

Changing Human Populations in Post-Soviet Kamchatka: An Integrated Study of Shifts in Fertility and Net Population

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We expect population changes to be closely tied to resource abundance or scarcity. Here, I demonstrate a clear relationship between the widespread socio-economic crisis of the post-Soviet period and declining population patterns in central Kamchatka. These broad patterns, however, vary among populations, reflecting particular interlinked socio-economic, ecological, and historical conditions. More dramatic decline is observed in areas where the socio-economic crisis has coincided with a local natural resource crisis. Analyzing population shifts in the context of local circumstances, this paper corroborates the link between resource conditions and changes at the family level.

KEY WORDS: population decline; resources; population growth rate; general fertility rate; early (but low) fertility; indigenous fertility; post-Soviet period; Kamchatka Peninsula.

INTRODUCTION

A vast literature of empirical evidence demonstrates how resource abundance and variation influence people's decisions concerning family formation. The core components of population change are linked to environmental conditions at the family level (e.g., Low & Clarke, 1992, p. 487), but exactly how the links operate varies. Here, I explore the relationship between resource patterns and population patterns in post-Soviet rural Russia. I argue that certain predictable ecological rules underlie fertility and

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population growth trends; such rules pose similar constraints for people everywhere.

Specifically, when examining individual and familial fertility patterns, both behavioral ecologists and demographers typically find *growth* (through both births and in-migration) in resource rich times and places, and *stagnation* in resource-constricted situations (e.g., Clarke & Low, 2001; Lee, 1990; Low, 2000, 2001; Low, Simon, & Anderson, 2003). Moreover, a large body of studies on non-human species and traditional human societies, including the Yanomamo, the Ache, and the Mukogodo (review in Low, 2000), supports this hypothesis.

This hypothesis does not discount the significant impact of historical, socio-economic, cultural, and political factors, particularly those observed in the modern world. Likewise, it does not imply a ubiquitous normal positive relationship between resources and fertility. Modern fertility patterns, for instance, sometimes exhibit an inverse relationship in which fertility declines as resources increase. Western Europe, with its very low fertility, is a classic case of this novel situation. To a large degree, modern declining fertility trends signify people's decision to have few children, but to commit more resources to each child (Borgerhoff Mulder, 1998; Low, 2000, 2001; Clarke & Low, 2001).

I further investigate how socio-economic, ecological, and historical conditions create patterned variation in fertility and mortality. These aspects have been paramount in shaping local economies and people's lives in my central Kamchatkan study site, particularly when the post-Soviet restructuring of the previous social and economic order spurred a remarkable transformation¹ period in Russia. It is against this backdrop that I briefly introduce Russia's current demographic situation with an emphasis on fertility trends.

Post-Soviet Fertility Patterns

Throughout Russia, demographic patterns have changed dramatically in the post-Soviet period. The country's total fertility rate declined rapidly in the 1990s, due in large part to deteriorating economic conditions (Anderson, 2002, p. 445); at the same time, mortality rates climbed (Williams, 1996, p. 57). Russia today is characterized by one of the lowest population growth rates in the world.

Clearly, this trend is not due to rapid economic growth and rising per capita income throughout the population, two factors commonly believed to slow or halt population growth (Fernandez-Villaverde, 2001, p. 2). Moreover, it is unusual in a country where women typically marry and give

birth to their first child at earlier ages than their Western counterparts (Zakharov & Ivanova, 1996), a trend that became more apparent after the 1980s pro-natalist policies in Russia (Zakharov, 1999, p. 43).

Falling fertility and rising mortality are also observed on the Kamchatka Peninsula, in the Russian Far East. However, several factors contribute to a unique demographic situation on Kamchatka. First, the countrywide socio-economic crisis has proven more debilitating for Kamchatka than elsewhere. The abrupt removal of government subsidies following the dissolution of the Soviet Union translated into precipitous price rises, due to the high costs of transporting essential goods and materials (e.g., fuel) to this former frontier region.

Finally, up until the end of the Soviet Union, the average age on Kamchatka was lower than elsewhere in Russia, due to high in-migration of young, working-age people (Hitztaler, this issue). Thus, the abrupt fertility decline beginning here in 1992 is striking, considering the comparatively high proportion of people who were in their prime childbearing years at this time.

