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Health Insurance Coverage Rates In 9 Provinces In China Doubled To 49 Percent From 1997-2006, With A Dramatic Rural Upswing

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Abstract

We examined the distribution of health insurance in China during 1997-2006, a period when government interventions were implemented to improve access to health care. We analyzed data from a survey that follows households in nine provinces that are home to more than 40 percent of China's population. The analysis shows that the percentage of individuals with insurance increased from 24 percent in 1997 to 28 percent in 2004 and then rose dramatically, to 49 percent in 2006. Rural and urban levels of insurance coverage became more similar, reflecting a dramatic upswing in coverage in rural areas that is likely to have benefited millions of rural Chinese. At the same time, the analysis suggests that health insurance reimbursement rates to consumers for inpatient care might have declined in rural villages. Because reimbursement and other insurance characteristics affect health care use, future efforts to reduce rural-urban disparities should address the quality of health insurance and the level of reimbursement in addition to coverage rates.

This study examines the distribution of health insurance in China between 1997 and 2006, a period when government interventions were implemented to improve access to health care. Since the mid-1990s the government has promoted policies aimed at increasing the proportion of the population covered by health insurance, especially in rural areas.

Research conducted among urban¹ and rural^{2,3} residents separately details the contours of such changes. Empirical research that includes data on both urban and rural populations and that compares patterns in insurance across these populations is less common. Nonetheless, investigations that include both rural and urban data are critical to tracking and addressing rural-urban differences in insurance. Such studies can be useful to policy makers in China and other countries who seek to ameliorate disparities in population health.⁴⁻⁷

In this article, using data from the China Health and Nutrition Survey, we examine patterns in the distribution of health insurance among rural and urban residents across nine provinces. We focus on rural-urban equity as indicated by insurance coverage and reimbursement rates.

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Health Insurance In China

Rural-Urban Disparities

The distribution of health insurance across rural and urban areas is of particular interest in China given major changes in coverage in recent decades. In the late 1970s, although characteristics of insurance varied by locale, coverage was extensive. Almost all urban residents were covered by health insurance plans,⁸ and approximately 90 percent of rural residents were insured through the Rural Cooperative Medical System.^{9,10}

Beginning in the early 1980s, reforms to privatize the role previously played by the government in the economic and public health sectors were introduced.¹⁰ The share of the population with health insurance declined substantially, and inequities in coverage grew.¹¹ Overall, the percentage of Chinese with insurance dropped from more than 90 percent to around 20 percent by the late 1980s or the early 1990s.¹² The share of health costs borne by individuals almost tripled, from 20.4 percent in 1978 to 58.30 percent in 2002.¹³ As a result, the uninsured population had limited access to health care because of financial barriers.¹⁴

Urban and rural areas were affected differently by these changes. Urban residents were substantially more likely to be insured than rural residents during the late 1980s and early 1990s,¹⁵ even though coverage declined in both regions. By the early 1990s about 51 percent of urban residents were covered.¹⁶ Estimates of coverage in rural areas ranged from 5.5 percent to 13 percent.^{9,12}

With the collapse of the rural medical program, rural health care workers and organizations lacked adequate financing from the government and began searching for funds elsewhere. For instance, many providers overprescribed drugs and overused costly medical equipment and examinations, which led to more fees for them but also to rising costs and decreasing quality of health care for rural Chinese.¹⁴ In contrast, urban residents, who could participate in a better-funded health care system, saw improvements in their access to care and its quality.⁶

Increasing rural-urban income gaps exacerbated these disparities, especially for uninsured populations.⁶ By 1993 the proportion of patients who did not go to see a doctor because of economic difficulty was only about 4 percent in cities but as high as 20 percent in the countryside.¹⁷ The proportion of patients who needed to be hospitalized but were unable to do so because of economic difficulty was about 40 percent in cities but near 60 percent in rural areas.¹⁷

Rural-urban disparities were also fueled by organizational differences. From the early 1980s to about 2002, having health insurance was in principle mandatory in urban areas, with financial support for premiums from the local government at the city level. In contrast, enrollment was voluntary in rural areas and insurance was characterized as a risk-pool system at the community level, with primary funding from individual participants' contributions.¹⁸ One result of these rural-urban inequities in government financial support for health insurance was that urban residents paid about 25 percent of their insurance premiums in the 1990s, while rural residents paid almost 80 percent.¹⁸

