrangements are inferior to the formal institutions they attempt to replace. Privatization of risk management seldom works well, particularly for low income groups in low income countries.

Vulnerable Women in the New Pastoral Economy

Gender roles are central elements of the scheme by which tasks are allocated in pastoral families. The female sphere of capability and responsibility is centered on the household. Women prepare food products (cheese, butter, yogurt), cook, make tea, make and repair clothes, care for children, wash and clean, undertake all milking activities, care for animals close to the encampment (particularly young animals in springtime), collect dried dung for fuel, and fetch water. Men are responsible for all herding activities, especially those at a distance from the encampment. From a very young age, girls begin to help their mothers in the household. Lack of economic stability and a general and pervasive sense of subsistence insecurity have led many Mongolian families to increase the amount of self-provisioning production (Griffin et al. 2001). Much of this work is production directed by women (Humphrey and Sneath 1999).

In a harsh climate with long and cold winters and frequent summer drought, substantial labor is required for raising animals. Except in winter, women, men, and their older children engage in physically demanding work 15-18 hours per day. Women's work is particularly critical during spring and summer, when they are responsible for all milking and milk processing chores along with the care of the young animals.

In a subsistence-oriented mode of production, such chores may affect a woman's health, both directly and indirectly. She may reduce food consumption in favor of other family members. If a problem seems minor, she may delay visiting a hospital or clinic so as not to waste valuable time or leave her children unattended. The call for a midwife may be delayed if she is in labor but the contractions are weak. If she has few family or kin nearby, there may be no one to ride a horse 40-50 km to the district center to fetch help. And these days, even if her husband makes it to the district center on his horse, he may find that the ambulance is out of fuel, and the driver reluctant to venture out.

risks to livestock from climate and disease, degradation of pasturage due to public disinvestment in water resources and absence of supra-household cooperative structures that would mitigate the "tragedy of the commons," and lack of access to the market institutions from which households might derive cash incomes. Level and stability of cash income, in turn, determine household access to essential social and health services. Second, in this new subsistence economy, women's labor is both critical and highly demanding. Labor demands, especially if they have no kin close by to help. Third, affect women's freedom to seek health care, particularly if they have no kin close by to help. Third, these labor demands in the presence of severe poverty may affect women's health directly through a negative impact on the nutritional adequacy of their diets. We suggest that these three kinds and levels of risk combine to produce the particular pattern of maternal mortality seen in Mongolia over the transition period.

Maternal Mortality in Post-Socialist Mongolia

Maternal mortality in Mongolia peaked during the most chaotic years of the transition (1992-1994) and remains higher than the pretransition rates. The degree to which maternal mortality rates reflect general macroeconomic conditions can be seen in Figure 2, where we plot maternal mortality rates (maternal deaths per 100,000 live births) and per capita GDP from 1990 to 1999. In 1990, the maternal mortality rate was 119. It increased dramatically to a high of 240 in 1994, and declined slightly to 175 in 1999. Rates during the socialist period must be interpreted cautiously, but show that maternal mortality was lower than at present, falling from 140/100,000 in 1970 to the rate of 119/100,000 in 1990.10 GDP fell dramatically from 1990 to 1994, then increased slowly, but remains much lower than pretransition levels (the per capita GDP in 1985 was about US\$1,800 in 1993 dollars; it is now about US\$360). As Figure 2 suggests, there is a strong inverse correlation of per capita GDP and maternal mortality. Controlling for the total fertility rate—which is a measure of "risk" associated with each pregnancy-GDP per capita explains 93 percent of the variation in maternal mortality between 1990 and 1999 (i.e., $R^2 = .93$).

In a global context, these data are not particularly surprising; maternal mortality rates tend to reflect the overall economic conditions within a country (Abouzahr et al. 1996). However, poor economic conditions in many of the countries studied globally also correspond with high fertility rates, limited access to reproductive health care including legal abortion, lack of education, and a lower social status for women (Abouzahr et al. 1996; Kobinsky 1995; Okonofua et al. 1992; Sundari 1992; Turshen 1999; Wall 1998).