HYPOTHESES AND PREDICTIONS

A vast resource base subject to low pressure (e.g., low population density) typically allows people to obtain abundant resources (e.g., Low, 1991, pp. 415–416). Individuals respond to such an environment in their fertility decisions, which should result in larger family size. Conversely, when this base is exhausted and resources become restricted, people may choose to have fewer children, to maximize effective allocation of resources that they have (e.g., Becker, 1981; Easterlin, 1978; Low et al., 2003). Closely tied to availability of ecological resources, economic resources are vital for family formation and population growth. I predicted the following:

- (1) Fertility and population growth rates should decline throughout my study site in central Kamchatka, in response to the pervasive post-Soviet socio-economic crisis in Russia.
- (2) Despite proximity to one another and a shared Soviet legacy, distinct socio-economic, ecological, and historical factors characterize each village or region. Thus,
 - (a) patterns of fertility and growth rate decrease should exhibit some variation.
 - (b) Specifically, decline should be more pronounced in villages depending on extractive (logging) activities that have

exhausted the local resource base. Decline should be less dramatic in villages with more intact resources, and in those with deeper historical roots.

- (3) The current socio-economic crisis should also result in lower fertility levels among indigenous peoples, who form a considerable portion of the population in one region within my study site.

Description of Villages in Central Kamchatka

Clustered in the heart of the Kamchatkan Peninsula, my study site encompassed the villages of Kozyrevsk, Atlasovo, Esso, and Anavgai (the latter two are referred to collectively as the Bystrinsky Region throughout this paper).² Because an area's unique setting in time and space is central to resource acquisition, I sketch a brief history below of each village (or region), particularly the initial economic activities and ensuing settlement tendencies that have defined these areas in the 20th century. Current ecological forces are discussed in more detail in Hitztaler (this issue).

Officially established in 1928,³ Kozyrevsk is one of the first, and most stable, logging villages in the central Kamchatka River valley. Logging began in and around this village using low-technological, labor-intensive practices that resulted in selective timber harvesting. Following World War II, the advent of powerful new equipment changed the face of logging here. It also set an important precedent in forest exploitation for new logging villages, such as Atlasovo, founded nearly a half-century later in 1961.

In both Kozyrevsk and Atlasovo, forestry sector employees recall that timber harvesting during the peak years of production in both villages was fundamentally similar, driven at a frenetic pace to fulfill the all-important Five-Year Plan set in Moscow. No nature conservation provisions were written into these cyclical plans; instead, workers were instilled with the Soviet philosophy of taming and manipulating nature to build a bright Socialist future. Nonetheless, forest use in Atlasovo acquired a more pervasive character, driven by an expanding technological base, resource accessibility, and heightened demand (Hitztaler, 2003, p. 38) from its beginnings.

In the Bystrinsky region, situated in the mountainous region that abuts the Kamchatka River valley to the west, the forestry sector plays only a secondary role. Today the village of Esso, established on the site of an indigenous reindeer camp in 1932, serves as the regional center; it offers steady employment in various official posts. This region was officially created in 1926 as an ethnic territory whose original dwellers were the Even peoples, and later, a small contingent of the Koryak peoples (Murashko et al., 1993, p. 66). Both groups practiced nomadic livelihoods of reindeer

herding and hunting that were collectivized during the Soviet period. The collapse of these state collectives after the dissolution of the Soviet Union, however, has deprived most indigenous peoples in this region of their former way of life.

MATERIALS AND METHODS

Sample and Data Analysis

The sample for this study consists of population data from Atlasovo, Kozyrevsk, and the Bystrinsky Region (Esso and Anavgai) during the post-Soviet period (1992–2002). In some cases, earlier data (late 1970s, mid-1980s) are included for comparison. The data contain aggregate numbers for each village; there are no data for individuals (with the exception of a detailed set from the Bystrinsky Region that includes mother's age for all births in 1991 and 2000). I analyze death rate per 1000 people; births per 1000 women⁴ and general fertility rate (Palmore & Gardner, 1983), net population growth rate; and for the Bystrinsky Region, mothers' age at birth.

Net Population Growth Rate

This analysis is based on the growth rate, calculated from the crude birth and death and net migration rates (Hitztaler, this issue) for each village or region. Expressed per 1000 population, the growth rate facilitates comparisons among the populations. To calculate the components of population growth for each village, I used in- and out-migration, and birth and death, numbers in conjunction with the overall population numbers for each village. These numbers made it possible to calculate in- and out-migration, and crude birth and death rates per 1000 population. I then employed the following formula to determine the growth rate in each village (see Anderson, 2002, p. 441): $GR = CBR - CDR + Immig - Emig$ where:

GR = Growth rate between Times 1 and 2

CBR = Crude birth rate (births per 1000 population) between Times 1 and 2

CDR = Crude death rate (deaths per 1000 population) between Times 1 and 2

Immig = Gross immigration rate (immigrants per 1000 population) between Times 1 and 2

Emig =Gross emigration rate (emigrants per 1000 population) between Times 1 and 2

Variation in Village Samples

I collected demographic data during the summers of 2001 and 2002. Although my study overlapped with the 2002 nationwide census in Russia, I could not obtain the new census data in time to incorporate them here. Data used in this study originated from the Kamchatka Oblast Committee of Governmental Statistics, and from village administrative offices. Three of the four villages in this study are located in different regions, or districts, with different administrations, making fully systematic data difficult to obtain. Consequently, some gaps in the data were simply unavoidable. For instance, analogous data on sex of births in 1991 and 2000, plus age and nationality of parents, were not available for the villages of Atlasovo and Kozyrevsk. Also, because data were typically available on a fee-only basis, I was limited in the quantity that I could acquire, particularly in the Bystrinsky Region.