Policy Changes

In response to increased numbers of uninsured people and growing rural-urban disparities, the Chinese government initiated policy interventions in the 1990s to promote insurance coverage for everyone and equal enrollment rates between rural and urban populations. A trial of a revised rural insurance program was launched in fourteen counties across seven provinces in 1994. This initiative incorporated voluntary contributions from rural residents

as well as local government funding.¹⁹ An evaluation indicated that under this pilot program, insurance coverage ranged from almost 50 percent to near 80 percent in the participating counties, and effective reimbursement rates—that is, the actual percentage of costs reimbursed to patients who incurred expenses for specific types of health services—ranged from 20 percent to 70 percent.¹⁹

During this same period the government addressed the decline in urban health insurance coverage with a trial program for urban employees known as the Urban Employee Basic Medical Insurance. This program, launched in Zhengjiang and Jiujiang (two medium-size cities) in 1994, required all urban employers and employees to share an insurance premium equivalent to 8 percent of employees' monthly pay, with the employee contributing 2 percent and the employer paying 6 percent.²⁰ The program was implemented nationally in 1998, with flexibility for local governments to adjust policies regarding reimbursement and other aspects of implementation. By 2004 about 34 percent of urban employees in China were reported to be covered by the program.²⁰

Most unemployed urban residents, including children and housewives, were left uninsured, although some more affluent households sought alternatives such as private insurance. Private insurance has become increasingly common, but it played only a minor role during this period.²⁰ Between 1998 and 2003, when overall insurance coverage declined, the share of the insured urban population with private insurance increased slightly, from 3.3 percent to 5.6 percent.²¹

Since 2002 the government has introduced other policies aimed at improving public health, especially in rural areas.^{22,23} Overall, the goal of these new policies was to provide coverage to the majority of rural Chinese by 2010. The Ministry of Health of China claimed a 90 percent enrollment rate by the end 2010.²⁴

Four policy changes were implemented. First, policy mandated that government investment in public health focus on rural communities. Second, it required that both the central and local governments play an active role in organizing farming populations to establish a mandatory new rural health insurance program that is funded by individual participants, rural communities, and governments. This was in contrast to a voluntary system funded just by participants.

Third, policy supported the establishment of a medical care fund financed through subsidies and donations from the government. The fund was designed to help poor rural families pay premiums so they could participate in the new rural insurance program.

Fourth the central and local governments separately agreed to pay a 20 yuan (US \$2.50) per capita subsidy each year for every farmer who pays an annual premium of 10 yuan (US \$1.25) to enroll in the new program. Although this subsidy is modest, it is considered a significant indication of government commitment to the new program. This is particularly true given that the central government had provided little financial support for farmers' expenditures on health care during the previous thirty years.¹⁸

Although previous research has provided important insights about health insurance coverage in China during the 1990s,^{12,15} we know considerably less about trends in coverage—especially rural-urban inequities—since the late 1990s, when these extraordinary policy changes occurred. Therefore, our analysis of the changes in coverage from 1997 to 2006 focused on rural-urban differences.

Study Data And Methods

Data Source

Data for our analysis came from the China Health and Nutrition Survey, a multipurpose health survey begun in 1989 that includes more than 4,000 households across nine provinces (Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong). Households were selected through a multistage, random cluster sampling process, and the survey currently consists of households from neighborhoods in 36 cities, 36 suburbs, 36 towns, and 108 villages. The response rate at the individual level is 88 percent.²⁵

Our analysis drew on data from the four most recent waves of the survey, 1997, 2000, 2004, and 2006. Across these years, the sample size ranged from 10,869 to 13,286. In every year between 88 percent and 95 percent of the original sample interviewed about health insurance was re-interviewed. Details on the design of the survey are available online.²⁶

The survey data are not nationally representative. However, households were randomly selected from a diverse set of nine provinces from coastal and inland regions located in northeast, central, and south China. Together, these nine provinces are home to more than 40 percent of China's population, or 548.6 million people. Rural-urban population distribution and household per capita income varies considerably across the provinces. Details on this variation in comparison to all of China are presented in Technical Appendix 1.²⁷

Study Variables

Consistent with previous analyses of data from the China Health and Nutrition Survey,^{12,15} we specified insurance coverage to include four types of coverage: almost full coverage through social or public insurance, which is usually government-sponsored; partial coverage, such as employer-based insurance and cooperative insurance, including dependents' insurance; prepaid insurance, which usually involves health maintenance organizations; and private insurance, involving a personal contract with a private insurance company.

