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Health insurance benefit packages prioritized by low-income clients in India: Three criteria to estimate effectiveness of choice ☆

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Abstract

We applied a decision tool for rationing choices, with a predetermined budget of about US$11 per household per year, to identify priorities of poor people regarding health insurance benefits in India in late 2005. A total of 302 individuals, organized in 24 groups, participated from a number of villages and neighborhoods of towns in Karnataka and Maharashtra. Many individuals were illiterate, innumerate and without insurance experience. Involving clients in insurance package design is based on an implied assumption that people can make judicious rationing decisions. Judiciousness was assessed by examining the association between the frequency of choosing a package and its perceived effectiveness. Perceived effectiveness was evaluated by comparing respondents' choices to the costs registered in 2049 illness episodes among a comparable cohort, using three criteria: '*reimbursement*' (reimbursement regardless of the absolute level of expenditure), '*fairness*' (higher reimbursement rate for higher expenses) and '*catastrophic coverage*' (insurance for catastrophic exposure). The most frequently chosen packages scored highly on all three criteria; thus, rationing choices were confirmed as judicious. Fully 88.4% of the respondents selected at least three of the following benefits: outpatient, inpatient, drugs and tests, with a clear preference to cover high aggregate costs regardless of their probability. The results

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show that involving prospective clients in benefit package design can be done without compromising the judiciousness of rationing choices, even with people who have low education, low-income and no previous experience in similar exercises.
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Introduction

The purpose of this article is to draw policy insights from the analysis of choices made by prospective clients among the poor in India on benefit-package composition for health insurance.

Many authors agree that if the poor are to accept insurance, it must respond to their needs (Ahuja & Jütting, 2004; Gumber, 2002; Leftley, 2005; Radwan, 2005). However, these authors advocate that the industry design different insurance products for the poor, but do not refer to perceived priorities of the clients themselves. The literature on consumer-driven healthcare has so far dealt mainly with the situation in rich countries. Coast (2001) investigated whether citizens want to make rationing decisions in healthcare in the context of universal coverage in the UK. Her findings suggest inter alia that the potential distress that denying care may cause increases citizens' desire to be directly involved in such decisions. Following this logic, poor population segments in low-income countries, who can at best buy only severely rationed health insurance packages, would presumably be exposed to high potential distress due to limited access to healthcare, and would therefore wish to be involved in rationing decisions. In developing countries, there is a general shortage of information and data about the preferences of households (Asfaw, 2003). Specifically, there is very little literature on the preferences of prospective clients of health insurance who personify simultaneously low-income, low-education, low-numeracy and low- or no experience with insurance. The few studies we were able to identify concluded that 'groups of low-income uninsured individuals [in the USA] are able to identify acceptable benefit packages that are comparable in cost but differ in benefit design from managed care contracts offered to many US employees' (Danis, Biddle, & Goold, 2002); that clients' satisfaction with benefit-package design in a community-based health insurance scheme in West Africa contributed to a higher willingness to enroll (De Allegri, Sanon, Bridges, & Sauerborn, 2006); and that in the same area, there were strong preferences for inclusion of high-cost health services such as operation, essential drugs and consultation fees in the benefit package (Dong, Mugisha, Gbangou, Kouyate, & Sauerborn, 2004). Finally, one study, carried out in India on a somewhat related topic, suggested that most households would prefer a comprehensive benefit package over partial coverage (Mathiyazhagan, 1998). However, this falls short of evidence-based reporting of the preferences of such population segments in India. Thus, our article offers new information on the expressed priorities of households that were asked to compose the health insurance package of their choice.

In India today, out-of-pocket spending by households for healthcare represents about 73% of total health expenditure (WHO, 2006); another estimate puts that rate at more than 80% (Devadasan, Ranson, Van Damme, Acharya, & Criel, 2005). This high rate exposes many households to unexpected and unaffordable healthcare costs for which insurance can be an attractive and cheaper alternative (Ray, Pandav, Anand, Kapoor, & Dwivedi, 2002). However, at present only about 3% of India's population, mostly in the formal sector, benefit from some form of health insurance and the role of grassroots community-based schemes is prominent in the informal economy relative to the alternatives offered by the public sector or by commercial insurers (Devadasan et al., 2005; Tabor, 2005).

Furthermore, community-based health insurance schemes in India cover a partial benefit package that reflects the assumption that premiums are the main source of financing. If the poor are to pay for insurance, the package must be attractive in two regards: it must meet clients' perceived needs and be affordable to them (Radwan, 2005; Wiesmann & Jütting, 2000). Since affiliation to grassroots schemes is voluntary, and considering that willingness to join such schemes may increase when prospective clients are satisfied with the benefit package and identify with it (De Allegri et al., 2006; Fleck, 1994; Schone & Cooper, 2001), it is important to develop a tool to assess prospective clients' priorities.

The novelty of the experiment described in this article is that it divulges information on the rationing choices of low-income, low-education population segments in India who were given the opportunity to compose an affordable benefit package.