Finally, it is likely that the data I collected are not fully accurate: general upheaval and financial constraints in the institutions responsible for data collection, in conjunction with general instability among the population, may have resulted in some inconsistencies among data sources. Nonetheless, these data reflect unmistakable patterns of the changing demographic situation in post-Soviet Kamchatka.

RESULTS AND DISCUSSION

These data provide a snapshot of demographic trends in central Kamchatkan villages. Deteriorating economic conditions have been particularly perceptible in Russia's rural areas, such as my study site, where people do not have the same access to better housing, cultural, transportation, and professional opportunities as do their urban counterparts (Williams, 1996, p. 66). The patterns I examine in central Kamchatka are congruent with overall demographic trends on Kamchatka; however, they also reflect variation across specific village conditions.

Crude Birth and Death Rates

Data for all villages reveal an abrupt fall in births, and an increase in deaths, in the post-Soviet period. The crude birth and death rates for the

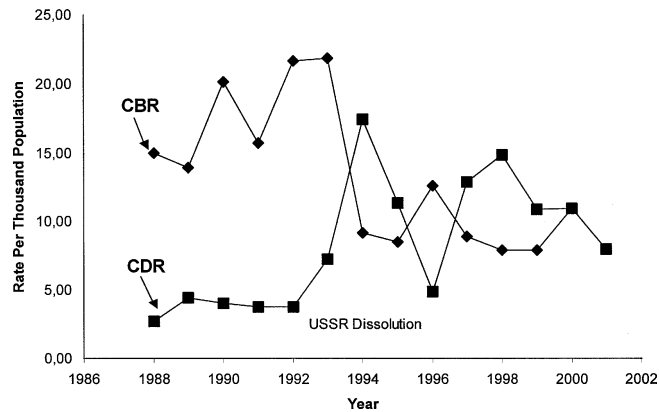


FIGURE 1. Crude birth rate (CBR) and crude death rate (CDR) in the village of Atlasovo. This figure represents a rare phenomenon that has occurred throughout central Kamchatka and Russia: the crossing of crude birth and death rate lines.

village of Atlasovo (see Figure 1) illustrates a rare occurrence, observed in all the villages: birth and death lines cross (in both Atlasovo and Kozyrevsk these lines cross in 1994). This striking trend mirrors that for Russia as a whole (Anderson, 2002, p. 442).

Although decreasing birth and increasing death rates prevail throughout central Kamchatka in the 1990s, these patterns vary from village to village. In Atlasovo, the birth rate rose slightly in 1992 before beginning a steady downward slide that reached its low in 1995. The number of births in Kozyrevsk dropped in 1992, but in 1993 these numbers rose before steadily declining to a low point in 1997. Smaller upturns in births are clear in 1995 and 1999.

Although data are missing from the early part of the 1990s for the Bystrinsky region, the birth and death numbers obtained for 1991 and 2000 strongly suggest a decline in births and an increase in deaths. Data available for the mid-to late 1990s reveal a cyclical pattern in the number of births that reached a peak in 1998, before decreasing in 2000.

The crude death rate also varied dramatically in these villages. After a 1994 peak in Atlasovo, it dipped to a low point in 1996; in Kozyrevsk, the number of deaths fell in 1994 before abruptly rising in 1996. Deaths in the Bystrinsky region hit a peak in 1997, fell in 1998, and rose again in 1999 to a level that persisted through 2000.

The cyclical mortality patterns observed in all villages roughly resemble those of other populations. For instance, in an analysis of

demographic responses to economic crises in historical and contemporary populations, Lee (1990, p. 6) notes that mortality rates typically remain high for 2 years before dipping below the normal level. The mortality rate then declines because fewer weak and older people remain in the population.

Fertility Patterns

Births per 1000 women. In response to the Soviet collapse, and loss of subsidies, the most drastic declines in the general fertility rates (births per 1000 women) occurred in Atlasovo and Kozyrevsk, although at distinctly different times (see Figure 2). From 1993 to 1994, the general fertility rate dropped from 85 per 1000 women to 39 in Atlasovo; in Kozyrevsk it fell from 57 per 1000 women to 36. The extreme decrease in Atlasovo during this time period was more than twice that in Kozyrevsk, which experienced its largest fertility decrease later, in 1999–2000 (when births per 1000 women dropped from 43 per 1000 women to 19).

