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Equity in community health insurance schemes: evidence and lessons from Armenia

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Introduction Community health insurance (CHI) schemes are growing in importance in low-income settings, where health systems based on user fees have resulted in significant barriers to care for the poorest members of communities. They increase revenue, access and financial protection, but concerns have been expressed about the equity of such schemes and their ability to reach the poorest. Few programmes routinely evaluate equity impacts, even though this is usually a key objective. This lack of evidence is related to the difficulties in collecting reliable data on utilization and socio-economic status. This paper describes the findings of an evaluation of the equity of Oxfam's CHI schemes in rural Armenia.

Methods Members of a random sample of 506 households in villages operating insurance schemes in rural Armenia were interviewed using a structured questionnaire. Household wealth scores based on ownership of assets were generated using principal components analysis. Logistic and Poisson regression analyses were performed to identify the determinants of health facility utilization, and equity of access across socio-economic strata.

Results The schemes have achieved a high level of equity, according to socio-economic status, age and gender. However, although levels of participation compare favourably with international experience, they remain relatively low due to a lack of affordability and a package of primary care that does not include coverage for chronic disease.

Conclusion This paper demonstrates that the distribution of benefits among members of this community-financing scheme is equitable, and that such a degree of equity in community insurance can be achieved in such settings, possibly through an emphasis on accountability and local management. Such a scheme presents a workable model for investing in primary health care in resource-poor settings.

Keywords Community-based health insurance, equity, health care utilization, Former Soviet Union, Armenia

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KEY MESSAGES

- Community health insurance schemes in low-income settings can be equitable, but may be constrained by low level of membership.
- Strengthening of such schemes represents a potential mechanism by which investments in primary health care can be channelled in resource-poor settings, while sustaining equity.
- Local management, accountability and monitoring may be important in implementing equitable and accountable community health financing schemes.

Introduction

Research frequently shows that the poorest members of society often fail to benefit from health care and social welfare programmes (Castro-Leal *et al*. 2000; Gwatkin 2000; World Bank 2004a,b), a result of which is increasing recognition of the need to evaluate equity (Wagstaff 2001a; Yazbeck *et al*. 2005). This applies to community health financing (Bennett *et al*. 1998; International Labour Organisation 2002), which is becoming an increasingly important health financing mechanism in lower-income countries (Carrin *et al*. 2001; Bennett *et al*. 2004). Some such financing schemes are reported to be equitable in terms of equal enrolment levels across socio-economic groups (Diop *et al*. 1995; Jakab *et al*. 2004), while in others the cost can be a barrier to the poorest (Arhin 1994; Ensor 1995; Bennett *et al*. 1998; Bennett and Gilson 2001; Schneider and Diop 2001; Criel and Waelkins 2003; Jakab *et al*. 2004). In a systematic review, Ekman (2004) concluded that CHI schemes reduce out-of-pocket payment and increase access to health care in low-income countries, but the poorest were still excluded, resulting in low levels of both vertical and horizontal equity.

In this paper we conduct multiple regression analyses, linking programme utilization to socio-economic status (SES) as described by Wagstaff (2001b), to examine the equity achieved by Oxfam's CHI schemes in rural Armenia. These were set up in response to failures of the public health system, which was profoundly affected by the severe economic contraction following independence in 1991. At the time of the study, Armenia was among the poorest countries in the former Soviet Union, with a GDP of US$556 per capita, compared with an average of US$1473 for the Commonwealth of Independent States (CIS).

The collapse in government revenue resulted in a 35% decline in public health expenditure, to a level considerably lower than the CIS levels (49 PPP$ per capita versus 204 for the CIS; WHO estimates, 2001) despite the fact that the overall level of spending remained similar, suggesting that the gap has been filled by private out-of-pocket payments. As described by Hakobyan *et al*. (2006), user fees were introduced to help bridge the financing gap, and by 1999 out-of-pocket expenditure due to formal user fees and informal payments was approximately 65% of total health care expenditure. Despite the introduction of a state-funded basic benefits package seeking to cover vulnerable groups and priority public health services, utilization rates declined. Inequities in access to care have been documented: in 1999, utilization of government-financed health services by the richest 20% of the population was three times higher than that of the poorest 20% (World Bank and IMF 2003). Reforms are continuing, with real-term increases in government expenditure on health care, and in January 2006, the government committed itself to providing universal free access to basic PHC services (Hakobyan *et al*. 2006).

