

6th Capacity Building Seminar in Health Care Insurance
The Pillazio Hotel, Gurugram
2nd August 2018

**Pricing of Community Based Health Insurance Products:
Data and Methods**

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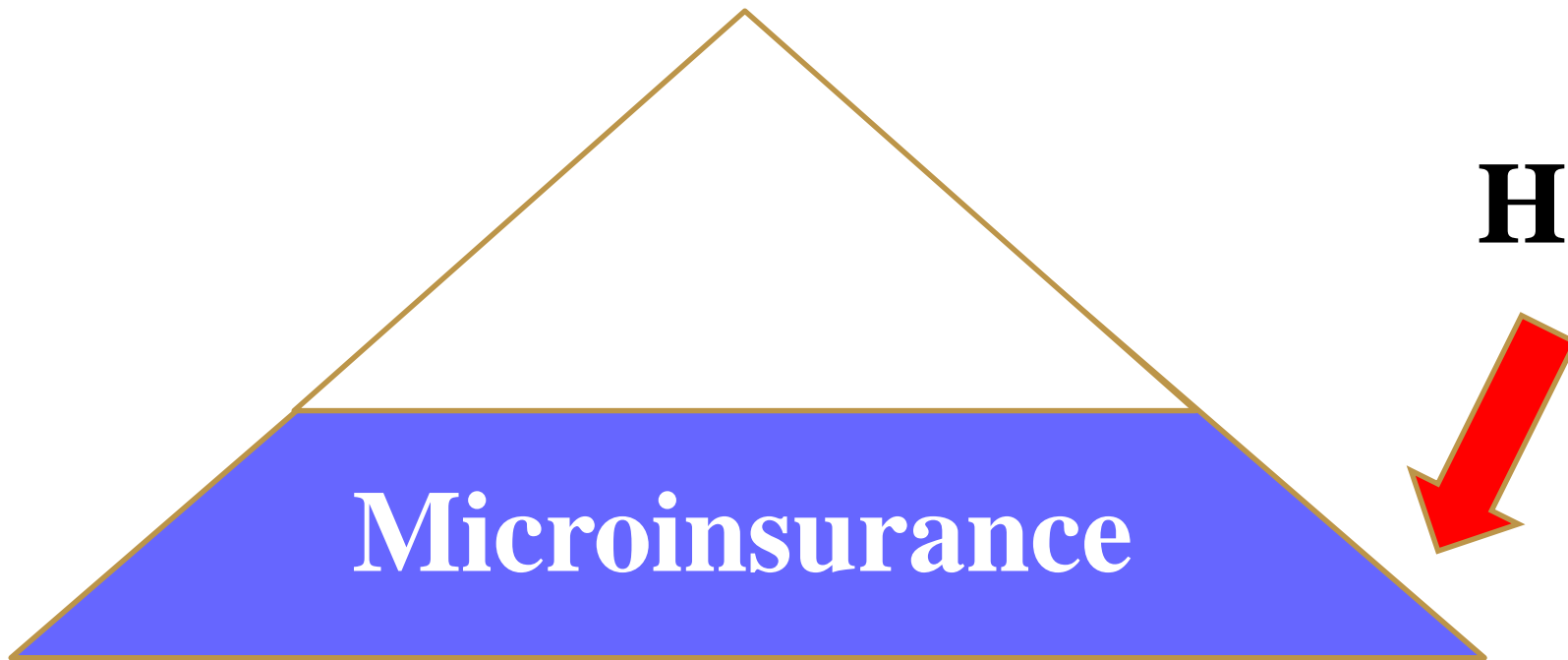


Indian Insurance Market



- Life: Approximately 20% of the insurable population are covered by various life insurance schemes.
- Health Insurance covers less than 20% of the population.
- PMFBY covers 26.5% of the farmers, 23% of the total cultivated area
- Car insurance – 100% (mandatory)

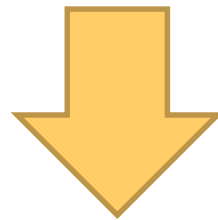
Where does the untapped market lie ?



