

Conducting Health Services Research in Nepal

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Overall Agenda for Today

- Share experience conducting *Targeting Using Differential Incentives: Evidence from a Field Experiment* (EDCC, 2022)
 - Goal: illustrate the amount of help you need on the ground and was available through ISER-Nepal (in this case)
- Provide "unsolicited advice" to doctoral students planning to collect primary data/conduct RCT
 - ...generally in Nepal or through ISER-Nepal

Targeting Using Differential Incentives: Evidence from a Field Experiment (EDCC, 2022)

- 1 Background
- 2 Research goals
- 3 Nepal's context
- 4 Study design
- 5 Data and validity of randomization
- 6 Empirical approach
- 7 Key findings

Section 1

Background

Background (1)

- Low uptake of healthcare services [Kremer and Glennerster, 2011]
- Demand-side efforts:
 - providing info., subsidies, or both [Jacobs et al., 2011] [Dupas, 2011]
- This study focuses on *differential* access
- Unequal access and outcomes a major problem [Braveman and Tarimo, 2002]
- Disadvantaged groups have lower access and worse outcomes [O'Hara and Caswell, 2012]

Background (2)

- Outreach workers are used widely to improve access
- Disadvantaged groups are under-represented [Snyder et al., 2015]
- Individuals find it easier to interact with those with similar identities [Barnes-Mauthe et al., 2013]
- Current outreach efforts may not solve the problem of low utilization by disadvantaged groups
- Generally, ethnic mismatch can be a barrier to healthcare utilization
- Need to find a way to encourage outreach workers to reach to individuals from disadvantaged groups

Section 2

Research goals

Research Questions

- 1 Can we incentivize outreach workers to refer disadvantaged individuals through *differential* financial incentives?
- 2 On the demand side, does providing financial incentives directly to disadvantaged clients encourage them to utilize healthcare services more?

Section 3

Nepal's context

Health:

- Rapid strides in maternal and child mortality reduction [MoHP, 2012]
 - Under-5 mortality decreased from 118 per 1,000 in 1996 to 39 in 2016
- Met many of the MDGs
- Two key challenges relevant to the study:
 - Significant disparities, including in health access and outcomes [Pandey et al., 2013]
 - Cited as a trigger of the conflict (from 1996 to 2006) [Nepal et al., 2011]
 - Renewed emphasis on addressing disparities after 2015
 - Shifting burden of diseases [MoHP, 2015]
 - Diabetes prevalence: 9.1%, and rising [WHO, 2016]
 - Health system ill-prepared for new challenges

Female Community Health Volunteers (HVs)

- Created in 1989 - Vitamin A Supplementation Program
- Currently 48,000 in the country [Andersen et al., 2013]
- One per Ward, the lowest administrative unit
- All women, with limited education
- Praised for strides in child and maternal health [CGD, 2011]
- Primary role: raising awareness
- Effectiveness in emerging medical conditions not clear
- Not salaried, but receive other benefits

Nepal's Ethnic Context

- > 106 ethnic groups → 6 categories:

① Brahmin/Chhetri

② Newar

③ Muslim

④ Madhesi

⑤ Janajati

⑥ Dalit

- Further aggregated to Advantaged (red) and Disadvantaged (blue) for the purpose of policy design
- HVs know which group every HH in their Ward belongs to
- Within-group differences exist, but between-group differences are more distinct

Population, HVs and Prevalence of Diabetes

- Advantaged groups are over-represented among the HVs
- Diabetes prevalence is similar in the two groups

Table: Distribution by ethnic category

	% population	% HVs	% diabetic
Advantaged	45.3	62.3	5.7
Disadvantaged	54.7	37.7	5.8

Section 4

Study design

The Study Site



Source: <http://un.org.np/attachments/district-map-chitwan>.

Key Activities

- 1 Obtained approval from U of Michigan and NHRC IRBs
- 2 Obtained approval from District Health Office
- 3 Collected information about HVs from health centers; established relationship with health post in-charge
- 4 Randomized HVs, stratified by ethnicity, age and education
- 5 Visited the health posts to confirm dates of training and checkup
- 6 Trained and interviewed HVs
- 7 Visited HVs individually (at their home) to explain incentives, and provided referral cards and letters
- 8 Held checkups, interviewed clients and provided incentive to the prospective patients (the clients)
- 9 Collected stubs and unused referral cards
- 10 Provided incentives to the HVs

Randomization

- Randomization was at two levels:
 - health volunteers
 - prospective patients (clients)
- Incentives to health volunteers, per referral:

	Arm 1 <i>(Low)</i>	Arm 2 <i>(NudgeDis)</i>	Arm 3 <i>(NudgeAdv)</i>	Arm 4 <i>(High)</i>
Refer advantaged	Rs 20	Rs 20	Rs 50	Rs 50
Refer disadvantaged	Rs 20	Rs 50	Rs 20	Rs 50

Note. USD:NRs = 1:100.