Methods

Study design

The 'Choosing Healthplans All Together' (CHAT) experiment described here is based on a modified version of an original CHAT tool developed and tested in the USA (Danis et al., 2002; Danis, Biddle, & Goold, 2004; Goold, Biddle, Klipp, Hall, & Danis, 2005; Keefe & Goold, 2004). Around 302 individuals organized in 24 groups participated in the exercise. The exercise was carried out in November–December 2005, in Karnataka and Maharashtra. Selection of the villages or neighborhoods of towns where the interviews were conducted was purposive, based on contacts the research group established through a household survey conducted earlier in 2005. Participation in the groups was voluntary, and depended on availability of persons at the day and time of assembly rather than on sampling techniques. In reality, most people in the locations wanted to participate. The material was translated into several local languages; local facilitators were trained to read out instructions and provide explanations so that illiterate persons could nevertheless participate. We saw no evidence that illiterate persons were less intelligent or less capable of making choices once they were given help to overcome the objective limitation of illiteracy.

The CHAT exercise enabled participants to choose from 10 benefit types; for most benefit types, participants could choose three coverage levels: basic, medium and high. The choice was limited to basic or high coverage level for three benefit types (see Table 1 for benefit types; and see algorithms of coverage levels below).

If the most expensive options were selected for all benefits, the estimated actuarial cost of the package would have been INR 1470 per household. This amount is far too high for most low-income households in India. We set the predetermined budget of the package at INR 500 (~US$11) per household per year, which approximates the level of willingness-to-pay (WTP) obtained from a survey conducted by the same research group simultaneously and reported elsewhere (Dror, Radermacher, & Koren, 2006). This WTP study suggested that about half the sampled population was willing to pay around 1.35% of annual HH income. We also checked the median HH income of the populations in the areas where the CHAT experiment unfolded; in Maharashtra, median income for the comparable cohort was INR 48,000; and in Karnataka, median income was INR 39,800. By determining a premium of INR 500 for this CHAT experiment, we ensured that it did not exceed 1.3% of income for 50% of the target population, i.e. within the range of the expressed WTP values. This estimate is also supported by the findings of Gumber (2002) that annual WTP in rural areas in India ranged from INR 80 to 95 per person per year for hospitalization, chronic care, specialist consultations; and that WTP was some 10% higher if medicines, diagnostic tests and transportation were added.

Table 1
Sticker cost of benefits

Benefit types	Coverage level		
	Basic	Medium	High
Drugs (D)	18	18 + 12	18 + 12 + 12
Outpatient medicine (OP)	11	11 + 6	11 + 6 + 10
Hospitalization (IP)	10	10 + 6	10 + 6 + 8
Tests (T)	8	8 + 5	8 + 5 + 5
Dental care (DEN)	7	7 + 4	7 + 4 + 5
Medical equipment (ME)	5	5 + 3	5 + 3 + 3
Preventive care (P)	1	1 + 1	1 + 1 + 1
Maternity (M)	1		1 + 1
Indirect costs (IC)	1		1 + 1
Mental health care (MH)	1		1 + 1

We would have liked to examine the judiciousness of rationing decisions of CHAT participants by applying actual reimbursement decisions. As the CHAT packages were not part of an insurance contract, we used as proxy the data of utilization and cost obtained from a household survey conducted by the same research group in 2005 in India (and which was also the source of data for the WTP study mentioned above). The utilization data originate from 2049 households that reported at least one illness episode during 3 months prior to the survey (out of 3531 households where we could obtain valid answers for the set of questions on spending on illness). This dataset is relevant for the CHAT experiment because the socio-economic–

demographic characteristics of the cohorts were comparable. We applied the CHAT business rules to this proxy.

Algorithms for the calculation of coverage levels

Basic level of coverage: covers 50% of all costs; 50% is paid out-of-pocket

Medium level of coverage: benefit increases as the bill increases, according to the following formula:

a. bill under median cost: insurance pays 50% of bill,
b. bill between median and 70th percentile: insurance pays

$$(\text{Median}/2) + (\text{bill} - \text{median} * 0.9).$$

c. bill higher than 70th percentile: insurance pays:

$$(\text{Median}/2) + (\text{p70} - \text{median}) * 0.9 + (\text{bill} - \text{p70}) * 0.95.$$

High level of coverage: 100% of all costs; zero out-of-pocket payment.

We did not expect the participants to understand these complex algorithms, and explained the reimbursement rules using easy-to-understand examples. For instance, the explanation for hospitalization was as follows: '*Basic level*: Insurance pays half your bill. *Medium level*: You pay half the cost of low amounts, but as your bill increases your insurance payments increase even more. For example, when your bill is INR 1000 you pay INR 500, but when the bill is INR 10,000 you pay only INR 1275. *High level*: Insurance pays your entire bill'.

Definitions of what is included under the various benefit types

The cost of drugs (**D**) includes only prescribed allopathic drugs but excludes the cost of traditional (homeopathic or ayurvedic) drugs and unprescribed drugs.

The cost of outpatient care (**OP**) includes payments for consultations with a general practitioner, pediatrician and with specialists, but excludes consultations with traditional practitioners.