Fewer fertility data are available for the Bystrinsky region, so it is more difficult to detail post-Soviet changes in fertility patterns. Data from 1991, however, allow delineation of general trends; fertility was markedly higher than in 1998–2000 (see Figure 2). The general fertility rate rose from

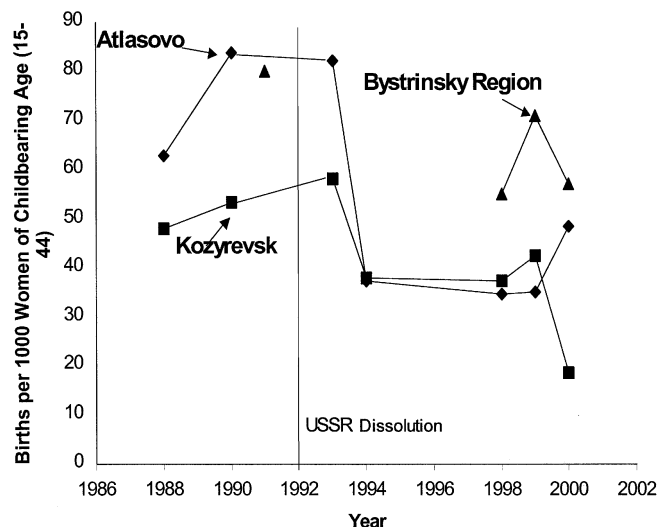


FIGURE 2. Births per 1000 women of childbearing age (15–44). (Data from 1992–1997 for the Bystrinsky Region are missing).

1998–2000 (peaking in 1999); at all times, however, it was nonetheless lower than its 1991 level (see also Hitztaler, 2003, p. 98).

Number of childbearing women (ages 15–44). Resource availability not only influences people's fertility decisions directly, but also acts indirectly on fertility, by spurring people to move from poorer to more favorable environments. An outmigration of people (see Hitztaler, this issue), particularly women of childbearing age, can lead to reduced fertility levels. It is probable that the fertility decline in central Kamchatka resulted in part from the departure of women of childbearing ages (15–44). In this section, I examine changes in the age structure of childbearing women.

Considering Kozyrevsk's comparatively larger population numbers, Atlasovo's loss of population dwarfs that in Kozyrevsk.⁵ The greatest decrease in women of childbearing age occurred earlier in Atlasovo than in Kozyrevsk. During the periods 1990–1994, Atlasovo lost 110 women, whereas Kozyrevsk lost 104 women later, from 1994–1998. During these periods, as people were leaving, there were also record low birth numbers in each village: nine births in Atlasovo (1995), 11 births in Kozyrevsk (1997).

These data suggest a logical link between the loss of childbearing women and reduced fertility levels. The rate of change in births per 1000 women, however, still is greater than would be expected from the change in the number of childbearing women in all three cases (Hitztaler, 2003, pp. 101–102). Moreover, there was not an even decrease across all groups of childbearing women: the number of women in the age groups 15–19 and 20–24 actually steadily grew in Kozyrevsk and in the Bystrinsky Region from 1990 to 2000. In Atlasovo, these numbers decreased negligibly.

Early but low fertility. Given the early ages of women at marriage and first birth throughout Russia (Zakharov & Ivanova, 1996), the declining general fertility rates in central Kamchatka during the post-Soviet period are particularly noteworthy. Data from the Bystrinsky Region on mother's age for all births in 1991 and 2000 corroborate continued early age at first birth. Remarkably, the percentage of all women in the 15–19 and 20–24 age groups giving birth increased by 25.52% and 39.45%, respectively, from 1991 to 2000 (see Figure 3).

Among non-indigenous women (primarily ethnic Russian and Ukrainian) in the 20–24 age group, there was a marked increase in the proportion of women who gave birth (+71.58%). This contrasts with a small decline among indigenous women (–5.7%) (Figure 4). Patterns for the 15–19 age group were similar (25.74% for indigenous women, 22.54% for non-indigenous women). These findings are in striking contrast to aggregate country data, which indicate a more even distribution of births by age from

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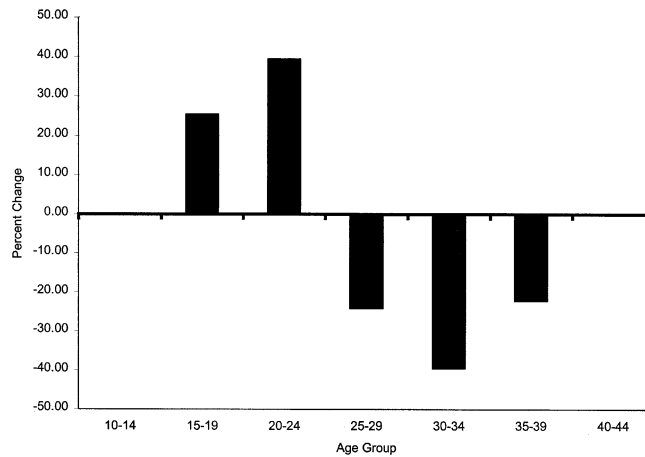


FIGURE 3. Changes in the Bystrinsky Region in age-specific patterns of births per 1000 women of childbearing age (15–44). Note that women’s responses included an increase in early births, and a large decrease in births to older women.