We examined outpatient and inpatient care reimbursement rates—that is, the percentage of outpatient and inpatient care costs covered by health insurance programs among insured respondents. We included these because most urban and rural residents with insurance continued to pay a portion of their health care expenses throughout the study period.¹⁶ This type of copayment has been negatively associated with health service use—for example, with fewer treatment visits per person per year and fewer health services per visit²⁸—and has implications for equity²⁹ and medical impoverishment.^{2,30,31} A further reason to include this analysis is the finding from previous analyses of data from the same survey through 1997 that reimbursement rates may be declining as coverage increases.¹⁵

Respondents' residence, of central interest in this study, is classified into four categories following the design of the survey: city, suburb, town, and village. By definition, a suburb is located on the outskirts of a city. A suburb can be rural even though it is relatively more industrialized and urbanized than a village. A town is the administrative center for a county. Towns are the urban centers within counties even though they are less industrialized and urbanized than a city.

We included four year dummy variables (for 1997, 2000, 2004, and 2006) and interaction terms between residence and year to investigate overall trends in coverage and trends in rural-urban disparities.

We also included a measure of urbanicity to capture features of environments that tend to vary across communities with urbanization. Essentially, the measure combines survey data at the community and household levels to summarize ten dimensions of urbanization, resulting in an index that ranges between 0 and 100. Detailed information on this measure is available elsewhere.³²

Other independent variables included respondents' sex, age, primary occupation, education, and household wealth. These variables were constructed to be similar to previous analyses.¹⁵ In the case of household wealth, we constructed a durable goods index by counting the number of electronic appliances and other goods—such as televisions, telephones, and cameras—owned by a household.³³ Wealth quartiles based on this index were represented with a set of dummy variables. Definitions and summary statistics for the independent variables are presented in Technical Appendix 2.²⁷

Statistical Analysis

We fit Bayesian random-intercept logistic models for having insurance or not, and truncated normal models for outpatient and inpatient care reimbursement rates that range between 0-100 percent, which adjust for the three-level hierarchical data structure with repeated measurements over time (level 1), nested within individuals (level 2), which in turn are nested within communities (level 3).³⁴ This method provides estimates and predictions that take into account the complex hierarchical data structure, such as data for the same individuals sampled from the same communities and followed over time, and the truncated distributions of reimbursement rates, which are bounded by 0 and 100.

We used WinBUGS software, version 1.4, for model estimation and predictions. For details on the statistical models, see Technical Appendix 3.²⁷

Limitations

The study has three limitations. First, the sample is not nationally representative, and we cannot generalize our conclusions to the entire Chinese population. These data do, however, allow us to summarize patterns across urban and rural areas in nine provinces that are home to more than 40 percent of the population. Importantly, we can describe changes in coverage for the individuals in these households over time, in a period when dramatic health reform is unfolding.²⁵

Second, although the analysis summarizes changes in insurance coverage, the survey data did not capture the subtle differences in benefit coverage between different insurance programs. For example, some programs had a ceiling above which health care costs were not covered. If such programs were more common in rural than in urban regions, rural residents might suffer more financial hardship than urban residents when, for example, they need surgery, even though they are insured.

And third, the self-reported outpatient and inpatient care reimbursement rates might not reflect reimbursement rates in practice. Respondents might have reported the rates that insurance programs claimed, rather than those that existed in reality—and the latter might be less than the former. In addition, a survey of 189 counties in 2005 found that about 10 percent of insured rural residents indicated that they planned to leave their insurance program because they had not received reimbursements, the reimbursements were too low, or the reimbursement process was too complicated.³⁵ Thus, although the data we used provide a window into a dimension of insurance beyond population coverage, the patterns that we report must be interpreted cautiously.

Study Results

Rates Of Insurance Coverage

The trend in coverage for our sample followed a *J* pattern over time—that is, a slight decrease from 1997 to 2000, followed by an increase between 2000 and 2004 and then a steep rise to 2006 (Exhibit 1). The positive trend from 2000 to 2006 is consistent with the Chinese government's increased efforts to restore the public health system during that period.

