

Adult Illness in Dhaka Slum Households

Jane A. Pryer, Stephen Rogers and Ataur Rahman

INTRODUCTION

The adult population is the productive sector of society and illness or disability will have inevitable adverse consequences for families and communities (Feachem et al., 1992; Over et al., 1992). Yet with notable exceptions (Over et al., 1992; Pryer et al., 1993), there is remarkably little empirical data on the burden of adult illness for households in developing countries.

The Urban Livelihood study (ULS) is a multidisciplinary research study which uses a variety of quantitative and qualitative methodologies to explore the social, material and financial conditions of households in an urban slum population in Dhaka city, Bangladesh. We have used cluster analysis to identify livelihood groups within the slum population. The clustering technique draws on nineteen variables to identify groups of households with similar characteristic. The groups emerging thus reflect the natural structure of the data and not constrained by any classification imposed by the investigator.

In this paper we assess the burden of ill health in these slum households and test the hypothesis there is an unequal burden of adult ill health between livelihood groups. We present information on the prevalence of work disabling morbidity, days lost from illness, and the costs of ill health, including income lost, and health expenditure. We also examine the impact of work disabling on household work.

Health insurance schemes offer considerable potential to provide care for the sick on account of their redistributive effects and their capacity to spread the economic burden of disease over the sick and non-sick (Millis, 1983). Credit schemes can also provide an option for households where falling incomes associated with illness have required assets to be sold. The implications of our findings are discussed in relation to policies and programmes that might be implemented to alleviate the worse effects of adult ill health.

MATERIALS AND METHODS

Setting: Dhaka is the national capital and the largest city of Bangladesh. Thirty million people,

around 20 per cent of the total population of Bangladesh, live in urban areas. By the year 2005 this figure will have risen to 46 million, and by 2015 projections indicate that 68 million (more than a third of the total population of Bangladesh) will live in urban areas (Task Force, 1992; World Bank Development Report, 1999). In the absence of commensurate industrialisation and on account of little planned urban or spatial development, this rapid expansion of urban population has serious implications for physical and socio-economic conditions of the country's cities (Task Force, 1992). The number of slum settlements has grown rapidly in recent years and the urban poor are now estimated at around 11 million, or 37% of the urban population (Islam, 1997).

The Gross National Product (GNP) in 1998 was US\$ 44 billion (per capita 350 dollars), and the rate of growth between 1997 and 1998 was 5 per cent. Despite economic growth, wealth is not evenly distributed. The Gini Index in 1992 was 28.3 with the lowest 10 % consuming 4.1% and the richest 10% consuming 23.7%. 14% of the urban population live below the national poverty line and the largest gap between rich and poor is in the urban areas (Task Force, 1992; World Bank Development Report, 1999).

The Urban Livelihoods Study is based in the slum settlements of Mohammadpur thana. *Agargaon* includes the biggest slum in Mohammadpur. The land is owned by the government but has been occupied informally by squatters for over 20 years. *Central Mohammadpur* includes slums in Rayer Bazaar, Jafarabad, Pisciculture, Adabar and Pulpur Bottola areas. Most of the slums in this area consist of poor housing within middle and lower-middle class residential housing settlements. Private landlords own most, though some are on disputed land. Finally, *Beri Badh* is the peripheral area of Mohammadpur. The settlements have been developed along the embankment of the Dhaka City Flood Protection alongside the Buri Ganga River. The embankment is government owned land, with slums adjacent to the embankment situated on privately owned land.

Medical Pluralism: In Bangladesh indigenous and naturalised traditional medical exist parallel to

the allopathic system. The major non-allopathic systems of medicine include *ayurveda*, *unani* and homeopathy. The practitioners called “*kabiraj*”, “*Hakim*” and “*homeopath*” respectively. The allopathic practitioners include qualified Doctors (M.B.B.S), who works in a hospital or a surgery and also in NGO clinics. Other allopathic practitioners (non-qualified) sell drugs (Bhardwaj and Paul, 1986). Children under five and their nursing mothers visit NGO clinics where the service is free.