What is “micro” in micro-insurance ?



- Micro transaction – low premium, low sum assured ?
- For people with micro income ?
- micro cost ? (for running the scheme)



**Implementing insurance mechanism at
the micro level of the society**

Key Challenges



Community Side

Very little understanding (or negative understanding) about how insurance works

Our Side

- Has to be voluntary
- Has to be contributory
- Has to be managed by themselves

Premium Calculation - 1



Assume that somehow we know that in a community of size N , the total expenditure on health care for one year is E . If everybody joins the scheme, what should be the premium for each person.

If P_i is the pure risk premium for the i^{th} person then

$$\sum_{i=1}^N P_i = E$$

Chargeable Premium for the i^{th} person

$$= P_i + \text{Risk Loading} + \text{Admin cost} + \dots + \text{Profit}$$

Premium Calculation – 1...contd



$$\sum_{i=1}^{i=N} P_i = E$$

If P_i is proportional to the risk of the i^{th} person then it is called risk-rated premium.

If P_i is proportional to the income of the i^{th} person then it is called income-rated premium.

In community-based health insurance it is community-rated which means everybody pays equal premium irrespective of their risk or income.

Mathematically Speaking....



$$P_1 = P_2 = P_3 = P_4 = \dots = P_N = P$$

$$\Rightarrow P = \frac{E}{N} \quad (\text{population mean})$$

$$\Rightarrow P = \left(\frac{I}{N} \right) \cdot \left(\frac{E}{I} \right)$$

**Incidence Rate
(Frequency)** **Average cost per Incidence
(Severity)**

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I = Total number of incidences

An Example



If the incidence rate for hospitalization is 4% and average cost of hospitalization is Rs 18,000 then the pure risk premium PPPY

