

The Sample Household Health Interview Survey

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Systematic study of the patterns of disease and health care activities in a community provides an important basis for understanding the health status, requirements for health services, and the quantity and quality of health care provided in that community. Household interview surveys are one potential source of such information. These surveys provide population-based data that generally are not available from any other source.¹ As part of the China-US collaborative study of Shanghai County, a sample household health interview survey was carried out.

Methods and Materials

Objectives of the Survey

The survey was primarily planned to provide comparative information about the use of services by individuals participating in the three major health care systems of the county.² The objectives of the survey were to measure:

- individually perceived morbidity and disability;
- use of health services, particularly examining this use in relation to the health system providing or financing the care (public welfare, factory insurance, or cooperative);
- out-of-pocket expenditures on health care, and other costs not accounted for by the formal health system, such as self-treatment and transportation for health care;
- outreach of the health system for preventive and health promotion services;
- frequency and amount of smoking and consumption of alcohol;
- pregnancy history of all ever-married women under the age of 75.

Sample Design

Households were the basic sampling units with all individuals in each sampled household to be interviewed. The sample was purposely designed to provide information from 150 to 200 households in each of the following four population groups in the county:

- Individuals (and their partially covered family members) receiving health care under the government public welfare plan;
- Individuals (and their partially covered family members) receiving health care under a labor insurance plan;
- Members of "low" cost cooperative health systems;
- Members of "high" cost cooperative health systems.

To conserve interviewing time, it was decided not to sample the whole county, but to purposely identify geographic areas that would have a high concentration of the four study groups and would not involve time-consuming transportation problems for the interviewing teams. Selection of study areas in this manner facilitated implementation of the survey but made it possible that some of the findings

would differ from those of a more representative countywide sample.

For the public welfare population, Cao-he-jin town was selected, and the households of four family member committees (representing the residential areas of four educational institutions) and one neighborhood lane with a high proportion of public welfare health care members were sampled. Qi-bao town was chosen for the labor insurance population. Samples of households were selected from those in the town's two neighborhoods in which the head of the family had labor insurance. Two communes, Qi-yi and Hong-qiao, were selected to provide the populations from "low" expenditure cooperative systems and "high" expenditure cooperative systems, respectively. Variations in financing of cooperative systems have been described in another paper in this series.³ The 1980 average brigade expenditure per capita for Qi-yi was ¥7.21* and for Hong-qiao was ¥13.41 excluding salaries of barefoot doctors. Six brigades were selected in each commune, distributed as much as possible to reflect the variation of expenditures and geographic areas within the commune. One production team in each brigade was then selected randomly, and households in each population team sampled systematically.

Contents of the Questionnaire

- Identification of all household members, including age, sex, marital status, education, occupation, and system of health care of each inhabitant;
- Determination of any illness or disability in the two weeks prior to the interview;
- Use of services for any illness or disability during the two weeks prior to the interview;
- Out-of-pocket expenditures for any illness or disability during the two weeks prior to the interview;
- Reasons for not seeking care, if illness or disability had occurred during the two weeks prior to the interview but no services were used;
- Determination of any preventive or health promotion services received during the two weeks prior to the interview;
- Details of any hospital admission during 1980, including number of admissions, days in hospital, and out-of-pocket expenses;
- Information about smoking and alcohol consumption among household members 15 years of age or older;
- Histories of all pregnancies and their outcomes among women under 75 years of age who were ever married.

Implementation of the Survey

The cooperation of the sample population was achieved through careful negotiations at each level of the county

*¥ = yuan, the Chinese unit of currency. At the time this paper was written, ¥1 was approximately equivalent to US \$0.60.