Oxfam set up and financially supported CHI schemes to address the problems that rural communities face in accessing care due to inadequate and inequitable publicly funded services, increasing out-of-pocket payments and severe poverty (World Bank and IMF 2003; National Statistics Service of the Republic of Armenia 2004). Ensuring equitable access has been an explicit objective of the schemes, which cover roughly 10% of the rural communities. Households pay a quarterly insurance premium of 1500 AMD (approximately US$4.6 at the time of the study in 2001), entitling them to basic drugs and a range of PHC services at the local health post (HP). This is the most peripheral level of the Armenian health system, and serves as a referral point to both ambulatories (clinics staffed by doctors in population centres of over 2000) and polyclinics (clinics in large towns with diagnostic and specialist services).

More recently, specialists and general practitioners have been providing reproductive and maternal health care, and care for chronically ill patients, during outreach visits. A community-led exemption procedure provides free membership for the most vulnerable, and aims to cover 10% of scheme members. The scheme is heavily subsidised, with contributions from Oxfam covering running and other excess costs (Poletti *et al*. 2007).

Evaluations have demonstrated that Oxfam's schemes have contributed to improving access and quality of care, primarily through rehabilitation of local HPs, providing basic equipment, training of nurses, and ensuring HPs are well-stocked with appropriate drugs (Oxfam 2000; Sloggett 2002; Poletti and Balabanova 2006). The schemes are now major providers of health care in rural communities. Forty per cent of the population were members at some stage over a 12-month period (2000–01), although this ranges from 10%–90% between villages. However, only 20% were members when this scheme was evaluated during Spring 2001. This compares favourably with international experience—Bennett *et al*. (1998) note that few schemes cover more than 25% of their target populations—but is of concern because it undermines risk pooling and the rate is low relative to the burden of disease. The main disincentives to participation relate to affordability, the accessibility of alternative avenues of care such as primary care specialists or pharmacists in the district town, and the limited package of services which is viewed as being poor value for

money (Sloggett 2002). A further disincentive to join is that non-members are entitled to consult the government-employed nurse, although they are not entitled to drugs provided under the scheme.

This paper has several objectives: (1) it seeks to assess equity in access to health care within the scheme; (2) it compares the distribution of the subsidy between members and non-members in villages operating an insurance scheme; (3) it examines the probability of consulting in villages with and without a scheme.

Methods

Data collection

The analyses presented in this paper were conducted using household survey data collected in July 2001 on health status, service utilization and health care expenditure (Sloggett 2001). Within each household, a 'main' or 'primary' respondent was identified, who provided information on behalf of the family. Information collected included scheme membership status and sources of family income. Individual data on health status and health-seeking behaviour were collected for main respondents and additional members of the household (secondary respondents) who reported experiencing ill-health during the 3-month recall period (April-June 2001). The inclusion of secondary respondents enabled the capture of the health experiences of the most vulnerable members of the society, namely young children and the elderly, who were less likely to be primary respondents.

Sampling took place in nine villages randomly selected from a list of 36 villages operating an insurance scheme in Vayots Dzor district. Two villages were excluded due to inaccessibility. Three comparable non-scheme villages (in terms of size, sources of income and geographical accessibility) were included as controls in the analysis, in order to correct for the advantages that the scheme introduces, both for the insured and uninsured, in villages operating it. Their inclusion permits a comparison between non-members in villages operating a scheme and inhabitants of villages without a scheme. Households were selected by random walk technique. A calculation based on the need to detect differences in payments between scheme members and non-members yielded a sample size requirement of 500 households.

Data analysis

SES was determined using an index combining seven indicators of ownership and use of land, and sources of income and savings. These indicators were derived from consultations with local experts, with the purpose of discriminating households into SES groups. All missing values were recoded to the mean. Weights were derived for each variable using principal components analysis (PCA), with the index being the first principal component, as described by McKenzie (2005) and Filmer and Pritchett (2001). 'Wealth scores' were generated for each household that were then ranked according to their SES score, and then classified into five quintiles, 1 being the poorest and 5 being the least poor.