In Mongolia, all else being equal, maternal mortality occurs in a social context that should otherwise be favorable to women's health. Although Mongolian women's access to education and careers outside the home has been compromised over the past decade due to rising levels of poverty and unemployment, in comparison with other nations in central Asia indicators of education and employment rates of women are highly promising, especially when compared with those of Mongolian men (ADB 2002). Mongolian women tend to marry and begin childbearing in their mid-20s; birth spacing is culturally desirable; and abortion is legally available, appears to be reasonably safe, and is widely sought even though in Mongolian terms it may be costly (the official abortion rate in 1998, which does not include many private abortions, was 20 percent of live births; Rak and Jaints 2004). As a result, the total fertility rate has dropped steadily over the past several decades to the present rate of 2.3 births/woman (the TFR in 1990 was 4.3). As we discuss further below, the vast majority of women continue to receive prenatal care, and nearly all births take place in medical facilities. These data suggest that the social, demographic, and institutional correlates of maternal mortality found in many poor and middle-income countries are not present in Mongolia.

Representatives of the Mongolia Ministry of Health and the World Health Organization interviewed in 2000 attributed the problem of maternal mortality to several interrelated factors that affect the quality and accessibility of health care, particularly in rural areas. They point to the closure of many maternity waiting homes, especially during the early years of the transition when government investments in health care declined rapidly. One consultant to the WHO suggested that much of the blame for high maternal mortality can be attributed to the inadequate training of rural physicians and midwives, coupled with the lack of emergency drugs and an overall disintegration of the health system. All interviewees suggested that a weakened communications infrastructure, the disintegration of the rural ambulance service, and a poor transportation system also contribute to the problem. Finally, an official in the Ministry of Health noted that substantial and increasing levels of underlying disease might contribute to the rates of complications and death. Women in Mongolia suffer from high rates of urinary tract infections and anemia (see Table 3 below, also UNDP 2000; WHO 1999). High rates of urinary tract infections may be explained in part by disturbingly high rates of sexually transmitted disease (UNFPA/MMOH 2001).

Officials noted that rates have improved since 1994 as a result of rebuilding and reopening many maternity waiting homes, improved supplies of emergency drugs, and concerted efforts by the government, supported by UNICEF and UNFPA, to train reproductive health care providers in managing reproductive and obstetric health problems.

In our review of documents and case records, we sought to examine these hypothesized determinants in greater detail. In Tables 2 and 3, we present information on all 217 maternal deaths recorded in Mongolia during the three-year period from 1996 to 1998. Attributions of cause of death (Table 2) were made in this case by physicians in the Ministry of Health, and are reported here as they were reported to us. Postpartum hemorrhage is the main direct cause of death, followed by underlying or "indirect causes" and eclampsia. Our review of the 1998 records suggests that underlying disease is increasing in importance as the attributable cause of death. Analysis of rural records suggest that eclampsia is more prevalent in rural than in urban areas. Physicians attribute these higher rates of eclampsia in rural areas to inadequate antenatal care and underlying urinary tract infections (Kidney disease), which they consider to be associated with "difficult conditions" and "cold" in the countryside.11 Other underlying causes include anemia, respiratory, and cardiovascular disease.

Published analyses of the most recent data (1999; these figures are not shown in Tables 2 or 3) by the Mongolian Ministry of Health indicates that 43 percent of deaths were attributed to underlying or indirect causes. These 1999 data also indicate high rates of anemia (47 percent) and urinary tract infections (32 percent) (Demberelasuren and Dorjpurev 2000). Corresponding to seasonal demands on women's labor in a high-risk economic environment, maternal mortality is greater during the highest stress period of February through July; 60 percent of all maternal deaths in 1996-1998 occurred during this period (Demberelasuren and Dorjpurev 2000).

Ministry of Health physicians attempted to come to a consensus regarding the relationship of inadequate health care and poor health care infrastructure to maternal deaths. Though antenatal care rates are quite high (the great majority of Mongolian women receive antenatal care by the second trimester), Ministry of Health physicians attributed most deaths to poor antenatal care (36 percent of deaths).

Our review of these records indicate that they typically provide little information on the specifics of this care provided and a judgment that there was some mistake made in assessing risk for later complications is, in our opinion, questionable. In about 20 percent of the cases, review of the medical

circumstances. Yet increases to maternal mortality rates since 1990 and documented changes to the rural economy and public health infrastructure suggest that economic reform at minimum exacerbates or amplifies the social factors that underlie maternal mortality in Mongolia and perhaps more importantly, will seriously impede attempts to prevent it.