Inpatient care (**IP**) costs reflect all out-of-pocket costs that are required during periods of IP, including surgery in hospital (note: antenatal & postnatal care & confinement for delivery are categorized as maternity benefits, not IP).

The cost of diagnostic tests (**T**) includes lab tests and medical imaging.

The cost of dental care (**Den**) includes all care given by a dentist.

The cost of medical equipment (**ME**) includes eye glasses, hearing aids, wheelchairs, crutches and ambulance.

The cost of preventive care (**P**) includes preventive services for household members older than 1 year.

The cost of maternity (**M**) includes mother's care before, during and after delivery in hospital, and child's care until 1 year; also includes family planning.

The cost of indirect costs (**IC**) covers INR 50 or INR 100 (for basic or high levels of coverage, respectively) per day of hospitalization (compensating wage loss and transportation of patient and care giver). IC also covers the cost of continuing the health insurance coverage if the HH head died or is permanently disabled (3 months coverage at basic level and 6 months' extension at high level).

The cost of mental health (**MH**) covers treatment for mental illnesses, alcohol or drug abuse.

Actuarial estimates of costs

The incidence and distribution of unit costs of hospitalizations, consultations, diagnostic tests and purchase of prescribed drugs was estimated based on the HH survey, and adjusted as necessary by an actuary with field experience in India. The incidence and distribution of unit costs of P, Den, mental care, ME and M was estimated by the same actuary. The estimated incidence of IC was established by the actuary. The adjustments made to the data were based on actuarial experience with various insurance schemes in India and other countries considering the overall national household expenditures for health in India.

The actuarial calculations that determine the cost of the benefits were expressed in monetary terms, which were converted to stickers. Respondents received a budget of 50 stickers (each sticker reflected the value of INR 10). The 'sticker values' of each benefit type and each level of coverage that was available in this experiment are shown in Table 1.

The choices that clients could make

The version of the CHAT exercise consisted of two rounds. In the *first round*, each participant

composed a benefit package that met his/her and her/his families' priorities separately, by selecting benefit types and the level of coverage (basic, medium or high). Players indicated their choices by gluing stickers on circles drawn on a board. In the *second round* of the game, the whole group (group sizes ranged from 10 to 17 respondents) composed a benefit package that reflected the choice of the entire group; at this stage, group discussions continued until a consensus had been reached. During the discussions, the facilitator mediated the process to ensure that preferences of all participants were considered. In cases when facilitators noted attempts of certain respondents to dominate the discussion, they intervened and requested those individuals to respect the feeling of others. The opinions of all participants on the fairness of the process were solicited through an exit questionnaire; 72% strongly agreed and 27% agreed with the statement: 'the way the group reached its decision was equally fair to each member of the group'. More details on the group dynamics and participants' satisfaction with the process are provided elsewhere (Danis et al., 2006).

The process of choice offered in the CHAT exercise obliged respondents to make a yes–no choice first; if respondents did not choose a particular benefit, the outcome was termed 'nothing'. For every benefit chosen, participants had to select the basic level of benefits first, and add stickers for the choice of a higher level of coverage thereafter.

At the end of round one, players picked *health event cards* that contain a scenario/story of an illness episode and what it costs. Participants could then estimate what they would have received from the insurance according to the coverage level they selected (basic, medium or high) if they had experienced the same scenario. The validation of choices against a concrete scenario was read out aloud and thus enabled participants to assess their choices, or change them in the next round.

Data

The choices noted by players on the CHAT boards were uploaded to an electronic file. The dataset retained the identification of each group of players, as well as a separate record of replies in round one and in round two. The structure of the record ensured confidentiality, as replies were not traceable back to any specific respondent.

Analysis

Statistical analysis of the data was performed by using SPSS statistical software.

Findings

Choices made by participants

The choices of respondents (the number of replies and percent of total population that selected the benefit types, as well as levels of service) are recorded in Table 2.

The number of positive replies (including basic, medium or high levels) is significantly higher (χ^2 test) than the negative ones (who preferred excluding that benefit), for all benefits except Den and ME. We observe more choices at the basic level (1626), followed by high level (521) and fewest choices of medium level of coverage (49). If benefit types are ranked according to the frequency of positive replies, the ranking is as follows: M (100% positive replies); drugs (92.7%); IC (90.4%); tests (83.8%); IP (82.1%); P (77.8%); OP (56.6%); MH (56.0%); ME (45.7%); and Den (42.1% positive replies).

Major benefits

The facilitators who observed the entire experiment reported that most respondents started the selection process by choosing two, three or four of the following: D, OP, IP and T. Non-access to these four benefits can spell disaster in case of illness, and paying for this access out-of-pocket could significantly deplete household finances because they represent the highest aggregate expenses. The high cost of these services was also reflected in the high sticker cost (shown in Table 1). They were thus denoted here as 'major benefits'.