However, most adults use drug stores traditional healers or homeopaths in the first instance depending upon their condition. Qualified doctors are so expensive that they resort to this only when the condition is life threatening. The choice of a practitioner is complex process varying with gender, health status, proximity to the nearest health practitioner, cost of care, attitude to different medicine systems, past experience, type of disease, and socio-economic status.

Higher socio-economic groups can afford the costs of health care. Specifically, the use of qualified allopathic doctors is higher among the well-off, but the private practitioners and the drug stores are used by the lower socio-economic groups (Claquin, 1981).

Method: The study is a collaborative effort by The London School of Hygiene and Tropical Medicine, Proshika, and Bath University. Data collection is based on two sets of interrelated activities; quantitative data collection on a panel of around 850 households -termed the quantitative panel survey and qualitative studies which explore the same study objectives within selected slum settlements in the study area.

The sample was a cluster random sample involving 25 clusters of slum households spread across Mohammadpur thana in Dhaka City. Following initial registration of 843 households in November 1995, clusters were visited every month until April 1997. The monthly questionnaire addresses information on the residency status and demographic characteristics of household members, anthropometric status, morbidity, food expenditure, work participation, and time off work because of ill-health, food expenditure and self-perceived financial situation. In addition, every three months, a longer questionnaire was fielded to collect additional information on savings and debts, income from employment and other sources, gifts and remittances, ownership of assets including land and animals, school attendance and group membership, stocks of food and household expenditure.

The sample size calculations were made based

on planned tests of hypothesised differences between child and adult nutritional status in different livelihood groups.

Data Analysis: We used cluster analyses to identify livelihood groups within the slum households participating in the study. The clustering technique used was a hierarchical agglomerative (or stepwise) technique available on SPSS for windows. Ward's method was used as suggested by Everitt (Everitt, 1980). In Monte Carlo studies, Ward's method has been found to be the most robust clustering method using a similarity matrix based upon squared Euclidean distances (Blashfield, 1976, Aldenderfer and Blashfield, 1984).

A number of economic and demographic variables were entered into the cluster including: land, animals, labour days worked per month, savings, and debts, income, business assets, occupational group, days off because of illness, household type, household size, earner: dependency ratio. Continuous variables were standardised by converting to the standard normal deviate. A matrix of distances based upon squared Euclidean distance was computed. A stepwise fusion of cases based upon the squared Euclidean distance was computed. The clustering coefficient was then used to indicate the stage on the agglomeration schedule where large changes between fusions were evident as compared to immediately preceding stages (Everitt, 1980). One major advantage of hierarchical clustering algorithms is that results are presented in the form of a dendrogram. This aids the investigator in exercising judgements on the number of clusters that exist or are useful for the purpose at hand.

As possible instability of results could be one of the limitations of a cluster analysis, we tested the stability of the cluster solution. Two methods were used: (1) discriminate analysis to test the degree of association between group membership assigned by cluster and that assigned by discriminant analysis and (2) by randomly splitting the data in two, clustering separately in each subset and comparing cluster membership in the split sample.

Statistical comparisons were made across the clusters in terms of reported, socio-economic and demographic variables. Parametric one-way analysis of variance (ANOVA) was used to test for between-group differences in mean values, and categorical variables were tested by chi square tests. Where the expected cell size was under five, Fisher's Exact Test was used. Measures of nutritional status and morbidity were available for individuals within clusters. Means and standard errors were calculated for body mass index, morbidity, and nutritional indices of children,

and comparisons across clusters were made using ANOVA.

RESULTS

Identification of Clusters: Four clusters were identified comprising 90% of the cross-sectional sample in round 4. The level of agreement between split samples were the same. The level of agreement between cluster and predicted group membership using discriminant analysis was 95%. In conclusion the cluster solution was robust.

The Clusters: Table 1 shows the socio-economic characteristics of the four clusters and table 2 shows the demographic and occupational characteristics.

Cluster 1 (n=178) was the richest group in the Dhaka slums. This group owned more land and animals than other groups and by far the most business assets and had the highest savings. Household loans were higher showing that this group was credit worthy. The household size was also higher than that in other groups, and household structure was mainly male headed. The earner: dependency ratio was second highest after cluster 4. The group was mainly self-employed (70%). This group worked 25 days/month, the highest among the groups.