Case Studies

Epidemiologic data outline only the rough edges of the problem. Ethnographic exploration of cases of maternal mortality—as seen from the perspectives of the spouse, other relatives, and health care providers—show how case-unique constellations of risks, in the context of individual and family decision-making, come together to produce this most tragic of events (e.g., Hay 1999). Such case studies have the potential to fill in the causal spaces left unfulfilled by crude nature of epidemiologic analyses and are particularly important to understanding the critical contextual factors that contribute to maternal deaths (Miller et al. 2003). The case studies of maternal mortality we have collected to date show how the causal pathways we identify above operate to create greater risks for and vulnerability of rural women. They also show how particular factors, operating at different social ecologic levels, coalesce to place women in danger.

Case 1

Dulamsuren, a very poor woman and migrant from the countryside to the provincial capital of Hovsgol, died in 2002. At the time of her death, Dulamsuren was 41 years old, and her occupation was indicated by her family doctor as being that of "housewife." Our assessment suggests that both she and her spouse were unemployed, poor, and often homeless. Dulamsuren had had six previous children. During the birth of the sixth child, there were several complications—edema and preeclampsia were noted, and after delivery, manual extraction of the placenta was required. After this birth, Dulamsuren said she wanted no more children, and was given an IUD. She had a history of problems with the IUD and finally, after six years of use, due primarily to pelvic inflammatory disease and associated pain, she asked to have the IUD removed. At the time, the province hospital's obstetrician who removed the IUD urged her to use another form of birth control. Her primary care physician gave her the same advice. For reasons that are unclear, Dulamsuren did not follow this advice and was soon pregnant again. She sought no prenatal care for this pregnancy. The family doctor discovered the pregnancy when she went to conduct a prenatal exam for Dulamsuren's 18-year old pregnant daughter. Because of Dulamsuren's history and age, and because Dulamsuren said that she did not want the child, the family doctor urged her to go to the province hospital for an abortion. However, by the time Dulamsuren collected sufficient funds for the abortion and returned to the hospital, she was told that her pregnancy was too advanced and that abortion was no longer an option.¹² Dulamsuren returned home and received prenatal care from the family doctor. As she came closer to term, she manifested symptoms of preeclampsia—high blood pressure and edema. Because of her age, history of complications, and the presence of these serious symptoms, the doctor urged her to go to the province hospital's maternity waiting home. However, initially because she did not have any record of having health insurance,¹³ and then because the province maternity waiting home had no beds at the time, Dulamsuren's admission to the hospital was delayed for over a week while the bureaucratic issues were resolved. Finally, she was admitted to the hospital about two days prior to going into labor. She was delivered via caesarean section, but suffered severe hemorrhaging. The hemorrhaging was eventually stopped by emergency surgery (there was a delay in finding the anesthesiologist), but hemorrhagic shock worsened because there was no blood infusion available at the province hospital. Dulamsuren died from hemorrhagic shock.

Case 2

records suggested that the physician or midwife made mistakes in handling the emergency, and in 12 percent of the cases, it is believed that the death might have been prevented had the doctor or midwife not delayed in referring the mother to a higher-level facility. Sixteen percent of the cases were attributed to difficulties women experienced in reaching a health care facility by virtue of the long distances she had to travel. The larger points to be drawn from this review are that: (1) only about half of the cases of death could be attributed to unanticipated emergent processes during labor and delivery (e.g., hemorrhage and eclampsia); (2) Mongolian women who died of maternal causes have high rates of underlying sickness, reflecting their overall poor health status (only 18 percent were considered free of underlying disease); and (3) medical system factors—primarily inadequate care provided by doctors and midwives—contributed to the death.

Table 3 describes the setting in which the death occurred and the sociodemographic status of the mothers. Delivery was more likely to occur in lower-level and rural facilities (county clinics, township clinics, or "fieldster" posts) or at home, although most deaths occurred in county or provincial level facilities (reflecting referral patterns from county to provincial hospitals in rural areas). Victims were primarily herders (49 percent), working class (14 percent), or were considered by their physicians to be unemployed outside the home ("housewives," 27 percent). Most victims had a middle school or higher level of education, reflecting the overall high literacy rates in Mongolia. Finally, and consistent with the global epidemiology of maternal mortality, the risk of dying is greatest for primigravids and women who have four or more pregnancies; together these account for more than half of all mortality.

