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Pregnancy Rate and Demographic Characteristics of Unmarried Pregnant Women Aged 15-24 in China, 2009

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A B S T R A C T

Purpose

This study provides a population-based national estimate of the pregnancy rate in unmarried women (aged 15-24) and explores their demographic characteristics compared to their sexually active but non-pregnant counterparts.

Methods

In 2009, the National Survey on Sexual and Reproductive Health for Unmarried Youth in China included 10,970 unmarried women (aged 15-24). Random forest classification was applied to select the most important characteristics from 16 factors including individual-, household- and societal-level characteristics.

Results

In 2009, the pregnancy rate (reported) in China was 20.85 pregnancies per 1,000 unmarried women aged 15-24. In descending order, age, family income and parental occupations were the key characteristics that distinguished the two groups.

Conclusions

The first national estimate of the pregnancy rate in unmarried youth in China was assessed as relatively low. Unmarried pregnancy in China is associated with a low accessibility to contraceptives. Instrumental factors are the important determinants of unmarried pregnancy in China.

Key Words: China; unmarried women; pregnancy rate; characteristics; random forest

Introduction

Unmarried pregnancy in young women in China is considered unintended. Evidence-based analysis indicates that in China 86-96% of unmarried pregnant women have an abortion [1]. In 2009, the National Survey on Sexual and Reproductive Health for Unmarried Youth (aged 15-24) in China revealed that 22.4% of the unmarried youth aged 15-24 (both male and female) in China have experienced sex, and the percentage of individuals not using any form of contraceptive during their first sexual experience and latest sexual experience is 51.2% and 21.4%, respectively. Moreover, 21.3% of unmarried women who have experienced sex have become pregnant; and 90.9% of unmarried pregnant youth have an abortion (induction of labor excluded) [2].

Considering these survey results, and to highlight the public-health implications of this issue in China, it is worthwhile to define the magnitude of the problem of unmarried pregnancy. This study therefore provides a national estimate of the unmarried pregnancy rate and explores the demographic characteristics of unmarried pregnancy in China.

Methods

Study design

In this cross-sectional study performed in China in 2009, the pregnancy rate in a population of unmarried women (aged 15-24) was estimated, and the population was analyzed to determine how demographic characteristics at individual-, household- and provincial-levels were associated with the pregnant individuals compared to their sexually active but non-pregnant counterparts.

Data sources

We performed the National Survey on Sexual and Reproductive Health for

Unmarried Youth (aged 15-24) in China in 2009. This survey represents the first national representative population-based KAP survey of the reproductive health of unmarried youth. For a more detailed methodology of the survey information regarding the attitudes and practices (KAP) of China's unmarried youth concerning reproductive health, please refer to our earlier study [2].

The data for the individual- and household-level characteristics measurements (Table 2) were derived from the survey and were taken as representative of the socioeconomic status thereof, which is in accordance with the CAPSES theory (this theory defines socioeconomic status as a function of material capital, human capital, and social capital) [3]. This study was supplemented with secondary data from societal-level characteristics at a provincial level. The data included the provincial Inequity-in-Health Index [4], the Gender Gap Index [5] and the Human Development Index [6] from 2003, 2004 and 2008, respectively. To our knowledge, these data are the best match in the context of China in 2009.

Data analysis

The pregnancy rate was defined as the number of pregnancies per 1,000 unmarried women aged 15-24 who participated in the survey. First, the sexually active respondents reporting the need for pregnancy/abortion services in 2009 were considered as being pregnant in that year. Second, the number of pregnancies reported by the participants that were considered pregnant was used as the numerator for the calculation of the pregnancy rate. Third, the number of women that did not answer whether need the pregnancy/abortion services in 2009 was subtracted from the total number of female respondents, and the difference was used as the denominator.

Random forest classification [7] was applied to identify the most important characteristics of the pregnant individuals from 16 factors in total (Table 2). This

analysis was performed in the R package randomForest, R version 2.9.2 (R Development Core Team, 2009).