$$= 0.04 * 18,000 = \text{Rs } 720$$

How to calculate Pure Risk Premium when we apply



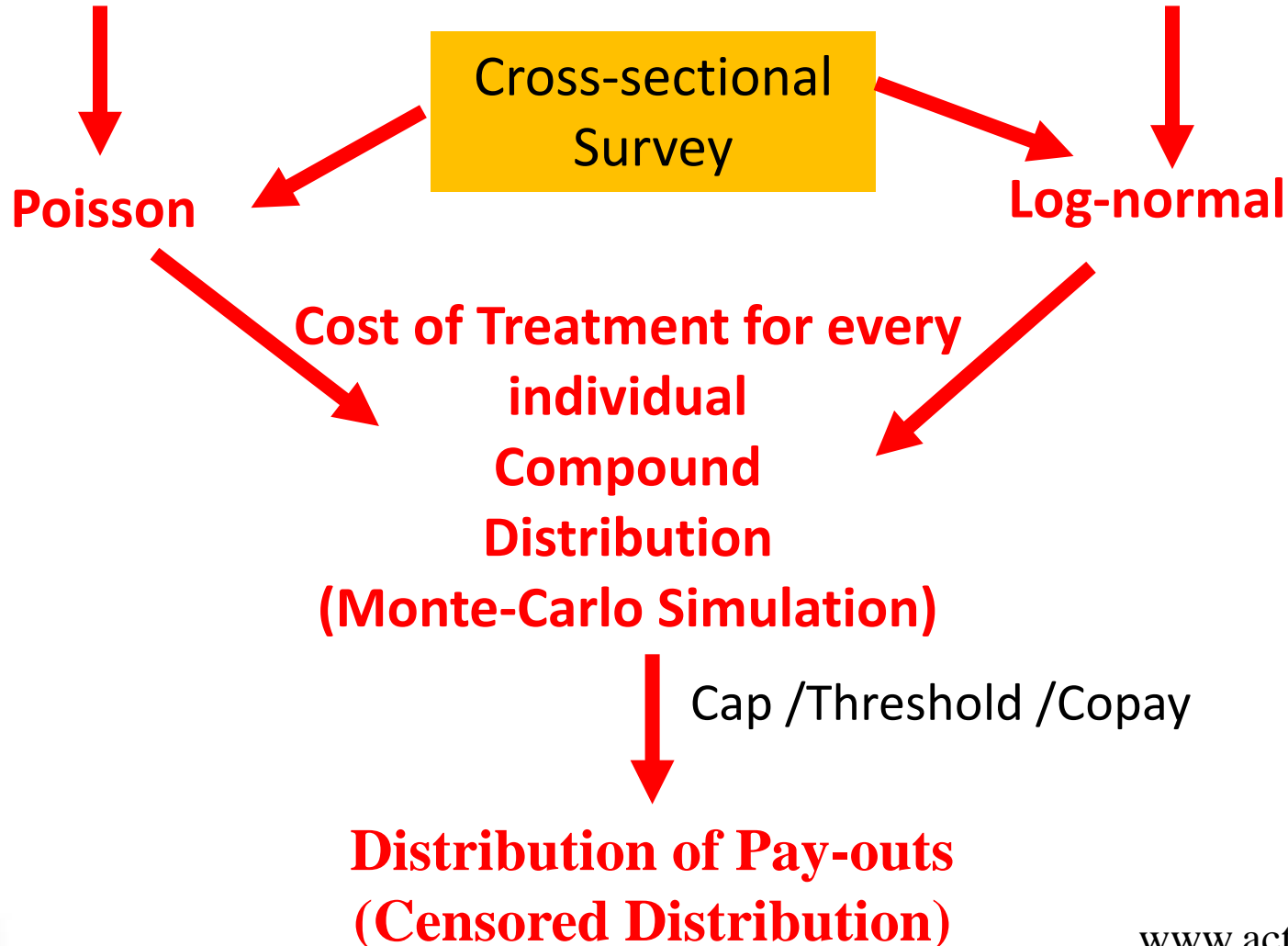
- Cap
- Threshold
- Copayment

Premium Calculation – 2



Pure Risk Premium PPPY

= Incidence Rate x Average Cost per Incidence



Distribution of Pay-outs => X
Pure Risk Premium PPPY = E(X)

$$X \sim ??? (\mu, \sigma^2)$$

BUT $\bar{x} \sim \text{Normal} \left(\mu, \frac{\sigma^2}{n} \right)$

Observed mean of the simulated sample is the best estimate for Pure Risk Premium.

And if we want to protect the scheme with 95% confidence, the chargeable premium after risk loading will be

$$P = \bar{x} + 1.64 * \frac{\hat{\sigma}}{\sqrt{n}}$$

\bar{x} and $\hat{\sigma}$ are estimated from the simulated sample (10 million)

n is the number of people who would join the scheme

$$P = \bar{x} + 1.64 * \frac{\hat{\sigma}}{\sqrt{n}} \quad (\text{chance of bankruptcy} = 5\%)$$

$$P = \bar{x} + 2.32 * \frac{\hat{\sigma}}{\sqrt{n}} \quad (\text{chance of bankruptcy} = 1\%)$$

Risk Loading

Pure Risk Premium

Final Chargeable Premium = P + Admin Loading (20-30%)

Steps



❑ **Cross sectional survey**

- Estimate incidence rate for various types of events: hospitalisation, Lab test, Imaging,.....
- Cost Distribution (for various types of events)

❑ **Monte Carlo Simulation (10 million data points) for various combinations of Cap and Threshold and Co-pay (and also for family size)**

- Estimate mean (for every combination)
- Estimate variance (for every combination)