In a separate analysis, we examined the geographic distribution of maternal mortality (Table 4). Our intent was to discover whether the risk for mortality correlated with regional differences in ecology and impact of economic reforms we describe in the preceding section. As expected, rates of mortality are significantly higher in the western part of the country. Western Mongolia is more mountainous, is more prone to severe winters, has the least developed transportation infrastructure, and has the least favorable economic conditions. In the very far west, there are Kazakh communities where the risks for maternal mortality are high. As indicated in our epidemiologic analysis of mortality during the four-year period of 1995 to 1998, women at significantly highest risk for death are those who live in the western regions of the country, especially in the most rural regions; are under 19 years of age or over the age of 35; and are herders.

In summary, our epidemiologic analysis of maternal mortality records suggests that maternal death is the result of a web of factors, operating at different levels, and are related to or consistent with macroeconomic changes wrought by neoliberal reform. In our search for the nexus where macroeconomic factors affect specific constellations of individual risks (Dunn and James 1986), we recognize two possible causal pathways. The first identifies the consequences of declining government investments in health care, specifically as these relate to the degradation of the health care system's ability to provide adequately for women's health. The importance of this pathway is suggested by the large proportion of causes attributed to health system factors: inadequate care, delays, poor skills, and compromised or degraded infrastructure. The second operates through the more diffuse impact of economic reform on the practice of pastoralism in the rural countryside, raising the levels of economic risk borne by individual households, increasing poverty and social inequality, and exacerbating the insecurity and vulnerability of women. The salience of this pathway is reflected in the sociodemographic and geographic patterning of maternal mortality and in the high rates of underlying disease among the cases of death. Poverty is likely the common denominator here.

Not all maternal mortality is related to neoliberal reform, and we do not intend to suggest such a unicausal relationship. Providing adequate health care in remote, rural regions where there is a poor transportation and communication infrastructure is a significant challenge under the best of

any assistance, economic or otherwise. We believe that this breakdown in social support systems is a casualty of the disordering of traditional social relations, first during the postwar period of radical collectivization, and later during the period of economic and social chaos that accompanied privatization (Griffin et al. 2001; Humphrey and Sneath 1999).

Third, their interactions with the health care system illustrate a cascade of failures-failure to act on medical advice (which may or may not be determined by their poverty), failure to seek health care when confronted with serious symptoms, and failure of the health system to provide adequate or timely emergency care. As we have discussed, poor quality health care and a weakened communications and transportation infrastructure are some of the casualties of the decline in government support for rural development and health care.

Fourth, many cases of maternal mortality illustrate how heavy labor demands in the rural economy underlie the risks previously cited. These demands have increased with the decline of cooperative production and the need for now economically independent households to maximize production when and wherever possible in order to minimize risk in a difficult environment.

Conclusions

In just over ten years, neoliberal economic reform and the retreat from social investment have had significant consequences for Mongolian women and their families. Maternal mortality has increased, particularly among rural populations in the west where privatization, economic chaos, and eroding infrastructure have combined to produce a large number of economically vulnerable households. For the first time in many generations, herding households have been forced to rely exclusively on independent, subsistence-oriented production. They have become increasingly vulnerable to disease and ecological perturbations and have suffered marked reductions in access to quality health care, education, and essential goods and commodities. A high degree of variability in access to resources, and hence, social inequality, now marks the rural landscape.

Women, chief architects of the household production of health, particularly their own, suffer under these circumstances. They may not have the resources in either money or time to invest in their own health. As a result, their level of overall health is compromised. Women who are at the greatest risk of dying in pregnancy and childbirth share the following characteristics: they are poor, have lower levels of education, are herdswomen or housewives, live in remote rural areas, are the youngest mothers, or have had many children. They die from hemorrhage, from many underlying or indirect causes, and from eclampsia. They die at home or in lower-level facilities with limited emergency drugs or equipment. They die because many social, economic, cultural factors lead them to postpone the call to a doctor, because poor infrastructure limits their ability to get health care on time, and because available medical personnel cannot cope effectively with the emergency. And finally, they die because in the frenzy to produce the ideal neoliberal state, the policy of economic reform implemented by government and its international allies did little but produce widespread poverty, inequality, and a radical decline in investment in human capital. In Mongolia, the strategies devised to create "free" markets have also created a population of vulnerable, sick, and dying mothers.