In Table 3 we show the combinations of major benefits that respondents selected in this CHAT experiment. The cost of the combination including all four major benefits at basic level of coverage was 47 stickers of the available 50. This leaves very few stickers for other benefit. Participants were thus confronted with the question whether to select all four major benefits at basic level or to forego one or more of the 'major four' in order to buy higher coverage levels for the remaining major benefits and/or include minor benefits in their package. Participants chose only eight combinations that

Table 2
Choices of the participants

Type of benefits	Nothing		Basic		Medium		High	
	Replies	% of total	Replies	% of total	Replies	% of total	Replies	% of total
Drugs (D)	22	7.28	280	92.72	0	0.00	0	0.00
Out patient medicine (OP)	131	43.38	171	56.62	0	0.00	0	0.00
Hospitalization (IP)	54	17.88	225	74.50	13	4.30	10	3.31
Tests (T)	49	16.23	231	76.49	12	3.97	10	3.31
Dental care (DEN)	175	57.95	115	38.08	12	3.97	0	0.00
Medical equipment (ME)	164	54.30	138	45.70	0	0.00	0	0.00
Preventive care (P)	67	22.19	105	34.77	12	3.97	118	39.07
Maternity (M)	0	0.00	144	47.68	0	0.00	158	52.32
Indirect costs (IC)	29	9.60	130	43.05	0	0.00	143	47.35
Mental health care (MH)	133	44.04	87	28.81	0	0.00	82	27.15
Totals	824		1626		49		521	

Table 3
Packages chosen

	Choice[a]	No. of groups	No. of individuals	% of all individuals	Sticker cost (%)	Stickers left for minor benefits
1	OP(b) + IP(b) + T(b) + D(b)	6	81	26.8	47	3
2	IP(b) + T(b) + D(b)	8	96	31.8	36	14
3	OP(b) + T(b) + D(b)	3	42	13.9	37	13
4	OP(b) + IP(b) + D(b)	3	36	11.9	39	11
5	OP(b) + IP(b) + T(b)	1	12	4.0	29	21
6	IP(m) + D(b)	1	13	4.3	34	16
7	T(m) + D(b)	1	12	4.0	31	19
8	IP(h) + T(h)	1	10	3.3	42	8

[a]OP = outpatient; IP = inpatient; T = tests; D = drugs; (b) = basic; (m) = medium; (h) = high.

include one or more of the four major benefits, described in Table 3. Many other permutations were theoretically possible.

The data in Table 3 show that 88.4% of the participants chose a package that includes at least three of the 'major benefits' and all choices are at the basic level of coverage. The remaining 11.6% of the participants chose only two of the major benefits, but at coverage levels that were sometimes higher than basic.

Criteria to determine the perceived effectiveness of benefit packages

The entire proposition of involving clients in benefit-package design is based on an implied assumption that a group of people acting as a cohesive social unit can relate, better than any outsider, needs and priorities to the location-specific conditions, prevalent activities and level of resources (Dror & Jacquier, 1999). It also implies that people are capable of judicious rationing decisions. We propose that a positive association between the frequency of a choice of a package and its perceived effectiveness would signify a 'judicious rationing decision'.

We define the following criteria as the quantitative expressions of the 'perceived effectiveness of a benefit package':

(1) *The reimbursement criterion*: suggests that insured wish to be reimbursed some part of every bill, regardless of whether the absolute level of expenditure is low or high. This attribute is important for people who perceive insurance as useless when there is no reimbursement in case

of an illness episode (Gumber, 2002; Insure.-com). This criterion can be gauged by the mean reimbursement rate.

(2) *The fairness criterion*: postulates that the insured would like insurance to pay a small part when the bill is small and a big part when the bill is big (Toth, 2005). This criterion can be gauged by the extent and direction of the correlations between expenditures and the rate of reimbursement.

(3) *The catastrophic protection criterion*: states that the insured wish to be covered against catastrophic exposure (Radermacher, 2006); this criterion can be measured by the extent of compensation of the outlier cases.

It has been explained under the 'Methods/Study design' section that utilization and cost data obtained in the HH survey were used to evaluate the effectiveness of the CHAT choices. For each illness episode we summed the costs related to the 'major benefits' and these sums were considered as the total expenditure. We then applied the CHAT business rules to each expenditure item, and obtained the estimated reimbursable amount for each package. This was repeated for all eight packages and for each of the 2049 episodes. The details of expenses and reimbursements are shown in Table 4.

Examining the reimbursement criterion

Table 4 provides the reimbursement levels of healthcare expenses both in INR and in percentages (the rates were shown relative to the total expenditure of each episode). The mean and maximum rates of reimbursement for the first five packages cannot exceed 50%, as the applicable business rule is that reimbursement at the basic level of coverage is 50% of expenses.

In looking at the mean percent of reimbursements, it is clear that selecting all four 'major benefits' at the basic level (package 1) yielded the best returns. Interestingly, the mean reimbursement rate per illness episode was very similar to package 4, in which T was dropped. Surprisingly, when IP is dropped (package 3) the mean level of reimbursement is lower by less than 5%; a likely explanation for this small reduction is the low probability of being hospitalized. On the other hand, dropping OP (package 2) caused a dramatic drop in mean reimbursement rate. And giving up D (package 5) caused a drop of about half the mean reimbursement rate. Similar results were noted when OP and T are dropped, even though IP coverage was increased to medium level (package 6). Finally, when both OP and D were dropped (package 8), mean reimbursement was only 11.1% of expenses during an illness episode, even though IP and T were covered at high level.