Cluster 2 (n=190) had the least land, animals and the least business assets. Loans were the lowest of any group. Household savings were lower than other groups. Total expenditure was second highest and food expenditure was the second highest after Cluster one (Table 1). The household size was smaller than other groups, and household structure was male headed. The earner:dependency ratio was lower than Cluster one and cluster four (Table 2). Nearly every household was dependent self-employed (dependent

upon one or more large enterprises for credit, tools or premises).

This group worked 21 days/month the second highest days work/month, after cluster one.

Cluster 3 (n=124) This cluster owned land and animals but less than cluster one and cluster four. Business assets were second highest after cluster one. Total and food expenditure was lowest among the clusters. The loans were least among the clusters. Household savings were third highest after cluster one and cluster four. The group was mainly casual unskilled workers (83%) (Table 1). The household size was second largest after cluster one. The household type was 40% female headed and 60% male headed households. The earner:dependency ratio was lowest among the clusters (Table 2) The days worked was 20 days/month.

Cluster 4 (n=67) had the second largest amounts of land and the third highest animals. Business assets were the second lowest among the Dhaka clusters. Household savings were second highest after the cluster one. Household loans were second highest after cluster one. Total expenditure and food expenditure was highest among the clusters (Table 1). The household size was third highest among the clusters, and household type was male headed. Earner:dependency ratio was higher among the clusters (Table 2). 95% were skilled casual workers. The group worked 19.5 days/month, the lowest among the clusters (Table 1).

The Cost of Ill Health: The burden of illness in the various clusters is presented in Table 3. 20% of households in the richest cluster time off work due to illness increasing to 44% of households in cluster 3, the poorest cluster. Work days lost due to illness was higher in the female headed cluster (C3), and lowest in the richest cluster (C1) ($p<0.0001$).

Table 1: Socio-economic variables by cluster

Variables	C1 (n=178) self-employed	C2 (n=190) casual unskilled	C3 (n=124) Female eaded households	C4 (n=67) Casual skilled	P
Land (mean and se) bhighas	0.27 (0.011)	0.15 (0.05)	0.201 (0.05)	0.23 (0.03)	<0.036
Animals (mean and se)	0.315 (0.03)	0.019 (0.01)	0.12 (0.03)	0.11 (0.019)	<0.0001
Household business assets (mean and se) Taka	4549.42(756.14)	89.32 (33.24)	344.04(103.13)	176.42 (95.65)	<0.0001
Household savings (mean and se) Taka	688.46(172.83)	353.33 (80.52)	367.87(134.48)	416.43 (92.24)	<0.0001
Household loans (mean and se) Taka	368.02 (72.24)	250.70 (28.90)	248.25 (43.94)	325.82 (66.55)	<0.0001
Household income per cu (mean and se) Taka	868.71 (39.88)	657.64 (45.93)	585.35 (68.26)	853.97 (81.18)	<0.0001
Total expenditure per cu (mean and se) Taka	578.35 (37.33)	572.70 (14.10)	509.98 (20.90)	567.74 (23.09)	<0.0001
Food expenditure per cu (mean and se) Taka	466.31 (12.46)	498.68 (12.55)	435.95 (16.72)	535.87 (32.88)	<0.0001

Table 2: Demographic characteristics by cluster

<i>Variables</i>	<i>C1 (n=178) self-employed</i>	<i>C2 (n=190) casual unskilled</i>	<i>C3 (n=124) female headed households</i>	<i>C4 (n=67) casual skilled</i>	<i>P</i>
Household size (mean and se)	5.26 (0.15)	4.34 (0.12)	4.63 (0.18)	4.47 (0.17)	<0.0001
Household type					<0.0001
Female headed	2	0	49	0	
Male headed	176	190	75	67	<0.0001
Earners:	2.202 (0.13)	1.989 (0.098)	1.579 (0.13)	2.226 (0.15)	<0.004
Dependency ratio (mean and se)					