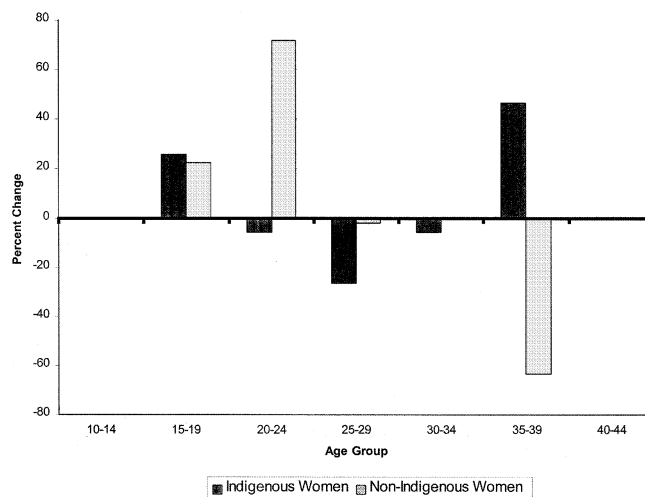


FIGURE 4. In the Bystrinsky Region, patterns of age-specific births per 1000 women of childbearing age (15–44) changed both for indigenous and non-indigenous women, but the magnitude of changes differed.

1993 to 1996 (Zakharov, 1999, p. 56). Zakharov contends that this shift verifies Russia's move to adopt Western trends during a period of transformation (Zakharov, 1999, pp. 49, 56). Clearly, further regional analyses would help clarify the picture.

Personal observations and conversations with women further confirm the preservation of early age at birth in Kamchatka. I often met women who were grandmothers in their early 1940s. The reasons women gave for early birth were varied, including greater physical stamina to take care of children and grandchildren, and to have a safeguard in mid-life and old age. Here, discounting of the future is evident: women see only a narrow window of opportunity to give birth, believing they will miss their chance if they wait too long.

Although I could not collect analogous data on mother's age at birth for Kozyrevsk and Atlasovo, I expect general patterns of early age at birth similar to those among women in the Bystrinsky Region. This phenomenon of low fertility, coupled with young birth age, has singled Russia out among First and Third World countries (Zakharov, 1999, p. 45).

Net Population Growth Rate

Comparing the growth rates of the three villages (see Figure 5), it is evident that the greatest negative growth rate occurred in Atlasovo in 1994, when the village's net migration rate bottomed out and the lines for the crude birth

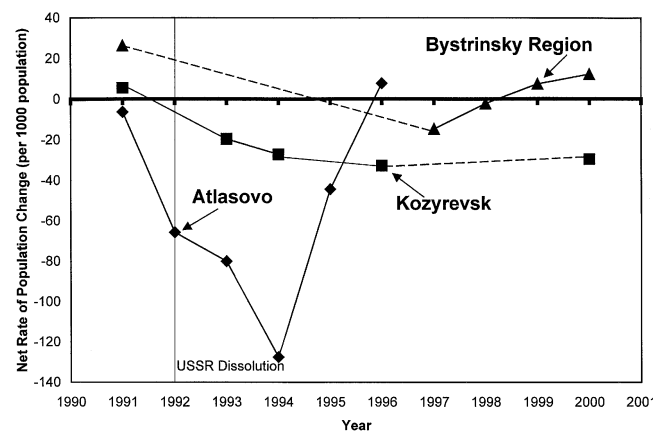


FIGURE 5. Net population growth rate. (Dashed lines indicate missing data).

and death rates crossed. Slight positive growth followed here in 1996, when net migration hit zero and there was a positive natural increase in the population.

In direct contrast to Atlasovo, Kozyrevsk's greatest negative growth rate occurred in 1996, reflecting comparatively large downward slides in both net natural population growth and net migration rate. Also, whereas the growth rate in Atlasovo began to increase following its 1994 low, it appears to decline steadily in Kozyrevsk, where the crude birth rate hit an all time low of 8 per thousand women in the year 2000.

Finally, there is a notable difference in the population growth rates for Kozyrevsk and the Bystrinsky Region in 2000, when Kozyrevsk experienced its second lowest growth rate. In the Bystrinsky Region, however, according to available data, the growth rate reached a post-Soviet high during this year. This upturn in growth rate is a recent phenomenon, especially considering the overall population decline throughout Russia in the 1990s (Anderson, 2002, p. 441).