However, this aggregate summary masks differences in levels and trends in population coverage across place. In villages the coverage rate declined markedly from 1997 to 2000, but rates changed little in cities, suburbs, and towns during the same period (Exhibit 1). This pattern is consistent with previous observations that the government's efforts to establish the new rural insurance program were limited to a few pilot rural counties¹⁵ and did not include financial subsidies for the rural population.¹⁸

After 2000 the coverage rate for villages began to rise, almost tripling between 2004 and 2006 (Exhibit 1). Rates also rose markedly in towns and suburbs, and but changed modestly in cities. The greater increase in coverage rates in rural villages compared to other places from 2000 to 2006 is consistent with policy interventions that included a financial subsidy for rural populations participating in the new insurance program as it was rolled out in 2003.

The *J* shaped pattern of insurance coverage held across most sociodemographic characteristics (Exhibit 1). Farmers saw a more dramatic increase in coverage between 2000 and 2006 than did those in other occupational categories. Similarly, between 2000 and 2006 coverage rates increased more steeply for poorer people than for wealthier ones. Taken together, the patterns across locations, occupations, and levels of wealth suggest that socioeconomic differentials in coverage rates were reduced between 2000 and 2006.

Results from the regression analyses confirm the longitudinal *J* shaped pattern of coverage rates (see Model 1 in Technical Appendix 4)²⁷ and show that—even adjusting for urbanization as measured by the urbanicity index—residents of city neighborhoods were still the most advantaged group, whereas residents of towns and suburban neighborhoods did not differ from villagers (see Models 2 and 3 in Technical Appendix 4).²⁷

In addition, sex, age, occupation, education, and household wealth all have statistically significant associations in expected ways—for example, people with more education are more likely to have insurance than people with less education—on the likelihood of having insurance (see Model 2 in Technical Appendix 4).²⁷

To summarize the regression results, Exhibit 2 shows the average predicted probabilities of having insurance for urban and rural residents over time. The likelihood of having health insurance grew more similar regardless of location. This convergence mostly reflected the increased probability over time that rural residents would have health insurance. After the drop between 1997 and 2000, the predicted probability rebounded in 2004 and then rose sharply in 2006 for villagers

Residents of cities started with a higher probability of insurance in 1997. They also experienced a decline, in their case between 2000 and 2004, followed by a rise in the probability of having insurance in 2006. However, the overall increase in coverage among villagers between 2004 and 2006 was much greater than that among city dwellers during the same period.

Overall, the patterns of coverage from 1997 to 2006 were consistent with efforts by the government to both improve rates of coverage overall and reduce rural-urban disparities. The dramatic rise in rural coverage rates coincided with the efforts to develop a new insurance program and provide increased subsidies for rural participants.

Outpatient And Inpatient Reimbursement Rates

The regression results show that, without considering temporal changes, insured residents of cities, suburbs, and towns all enjoyed higher reimbursement rates for outpatient and inpatient care than insured villagers did (see Model 1 in Technical Appendix 5).²⁷ Other associations with respect to sex, education, and occupation varied across outpatient and inpatient care (see Technical Appendix 5).²⁷ Based on the model's estimates with interactions between locations and time (see Model 2 in Technical Appendix 5),²⁷ Exhibits 3 and 4 present the average predicted reimbursement rates for outpatient and inpatient care by location from 1997 to 2006, holding urbanicity at its mean and the other covariates at their modes.

The insured rural and urban populations saw a convergence in their outpatient care reimbursement rates over time, which is largely attributed to a sharper increase for town and village residents than for residents of cities and suburbs (Exhibit 3).

For inpatient care reimbursement rates, the gap between insured city residents and villagers initially narrowed as the former experienced a steeper decline between 2000 and 2004. However, the gap then widened as city residents enjoyed a sharper rise than villagers (Exhibit 4). Town residents benefited from an increase in reimbursement rate between 2000 and 2004 when all other groups saw a decline. In 2006 the reimbursement rate remained lowest for village residents.