NOTES

1. The causes of maternal deaths fall into two groups: direct and indirect obstetric causes. Direct obstetric deaths are those resulting from obstetric complications of the pregnant state and are the same worldwide: hemorrhage, sepsis, eclampsia, obstructed labor, and complications of abortion. Indirect obstetric deaths are those resulting from previous existing disease, or nonobstetric diseases that arise during pregnancy and are exacerbated by the physiologic effects of pregnancy (Abouzahr et al. 1996). These include such things as anemia, cardiovascular disease, hepatitis, diabetes, and tuberculosis.

Enkhtuya was a herdswoman in the central province of Tov, within a day's travel of the capital, Ulaanbaatar. At the time of her death in 2001, she was 35 years old and pregnant for the fourth time. During this pregnancy, she was diagnosed by a county-level physician as suffering from a cardiovascular anomaly, probably (though not definitively) of congenital origin. The midwife who supervised her prenatal care advised her to give birth in a maternity house in Ulaanbaatar organized to provide care to women experiencing high-risk pregnancies. However, Enkhtuya refused to go because her husband had gone to Ulaanbaatar to try to sell some animal fur for desperately needed cash, and she needed to stay at home with two of her children, who at the time were eight and ten years old. When she went into labor, she traveled to the county clinic where she had received prenatal care. The county clinic was ill equipped to deal with cardiovascular complications. Enkhtuya died suddenly during childbirth from heart failure.

Case 3

Norjmaa was a herdswoman in Gov-Altai province. At age 33, she became pregnant for the fourth time. In October 2001, pregnant about 30 weeks, she walked some distance into the mountains to cut wood for the coming winter. According to her husband, she collected and carried a large quantity of firewood back to the family home. This effort apparently resulted in placental abruption and she began to hemorrhage. The woman did not tell anyone, but her husband noticed her hemorrhaging and sent his brother to get help from the midwife who worked in the county hospital. The midwife arrived within four hours, but Norjmaa was already in deep hemorrhagic shock, and nothing could be done to save her.

Case 4

Tsetseg was a herdswoman from a very remote county in the western province of Arkhangai. At the time of her death in 2001, Tsetseg was 24 years old and experiencing her second pregnancy. When she was about 32 weeks pregnant, she went into labor and gave birth prematurely at home. Her husband attempted to make a call from the nearest township center to the county hospital at 11:30 p.m., but because the county post office was closed the call did not go through. The husband was eventually able to contact the hospital at 9:00 the next morning. However, the hospital ambulance was out of fuel, and it took one and a half hours to find sufficient money and fuel for the driver to make the trip. It took about five hours of driving to reach the woman's home. By the time the ambulance arrived, Tsetseg had died from hemorrhage.

In each of these cases, and in the many others we have collected, it appears that women die as a result of highly unique constellations of factors, some preventable, some not. Although a focus on individual cases does not always reveal links to higher-order, contributing causes for example, economic transformation to the rural economy, we believe that these cases are suggestive of the etiologic importance of four processes, acting singly or in concert, that link these cases to the macroeconomic and macrosocial factors identified in this article.

First, women who die in childbirth are economically marginal: they are invariably poor, often desperately so. While many rural women and their families were probably economically disadvantaged during the socialist period, particularly in comparison with urban and bureaucratic elites, it is doubtful that they suffered the depth and severity of poverty that is now virtually commonplace throughout Mongolia (ADB 2002; Griffin et al. 2001; UNDP 2000).

Second, victims are often socially marginal. They lack an integrated and well-functioning social support system: their spouses may be absent, abusive, and/or alcoholic; their living situations are characterized by instability, and their relatives may be absent or unable and/or unwilling to provide