Fertility Variation in Time and Space

In central Kamchatka, women have responded to a resource-crisis period by having fewer children, postponing births, or forgoing children altogether. Undoubtedly, the outflow of childbearing women from this region has helped curb fertility. This alone, however, cannot account for the fertility decline in this area, which suggests that resource scarcity (both economic and ecological) strongly influences people's fertility decisions. Put another way, the predilection to secure resources has evolved in humans (and other species) as a way to increase lineage success (e.g., Strassmann & Clarke, 1998, p. 46).

Analyzed together, post-Soviet fertility and migration choices have vividly influenced population processes in central Kamchatka. In particular, they have greatly suppressed the population growth rate, which has been primarily negative during this period. Anecdotal evidence also testifies to a population structure that has undergone vast change in a relatively short period of time. The head of the Atlasovo village administration, for instance, reminisced about the village's nascent days when preschools were brimming with children, implying a stark contrast with the village's population composition today.

Specific conditions at the village level have either amplified or subdued people's responses to hardship. Variation in fertility and population growth rates in my study site necessitates a close look at the interwoven factors that help shape these demographic indicators. Socio-economic, ecological, and

historical conditions affect resource acquisition and ultimately, fertility and growth rate; patterns will vary in each locality.

The immense drop in production at the beginning of the 1990s has precipitated a socio-economic crisis, manifested in unemployment, which is endemic throughout central Kamchatka (see Table 1). Translating into few economic resources, unemployment has a strong bearing on fertility levels. Uncertainty about future income also negatively affects fertility behavior (Ranjan, 1999, p. 29). Together with uncertainty, declining per capita income throughout the former Soviet Union and East Europe may further depress birth rates in this region (Ranjan, 1999, p. 41).

Although the socio-economic crisis has been widespread, people in each locality have experienced it in varying degrees. In central Kamchatka, where rural livelihoods have been intrinsically tied to local ecological resources, the physical environment has largely dictated the socio-economic situation in each village or region. For example, the formerly prosperous logging villages of Atlasovo and Kozyrevsk have experienced the crisis effects more deeply than other localities, owing to decades of intensive forest exploitation that have greatly degraded local resource bases. The Bystrinsky Region, however, has been spared large-scale ecosystem destruction, due to its dependence on plentiful and quickly renewed resources, including agriculture, geothermal water, and more recently, hydroelectric power.

Finally, historical setting plays a substantial role in shaping fertility and growth rate. Founded in the early 20th century, Kozyrevsk and the

TABLE 1

Employment Statistics in Central Kamchatka

Village or Region	Total 2002 Population	Number of People Able to Work	Number of Employed People	Official Count of Unemployed People
Bystrinsky Region	2600	1600	800	283
Kozyrevsk	1700	850	512	300
Atlasovo	938	600	405	51

(Data from the Bystrinsky Regional Statistics Department, and employment agencies in the villages of Kozyrevsk and Atlasovo).

^aThese numbers only indicate those who are officially registered in village employment agencies. They do not take into account people who are effectively unemployed or work a minimal number of hours, but still remain on an institution or organization's payroll. If such people were factored into the official unemployment count, these numbers would be notably higher (see Galitsky, 2000, p. 576).

Bystrinsky Region have acquired a certain degree of stability that has helped people to withstand trying times. In contrast, an ephemeral frontier history characterizes Atlasovo.

Because these conditions vary at the local level, each village (or region) exhibits distinct post-Soviet population patterns, differing in fertility and growth rate decrease. This finding is especially interesting because it contradicts Lee's statement that fertility patterns, unlike mortality patterns, are more homogenous across populations (Lee, 1990, p. 7). Below, I discuss the observed patterns for each locality in the context of its prevailing socio-economic, ecological, and historical conditions, noting areas of convergence and divergence.

In Atlasovo, the closing of the enormous Kamchatksy Forestry Enterprise in 1993, due to tumultuous economic conditions, is most likely tied to the village's abrupt general fertility and growth rate decline in 1994. The leveling off and modest increase of the fertility rate from 1995 to 2000, and a positive growth rate in 1996, may be attributed to the start up of small-scale forestry operations in the wake of the former giant.

In contrast, Kozyrevsk's forestry enterprise persisted throughout the tenuous post-Soviet period, although it operates at a fraction of its former capacity. One long-term employee equated the enterprise's yearly production today to one month's output at the height of logging operations. As in Atlasovo, unemployment accompanying curtailed production has been a leading difficulty in Kozyrevsk (Borisov, 2002, p. 19), partly explaining Kozyrevsk's fertility and growth rate decreases during the period 1993–1994.