Univariate and multivariate (Poisson and logistic regression) analyses were undertaken to investigate *rates* of utilization (among main respondents only) and the *odds* of visiting a HP at least once during the recall period (among all respondents). Robust standard errors were calculated to account for clustering at the household level when including all respondents in the analysis.

Results

Description of sample

The survey sample included 506 households from 12 villages; 342 from villages with a CHI scheme, and 164 from villages without (Table 1). All households consented to involvement in the study. In the villages operating the scheme, 176 (51%) households were enrolled in the scheme at the time of the survey. Of the 948 individuals interviewed, 506 were primary respondents (spoke on behalf of the household) and 442 were secondary respondents. The mean number of respondents per household was 1.87.

Participation rates in the insurance schemes ranged from 24% to 57% between villages. The average cost per HP visit was 15 660 AMD (approximately US$29 at time of survey), and ranged from 3987 to 24 989 AMD (US$7–45). This variation in cost is due to differential rates of utilization in each village, leading to economies of scale. There is no evidence for an association between membership status and SES (Table 2).

Of the 176 member households included in the sample, eight (4.5%) were exempt from payment, which is less than the 10% envisaged by the scheme design. This may imply some degree of bias in the sample, or that the intention of exempting 10% of the population is not always implemented in practice.

Seventy-five per cent of the main respondents were female (Table 2), compared with 46% of the secondary respondents. The mean age was 47 years among primary respondents and 38 among secondary respondents. There is some evidence to suggest that lower SES is associated with older age of the primary respondent ($P < 0.001$) and larger household size ($P = 0.014$, Table 2).

Utilization

Utilization tended to be higher in scheme villages. Fifty-eight per cent of all primary respondents in such settings reported having visited a HP at least once during the study period (mean number of visits = 3.1, Table 2), compared with 35% in non-scheme villages (mean number of visits = 1.2). Scheme members made most use of the local services, with 77% of main respondents reported having visited a HP at least once in the past 3 months (mean number of visits = 4.6), compared with 36% among non-members (mean number of visits = 1.3).

The percentage of respondents reporting at least one episode of ill-health increases with decreasing SES in scheme villages (Chi-squared test for trend, $P = 0.021$, Table 2) but there was no relationship between SES and scheme membership. Scheme members were more likely than non-members to have experienced an episode of ill-health (OR = 2.83, $P < 0.001$).

Table 1 Distribution by village of households and individuals included in the analysis, scheme participation rates, and cost of visits to health posts

Village	No. of households included in the survey	No. of people included in the survey (primary and secondary respondents)	Overall participation rates in the schemes (%)	Cost per health post visit (AMD)
Scheme villages				
Artabjunk	38	73	32	3987
Gndevaz	58	123	24	14 232
Herher	36	68	43	10 039
Martiros	32	77	29	21 604
Taratoumb	26	62	57	11 521
Eghegis	41	73	51	21 764
Saravan	32	66	33	22 518
Bartsruni	49	90	51	24 989
Gokhtanik	30	50	42	10 271
Non-scheme villages				
Srashen	50	80	–	–
Davit-Bek	30	48	–	–
Chakaten	84	138	–	–
Total	**506**	**948**		**Mean = 15 660**

Table 2 Primary respondents' characteristics by socio-economic group in villages operating a CHI scheme

	Socio-economic status					Total	Chi-squared test for trend of association between SES and variable (*P*)
	Q1 (Poorest)	Q2	Q3	Q4	Q5 (Richest)		
N	72	84	57	56	73	**342**	–
Age of primary respondent (mean)	49.8	44.9	49.8	39.5	40.0	**47.2**	<0.001
Male (%)	23.6	27.3	30.0	30.0	19.1	**24.7**	0.603
Household size (mean)	2.8	2.2	2.1	2.1	2.0	**2.2**	0.014
% reporting episode of ill-health during study period	80.2	75.3	67.7	66.7	68.0	**71.6**	0.021
Visited health post during last quarter (%)	61.1	57.1	66.7	61.8	46.6	**58.1**	0.065
Mean no. of visits to health post	3.4	2.8	3.5	3.3	2.4	**3.1**	0.519
% membership	47.5	54.6	51.6	51.9	50.8	**51.5**	0.973