The strong impact of dropping either OP (package 2) or D (package 5) on reimbursement rates, and the minor impact of dropping IP (package 3) or T (package 4) is even more apparent when looking at median levels of reimbursement: whereas 50% of those who chose packages 3 or 4 received the same reimbursement level that they would have received had they chosen package 1,

Table 4
Hypothetical reimbursements for the different packages

No.	Combination	Reimbursed (in INR)			Reimbursement % of expense[a]		Percentile of reimbursements (%)			
		Mean	SE±	Median	Mean[b]	SE±	10th	25th	Median	90th
1	OP+IP+T+D	489	±30	125	46.80	±0.27	50.0	50.0	50.0	50.0
2	IP+T+D	393	±26	90	30.72	±0.38	0.0	20.0	35.7	50.0
3	OP+T+D	322	±15	115	41.97	±0.34	12.5	41.7	50.0	50.0
4	OP+IP+D	447	±28	120	44.26	±0.30	28.5	47.8	50.0	50.0
5	OP+IP+T	305	±26	40	23.46	±0.37	0.0	10.0	21.7	50.0
6	IP(m)+D(b)	432	±38	75	22.72	± 0.37	0.0	7.6	22.6	45.3
7	T(m)+D(b)	225	±12	60	19.41	±0.34	0.0	4.7	18.8	41.7
8	IP(h)+T(h)	418	±45	0	11.10	± 0.46	0.0	0.0	0.0	42.9

OP = outpatient; IP = inpatient; T = tests; D = drugs; levels of benefit: (b) = basic; (m) = medium; (h) = high.

[a]Expenses per illness episode were calculated on the basis of responses to the HH survey. Of the 2049 illness episodes, 131 cases did not report any expenses for any of the 'major benefits' types. The nominal values of all illness episodes were: mean INR 1045 (SE ±63) and median INR 290.

[b]HH that reported zero expenditure for the 'major benefits' types were considered as obtaining zero reimbursement (and zero %); this explains why the mean reimbursement figures (calculated for the entire population) are lower than 50% of expenses, even for package 1.

half the people who chose packages 2 or 5 obtained considerably lower reimbursements. Choosing packages 6 or 7, which included only two of the major benefits, resulted in median reimbursement of less than half the percentage payable for package 1. The most dramatic effect is observable with package 8, where the reimbursement rate was zero in half the illness episodes. It is noteworthy that 10% of the episodes would not generate any reimbursement at all under packages 2 or 5 or 6 or 7; and 10% of those who selected packages 3 or 4 would have been entitled to much lower reimbursement than under package 1.

Examining the fairness criterion

The situation whereby 10% of the population is getting low or no reimbursement may be acceptable when it applies to inexpensive episodes. However, such an outcome would be unsatisfactory if it caused low reimbursement rates to those who incur high healthcare costs. From the data presented so far it is not clear which illness episodes received low reimbursement when respondents forego one or more of the 'major benefits'. The answer to this question can be found by looking at the correlations between the level of reimbursement and the absolute level of expenses. A positive correlation means that people who incur higher expenses are entitled to higher compensation (in %); and a negative correlation means that those with higher expenses are entitled to lower compensation, which is an undesirable outcome.

In package 1 there is no correlation between expenses and reimbursement (expressed as % of total costs) because the rule is to always reimburse 50%, regardless of cost. As can be seen in Table 5, the coverage of IP is associated with significant and positive correlations (packages 8, 6, 2, 5). Dropping IP from the benefit package resulted in a negative correlation (which is strong for package 3, but much weaker for package 7). An interesting case is package 4, which contains IP at the basic level of coverage but does not include T; it is associated with a significant negative correlation which is however much weaker than package 3.

Examining the catastrophic protection criterion

So far, the calculations were based on the entire sample. We now wish to examine which package would yield the highest reimbursement when the most expensive episodes occur. This question was analyzed by reference to the most costly decile, i.e. 195 illness episodes that cost more than INR 2400. The results are shown in Table 6:

Table 5
Correlations between expenses and reimbursement levels (in %)

No.	Combination	Correlation coefficient (Pearson)	Significance
1	OP + IP + T + D	0.0	
2	IP + T + D	0.1766	$P<0.0001$
3	OP + T + D	−0.3947	$P<0.0001$
4	OP + IP + D	−0.0801	$P<0.0005$
5	OP + IP + T	0.1431	$P<0.0001$
6	IP(m) + D(b)	0.2848	$P<0.0001$
7	T(m) + D(b)	−0.0598	$P<0.001$
8	IP(h) + T(h)	0.4081	$P<0.0001$

The package including all 'major benefits' secured the highest mean reimbursement rate in the case of outliers as before, followed by package 4, with packages 2 and 8 tagging closely behind. The difference between the packages is more pronounced when one looks at the lowest 10th percentile of reimbursement: whereas package 4 guarantees up to 37.1% reimbursement, package 2 provides only up to 26.9% and package 8 (composed only of IP and T at high coverage level) a mere 3.4% reimbursement. The explanation for this low reimbursement rate under Package 8 is found in its composition: high coverage level for IP and T offers no protection for high expenses due to D or OP. And, contrary to what one might have expected, outlier cases (top 10% of expenses) cannot automatically be assumed to involve hospitalizations, even if it is true that the highest outlier cases do involve IP.