Results

Of the 10,970 unmarried women (aged 15-24) sampled in 2009, 2,073 had sex in the last twelve months. The weighted number of pregnancies was 223 out of the 10,697 female respondents (the 273 missing responses were subtracted from the original total of 10,970). The estimated pregnancy rate (reported) was 20.85 pregnancies per 1,000 unmarried women aged 15-24 in China in 2009.

Of the 16 factors, parental occupation was important, the family income was more important, and the age was the most important factor for predicting the possibility of an unmarried pregnancy (The accuracy rate 88.9%, with a sensitivity of 10.1% and a specificity 98.8%) (Table 2).

Table 2 The rankings of the characteristics of the unmarried pregnant (n=1777)

Variable	Gini importance[a]
age	**45.74**
average household income	**37.12**
maternal occupation	**31.86**
paternal occupation	**30.72**
provincial Inequity-in-Health Index	22.1
maternal education	20.74
occupation	20.73
provincial Human Development Index	20.67
education	20.41
provincial Gender Gap Index	20.18
family size	19.74
income	17.39
paternal education	17.02
migration	11.74
residence	6.67
habitancy	4.44

Note: Gini importance, shown as “Mean Decrease Gini” in the random forest model output, refers to the adding up of the gini decreases for each individual variable over all trees in the forest.

After controlling for the rest factors, each of these important factors demonstrated a nonlinear association with the unmarried women's possibility of being pregnant: (1) Age and family income exhibited a V-shaped relationship with the possibility of unmarried pregnancy. (2) Generally, the lower the social status of the parental occupations, the higher the possibility of pregnancy; whereas, parental unemployment was associated with a low possibility for pregnancy in unmarried daughters.

Discussion

In 2009, the estimated pregnancy rate (reported) for China was 20.85 pregnancies per 1,000 unmarried women aged 15-24. These data indicate that there is a relatively low incidence of unmarried pregnancies in China compared to other countries in which the adolescent pregnancy rate has been reported [8-10].

Parental occupation. Although as it has been documented that the lower the social status the greater the possibility of pregnancy [11], parental unemployment is associated with a low probability of an unmarried pregnancy in a daughter in China. Unemployment of either parent means that the unmarried daughter has a stay-at-home-mom and/or a stay-at-home-dad. This situation may enhance the parent/child closeness or connectedness, which decreases the risk of adolescent pregnancy [11-13], especially when the other parent's occupation is of a high social status.

Family income. This study also reveals that the family income is more closely associated with the possibility of pregnancy in unmarried young women than the actual occupation per se, and this possibility is closely associated with average household income of the lowest quartile in China. In this quartile, the lower the average household income, the more likely an unmarried woman becomes pregnant,

which is also observed in the United States [14]. Other studies have revealed that higher insurance coverage and the receipt of Medicaid among women aged 15-44 is associated with a lower intended pregnancy rate [15]. These phenomena suggest that the threshold of financial impact on the reproductive health of women could lie in the first quartile of family income.

To be noted that in China the possibility of unmarried pregnancy changes to a moderate level when the average household income is in and above the third quartile. Further research will be needed to correlate the variables between the highest quartile family income and the unmarried pregnancy rate in China.

Age. After controlling for the remaining 15 variables, age is the most important factor contributing to the probability of pregnancy in unmarried women, exhibiting a V-shaped relationship. The possible differential underlying factors lie in the lower psychosocial competence of the younger for 15-18 year old women [16, 17], less frequency of intercourse for 18-20 year old women who mostly experience the stress of the competitive college entrance examination [18, 19] , and less careful about contraception for 20-24 old women who reach the legal age of marriage (20 year old) in China.

Limitations of this study

First, the young women who were married soon after becoming pregnant were excluded from the survey. Second, the numbers used for the estimation of the pregnancy rate were not adjusted for under-reporting.

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