TABLE 1—Household Interview Population by Sampling Area and Type of Health Care Reimbursement System

Reimbursement System	Sampling Area				TOTAL
	Commune		Town		
	Qi-Yi ¹	Hong-Qiao ²	Qi-Bao ³	Cao-He-Jin ⁴	
Full Public Welfare	21	21	53	398	493
Partial Public Welfare	1	3	1	109	114
Full Labor Insurance	111	154	466	199	930
Partial Labor Insurance	15	37	137	45	234
Cooperative Systems	655	644	15	2	1316
None	1	3	23	8	35
Total Persons	804	862	695	761	3122
Total Households	190	198	160	189	737
Persons per Household	4.2	4.4	4.3	4.0	4.2

- 1 - Selected as a "low" cost cooperative system.
- 2 - Selected as a "high" cost cooperative system.
- 3 - Selected for its high concentration of labor insurance members.
- 4 - Selected for its high concentration of public welfare members (government employees).

(commune/town and brigade/neighborhood), including the overall county government. Mass meetings were held with the leaders and, finally, with the household members themselves to explain the purpose of the survey and encourage their active participation. This process produced remarkable cooperation.

The interviewing team consisted of 25 members who participated in the development and pretesting of the questionnaire over a two-week period as part of their training. Data collection took place during the first half of May 1981 and provided completed interviews in 96.6 per cent of the targeted households.

Results

A total of 737 households were interviewed, providing information on 3,122 individuals (Table 1). The average household size was 4.2 members with 88 per cent of households having three to six members. Although the areas sampled were selected on the basis of the predominant health care system available to that population, Table 1 shows that, in all sample areas, there were individuals

covered by different systems. For example, many households in the communes had one or more individuals who worked in a factory rather than in farming. Overall, less than 2 per cent of the population did not participate in any health care reimbursement system.

The age and sex composition of the surveyed population was similar to that of the county as a whole except that the proportion of children under age 15 was a little smaller and the proportion of adults 40-59 years of age a little larger in the sample (Table 2). Only 10 per cent had no formal schooling; the median age of illiterates was over 60. A greater proportion of females were illiterate (17 per cent) than males (3 per cent). Almost all children were in school. Among the working age population (20 through 59 years of age), 30 per cent had completed only some grades in primary school, 50 per cent had attended middle school, and 11 per cent had attended a college or university. Individuals from towns were better educated than those from communes. In

TABLE 2—Age and Sex Distribution of Household Interview Sample Compared with 1981 County Registration Information

Age (years)	Male (%)		Female (%)	
	County	Sample	County	Sample
0-4	3.9	2.8	3.8	2.4
5-14	7.8	6.4	7.6	5.5
15-39	23.3	22.9	23.8	24.4
40-59	9.6	12.9	10.3	13.6
60+	4.0	4.1	5.9	5.0
TOTAL (%)	48.6	49.1	51.4	50.9
(N)	273,712	1532	287,715	1590

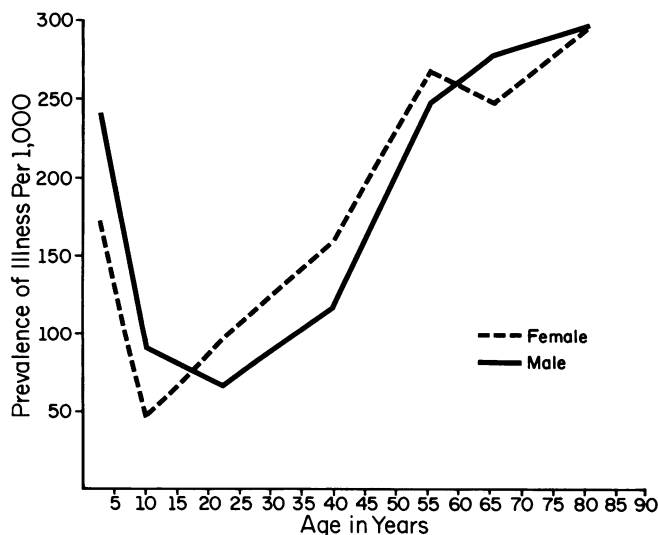


FIGURE 1—Prevalence of Illness by Age and Sex

towns, 43 per cent had attended senior middle school or university, compared to only 9 per cent in the communes.