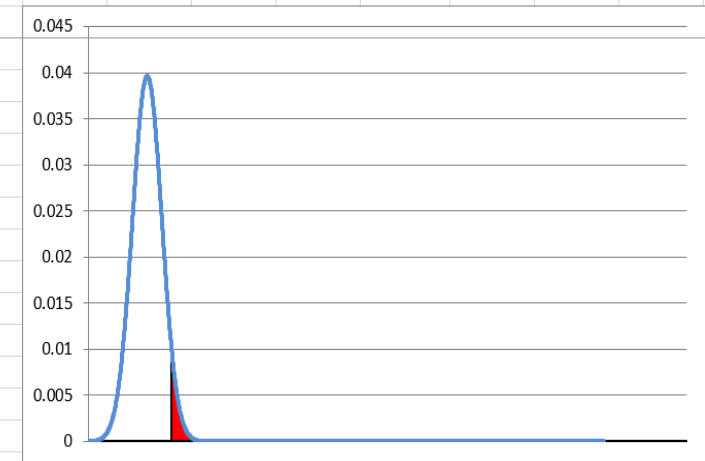
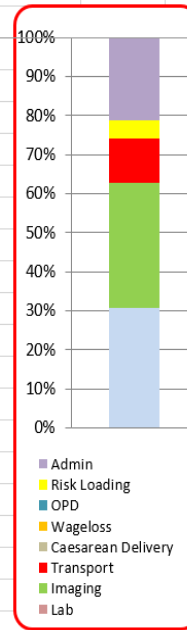
❑ **Create an Excel Calculator**

- People can see premiums for different types of events and various combinations of cap, threshold and co-pay
- A few packages are shortlisted through a workshop with the community gate-keepers (based on the community's willingness to pay)

Premium Calculator



Benefit	Threshold	Event	Family	Pure Risk Premium
Hospitalisation		3000	10000	111
Injury	0	700	3000	99
Lab (only OPD)	0			0
Imaging (only OPD)	0	1000	5000	116
Transport (for hospitalisation) Fixed		1000		42
Caesarean Delivery Fixed				0
Wageloss	Start Day	Last Day	Rate	0
	4	13		
OPD				
TOTAL				368
Community Size	5000			
Chance of Bankruptcy	5%			
Risk Loading	5%			17
Premium with Risk Loading				384
Admin Cost	20%			77
Total Premium Payable PPPY				461
Larger (4+ family size) discount	10%			
Proportion of people belonging to larger	34%			
PPPY upto size 3	PPPY for size 4+			Average
477	429			461



RISK TO THE SCHEME **5%**
 PREMIUM PPPY **461**



Steps



❑ **Cross sectional survey**

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❑ **Monte Carlo Simulation (10 million data points) for various combinations of Cap and Threshold and Co-pay**

- Estimate mean (for every combination)
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❑ **Create an Excel Calculator**

- People can see premiums for different types of events and various combinations of cap, threshold and co-pay
- A few packages are shortlisted through a workshop with the community gate-keepers (based on the community's willingness to pay)

❑ **Shortlisted packages are printed on a CHAT Board and taken to the community.**

- Finally ONE BENEFIT PACKAGE is selected by the community in this process.

CHAT Process



Results-1: Premium Per HH over the years



	2010	2011	2012	2013	2014	2015	2016
Kalahandi (Odisha)	383	412	370	340	369	478	
Dhading (Nepal)		562	586	651	744	957	952
Banke (Nepal)		394	601	696	899	1,123	1,113
Vaishali (Bihar)		754	624	542	485	525	598
Muzaffarpur (Bihar)							500
Beed (Maharashtra)							904
Kanpur (UP)		661	634	519			
Allahabad (UP)		628	711	673			
Rajnandangao (Chattishgarh)				265	316		
Total	383	568	588	527	563	771	813

Results-2



- ❑ # policy years = **145,173**
- ❑ Total Premiums mobilized = **INR 3,52,54,537**
(INR 242 PPPY)
- ❑ Cumulative Claim Ratio = **68.36%**
(no premium subsidy)
- ❑ Average premium turn-over handled per scheme per year = **INR 8,39,394**
(max INR 42,96,138 by one scheme in one year)

Lessons Learnt - 1



Poor people can pay the premium.

(in fact, they are ready to increase premium over the years)

When

- They ~~understand~~ **see** the value proposition of insurance.
- They see different packages and their fair-price (actuarial) premium
- They are given options to choose from
- They participate in governance structure including claim processing (they know they are not harassed and cheated by anybody)

Lessons Learnt - 2

Community can manage an insurance scheme.