Utilization increases with increasing age (Figure 1), reflecting greater health needs among older individuals, with the odds of reporting an episode of ill-health increasing with age (OR = 2.4 per unit increase in age category, $P < 0.001$). Among women, the most frequent users are those over the age of 60, rather than those of reproductive age (mean = 3.1 vs. 2.1 visits, respectively). Fifty-two per cent of women visited HPs compared with 45% of men, but among those primary respondents that did visit HPs at least once, men visited more frequently than women (5.4 vs. 4.7 visits).

Poisson regression revealed higher utilization rates in villages with a scheme (RR = 1.28, $P = 0.014$), and among the poorest quintile relative to all other groups (Table 3). Members visited HPs more frequently, at over 3.5 times the rate of non-members (Table 3). The rates of visitation increased with age and were slightly elevated among women (RR = 1.13, $P = 0.068$, Table 3).

The analysis of the odds of visiting HPs at least once was repeated among only those respondents (primary and secondary) reporting an episode of ill-health during the specified recall period (Table 4). This includes individuals solely on the basis of self-reported illness, and excludes visits made for preventive care, therefore permitting the investigation of health-seeking behaviour among those experiencing ill-health. In this analysis, there was no evidence of utilization differences according to SES, sex or age, although membership status remained an important determinant of the odds of visiting a HP at least once, after adjusting for all other variables (OR = 6.71, $P < 0.001$).

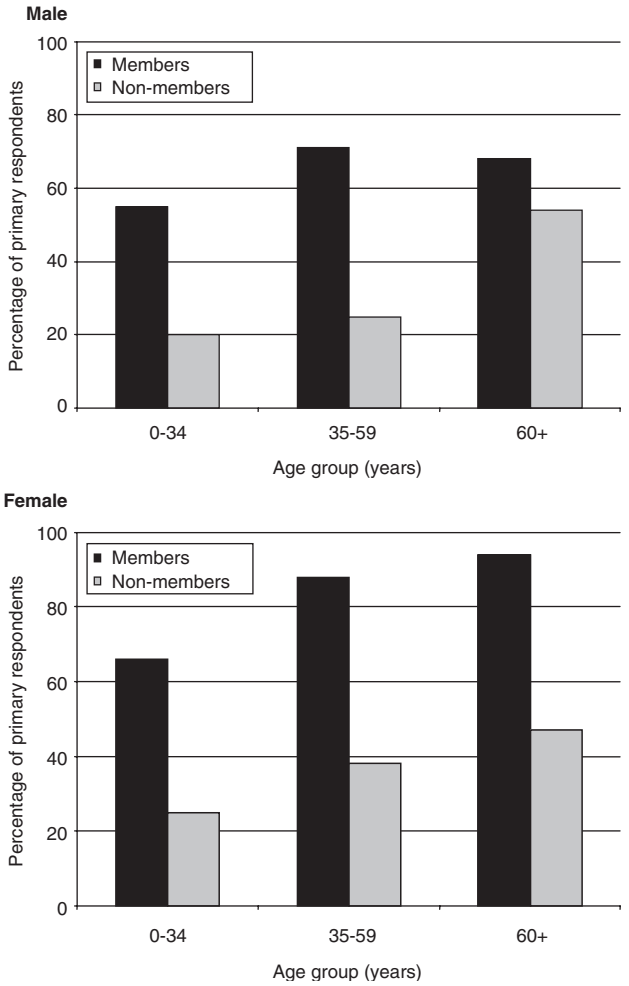

Figure 1 Variations in percentages of primary respondents visiting a health post at least once during the study period by gender, age group and membership status

Table 3 Adjusted ratios of the rates of visiting a health post during the study period among primary household respondents, according to various characteristics, derived from Poisson regression