The population in Atlasovo recovered slightly in the mid- to late-1990s, but both the general fertility and growth rates in Kozyrevsk continued to decrease. These trends seem to reflect record low timber production in 1999 (Borisov, 2002, p. 30), and the aftermath of Russia's 1998 financial crisis, including layoffs in the village's telecommunications company.

Unlike the logging villages of Atlasovo and Kozyrevsk, the Bystrinsky Region (particularly the village of Esso) has not been completely dependent on one industry for its survival. As a result, the severe fall in production at the beginning of the 1990s in its agricultural and reindeer herding sectors did not spell total demise. Rather, Esso's designation as the regional center has ensured a consistent supply of jobs for at least some people, leading to muted declines in fertility and growth rate. From 1997 to 2000, available data confirm a steady rise in the growth rate; the fertility rate also shows signs of increase during this period. It is possible that the fertility drop in 2000 is a response to the 1998 financial crisis.

Land cover and land use measures in the areas surrounding these villages reflect distinct differences among resource bases (Hitztaler, this issue), correlated with the variation in population patterns. For instance, the natural constraints of Kozyrevsk's geographical location, coupled with the initially less intensive forestry practices in this region, seem to have put a check on rampant resource exploitation, such as that in Atlasovo. In Atlasovo, the highly fragmented resource base corresponds to the greatest decreases in fertility and growth rate observed in this study. Likewise, the most moderate population changes have occurred in the Bystrinsky Region, where a relatively abundant resource base has helped buffer the population from dramatic downswings.

Besides current socio-economic and ecological conditions, historical setting has played a role in local population patterns. In central Kamchatka, a village (or region's) relative stability, particularly in terms of settlement, has likely mitigated drastic population change. For instance, the majority of settlers arrived in Atlasovo intending to earn high pay and return to their original location; thus, the post-Soviet socio-economic crisis only exacerbated an existing tendency for major population shifts. Although Kozyrevsk is also considered a frontier village, its longer history has facilitated a more gradual settling of the village, and consequently a greater allegiance to it. With a large indigenous population whose roots trace back 150 years, the Bystrinsky Region is the least transient area. In the next section, I explore how ethnicity affects fertility patterns in this region where indigenous peoples make up a sizable portion of the population.

Ethnicity and Fertility

It is important to consider this relationship, especially in light of anecdotal evidence suggesting that indigenous fertility levels have remained high throughout the post-Soviet period, despite economic and social turmoil.

Until the 1960s the birth rate was high among indigenous women. For instance, births per thousand women in the Bystrinsky Region for the period 1958–1962 was 50.3 for indigenous peoples, whereas it was only 28.3 for non-indigenous people (Murashko, Pika, & Bogoyavlensky, 1993, p. 68). The total fertility rate (Palmore & Gardner, 1983) among indigenous peoples was also high: by the end of the 1950s, TFR was reported as 4.5 for both the Even and Koryak peoples (Murashko et al., 1993, p. 68); in fact, fertility was probably higher than these official figures, because of underreporting of births.

Beginning in the late 1950s, however, the Soviet government closed indigenous settlements and relocated people to a few designated commu-

nities, as part of an involuntary assimilation program. This program aimed to “civilize” indigenous peoples by introducing them to modern medicine and formal education. Moreover, it indoctrinated them in Socialist philosophy, emphasizing their status as Soviet citizens. The upshot of Soviet infiltration in the traditional indigenous lifestyles was a considerable decline in birth rate, accompanied by a swell in the death rate, which persisted throughout the 1970s (Murashko et al., 1993, p. 70).

As the birth rate decreased, so did family size. A growing number of single-parent families (usually a mother with children) began to overshadow the traditionally large, multigenerational families (Murashko et al., 1993, p. 73). The falling birth rate was exacerbated by the long stints that collective reindeer herders spent away from their families (Murashko et al., 1993, p. 96). Even though the birth rate rebounded during the 1980s, by the end of the decade the total fertility rate among the Even and Koryak peoples had fallen to 3.6.

To support indigenous peoples, the Soviet state heavily subsidized reindeer herding and other traditional activities (e.g., hunting and fishing), providing the herders with fine salaries that surpassed those of other collective workers. The state also allocated ample provisions of medicines and foodstuffs to the collective workers. In the post-Soviet period, reindeer herding has virtually ceased in the Bystrinsky Region: the number of reindeer has shrunk from 19,600 to approximately 4600. The ensuing situation has been devastating for the indigenous peoples.

Post-Soviet Indigenous Fertility

Available data for the Bystrinsky Region reveal patterns of decreasing fertility among both indigenous and non-indigenous groups during the post-Soviet period. It was expected that fertility declines would be comparable between the two groups; however, fertility decline has been much more drastic among indigenous peoples. For example, in 1991 births per thousand indigenous and non-indigenous women were 45.58 and 34.53, respectively (Hitztaler, 2004, p. 110). By the year 2000, however, births per thousand indigenous women had fallen to 25.21, whereas this indicator had only dropped to 28.57 for non-indigenous women (Hitztaler, 2004, p. 110).