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2. The tenth revision of the international statistical classification of diseases (ICD-10) defines a maternal death as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
 3. Maternity waiting homes were residential facilities attached to county-level hospitals throughout rural Mongolia. Pregnant women would be brought to stay in the homes weeks prior to term, and would stay for weeks after birth. This process ensured that mother and child had access to basic medical care prior to, during, and after birth (Figa-Talamanca 1996).
 4. Over the period of 1990-1992, about 3,000 enterprises of various sizes were privatized. Initially, privatization was accomplished via the distribution of vouchers, although after 1996 it was largely via cash sales at public auctions. The voucher system was used to ensure a relatively equitable distribution of assets and to avoid the concentration of wealth in the hands of well-positioned elites (which came to be known to some as "crony capitalism") that characterized economic reform in the states of the former Soviet Union and some eastern European countries (see, e.g., the works by Wade [2000] and Vaidya [2001]). However, due to a lack of public education, and from confusion in its implementation, the voucher system was not completely successful in preventing inequitable privatization.
 5. The "depth" of poverty is the percentage that the average poor person's income is below the poverty line. The "severity" takes into account income distribution within the poor, giving more weight to those who are furthest from the poverty line. These increases correspond to the increasing income inequality referred to in the text.
 6. Winter disasters, or dzud, are abnormally cold and/or snowy winters that follow dry summers. Livestock, already weakened by the scarcity of grass during the summer, may die in great numbers as a consequence of extreme cold, or when snow covers what few grasses remain.
 7. The so-called tragedy of the commons is not inevitable if there are customary social and economic mechanisms in place that regulate access to productive resources. Unfortunately, these mechanisms were displaced by economic reform and have yet to be reconstituted.
 8. Generally speaking, to be reasonably self-sufficient, a rural household with four-six members requires about 100 animals. This number provides a buffer for difficult years and sufficient numbers to trade or sell for essential commodities when needed.
 9. In the summer of 2002, we interviewed the heads of 24 rural households on the subject of household economics and access to health care (James 2003). Most of these households depended either solely, or in part, on herding. We discovered a high degree of economic inequality even among households of herders in close proximity. In one area of southern Hovsgol province, we interviewed a household that owned over 1,000 animals. They employed members of several other much less prosperous households. The cash income from the sale of cashmere permitted the family to buy several motor vehicles, which they used to transport animal products to market in Ulaanbaatar and which they hired out to less-fortunate households. A few kilometers away, we interviewed a female herder and her household that had lost what few animals they had to the winter disaster of 2000. They survived with the help of neighbors, but it did not seem likely that they would be able to remain in the countryside. Maternal mortality rates varied during the socialist period from a high of 140/100,000 in 1970 to 120/100,000 in 1989. However, Mongolia did not use the ICD-10 methodology in calculating maternal mortality rates, so pre-transition rates are probably not comparable to post-transition rates. These figures are thus not included in the tables or figures presented in this article.
 11. The reportedly high rates of kidney disease, and the attribution of this disease to "cold," may reflect Tibeto-Mongolian humoral thinking. Western researchers have been puzzled by the purportedly high rates of nephritis, particularly in the absence of diagnostic testing.
 12. Several physicians noted the serious consequences of restricted access to abortion services by poor women. Reported one family doctor, "By the time a woman collects money for an abortion, the safe, first-trimester period for the procedure has already passed, and a woman must then collect money for the pregnancy termination in the second trimester of pregnancy, which is three times as expensive as the price of medical abortion in the first two months. And by the time she collects enough money for the later termination of pregnancy, it is already time to deliver the baby."
 13. Mongolia adopted a national health insurance system in 1994 (see James 2003). Dulamsuren, as a pregnant woman, is enrolled under this system for free health insurance. However, she is required to apply for such insurance and to present proof of insurance when seeking health services. Health insurance requires proof of residence, which is sometimes difficult for the very poor who are either homeless, move from one relative's residence to another's, and do not take the steps necessary to establish legal residency.

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Table 2
Attributed direct and indirect causes of death, cases of maternal mortality, Mongolia 1996-1998.

Main causes:	No. of cases	% of cases
Postpartum hemorrhage	86	39.6
Indirect causes "extragenital diseases"	60	27.6
Relapsing	35	16.1
Sepsis	18	8.3
Rupture of the uterus	6	2.8
Ectopic pregnancy	4	1.8
Abortion complications	1	.5
Other causes	5	2.4
No data	2	1
Contributing factors:		
Poor antenatal care	79	36.4
"Inadequate skills" of doctor or midwife	43	19.8
Long distance from medical care facilities	35	16.1
Late referral to a doctor or midwife	26	12.0
"Irresponsibility" of doctors and medical staff	7	3.2
Shortage of drugs	5	2.3
Delay of ambulance	4	1.8
No clear contributing factor	3	1.4
No data	15	6.9
Underlying disease present in mortality cases (some cases had more than one diagnosis)		
Kidney and urinary tract	64	29.5
Anemia	34	15.6
Respiratory	30	13.8
Cardiovascular	22	10.1
Liver	21	9.7
Gastrointestinal	9	4.1
Infectious	6	2.7
Tuberculosis	5	2.3
Neurological and psychiatric diseases	5	2.3
No underlying disease noted	40	18.4
No data	28	12.9