The occupations of individuals in the surveyed population were as follows: 26 per cent were "workers," primarily in factories; 26 per cent were "peasants" involved in agriculture; 18 per cent were "functionaries," (office staff, teachers, administrators, or other government personnel); 14 per cent were students; 8 per cent were retired; and the remaining 8 per cent were preschool children, housewives, and others. Approximately 70 per cent of the study population was in the labor force. Because the sample was stratified by system of reimbursement, the study population markedly overrepresents government staff which are only about 5 per cent of the county population, overrepresents factory workers who make up less than 20 per cent of the county population, and underrepresents peasants who make up 40 to 50 per cent of the population (over 70 per cent of the work force).

Illness and Disability

The two-week prevalence rates for specific conditions in the study population are shown in Table 3. The overall prevalence of conditions was 156 per 1,000, but, since some individuals had more than one condition, the prevalence of ill individuals was 144 per 1,000. The rates for reported conditions were lower in communes (122) than in towns (194). Figure 1 summarizes illness rates by age and sex: children 0-4 years of age had illness rates that averaged around 200 per 1,000, 5- to 14-year-olds had the lowest rates (70 per 1,000), and persons over age 50 had rates between 250 to 300 per 1,000. Women uniformly reported more illnesses than men between the ages of 20 and 60. At the time of the survey, respiratory and gastrointestinal conditions made up over 40 per cent of all reported conditions with prevalence rates of 43 and 22 per 1,000, respectively.

Illness rates varied, depending on the reimbursement system to which the person belonged. Some of the variation was due to differences in age groups belonging to each system. For example, school-aged children with low prevalence rates predominate among individuals who receive 50

per cent reimbursement ("partial" coverage) under the labor insurance or public welfare systems. However, differences can be found between similar age groups in each reimbursement system (Table 4). In general, males over 49 years of age and females over 14 years of age in the cooperative health systems reported fewer illnesses than individuals of similar ages in other systems. Children in the cooperative systems, however, reported more illnesses than in the other systems (except for the few males under age 15 covered by public welfare). Differences in education, working and living conditions, or perceptions about illness may explain some of the remaining variation in reporting of conditions among the different systems when controlled for age.

The perceived severity of the reported illnesses was analyzed, using the number of days lost from work or school, spent in bed, or with restricted activity during the two-week recall period. Presuming the two-week data obtained in the interview were representative of the entire year, these data can be converted into an estimate of days of disability per person per year. They are compared with similar 1978 data from the US⁴ in Table 5. Overall, the Shanghai County population had about half as many days of restricted activity as the US population (6.0 versus 11.7), fewer days absent from school, and fewer days in bed. Adjustment of the Shanghai data to the age and sex distribution of the US sample population increased restricted activity and bed days only slightly to 6.3 and 2.6 days, respectively. The working population in Shanghai County had 7.6 days away from work due to illness compared with 5.2 in the US. In part, this may reflect the fact that the work week in Shanghai County is six days (often seven days for many peasants), whereas, in the US, it is usually five days. When the work loss in Shanghai was calculated by occupation and adjusted for age and sex differences, factory workers had the highest absenteeism, with 13.5 days per year; office staff had 12.2; and peasants had 6.3. These findings tend to parallel the illness prevalence rates for these groups and may demonstrate a different perception about the severity of illness, different degrees of willingness to be absent from work, and/or possibly actual differences in illness levels.

TABLE 3—Two-Week Prevalence Rates of Specific Conditions*

Condition	Number	Per Cent	Prevalence per 1000
Respiratory	133	27.3	43
Gastrointestinal	70	14.4	22
Cardiovascular	65	13.3	21
Musculo-skeletal	38	7.8	12
Nervous System	25	5.1	8
Injuries, Trauma	24	4.9	8
Dental	21	4.3	7
Communicable Diseases	18	3.7	6
Eye, ENT	16	3.3	5
Genito-urinary	15	3.1	5
Skin	14	2.9	4
Other	48	9.9	15
TOTAL	487*	100.0	156

*Out of a population of 3,122 there were 449 ill persons who altogether experienced 487 conditions.

