**Reproductive Consequences of China's Great Famine, 1959-1961**

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*Context* The Great Leap Forward Famine of China (1959-1961) is the costliest famine ever in human history in terms of human lives lost. Political blunders during the Great Leap Forward movement that collectivized hundreds of millions of Chinese farmers, occasioned by severe weather conditions, resulted in a sharp drop in grain output of about 25% in 1960-61. Between 1958 and 1961, China experienced an estimated 30 million premature deaths and about 33 million lost or postponed births (Ashton et al. 1984; Kane 1988; Peng, 1987, Yang 1996). Birth rate plummeted from the high of 34 per thousand in pre-famine 1957 to 18 per thousand in 1961, nearly halved, before rebounding to 43.4 in post-famine 1963. The average number of birth per woman, measured by the total fertility rate (TFR), dropped from 6.41 in 1957 to 3.29 in 1961, before rebounding to 7.5 in 1964. Together with an enormous increase in mortality, with crude death rate more than doubling from 10.8 per thousand in 1957 to 25.3 per thousand in 1960, China experienced its first net population decline in decades, with a natural rate of increase of -4.57 per thousand recorded for 1960. Such huge demographic losses and swings not only wrought havoc and generated profound reverberations for the Chinese people and society, felt up to this date, they also provide a rare opportunity to understand how human populations react and adapt to such calamities, and how social organization helped to protect some while punish other. In this paper, we focus on the reproductive consequences, namely the magnitude and the mechanisms of reproductive (fertility) loss.

*Main Questions* We have two broad questions in mind in examining the reproductive consequences of the great China famine: through what mechanisms did reproductive loss occur or how did the population cope, and how did population of different social strata react differently to the famine? Answering the first question allows us to better understand how human populations react to famines by resorting to different mechanism at their disposal, and answering the second helps us to gain an appreciation of the sociological underpinnings of human societies in times of serious crises, namely how

power and status in the society affected the chances of reproduction of population occupying different positions.

*Decomposing Reproductive Consequences* The drop in fertility can be examined by separating the roles of the following factors: marriage, occurrence of pregnancy (both first and later births), pregnancy outcomes (miscarriage, induced abortion, still birth, and live birth). In our previous work (Wang 1995, Cai and Wang 2005), we have documented the rise in induced abortion and in miscarriage and stillbirths. In this paper we plan to examine the other components of the reproductive process as well, and to put every component in the same picture, to provide an estimate of the contribution by each factor to the overall decline in reproduction. Such an estimation can be carried out by using the methods of standardization and decomposition, which require the calculation of various rates, to be applied to the standard age-factor structures.

*Social Responses to Famine* In any society, not all members suffer from an acute crisis by the same extent, nor do they all respond to a crisis with the same strategies. Differences in economic, social, and political power, in addition to biological differences, result in different strategies. In the case of reproduction, some stopped, some continued, while others postponed. Why the differences? Who used what strategies and why? From our previous work we already learned that induced abortion was used more in cities and miscarriage and stillbirths were at a higher occurrence levels in the countryside and among women who had lower level of educational attainment. With information for individual as well as household socioeconomic characteristics, we shall be able to examine the socially differential response to famine. Such a study can be carried out by utilizing multi-variate statistical analysis.

*Data Sources* We are in a unique position to benefit from two excellent data sources. They are the two large-scale retrospective surveys of pregnancy histories conducted in China in 1982 and 1988. The 1982 survey, known as the One-Per-Thousand Survey as it covered one per thousand of China's population, included over 300,000 (310,462) women aged 15-67 at the time, many of whom experienced the great famine. The 1988 China's National Survey of Fertility and Contraception, known as the Two-Per-Thousand Survey, is the largest fertility survey ever for any population, this survey employed a stratified, systematic, clustered, non-proportional probability sampling design, with an aim to ensure representativeness at the national as well as the Chinese provincial level. The primary respondents were ever-married women between ages 15 and 57 in 1988. The sample contains nearly half million of ever-married women with 1.5 million pregnancies. For both surveys, the centerpiece of the survey is the reproductive history of each woman interviewed. The pregnancy history is integrated with contraceptive and birth histories. Such a survey design, with redundant questions in different sections and successive questions of pregnancy, birth and contraceptive use, help to reduce problems caused by fading memory or recall bias, which represents the most common and serious problem in using retrospective surveys to estimate the prevalence of fetal loss. The survey also collected information on each household member's socioeconomic characteristics (e.g. education, occupation, and household registration status), which

enable us to study social risk factors of reproductive loss, be it postponement of marriage, birth, or increased intrauterine mortality. Information on reproductive history includes age at menarche and menopause, age at first marriage, and history of pregnancy and contraceptive use. For each pregnancy, order, time when pregnancy ended, and pregnancy outcome were recorded. The outcome of each pregnancy is coded into one of five mutually exclusive categories: live birth (male or female), miscarriage (before the seventh month), stillbirth, induced abortion, and currently pregnant.

In sum, benefiting from good data sources and previous research, we are in a good position to explore one aspect of the demographic consequence, reproduction, of one of human history's most unfortunate and costly events, the Chinese Great Leap Forward Famine of 1959-1961. Our work also promises to contribute to the general literature of demographic responses to famines in human history.

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