Comparing the effectiveness of the benefit packages according to the three criteria

We wish to compare the effectiveness of the different benefit packages in the light of the three criteria elaborated earlier. For this purpose, we developed a ranking system whereby the package that scores highest under each criterion was assigned the score of 1 and the package that scored lowest was assigned the value of zero. All other packages were assigned a value between zero and one, reflecting their relative position on a linear scale. For the *reimbursement criterion*, packages were scored according to the mean reimbursement rate (in %)—values noted in Table 4 column 6—and package 1 was assigned the score of 1, while

Table 6
Expenses and reimbursement levels—outlier cases

No.	Combination	Reimbursed			Reimbursement % of expense[a]		Percentile of reimbursements			
		Mean (INR)	SE± (INR)	Median (INR)	Mean (%)	SE± (%)	10th	25th	Median	90th
1	OP + IP + T + D	3298	±226	2125	50.0	±0.0	50.0	50.0	50.0	50.0
2	IP + T + D	2765	±209	1725	41.7	±0.7	26.9	37.7	45.8	50.0
3	OP + T + D	1761	±100	1425	31.7	±1.1	10.3	17.0	34.4	50.0
4	OP + IP + D	2990	±213	1950	44.3	±0.6	37.1	42.9	46.8	50.0
5	OP + IP + T	2377	±219	1500	32.4	±1.0	10.0	22.2	35.9	50.0
6	IP(m) + D(b)	3312	±337	1700	34.9	±1.3	14.3	20.9	32.3	61.3
7	T(m) + D(b)	1261	±86	1000	18.4	±1.1	2.1	5.8	14.2	41.4
8	IP(h) + T(h)	3688	±406	2300	38.9	±2.0	3.4	13.8	36.4	78.1

OP = outpatient; IP = inpatient; T = tests; D = drugs; levels of benefit: (b) = basic; (m) = medium; (h) = high.
[a]Expenses per illness episode were calculated on the basis of responses to the HH survey, based on 195 illness episodes that represented the top 10%. The values of all illness episodes were: mean (INR 6595), SE (±452) and median (INR 4250).

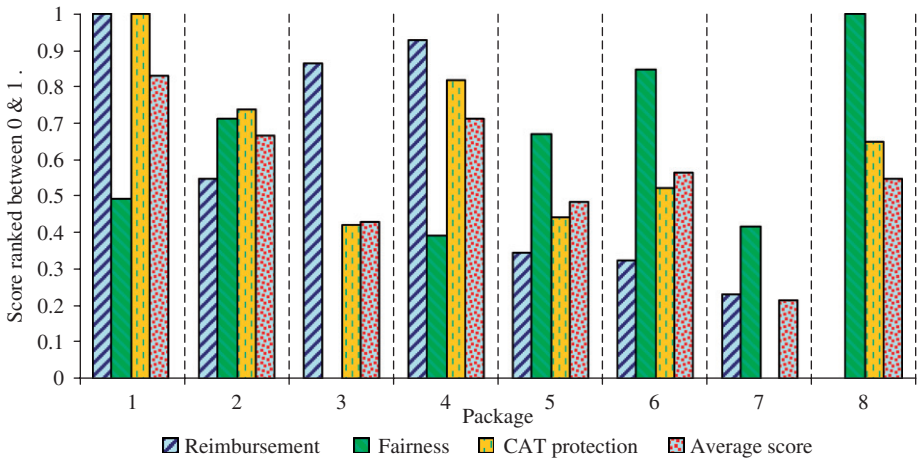

Fig. 1. Weighted ranking of benefit packages according to the three criteria.

package 8 scored zero. For the *fairness criterion*, packages were scored according to the correlation coefficients—noted in Table 5 column 3—and package 8 was assigned the score of 1, while package 3 was assigned the score of zero. For the *catastrophic protection criterion*, packages were scored according to the mean reimbursement of outlier cases (in %)—values noted in Table 6 column 6—and package 1 was assigned the score of 1, while package 7 was assigned the score of zero. As we have no information on the relative value that clients attach to the three criteria, we consider them to be of equal importance. Fig. 1 shows the scores for all three criteria, as well as the average score for each package.

Fig. 1 shows that the three packages with the highest average score were 1, 2 and 4. These packages include IP and D, plus at least one other major benefit. Package 1 had the highest average score, yet package 2 was the most popular, maybe because the latter left a balance of 14 stickers with which to buy 'minor' benefits compared to only 3 stickers for package 1 (Table 3). Packages 2 and 4 have similar average scores, but the former scored above average on all three criteria, whereas the latter scored above average on two criteria but below average on the fairness criterion. Another explanation for the difference in the popularity between packages 2 and 4 might be that the former included T (but not OP), while the latter included OP but not T. Indeed, the facilitators who accompanied the experiment reported that the respondents explained their preference for T by saying they were much less sure of the cost of tests,

some of which could be very expensive, but knew the expected costs of OP.