TABLE 4—Two-Week Prevalence of Illness by Age, Sex, and Reimbursement System (per 1000)

Sex/Age (years)	Full and Partial Public Welfare	Full and Partial Labor Insurance	High- and Low-Cost Cooperatives
Males			
0-14	229	58	131
15-29	28	72	55
30-39	71	111	95
40-49	200	79	98
50-59	338	238	148
≥60	353	277	244
Females			
0-14	56	82	101
15-29	111	121	58
30-39	182	159	78
40-49	211	286	94
50-59	362	318	176
≥60	320	225	202

TABLE 5—Estimated Annual Number of Days of Acute and Chronic Disability per Person Compared to the US

	Days per Person per Year	
	Shanghai County**	US NCHS Survey ⁴
Days of Restricted Activity	6.0 (6.3)	11.7
Days in Bed*	2.4 (2.6)	7.1
Days of Work Lost (Per Worker)	7.6	5.2
Days of School Lost (Per Student)	2.6	5.4

*Not included in days of restricted activity.

**Household survey data were adjusted to represent the occupation distribution of the whole county.

Note: Rates in parentheses adjusted to the US 1978 NCHS sample survey population.

Use of Medical Care

Out of 449 persons who were ill during the two-week recall period, 346 (77 per cent) sought some type of medical care. Those who did not seek care gave the following reasons: the illness was chronic or they had been treated before (35 per cent); it was mild and needed no treatment (29 per cent); or they were too busy to seek care (7 per cent). The remainder gave a mixture of reasons, but none mentioned inability to pay.

Patient care visits for outpatient services occurred at the overall rate of 187 per 1,000 population during the two weeks prior to the interview. For persons belonging to cooperative health systems, 80 per cent of care was received from brigade health centers (barefoot doctors) or commune hospital outpatient departments. Approximately 50 per cent to 70 per cent of care was received from institution, factory, commune, or town clinics by public welfare or labor insurance members. Cooperative members used the county hospital outpatient department only minimally (about 3 per cent of care), while labor insurance and public welfare members used it in over 12 per cent and 20 per cent of cases, respectively.

Use of Shanghai City facilities or services outside the county varied by distance from the city, ranging from about 4 per cent of care for members of the most distant cooperatives to 21 per cent for general welfare members who mainly lived near the city.

Use of outpatient services varied, depending on the reimbursement system. This was partly related to variations

in the age distribution of individuals in each system and associated differences in levels of illness. In general, however, visits per person were higher among individuals receiving more complete reimbursement of the charges made by the different clinics, even when accounting for differences in levels of incapacitating illness. For example, the number of visits to a health care provider per 100 days of disability was 80 in the cooperative systems with higher expenditures, compared with 47 in cooperative systems with lower expenditures.

During 1980, 120 persons in the study population experienced 137 hospital admissions, a rate of 44 per 1,000 per year. The average length of stay for these admissions was about 20 days. Admission rates among members of different reimbursement systems followed a pattern similar to outpatient visits, with more admissions among those with more complete or costly coverage. Only part of these differences are accounted for by different age and sex patterns in the different groups. More detailed comparison of the use of health services by the different reimbursement systems has been reported in an accompanying article.⁵

Medical Care Expenditures

The average out-of-pocket expenditure per ill person during the two-week period was ¥1.40. This included an average of ¥0.53 for registration fees and charges not reimbursable by the person's cooperative, labor insurance, or government system; ¥0.63 for special foods eaten because of the illness or meals while in hospital; ¥0.12 for

TABLE 6—Use of Preventive Services during a Two-Week Period

Service	Number of Contacts	Persons Contacted	Target Population	
			Number	Per Cent Contacted
Immunization	133	130	207 (Children <7)	62.8
Child Health	20	18	207 (Children <7)	8.7
Family Planning	70	65	270 (Eligible Couples)	24.1
Maternity Care	38	28	35 (Pregnant/Postpartum Women)	80.0
Health Education*	680	552	2915 (Population ≥7)	18.9
Household Inspection and Other	64	43	737 (Households)	5.8

*Health education distinct from that provided in an individual care situation, usually in group meetings at work or school.