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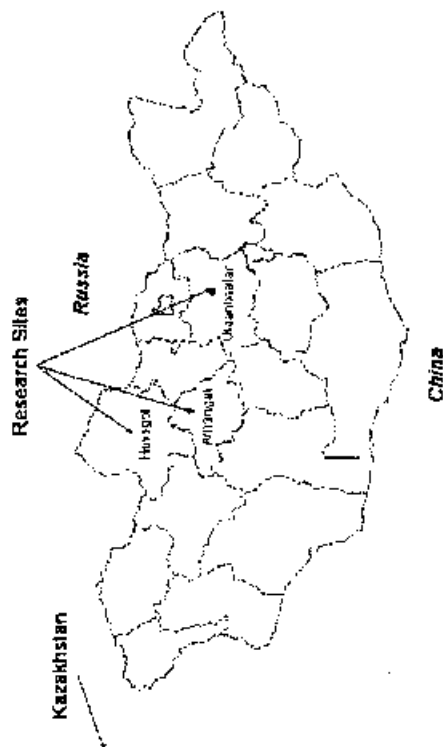


Figure 1
Map of Mongolia showing research sites.

Table 1
Economic output, inflation, and personal incomes, Mongolia, 1989-2000.

Year	GDP (Index: 1989 = 100)	Per capita income (US\$ at 1993 prices)	Rate of inflation (% change in the consumer price index)
1989	100.0	1,643	0.0
1990	97.5	1,245	0.0
1991	88.5	617	152.7
1992	80.1	478	325.5
1993	77.7	328	183.0
1994	79.5	334	66.3
1995	84.5	329	53.1
1996	86.5	445	84.6
1997	89.4	467	20.5
1998	92.5	426	6.0
1999	95.3	374	10.0
2000	96.5	8.1	8.1

Source: Griffin et al. (2001:2).

Table 3
Description of maternal deaths, Mongolia, 1996-1998.

Indicator	Cases (217)	% of Cases
Mother's residence		
Cities	19	8.8
Aimags (provinces) centers	24	11.1
Suaim (county or district) centers	80	36.9
Biag (township or community)	90	43.3
Where delivery occurred:		
Maternity houses in cities	23	10.6
Aimags hospital's obstetrical department	57	26.3
Suaim hospital	74	34.1
Feldsher's department	4	1.8
Home	26	12.0
Others	33	15.2
Where death occurred:		
Maternity houses in cities	31	14.3
Aimags hospital's obstetrical department	72	33.2
Suaim hospital	83	38.2
Feldsher's department	5	2.3
Home	20	9.2
Others	6	2.8
Educational level of mothers:		
College	8	3.7
Opportunity school	5	2.3
High school	129	59.4
Middle school	56	25.8
Elementary school	19	8.8
None	0	0
General occupational status of mothers:		
Blue-collar worker	31	14.3
Herdsman	107	49.3
Office worker/professional	16	7.4
Student	4	1.8
"Housewife"	59	27.2
Age-specific mortality		
15-19	18	8.3
20-24	58	26.7
25-29	45	20.7
30-34	37	17.1
35-39	39	18.0
40-44	14	6.5
45-49	2	.9
Age unknown	4	1.8

Table 4
Relationship of residence and sociodemographic factors to maternal mortality, Mongolia 1995-1998.

Residence	Maternal deaths	Women giving birth	4-Year incidence rate	Rate ratio 95%CI
Western provinces	208	102,686	0.001322	1.53 (1.23, 1.90)
Eastern & central provinces	134	101,363	0.001326	1.0 (ref)
Pastoral (most rural) zones	248	111,427	0.002234	2.17 (1.71, 2.75)
Living elsewhere	94	91,622	0.001027	1.0 (ref)
Age				
15-19	29	16,362	0.001772	1.33 (0.9, 1.96)
20-34	225	169,132	0.00133	1.0 (ref)
> 35	88	19,349	0.004548	3.41 (2.66, 4.36)
Occupation				
Herding	169	77,614	0.002182	1.59 (1.29, 1.97)
Other	173	126,435	0.00137	1.0 (ref)

The 1995 cases we include in this analysis lacked sufficient information on the cause of death to be included in Tables 2 and 3. However, there was sufficient information present to determine residence, age, and main occupation of the deceased to be included in this ecological analysis of mortality incidences.

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