(Adverse selection and moral hazard remain under control.)

- When piggybacking on existing community based structure (SHGs, Cooperatives, Farmers' Associations etc.)
- Anybody can participate in the Governance Structure and it is transparent to all
- Claim processing is simple
(~~laparoscopic cholecystectomy~~
hospitalization for operation,
~~Room rent max 1% of SI,~~
~~surgeon's fee max 25% of SI,.....~~
hospitalization benefit =
max Rs 5,000 subject to the production of bills)



Lessons Learnt - 3

There is a successful business proposition for a well-managed scheme.
(surplus is not distributed as profit, but remains as community asset.)

Indicators	An average year of an average scheme (achieved)	Schemes sustained (2017-18)	
		NIDAN (Vaishali, Bihar) (No donor fund)	NIRDHAN (Banke, Nepal) (Partial donor fund)
# HHs	1,131	605	3,229
# insured	3,091	1,400	11,300
# individuals/HH	2.73	2.31	3.50
Premium per HH (INR)	742	579	1,181
Premium per person (INR)	272	250	338
Total Premium (INR)	839,394	350,000	3,813,750
Claim Ratio	68.36%	74.60%	63.61%
Excess of premium over claim (INR)	265,578	88,900	1,387,824
Interest Earning potential @4% pa (INR)	33,576	14,000	152,550
Amount available for OpEx pm (INR)	24,930	8,575	128,364

Lessons Learnt – 4 to 8



4. Multiple packages in one scheme opens the door for adverse selection. It requires to build consensus on one package for one scheme.
5. Open enrollment (giving the option that one can enroll at any time) also leads to adverse selection. All policies should start on a same date and expire on a same date.
6. Norms for premium payment should be same for everybody. Giving “advantage” to some is not appreciated by the community.
7. Trust on the local partner matters a lot.
8. Blacklisting of fraudulent providers works better than empanelment of providers with negotiated rates.

Lessons Learnt – 9 to 11



9. Coverage of the CBHI is insufficient compared to the actual cost incurred. Does not have much impact on the OOP expenditure.
10. High demand for OPD coverages, which is uninsurable from some perspective.
11. Cost of technical assistance for a short period is high compared to the premium charged and it cannot be loaded in the premium.

Issue: CBHI or Commercial Insurance ?



We have to find a hybrid model, involving both.

WIN-WIN SOLUTION

- CBHI underwrites the claim upto a certain threshold level,
- Commercial insurers chip in above the threshold level
- Part of the claim underwritten by the community is equivalent to the co-pay for the Commercial Insurer. Co-payment is antidote for moral hazards.
- Avoid adverse selection through en-block affiliation: Either all or none.
- Premium should be community-rated instead of risk-rated.

Issue: Subsidy



Premium subsidy is required to give people a better coverage.

WIN-WIN SOLUTION

- Subsidy should be routed through the CBHI scheme in some proportions of the total premium mobilized by them.
- Subsidy should be gradually reducing and come to zero in certain number of years.
- CBHI should select the benefit package (and the corresponding commercial insurer) and augment their own package with it.

Issue: BPL vs APL



Instead of BPL why not target 10 crores households through the network of 85 lakhs SHGs ?

- BPL lists are dynamic.
- BPL lists are not free from errors.
- Households who are members of SHGs are not rich.
- Where poor/ultra-poor households are not part of any SHG network, efforts can be made to bring them under some SHG networks.
- If a household cannot afford to pay upfront premium, it can be given a loan by the SHG as per their rules.
- Cost of maintaining governance structure will be minimal.

Technical Assistance



Required for the capacity building of the SHGs (Cluster and Federation Level) in handling insurance scheme.

- Mostly one-time cost (at least it will be reducing in nature and will come to zero at some point of time)
- Use of modern technology for training to reduce cost
- Impact is permanent.
- Insurance education in school

Required Change in MINDSET



To provide insurance cover to the poor.

Required Change in MINDSET



~~To provide insurance cover to the poor.~~

To create a market for insurance at the base of the pyramid.



THANK YOU