TABLE 7—Outcome of Pregnancies among Married Women by Date of Marriage

Date of Marriage	Number of Women	Number of Pregnancies per Woman	Number of Live Births per Woman	Per Cent of Pregnancies Terminating in Abortion	
				Spontaneous	Induced
Before 1940	83	5.7	5.1	6.4	0.4
1940-49	177	5.1	4.4	6.6	4.7
1950-59*	205	3.8	3.1	7.0	10.9
1960-69*	168	3.0	2.1	6.6	19.0
1970-74*	77	2.7	1.7	3.9	33.7
1975-79*	116	1.3	1.0	5.8	22.6
1980-81*	97	0.2	0.2	5.6	—
All Women under age 75	924	3.3	2.7	6.4	10.8

*Women in these cohorts are potentially still fertile, therefore their pregnancy histories are subject to change in the future.

nonprescribed remedies; ¥0.09 for transportation; and ¥0.04 for other costs related to the illness. Among the 137 hospital admissions during 1980, the average out-of-pocket expenditure was about ¥22.50 per admission. The amount spent per illness was highly dependent on the reimbursement system. Persons under the full reimbursement government system spent ¥0.97 per outpatient visit, while those with partial coverage by this system spent ¥3.80. Similar expenditures by full and partial labor insurance coverage were ¥0.35 and ¥0.76, respectively, and by "high" and "low" expenditure cooperative systems were ¥1.16 and ¥1.85, respectively. Similar analysis of expenditures for hospital admissions was confounded by the small numbers and the different reasons for admission. Using the overall expenditures for outpatient and inpatient care, the annual out-of-pocket expenditure per person in the study population was estimated to be ¥5.80.

Preventive Services

Preventive health activities have received high priority throughout China. Table 6 summarizes the experience with

TABLE 8—Cigarette Smoking by Age and Sex

Age Group (years)	Per Cent of Individuals 15 Years and Over Smoking*	
	Males	Females
15-19	4.9	0.7
20-29	42.5	0.5
30-39	52.1	1.4
40-49	46.2	1.4
50-59	57.5	4.9
60-69	58.9	11.8
70 and Over	40.5	8.5
All	43.9	2.6
Number of Individuals Surveyed	1244	1343

*Respondents stating they were currently smokers. Infrequent smokers were included if they indicated they intended to continue smoking.

selected preventive services over a two-week period. Out of a total population of 207 children under seven years of age, 63 per cent received immunizations (an Encephalitis B immunization program which is scheduled annually during April and May was in progress at the time of the survey), and 9 per cent were given routine well-baby checks or physical examinations. Among 270 married women eligible for, or using, family planning, 24 per cent were contacted during the two weeks. An estimated 35 women were either pregnant or in the postpartum period. Of these, 80 per cent received some type of maternity care in the two-week period. Out of the population seven years or older, 552 received health education, usually in groups at work or school (19 per cent). Finally, 6 per cent of the households had a general visit by a health worker, often involving inspection for sanitation purposes.

Marital and Pregnancy History

Only two individuals under 20 years of age in the surveyed population were married. In the 20-24 age group, 22 per cent of women and 7 per cent of men were married. By the age of 30-34, 95 per cent of women and 92 per cent of men were married. There were only three divorced persons in this population. The changing age at marriage was evident. Among currently married women aged 30-39, 15 per cent had been married before age 20. Comparable figures for older women were 32 per cent for the 40-49 age group, 37 per cent for the 50-59 age group, 42 per cent for the 60-69 age group, and 67 per cent for those 70-74.

