HOUSEHOLD INCOME, HEALTH AND EDUCATION IN A RURAL AREA OF MYANMAR

Ohnmar, Than-Tun-Sein, Ko-Ko-Zaw, Saw-Saw and Soe-Win

Department of Medical Research, Lower Myanmar

Abstract. This study was to determine the relationship between a commonly used social stratification indicator, net equivalent income, and self-rated health, long-term disability, visual acuity status, death rate, birth rate, unsafe delivery and school enrollment in a rural area of Myanmar. Data were collected from 3,558 respondents in 805 households of all ages. Data analysis for various items was based on different age groups. The results from two income groups (highest and lowest) are as follows : the percent of those who self-rated their health as very good were 17.8% and 10.4% in the highest and lowest income groups, respectively (adjusted coefficient = 0.30, 95%CI 0.11-0.50); those with an acute medical condition were found in 16.3% and 20.8% in the highest and lowest income groups, respectively (adjusted OR = 1.35, 95%CI 1.08-1.68); those with long-term disability were found in 15.3% and 21.2% in the highest and lowest income groups, respectively (adjusted OR = 1.39, 95%CI 1.05-1.84); and those with poor visual acuity at a distance of 13 feet were found in 8.1% and 13.5% in the highest and lowest income groups, respectively (adjusted OR = 1.64, 95% CI 1.18-2.30). The birth rate ratio was 1.3, the death rate ratio was 1.2, and school enrollment was found in 92.8% and 83.2% in the highest and lowest income groups, respectively (adjusted OR = 0.34, 95%CI 0.1-0.8). These results indicate that there is an urgent need to strengthen the health care infrastructure and educational system, targeting the poor in rural areas.

INTRODUCTION

There are unnecessary, unfair and unjust health differences between people who are socially advantaged and disadvantaged. Khowledge of social group health differences is important in decision-making regarding health policies. It has been stated that the health status differences between the rich and poor are more useful indicators than the average health status of the whole population (Gwatkin, 2000). The commitment and willingness to make changes among policy makers are vitally important in health and development. In each country, the health sector aims to provide equality, which is defined as the accessibility of services to those who need them, regardless of geographic location or social status. There are studies on the differences in health by geographic region, age and sex (Central Statistical Organization, 2001; Department of Health Planning, 2000), but none on health differences by social stratification in Myanmar.

Income has been commonly used as an indicator for social stratification and measuring socioeconomic inequalities (WHO, 1995). Many studies have been published investigating the link between income inequality and a variety of health outcomes. It has been considered a controversial issue (Kaplan *et al,* 1996; Kennedy *et al,* 1996; Blakely *et al,* 2002; Macinko *et al,* 2003; Mellor and Milyo, 2003; Subramanian *et al,* 2003a,b). Income inequalities is considered a likely case of adverse health consequences (Subramanian and Kawachi, 2003). Data on social groups is still needed to monitor equality in health (WHO, 1998).

In 1999, the SEAMEO TROPMED Network initiated a health equalty research project to strengthen the capacity of community volunteers. In Myanmar, health care services are provided mainly by the public sector, with the private sector contribution increasing gradually. As in some countries, in-patient treatment in the public sector is free-of-charge to the poor for life threatening diseases. A cost-sharing system has been used for those who can afford care, whereas all out-patients have to pay for the cost of their medicine. In one area, surgical treatment or cataracts was provided free-of-charge to the elderly at a hospital in Yangon. In spite of this,

Correspondence: Dr Ohnmar, Department of Medical Research, Lower Myanmar.
Mobile: 98997 23229
E-mail: ohnmar@mptmail.net.mm

the poorest people can not afford the cost of care as there is no special exemption for the poorest. Most people with visual impairment are not covered, this is the poorest social group. We also noted that the percentage of children age 5 to 9 currently attending school in Myanmar is lower in the rural areas (77%) than in the urban areas (90.3%) (Department of Health Planning, 2001). Children are encouraged to enroll in school by authorities beginning at age 5 years. School enrollment may be lower among children from poor families but data are not available by social stratification. Our study was initiated due to this lack of socially stratified data on education and health.