These results should be interpreted with caution because of missing values in self-reported reimbursement rates (see Technical Appendix 3).²⁷

Discussion And Conclusion

Previous studies suggest that strong government support is essential for establishing a wide and sustainable health insurance system for rural populations.^{18,36} The argument is that the government may be the only entity that can provide sufficient financial support for an insurance system for poor rural communities. It may also be the only entity that can manage the complicated process of operating an effective insurance system in rural communities.

Although we did not set out to evaluate these observations, this article does provide analysis on changes in health insurance coverage in China during a period when, after privatization, the government took action to improve health insurance coverage, especially for rural people.

Our analysis showed a large increase in health insurance coverage that coincided with these changes, especially in rural areas. Changes in insurance coverage, although certainly influenced by government interventions, probably reflected a confluence of factors including changes in the country's economy and society. Individual preference could also affect coverage status. Nonetheless, the sharp upswing in coverage in rural areas is nothing short of dramatic. Millions of rural Chinese are likely to have benefited.

At the same time, the analysis suggests that health insurance might have become less generous in terms of reimbursement rates over time. We found that inpatient care reimbursement rates fell from 1997 to 2006, continuing a trend observed in the period

1989-97.¹⁵ Thus, the impressive achievement of increasing coverage rates may have come at some cost.^{16,20,37} Furthermore, the difference in inpatient care reimbursement between urban neighborhoods and villages grew modestly between 1997 and 2007. This means that insured urban residents continued to have an advantage over insured rural residents.

Consistent with this finding, several scholars have criticized the low reimbursement rates of the new rural insurance program and have suggested that insured rural residents' out-of-pocket medical costs might not have declined—they might even have increased.^{2,3,30,38,39}

More in-depth studies that consider differences in reimbursement among the insured populations, as well as other health insurance benefits, would further inform understanding as China strives to improve health insurance coverage and the health and well-being of all of its citizens. Nonetheless, this study, which reports on changes in insurance coverage for the same sample of individuals over time, provides a useful vantage point from which to examine patterns of urban and rural coverage in an environment of dramatic changes in policy and economy.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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NOTES

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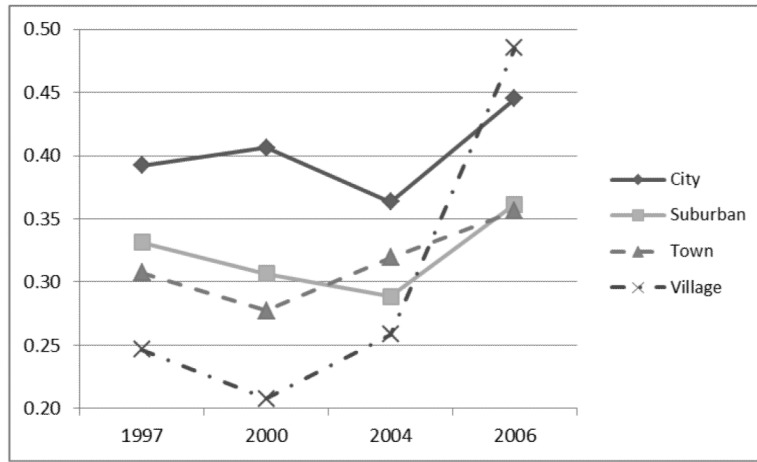


Exhibit 2.
Predicted Probability Of Having Insurance By Location
SOURCE China Health and Nutrition Surveys for 1997, 2000, 2004, and 2006.

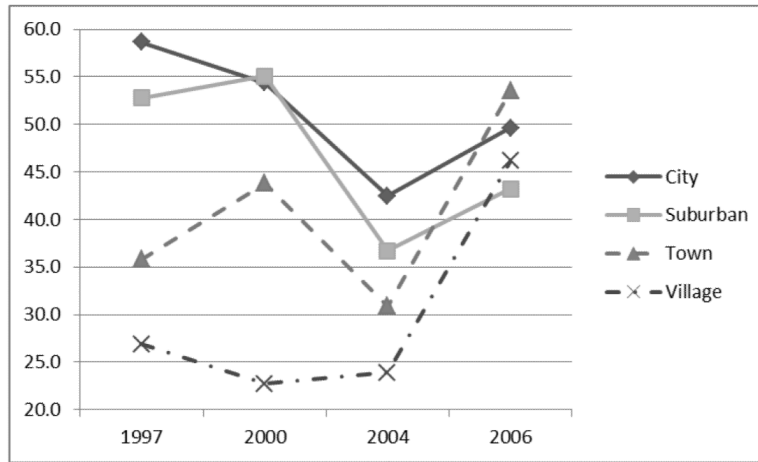


Exhibit 3.
Predicted Average Outpatient Care Reimbursement Rate By Location
SOURCE China Health and Nutrition Surveys for 1997, 2000, 2004, and 2006.