Packages 3 and5 also include three of the four major benefits, but unlike packages 2 and 4, did not include one of the critical components: IP or D. They scored below average. Packages 6, 7 and 8 are composed of only two major benefits, which prevented them from scoring high (except on the fairness criterion); these packages were selected by only one group each.

In summary, the analysis shown in Fig. 1 helps distill an important insight on the effective composition of the benefit packages: IP and D have a higher significance than the other major benefits. And a composition of three major benefits that includes these two and that scores well on all three criteria is the most interesting for the clients.

Minor benefits

The balance of the sticker-budget after the major benefits are chosen determines the choices of minor benefits. The balance of sticker-budget and the number of possible combinations to select minor benefits are shown in Table 7 for each of the packages. The large gap between the number of possible combinations and the number of the combinations actually chosen indicates a coherent set of priorities rather than random distribution of choices.

It should be noted that two of the minor benefits (ME and Den) are more costly than the other four which offer basic coverage with one sticker and high coverage with 2 or 3 stickers only (Table 1). This price difference has an impact on the possible choices. For instance, respondents with a balance of less than five stickers must buy the cheap minor benefits. And respondents who have more than nine stickers must buy at least one of the costly minor benefits, because the cost of buying all the cheap minor benefits at the high level is exactly nine stickers.

Table 8 presents the choices of minor benefits that were recorded during the experiment. The choices are represented here as scores, where '0' means that the benefit was not chosen, and '1', '2' and '3' that the benefit was chosen at the basic, medium and high level of coverage, respectively.

The average scores shown at the bottom of Table 8 are weighted according to the number of respondents in each of the 24 groups. As can be seen, in the choice between the two costly minor benefits (Den and ME) the score was the same for both. And in the choice of the less costly minor benefits, groups consistently favored M, followed by IC, followed by P, and mental care came last.

Discussion and conclusions

The main finding of this study is that rural, poor, predominantly illiterate and innumerate groups in India, many of whom have little experience with health insurance, have been able to compose benefit packages for health insurance with a limited budget of INR 500 (~US$11) per household per year.

The study shows that about 88% of respondents chose at least three out of four benefits that are directly related to vital care in case of illness and which also cost the most: D, IP, OP and T (denoted here as 'major benefits'). 92.7% of the respondents chose to cover D, and 82.1% chose IP. 70.5% of the respondents chose benefit packages that included both IP and D (Table 3). Interestingly, these choices echo findings from Africa that people clearly preferred a benefit package that included high-cost

Table 7
The number of possible combinations and the number actually chosen

	Package	Stickers left for minors	Possible combinations	Combinations chosen	No. of groups
1	OP(b) + IP(b) + T(b) + D(b)	3	17	3	6
2	IP(b) + T(b) + D(b)	14	52	4	8
3	OP(b) + T(b) + D(b)	13	48	2	3
4	OP(b) + IP(b) + D(b)	11	55	3	3
5	OP(b) + IP(b) + T(b)	21	53	1	1
6	IP(m) + D(b)	16	48	1	1
7	T(m) + D(b)	19	53	1	1
8	IP(h) + T(h)	8	21	1	1

Table 8
The choices recorded for the various minor benefits

	Package	Group	*n*	Medical equipment	Dental care	Preventive care	Indirect cost	Mental care	Maternity
1	OP(b) + IP(b) + T(b) + D(b)	1	12	0	0	1	1	0	1
		2	17	0	0	1	1	0	1
		3	12	0	0	1	1	0	1
		4	13	0	0	0	1	1	1
		5	13	0	0	1	1	0	1
		6	14	0	0	1	1	0	1
2	IP(b) + T(b) + D(b)	7[a]	12	0	0	3	3	3	3
		8	12	0	1	3	1	1	3
		9	12	1	0	3	3	3	3
		10	12	1	1	0	1	0	1
		11	12	0	1	2	3	1	3
		12	12	1	0	3	3	3	3
		13	13	1	0	3	3	3	3
		14	11	1	0	3	3	3	3
3	OP(b) + T(b) + D(b)	15	16	1	1	0	0	0	1
		16	13	1	1	0	0	0	1
		17	13	0	1	1	3	1	3
4	OP(b) + IP(b) + D(b)	18	12	1	0	1	3	1	3
		19	12	0	1	1	3	0	1
		20	12	1	0	3	1	0	3
5	OP(b) + IP(b) + T(b)	21	12	1	1	3	3	3	3
6	IP(m) + D(b)	22	13	1	1	0	1	1	3
7	T(m) + D(b)	23	12	0	2	3	3	1	3
8	IP(h) + T(h)	24	10	0	0	3	3	3	1
	Weighted average score			0.46	0.46	1.60	1.85	1.10	2.05
	SE ±			0.104	0.12	0.24	0.22	0.24	0.19

[a]This group decided not to use all their stickers and to stop the game when they had five stickers left.

health services, e.g. operations, drugs and consultation fees (Dong et al., 2004).