The considerable decrease in births per 1000 women of childbearing age among indigenous peoples is remarkable, considering the traditionally high fertility rates among this group, and the deep-seated societal perception that indigenous fertility has remained relatively unchanged during the post-Soviet period. The fall in the general fertility rate suggests the

immense resource constraints and economic hardships indigenous peoples have faced as a result of the nearly complete loss of their traditional livelihoods.

Despite the decrease in births, the percentage of indigenous women in the 15–19 age group giving birth actually increased by 25.74% from 2000 to 1991 (Figure 4). Additionally, the percentage of women in the 35–39 age group giving birth grew by 46.64% during this same period, in contrast to a decrease of 63.25% for non-indigenous women. The increase of births in the older age group may reflect birth postponement among indigenous women in the early 1990s.

Further, the percentage of indigenous women giving birth decreased slightly in the 20–24 and 30–34 age groups (5.7%), and moderately (26.66%) in the 25–29 age group. These data reveal that the overall age structure of women giving birth did not change greatly from 1991 to 2000, thereby preserving early, but low fertility. In fact, this phenomenon has become more prevalent, reflecting a heavy discounting of the future in terms of giving birth.

CONCLUSION

These data highlight several patterns in post-Soviet central Kamchatka: crude death rate exceeds birth rate; the general fertility rate has fallen, especially among indigenous women; women's age at birth has decreased; and the growth rate is primarily negative. Resource scarcity, stemming from post-Soviet socio-economic, and local resource crises, has no doubt damped the general fertility and growth rate in central Kamchatka.

This study adopted a broad approach in analyzing population decline, addressing variation in both resource control and fertility across populations (see Low & Clarke, 1993, p. 215). An integrated look at a locality's particular demographic situation, in conjunction with its socio-economic, ecological, and historical circumstances, points to two main conclusions.

Foremost, it confirms the broad statement that resources do affect population change. Specifically, abundances or scarcities of resources are linked to rises and declines in fertility. Here, resource scarcity led to declines. The overarching fertility patterns for all villages in this study follow certain predictable ecological rules in a resource poor environment; specifically fertility decline is observed everywhere.

This perceptible decrease is a response to the pervasive crisis following the Soviet Union's collapse that crippled the economic base of each village, especially in the early 1990s. Resource scarcity resulting from decades of intensive forest exploitation in the central Kamchatka River valley

confounded the effects of this crisis in the logging villages of Kozyrevsk and Atlasovo.

It is essential, however, to look beyond the simple equation of “resource scarcity leads to decline.” Several aspects of an area, including ecological and historical, must be considered to understand more precisely the underlying causes of variation in population patterns. For instance, declines in fertility and growth rates were more pronounced in the logging villages than in the Bystrinsky Region, which had a more diverse and abundant resource base. In fact, the greatest drops in fertility and growth rates in my study site during the early 1990s were observed in Atlasovo, where intensive forest exploitation had converted a plentiful and accessible resource base into a highly fragmented one.

Ethnicity also shapes fertility patterns. The steep fall in indigenous fertility during the post-Soviet period points to a disparity in resources that likely runs along ethnic lines in the Bystrinsky Region. During this period, indigenous peoples lost both their former traditional livelihoods and the generous governmental support that followed their assimilation into Soviet mass culture.

Central Kamchatka is fertile ground for examining the sudden and dramatic population shifts that have occurred during the post-Soviet period, and how they vary among populations. This study firmly reinforces that the core components of change are linked to resource abundance, and to specific conditions, including socio-economic and ecological, at the family level.

ENDNOTES

1. Although the post-Soviet period is frequently referred to as a “transition period” in the literature, I prefer to use the term “transformation” as it does not imply a clear trajectory from one order to the next, for instance from socialism to capitalism (Verdery, 1996, p. 15).
2. I combine Esso and Anavgai into one region due to the difficulty involved in obtaining separate data for each (they are the only villages in the Bystrinsky Region), and to their proximity and similarity. For instance, indigenous peoples make up a considerable portion of each village’s population.
3. Originally an indigenous village, Kozyrevsk’s history stretches far back in time; however, the village began to flourish after the commencement of logging activities in 1928 (Borisov, 2000, p. 24).
4. The number of women of childbearing age was obtained from catalogs specifying sex and age composition; where these data were available only for the region or district and not the village, I calculated the total village population and extrapolated from the regional data.
5. Kozyrevsk’s overall population numbers for the years 1990, 1994, 1996, and 1998 were 2298, 2205, 2200, and 2013, respectively; Altsovo’s population numbers for these same years were 1490, 1090, 1030, and 1010, respectively.

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