	No. of individuals (%)	Rate ratio	95% confidence interval	*P* value
SES quintile				
Q1 (poorest) (ref.)	101 (20)	1	–	–
Q2	100 (20)	0.60	0.50–0.71	<0.001
Q3	100 (20)	0.63	0.53–0.76	<0.001
Q4	103 (20)	0.76	0.64–0.90	0.002
Q5 (richest)	102 (20)	0.67	0.56–0.80	<0.001
Age group (years)				
0–34 (ref.)	144 (28)	1	–	–
35–59	205 (41)	1.55	1.32–1.82	<0.001
60+	157 (31)	2.58	2.20–3.01	<0.001
Sex				
Male (ref.)	126 (25)	1	–	–
Female	380 (75)	1.13	0.99–1.29	0.068
Membership status				
Non-members (ref.)	176 (35)	1	–	–
Members	330 (65)	3.65	3.13–4.24	<0.001
Village group				
Without CHI scheme (ref.)	164 (32)	1	–	–
Operating CHI scheme	342 (68)	1.28	1.05–1.55	0.014

Discussion

Inequitable distribution of benefits is a common failing of subsidized health care (World Bank 2004b; Gwatkin *et al*. 2005), and the importance of equitable coverage within community financing arrangements is being increasingly emphasized. The analyses presented here examined the extent to which a CHI scheme provides equitable access to basic primary health care in rural Armenia, and demonstrated that there is a considerable degree of equity, in accordance with its objectives. This is an important achievement, as similar schemes often fail to achieve equitable coverage, as described by Preker *et al*. (2004) and Bennett *et al*. (1998). Likely explanations may include the sustained and significant external subsidy, possibly through an emphasis on accountability, community ownership, and to some extent practising a community-implemented exemption (Poletti *et al*. 2007). However, further research is needed to identify the crucial factors for achieving equity and identifying replicable experiences.

The strongest predictor of health service utilization is membership of the scheme. This is as expected, and has several implications. The increased levels of use among members may be the result of the successful elimination of barriers to seeking care during episodes of genuine ill-health. Adverse selection and moral hazard could also play a role (Nyman 1998). Adverse selection is a generic problem with insurance schemes as individuals who are more likely to need care have a greater incentive to join. However, the Oxfam schemes have membership on a household basis, which has been recognized to address this problem (Bennett *et al*. 1998; Jakab and Krishnan 2001). Further, adverse selection is not necessarily undesirable. The objective of the scheme is to provide equitable access to health care on the basis of need; if people with the greatest needs are joining the scheme and increasing their use of services that is consistent with this objective. However, this raises concerns about the future sustainability of the programme if the external subsidies decline.

A degree of gender equity has been achieved, as women, who generally have greater need of health care, make more use of the HPs. Health service utilization increases with age, a commonly reported finding. As age increases, there is increasing likelihood of experiencing an episode of ill-health, and this greater health need accounts for the increased levels of utilization among individuals aged over 60. These results reflect the high prevalence of chronic disease and disability in old age in this region, particularly among women, as described by Andreev *et al*. (2003).

Both members and non-members in CHI villages visit HPs more frequently than people from non-scheme villages, perhaps

Table 4 Adjusted ratios of the odds of visiting a health post at least once during the study period among all household respondents, according to various characteristics, derived from logistic regression

	No. of individuals (%)	Odds ratio	95% confidence interval	*P* value
SES quintile				
Q1 (poorest) (ref.)	189 (20)	1	–	–
Q2	189 (20)	1.24	0.71–2.22	0.427
Q3	161 (17)	1.22	0.66–2.20	0.547
Q4	173 (18)	1.78	0.96–3.22	0.067
Q5 (richest)	236 (25)	1.07	0.66–1.83	0.730
Age group (years)				
0–34 (ref.)	346 (37)	1	–	–
35–59	305 (32)	0.67	0.42–1.07	0.092
60+	297 (31)	0.78	0.47–1.29	0.330
Sex				
Male (ref.)	365 (39)	1	–	–
Female	583 (61)	0.95	0.65–1.39	0.799
Membership status				
Non-members (ref.)	521 (55)	1	–	–
Members	427 (45)	6.71	4.01–11.23	<0.001
Village group				
Without CHI scheme (ref.)	266 (28)	1	–	–
Operating CHI scheme	682 (72)	1.34	0.88–2.03	0.172

due to the improvements in the quality of care received at the Oxfam-operated HPs, including rehabilitated facilities, well-trained nurses and a good range of essential drugs. It is plausible that the better quality of consultations (which non-members are entitled to) makes clinic visits more worthwhile even if patients must obtain drugs elsewhere.