This pattern of choices reflects the reality whereby the aggregate cost of drugs is higher than the aggregate cost of IP, even though the average cost of drugs per illness is much lower than the average cost of an IP episode. We note that the respondents, that were poor, prioritized protection against the aggregate costs of illness as much as protection against rare and costly medical events. This observation is consistent with experience in other areas of insurance where WTP for rare catastrophic events (e.g. life insurance) is often significantly reduced in comparison with readiness to pay for coverage of events that are more likely to happen with greater frequency (e.g. crop insurance) (Preker et al., 2002). It also fits with the finding that it is harder to sell only catastrophic coverage to clients who do not fully understand the value of insurance, and covering only common health events raises the question of whether the poor would be better off with a flexible savings account rather than insurance. The solution is to provide coverage for a mix of hospitalization and primary healthcare services—this helps make the insurance service more desirable to target beneficiaries since all are likely to make some use of the scheme during the course of a year (Tabor, 2005).

In exercising choices, the respondents had to trade off a diversity of benefit types against levels of coverage. The respondents have shown clearly that they prefer a wide range of benefits at basic levels of coverage over a narrow choice of benefit types with higher coverage levels (Table 2). The paradigm emerging from these findings is that respondents seek coverage for expensive care, regardless of whether the expense is generated by a few rare and costly events or by frequent events bearing each

a moderate cost. This pattern of choice suggests that health insurance covering only low-probability-&-high-cost care would probably not be attractive to this target population. On the other hand, benefit packages that also include high-probability-&-low-cost care would find takers.

As this benefit-package composition challenges the prevailing thought that health insurance can be operated for low-probability-&-high-cost care but less so for high-probability-&-low-cost care (Churchill, Liber, McCord, & Roth, 2003; Morduch, 2006), we examined the judiciousness of the choices people make.

The literature on public involvement in healthcare priority setting cites a range of methods to elicit people's preferences regarding rationing priorities within a fixed budget (Coast, 2001; Mullen, 1999; Ryan et al., 2001). However, we have been unable to find reports using quantitative methods to examine the judiciousness of choices made, let alone in a relevant context. Hence, the exercise of simulating the impact of different rationing choices on HH expenditure for healthcare, and the criteria we formulated to evaluate different choices, are novel to the best of our knowledge.

We juxtaposed the choices respondents made with costs related to actual illness episodes that were registered within a comparable cohort among poor people in India. Three criteria were employed for the assessment of the results: the '*reimbursement criterion*' (which is based on the assumption that respondents will reject insurance when costs that they associate with the insurance are not reimbursed, regardless of the absolute level); the '*fairness criterion*' (the underlying assumption of which is that people prefer a higher share of reimbursement when higher costs are incurred, even when costs are not catastrophically high); and the '*catastrophic protection criterion*' (which is based on the concept that insurance should provide adequate protection against catastrophes).

The results confirm that the packages chosen most frequently satisfied all three criteria. Including IP contributed most to protection against catastrophic costs and to fairness, and including drugs was critical for the reimbursement criterion.

The analysis also showed that respondents were willing to trade off optimal coverage of major benefits (package 1) in return for coverage of minor benefits. The choice of minor benefits in lieu of major benefits reflects a wish to improve quality of life (by including ME) and prevent situations of severe morbidity (by including P). This trade off also reflects the ability of the respondents to address their long-term needs as well as the needs of entire communities, rather than the needs of people with acute illnesses only.

However, one should recall that contributory health insurance schemes depend on a broad-based willingness to affiliate, which is presumably associated with clients' satisfaction with the composition of the benefit package. Hence, there would be a strong case for considering the choices of prospective clients as a basis for benefit-package design. And this experiment provides encouraging proof that the CHAT method offers a workable way to elicit respondents' choices effectively.

The CHAT decision tool imposes the rule that respondents must choose benefits until they exhaust a predetermined sticker budget; respondents can neither buy additional stickers nor forego stickers in exchange for a premium reduction. Nor can respondents negotiate the prices of the benefits in the setting of the game. This double inflexibility could bias the choices of benefits when respondents are left with a small number of stickers that they must 'get rid of'. The bias occurs when respondents select benefits they do not really prioritize because this is their only option to dispose of the residual stickers ('the residual sticker bias'). For instance, 77.8% of the respondents chose P, but would as many have made the same choice if P had cost more than 1 to 3 stickers, or if they could have obtained a premium reduction in lieu of the residual stickers?

In conclusion, the results of this analysis demonstrate that respondents can participate actively in the design of their health insurance packages; that they make judicious choices even at their present level of literacy and numeracy; and that the CHAT exercise provides a means to identify clients' perceived priorities. Therefore, it seems an attractive tool for engaging potential clients in the launch of voluntary health insurance. This tool opens up options for policy makers in resource-poor countries wishing to encourage the successful implementation of contributory health insurance among low-income populations by supporting benefits that the clients prioritize through a subsidy of medium cover at the cost of basic cover. Such policy choice would have the added advantage that it does not dampen the willingness to affiliate and to pay, and limits the subsidy to those who commit their own resources in

improving their access to healthcare through health insurance.

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