MATERIALS AND METHODS

A community-based cross-sectional survey was conducted in 2002 in the Ah-Phyauk area (Population - 26,989), 80 miles from Yangon. A Station Hospital (16 beds) and 5 Rural Health Sub-centers provide the health services. From a list of 4,620 households in Ah-Phyauk, 817 were selected using random numbers, then household characteristics, members, and births and deaths within the past two years were recorded. Twelve households were excluded from data analysis for incompleteness. Out of the remaining 805 households, 3,558 (92.4% of 3,852 total household members) respondents of all ages were included for interview. Mothers were interviewed on the socio-demographic characteristics and acute health conditions of their children under 16 years old (WHO, 1996). Questions on self-rated health and visual acuity status at different distances were asked of all respondents aged 12 years old and above. Information regarding long-term disability was asked of all respondents aged 16 years and above. Ten questions regarding long-term disability in various areas were asked, including locomotion, dressing, washing, feeding, toilet use, hearing and seeing (WHO, 1996). The income questions were modified according to the local setting and income calculation in a previous study (Central Statistical Organization, 1999).

Statistical analysis

A yearly net household income (WHO, 1995) in kyats was calculated using a simple formula [the household income was divided by the number of household members (n) to the power of 0.36 ($n^{0.36}$)] and used for social stratification (low income <50,001; middle income 50,001 to 100,000; high income >100,000). Such a stratification was used rather than equal quintiles with the assumption that it would not affect the variables of interest (Subramanian and Kawachi, 2003). Long-term disability was calculated by scoring the ten questions as recommended (WHO, 1996). A zero score was taken as free from disability, and 1-20 was regarded as the presence of disability, regardless of the severity. Ordinal logistic regression analysis was employed for the outcome variable self-rated health, and the logistic regression method was used for the outcome variables history of acute condition within two weeks, long term disability, visual acuity status at 13 feet, school enrollment. In these regression analyses, the odds ratios adjusted for area, age, and sex were calculated for the different income groups. Rate ratios and rate differences of crude birth rates and crude death rates were calculated for the different income levels.

RESULTS

Sixty percent of houses were made of bamboo. Wooden or brick-based houses were used more by the higher income group (54.6%) than the middle (29%) and lower income groups (22%). The ethnic and religious compositions were similar in all the groups. Being jobless or dependent was higher among females (45.2%; n=1,341) than males (13.0%, n=1,074) and more in the 15 years and above age group. Among females, half were jobless in the lower income group. There was no significant difference in age distribution by income level. Being divorced or a widow was found more often in the lower income group (12.3%) than in the middle (7.8%) and higher income groups (6.3%).

Health status

The lower income group had fewer respondents in the 'very good' category for self-rated health. The percentages of recent acute medical conditions, long-term disability, and poor visual acuity were the highest in the lower income group and decreased with increasing income level (Table 1). The mean score for reported disability was not high 2.5 (SD=2.9, median=1). Multivariate analyses showed that the risk of having a recent acute medical condition or poor visual acuity significantly increased with decreas-

Table 1
Health conditions by yearly household income level and adjusted odds ratio[e].

Outcomes	Yearly household income level			Total	P value f
	High	Middle	Low		
Sample size	1,037	937	684	2,658	
Self rated health[a]					0.0025
Very good (%)	17.8	19.1	10.4	16.4	
Good (%)	59.9	59	64.6	60.8	
Less than good (%)	22.3	21.9	25	22.8	
Coefficients	1	-0.005	0.3		
(95%CI)		(-0.18-0.17)	(0.11-0.5)		
Sample size	1,315	1,299	944	3,558	
Acute condition[b] (%)	16.2	19.2	20.8	18.5	0.014
Odds ratio	1	1.27	1.35		
(95% CI)		(1.03-1.56)	(1.08-1.68)		
Sample size	927	801	598	2,326	
Long term disability[c] (%)	15.3	16.7	21.2	17.3	0.069
Odds ratio	1	1.14	1.39		
(95% CI)		(0.87-0.49)	(1.05-1.84)		
Sample size	1,036	938	683	2,657	
Poor visual acuity[d] (%)	8.1	10.1	13.5	10.2	0.000
Odds ratio	1	1.35	1.64		
(95% CI)		(0.97-1.87)	(1.18-2.30)		

[a]12 years and above respondents; [b]History of illness or injury during the last two weeks among all respondents of any age; [c]16 years and above respondents; [d]13 feet or more distance; [e]Adjusted for area, age and sex; [f]Likelihood ratio p-value regarding income variable for different outcome variables

ing levels of income.

Crude birth rates and crude death rates

The rate of births and the rate of deaths in one year per 1,000 population were 1.3 times and 1.2 times higher in the lower income group than in the higher income group (Table 2).

Delivery practices

Out of 140 children born within two years, 86.4% were delivered at home. After the exclusion of 2 missing values, delivery assisted by traditional birth attendants was more common in the lower (60.0% of 40) and middle (58.2% of 55) income groups than in the higher income group (27.9% of 43).

Education

Overall illiteracy rates were 1.7% among males and 10.4% among females of the 15-years and above population. Illiteracy rates were the highest in the lower income group both, among males (3.1%) and females (14.2%) (Table 3).