Pregnancy histories were determined for 924 married women. Altogether, these women experienced 3,050 pregnancies, with 6.4 per cent terminating as spontaneous abortions, 10.8 per cent as induced abortions, and 2.0 per cent as stillbirths. Table 7 summarizes the pregnancies and their outcomes for women married at differing periods.

Women married before 1940 averaged about six pregnancies and five live births. Those married after liberation, in 1950 to 1959 (with a majority now nearing the end of their reproductive years), averaged about four pregnancies and three live births per woman. More recently married women

TABLE 9—Consumption of Alcoholic Beverages

Type of Beverage Consumed	Per Cent of Individuals 15 Years and Older Drinking	
	Males	Females
Beer	4.3	0.4
Wine	8.1	0.5
Spirits (Liquor)	12.9	0.4
Number of Individuals Surveyed	1244	1343

have had fewer pregnancies, with those married since 1975 averaging no more than one live birth. In all groups, the proportion of pregnancies terminating in spontaneous abortions was fairly constant, ranging from 4 per cent-7 per cent. Induced abortions were most common among women married between 1970-1974, accounting for 34 per cent of all pregnancies.

Smoking and Drinking Habits

Overall, 43 per cent of men over 15 years of age and 2.6 per cent of women smoke (Table 8). Smoking was almost entirely limited to cigarettes. The highest proportion of women who smoke is in the 60-69 year age group (12 per cent). Among men, smoking reaches a peak during 50-69 years of age with nearly 60 per cent smoking. Men who smoke average 11 cigarettes per day (women average less), with only 5 per cent smoking more than 20 cigarettes per day. Male peasants and factory workers had the highest per cent of smokers, 55 per cent and 48 per cent, respectively.

Only a small proportion of the population over age 15 drinks alcoholic beverages, with women almost totally abstaining (Table 9). Spirits (hard liquor) are drunk by 13 per cent of men, wine by 8 per cent, and beer by 4 per cent. The greatest consumption of spirits is among men over 60 years of age, with 21 per cent drinking spirits daily. However, among those who drink, only 3 per cent consume 300 milliliters or more daily.

Conclusions

The sample household survey has provided very useful information concerning levels of illness and disability, use of health services, expenditures on health, health habits, and pregnancy patterns in Shanghai County. If expanded to the rest of the county, such a survey could yield data that would provide the County Health Bureau with important baseline information for comparative purposes over time. Comparisons with other areas of the world can also be made to judge the achievements of the county's health services. Table 10

TABLE 10—Comparison of Health Interview Survey Findings in Shanghai County and A WHO Study⁵

Measure	Shanghai County	WHO Study of 12 Areas [‡]
Health Status		
Morbidity Conditions/1000/2 Weeks	156 (148)	185*
Acute Disability/1000/2 Weeks	49 (45)	32-150**
Health Care Utilization		
Primary Care Visits/1000/2 Weeks	187 (177)	120-202**
Hospital Admissions/1000/Year	44 (40)	65-156**

*Median for the 12 areas.

**Range for the 12 areas.

Note: Rates in parentheses have been adjusted to the age and sex distribution of the 1978 US NCHS sample survey population.

- [‡]Argentina—Buenos Aires
 Canada—Grand Prairie, Alberta
 Canada—Saschatchewan
 Canada—Fraser, British Columbia
 Canada—Jersey, British Columbia
 Finland—Helsinki
 Poland—Lodz
 United Kingdom—Liverpool
 United States—Northwest Vermont
 United States—Baltimore, Maryland
 Yugoslavia—Banat, Serbia
 Yugoslavia—Rijeka, Croatia

shows data from a World Health Organization (WHO) study of 12 different areas in the world in comparison with Shanghai County.⁶ Levels of illness and health service utilization indicators in Shanghai County (even when adjusted to US age and sex distribution) generally fall within the range identified by WHO in these predominantly developed areas. More detailed comparative studies would be useful to analyze the delivery of health care in Shanghai County in contrast to other places in China and the rest of the world. Such studies could increase our understanding of the factors that have made the services of Shanghai County so effective, at comparatively low cost.

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