Table 3: Cost of ill-health

<i>Variables</i>	<i>C1 (n=178) self-employed</i>	<i>C2 (n=190) casual unskilled</i>	<i>C3 (n=124) Female headed households</i>	<i>C4 (n=67) casual skilled</i>	<i>P</i>
% of household with labour days lost due to illness	20.22	31.05	44.35	20.35	<0.0001
Total work days off/month due to illness (mean and se)	2.24 (0.42)	4.28 (0.59)	7.58 (1.01)	2.89 (0.83)	<0.0001
Household work days off/month due to illness (mean and se)	0.932(18.23)	1.15 (0.28)	4.68 (0.89)	1.16 (0.42)	<0.0001
Cost of illness health expenditure /month (mean and se) Taka	68.75 (18.23)	56.93 (25.66)	61.61 (19.04)	54.21 (16.04)	<0.990
Income lost due to illness /month (mean and se) Taka	28.6 (9.6)	30.9 (11.75)	46.2 (15.10)	15.40 (6.90)	<0.0001
Cost of illness health expenditure/month: total household income (%) (mean and se)	2.62 (0.56)	2.12 (0.48)	2.561 (0.60)	2.125 (0.50)	<0.988
Income loss due to illness/month: total household income(%) (Mean and se)	18.01 (0.95)	17.12 (0.46)	30.30 (2.26)	11.60 (0.55)	<0.0001

Similarly household work days off due to illness was highest among the amongst the female headed household cluster (C3) and least in the richer cluster (C1) ($p < 0.0001$).

Expenditure on health care was not significantly different between clusters, but the income lost due to illness/month as a percentage of household income was greater in female headed households (C3) and least in C4 ($p < 0.0001$). The cost of health expenditure was less than income lost due to workdays forgone due to illness. Only three people received help in cash or kind.

DISCUSSION

This paper uses cluster analysis to identify groups within the Dhaka slums, who report similar patterns of livelihoods. Four groups were identified with different socio-economic and demographic variables. We compared the degree of association between actual group membership assigned by cluster analysis and that predicted using discriminant analysis. Results indicated there was a good agreement between the two methods and we conclude that the cluster solution was robust.

20-40% of households reported labour days lost due to illness in any month and 10-30% of potential income was lost due to ill health. In absolute terms the income lost was highest in the richest households, but in proportional terms the greatest loss was in female-headed households, one of the two poorest groups. These levels are higher and the differentials between livelihood groups are higher than those reported an earlier study of a slum population in Khulna, Bangladesh (Pryer, 1993). In this study, average earnings lost due to illness were around 10% of monthly income, increasing to 24% of monthly income in the poorest group.

Illness may have serious consequences if it leads to a loss of income. While illness occurs in individuals the costs fall on the household. Sickness in one member influences household decision regarding the allocation of financial resources. In this study the burden of adult ill health is greatest in the poorest households. Such households are at risk of being pushed into decline by episodes of adult illness. Even when such households cope in the short term, they may need to sell assets with will reduce the household's ability to cope with future adverse events.

Expenditure on illness was similar across the

livelihood groups. Amongst the poor in developing countries, health is often not considered a priority by many households with income barely enough to meet the needs of daily food, shelter and clothing. The study did not focus on healthcare utilisation. However, it is known that most adults use drug stores, traditional healers or homeopaths for in the first instance, depending upon their health problem (Bhardwaj and Paul, 1986). Qualified doctors are so expensive that the poor resort to this only when the condition is life threatening (Claquin, 1981). While we do not have details of treatment choices, it is entirely possible that health expenditure had relatively little effect on the natural history of adult illness.

Policies and Coping Strategies: What policy options might strengthen the capacity of poor urban households to cope with the financial costs of illness? One suggestion is to develop programmes to increase the asset buffer of households, encouraging them to accumulate assets, which might be sold in a crisis. A second way is to diversify income sources, by increasing income-earning opportunities. Third is to develop credit schemes for the poor households and enhancing access to credit for poor households (Blashfield, 1976). Lastly to develop community based health insurance schemes.

Probably all of these strategies should be pursued simultaneously. None are without possible setbacks. For example, the concept of risk-sharing and its financial implications may not be understood by potential subscribers and technical and managerial issues may limit the ability of poor people to organise their own schemes (Mills, 1983). Nevertheless, there are two community health insurance schemes in Dhaka (The Grameen Health Programme, and the Gonoshasta Kendra Health Care System (Desmet et al., 1999) which might be accessed to reduce income lost during illness and to buy healthcare which could reduce the duration of work absence.