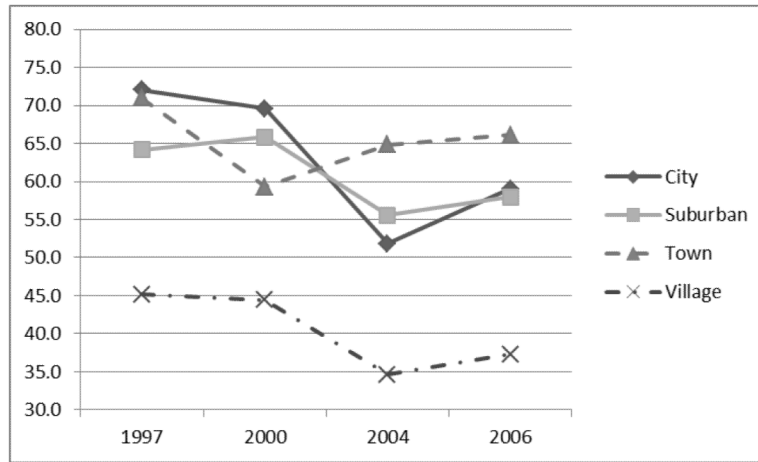


Exhibit 4.
Predicted Average Inpatient Care Reimbursement Rate By Location
SOURCE China Health and Nutrition Surveys for 1997, 2000, 2004, and 2006.

Exhibit 1

Percentages Of Respondents With Health Insurance, By Characteristics And Years

| Characteristic | Year | | | |
|--|------|------|------|------|
| | 1997 | 2000 | 2004 | 2006 |
| Total sample ^a | 23.6 | 20.4 | 27.5 | 48.5 |
| Sex ^b | | | | |
| Female | 22.0 | 18.7 | 25.0 | 47.3 |
| Male | 25.2 | 22.1 | 30.3 | 49.9 |
| Age (years) ^b | | | | |
| 0-12 | 15.4 | 15.9 | 24.0 | 44.0 |
| 13-19 | 14.6 | 12.5 | 24.0 | 36.9 |
| 20-59 | 26.2 | 21.1 | 27.4 | 49.1 |
| >=60 | 28.4 | 28.0 | 31.2 | 51.8 |
| Primary occupation ^b | | | | |
| Unemployed | 16.6 | 15.5 | 21.4 | 40.0 |
| Farmer | 16.5 | 13.3 | 20.2 | 46.8 |
| Unskilled worker | 23.1 | 16.1 | 23.1 | 46.0 |
| Skilled worker/professional | 45.4 | 40.5 | 46.9 | 58.0 |
| Education ^b | | | | |
| No schooling | 16.6 | 15.5 | 21.4 | 40.0 |
| Some/completed primary school | 16.5 | 13.3 | 20.2 | 46.8 |
| Some/completed junior high school | 23.1 | 16.1 | 23.1 | 46.0 |
| Household wealth (quartile) ^b | | | | |
| 1 (poorest) | 10.4 | 7.3 | 12.9 | 40.1 |
| 2 | 15.8 | 12.9 | 19.6 | 42.7 |
| 3 | 26.3 | 22.4 | 28.2 | 52.8 |
| 4 (wealthiest) | 48.2 | 45.6 | 49.7 | 59.6 |
| Location ^b | | | | |
| Urban neighborhood | 55.4 | 52.8 | 52.9 | 59.7 |
| Suburban neighborhood | 24.4 | 25.3 | 28.2 | 40.2 |
| Town | 26.0 | 23.7 | 33.6 | 40.8 |
| Village | 14.6 | 9.9 | 17.9 | 51.0 |

SOURCES China Health and Nutrition Surveys, 1997, 2000, 2004, and 2006.

^aFor each item in this column, significant difference in coverage across four years within category ($p < 0.05$) using chi-square test.

^bSignificant difference in coverage between categories within each year ($p < 0.05$) using chi-square test for every year.