All socio-economic groups have a similar probability of consulting at the HPs at least once during the study period, probably because the majority of individuals in this setting are likely to experience ill-health. However, those in the lowest socio-economic group tend to consult more frequently than those in other groups. This remains the case despite the lower levels of membership in this quintile, suggesting that there are barriers that limit membership among the poorest households, despite increased health needs, as confirmed in qualitative evaluations by Poletti *et al*. (2007). As SES increases, the likelihood of having experienced ill-health decreases, which is consistent with other findings. SES has an impact on health status, and health status can have an impact on SES (WHO 2001; Deaton 2003; World Bank 2004b). Therefore, the pattern of utilization, with poorer individuals making greater use of the HPs, is likely to be due to greater need among these groups.

HPs are the usual point of first contact when individuals become ill. However, those who can afford to are likely to visit higher levels of the system—such as hospitals or district-based polyclinics—for follow up or if referral is needed. The poorest people have little option but to continue their treatment at the local level, and this would be reflected in elevated rates of utilization of HPs among this group, as has been observed.

Similar patterns of utilization by SES are also observed in non-CHI villages, suggesting that access to rural health services in Armenia may already be reasonably equitable, regardless of the presence of the insurance scheme. This is corroborated by a World Bank benefit-incidence analysis of health services in Armenia (Hovhannisyan 2006), which found that government-funded local services provided by HPs are more equitable than the higher levels of the system, where utilization is more pro-rich. Findings from other Central and Eastern European settings show that primary care utilization tends to be more equitable than secondary care due to close proximity, lower opportunity and monetary access costs, and less frequent informal payments (Wagstaff *et al*. 1999; Balabanova and McKee 2002).

However, despite being equitable, the existing services in villages without a scheme are under-used due to their poor quality. In contrast, the Oxfam-funded insurance schemes have achieved considerable increases in access to basic primary care, in utilization and in affordability through improving financial protection in participating communities, while maintaining equitable access. The finding that the schemes are equitable is important in the context of extensive evidence that middle-income groups are often the most likely to benefit from health financing schemes, while the poor are unable to join without significant external subsidies (Bennett *et al*. 1998; Jütting 2001; Preker *et al*. 2002). It should be noted that equity of use might in part be due to the general socio-economic homogeneity among rural communities in Armenia, with relatively little variation in income, asset ownership, type of employment and social status.

While this study suggests that there is considerable equity, the overall rates of participation remain low. Qualitative research reported by Poletti and Balabanova (2006) found that the main reason for this was affordability, although dissatisfaction with the package of health care offered, perceptions that self-treatment (or buying drugs after consultation with the nurse) offers better value for money, and perhaps some free riding (people electing not to join because they know they can access care in an emergency) also played a part. Despite these perceptions, on average scheme members pay approximately eight times less for health care than non-members (16 AMD vs. 128 AMD), so that membership does appear to offer value-for-money (Sloggett 2002).

Conclusions

In summary, the findings suggest that the Oxfam-supported community health insurance schemes in rural Armenia are achieving their primary goal of equitable coverage of health care for the target population. Those most at risk of facing barriers in accessing health care—women, the elderly and the poorest—benefit most from membership in these schemes. Importantly, membership is improving overall utilization, indicating an improved quality of care.

The level of equity may be explained by the close supervision by the funder and the NGO implementing the programme, local ownership and strategies for ensuring that those most in need

were able to benefit, such as exemption for the poorest people. However, participation rates remain lower than expected given the health needs of the population, indicating that financial or other barriers to membership remain and should be further addressed.

CHI schemes may therefore be an effective mechanism for channelling much-needed investment into primary health care and maintaining equitable distribution among the poorer, rural population. However, questions remain about the scalability of this experience to higher levels of care and to other settings, and increasing participation while maintaining equity.

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