Of 382 children 5 to 9 years old, 14% had never been enrolled in school. Enrollment was significantly lower in village areas than in the central area (Table 4). A gender difference in school enrollment was not found, and 89% of children had been enrolled before 7 years of age. Both univariate and multivariate analyses showed that school enrollment was less in the lower income groups than in the higher income group.

DISCUSSION

The lower income group was found to be more vulnerable to poor health and educational situations. Socioeconomic inequalities in self-reported morbidity and health state by household income level have been reported in previous studies (Regidor *et al*, 1997; Shibuya *et al,* 2002; Subramanian *et al,* 2003b; Anson and Sun, 2004). Our study favors the association between income inequality and undesirable health outcomes at the individual level. The relatively lower individual income level in Myanmar compared to developed countries, along with scarce resources, may account for the obvious inequalities seen in our report.

Table 2
Crude birth rates and crude death rates by yearly household income.

Income level	Number of people (Population share)	Births				Deaths			
		Number in 2 years	Rate in one year per 1,000 population	Rate ratio	Rate difference	Number in 2 years	Rate in one year per 1000 population	Rate ratio	Rate difference
High	1,406 (0.37)	43	15.3	1.0	0	28	9.9	1.00	0
Middle	1,402 (0.36)	55	19.6	1.28	4.3	30	10.7	1.07	0.8
Low	1,044 (0.27)	42	20.1	1.31	4.8	25	12.0	1.20	2.1
Total	3,852 (1.0)	140				83			

Health differences may be due to different exposures to health risk, unhealthy behavior or inequalities in health care services. The poorest people may work in unsafe conditions. The stress due to inequality may have led to taking health risks, such as smoking, consumption of alcohol, and a poor diet. Whether or not risky health behavior is associated with social groups was not explored in this study. As in previous studies (Blakely *et al,* 2000; Mellor and Milyo, 2003; Subramanian *et al,* 2003a), there was a lag time between income inequality and health status. The current health and educational differences between the low and the higher income levels may due to the consequences of income inequality in previous decades.

Overall, the male and female literacy rates were slightly higher than national figures (93.3% *vs* 89.7%; 98.3% *vs* 93.7%; 89.4% *vs* 86.2% respectively) (Department of Health Planning, 2001). This can be explained by the absence of a language barrier; the study area was in Yangon. The village area was more likely to have poor visual acuity and lower school enrollment. This may reflect the barriers in the accessibility to health care and education, or other unknown factors. Females were found to be more illiterate than males. There was no significant gender difference in school enrollment to explain this inequality by gender in literacy in the past, but it has improved over time. We also noticed that unsafe delivery is common, even with the presence of qualified midwives. There should be explored further to find causes.

Disparities in health and education between those in the highest and lowest social groups may reflect inequity (Braveman and Gruskin, 2003) in the distribution of resources. Myanmar is pursuing poverty alleviation and primary health care. Our study indicates that routine primary health care is not sufficient to provide adequate equitable allocation of health resources. It may not be practicable to sustain 100% equity in the distribution of scarce resources to meet the needs of the poorest people. Health status varied according to income level. Many females are unemployed. Income generation, particularly among lower income group, may help to diminish the health differences.

Table 3
Literacy rate of population aged 15 years and above by yearly household income.

Income level	Male		Female	
	%	Total N	%	Total N
High	99.3	264	92.4	527
Middle	98.2	382	89.4	454
Low	97	428	85.8	360

In summary, although Myanmar country has been involved in poverty alleviation and has been providing primary health care, socioeconomic inequalities are found in health and education. The poorest are the most vulnerable to health and education risks. This is a need to find appropriate strategies for providing health care and education to the poorest people in rural areas.

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Table 4
Previous school enrollment among 5 to 9 year old children (total n=382).

Item	%	N	Crude odds ratio (95% CI)	Adjusted odds ratio (95% CI)	Likelihood ratio test p-value
Area					0.04
Central	89.1	138	1	1	
Village	84.1	244	0.55 (0.3-1.1)	0.49 (0.2-0.9)	
Sex					0.58
Male	86.1	187	1	1	
Female	85.6	195	0.79 (0.5-1.4)	0.84 (0.5-1.6)	
Age (years)			2.31 (1.8-3.0)	2.39 (1.8-3.2)	0.000
Income level					0.005
High	92.8	111	1	1	
Low	83.2	113	0.30 (0.1-0.7)	0.24 (0.1-0.6)	
Middle	83.5	158	0.36 (0.2-0.8)	0.34 (0.1-0.8)	

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