CONCLUSIONS

The prevalence of sickness-induced loss of employment was found to be very high in the Dhaka slums, represented substantial loss of earnings and was disproportionately borne by the poorest households. More emphasis should be placed upon community health insurance and credit schemes to ease the financial burden and distress incurred following sickness induced loss of income. There are two community health insurance schemes in Dhaka (The Grameen Health Programme, and the Gonoshastha Kendra Health Care System (Desmet et

al., 1999) which should be supported and developed to cover all areas.

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URBAN LIVELIHOOD STUDY

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ULS STEERING COMMITTEE

Dr. Qazi Faruque Ahmed (Proshika Co-Chair), Dr. Jane Pryer (LSHTM Co-Chair), Dr. Geof Wood, Mr. Shahabuddin, Dr. Sarah Salway, Mr. Iqbal Alam Khan, Mr. Matthew Kiggins, Mr. Mahbubul Karim, Professor Nazrul Islam, Dr. Oona Campbell.

PROSHIKA TEAM MEMBERS

Proshika Project Director: Mr. Md Shahabuddin
Project co-ordinator (Qualitative): Mr. Iqbal Alam Khan
Qualitative Researchers: Ms. Sonia Jesmin, Mr. Azmal Kabir Kazal, Ms. Mottahera Nasrin, Mr. AEA Opel
Quantitative research Officers: Dr. Ataur Rahman, Ms. Shahana Rahman.
Database manager: Mr. Mostafa el Helal
Supervisors: Mr. SM Zubair Ali Khan, Mr. Akramul Islam
Interviewers: Mr. Shahajahan Hossain, Ms. Rifat Aara, Mr. Md Salim, Ms. Dilafroze, Ms. Rezina Khan Ratna, Ms. Rafeza Shaheen, Mr. Patrick Rozario, Ms. Afsari Begum, Mr. Tasbir-ul-Hasnain, Mr. Moniruzzaman, Mr. Md Ataul Islam, Mr. Dayal Chandra Das, Mr. Golam Firoz, Ms. Nurun Nahar, Ms. Namita Chakravarti, Mr. Chandon Banik, Mr. Mustafiz Ali Khan, Ms. Shahina Khan, Ms. Asma Begum, Mr. Mahbubul Alam,
Data entry clerks: Mr. Md Helaluddin Farid, Ms. Nargis Akter, Mr. Md Sohel Ahmed Tarafder, Ms. Monira Islam
Mapping team: Ms. Rifat Aara, Mr. Arif Hossain Khan, Mr. Md Mainul Islam

LSHTM TEAM MEMBERS

Team Leader: Dr. Jane Pryer
Project Co-ordinator (Quantitative): Dr. Sarah Salway
Project Co-ordinator (Epidemiology): Mr. Matthew Kiggins
Epidemiology Adviser: Dr. Oona Campbell
Bath University Team members
Qualitative Adviser: Dr. Geof Wood
Student Placement: Ms. Emily Delap

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ABSTRACT Cluster analysis was used to identify relatively homogenous groups within Dhaka slum households, who report similar patterns of livelihood. Four groups emerged which may be summarised as “self employed”, “casual unskilled”, “female headed” and “casual skilled” households on the basis of their socio-economic, demographic and occupational characteristics. The “self employed” and “casual skilled” groups were better off in terms of income, assets and creditworthiness. The greatest burden of adult illness fell in the “casual unskilled” and “female headed”. Programmes, which mitigate the adverse effects of adult ill health on household economies, might help break the cycle of ill health and poverty, which characterise many urban slum households, and could help reduce inequalities between livelihood groups.

Authors' Address: **Dr. Jane Pryer**, Royal Free and University College Medical Schools, University College London, Department of Primary Care and Population Sciences, Royal Free Campus, Rowland Hill Street, London NW3 2PF, UNITED KINGDOM.
Telephone: + 44(0)20 7830 2239, **Fax:** +44 (0) 20 77941224
E-mail: J.Pryer@pcps.ucl.ac.uk
Stephen Rogers, Health Services Research Unit, London School of Hygiene and Tropical Medicine, London, UNITED KINGDOM
Ataur Rahman, Institute for Policy Analysis and Advocacy, Proshika, Dhaka, BANGLADESH