- Clients were offered Rs 20, 30, 40 or 50 for appearing for the checkup
 - Amount not known to the health volunteers

The Referral Card

Free Diabetes Checkup	
<p>ID Number</p> <p><input type="text"/> <input type="text"/> <input type="text"/></p>	<p>ID Number</p> <p><input type="text"/> <input type="text"/> <input type="text"/></p>
<p>For use by the Female Community Health Volunteer</p>	<p>Dear Mr/Mrs,</p>
<p>Information on the recipient:</p>	<p>Please bring this card, along with the letter provided to you by your health volunteer, when you come to the free diabetes (sugar) checkup at your health post.</p>
<p>Full name:.....</p>	<p>Venue:.....</p>
<p>Phone no.:.....</p>	<p>Date:.....</p>
<p>Envelop no.:.....</p>	<p>Time: 7 am (please fast overnight and do not eat anything before coming to the checkup)</p>
	<ul style="list-style-type: none">For use by the Female Community Health Volunteer: Envelop number:.....
	<p>Thank you!</p>

Section 5

Data and validity of randomization

The Numbers

- 72 HVs were randomized
- 69 received training
- 2,825 clients received a referral card
 - 2,755 with complete information → Sample 1
- 2,403 came to the checkup
- 2,365 were interviewed
 - 2,336 with complete information → Sample 2

Table: 1. Characteristics of the Clients (N=2,336)

	Mean	SD
Gender (female=1)	0.60	0.49
Age, years	52.1	12.3
Ethnicity (advantaged=1)	0.56	0.50
Same ethnic category as that of the HV	0.66	0.47
Marital status (married=1)	0.89	0.31
Years of schooling	4.1	4.6
Distance to the health center, minutes	27	24
Primary occupation is agriculture (yes=1)	0.82	0.38
Knew about diabetes before the HV's visit	0.61	0.49
Knew about the checkup from the HV	0.99	0.09
HV informed the client by visiting the client's house	0.98	0.12

Table: 2. Health Volunteers' Characteristics (N=69)

	Mean	SD
Age, years	46.1	9.3
Experience, years	18.9	7.5
Education higher than grade 10 (yes=1)	0.28	0.45
Had informal schooling (yes=1)	0.10	0.30
Ethnicity (Advantaged=1)	0.62	0.49
Number of household visited per month	50.3	42.7
Received money for work as HV in the previous month	0.78	0.42
Distance to the health center, minutes	30	20
Primary occupation is agriculture (yes=1)	0.83	0.38
Has one of five neighbors from a different ethnicity	0.20	0.41

Table: 3. Balance in Key Characteristics of the Health Volunteers between Incentive Arms

	Low	NudgeDis	NudgeAdv	High	p-values	
					All arms	1 vs 2
Age, years	49	48	46	41	0.07	0.54
Experience, years	21	20	19	15	0.06	0.58
Education > grade 10 (yes=1)	0.24	0.18	0.28	0.41	0.48	0.48
Informal schooling (yes=1)	0.12	0.18	0.06	0.06	0.62	0.26
Ethnicity (Advantaged=1)	0.65	0.65	0.56	0.65	0.93	0.58
HHs visited per month	38	57	59	47	0.48	0.88
Received money previous month	0.88	0.88	0.67	0.71	0.27	0.13
Distance to Health center, mins.	28	38	30	24	0.23	0.28
Occupation: agriculture	0.76	0.88	0.78	0.88	0.70	0.41

Table: 4. Balance in Key Characteristics of the Clients between Incentive Arms

	Rs 20	Rs 30	Rs 40	Rs 50	p-value
Age, years	52.5	51.7	51.8	52.4	0.45
Women, proportion of total	0.61	0.62	0.59	0.59	0.79
Currently married, proportion	0.88	0.89	0.90	0.89	0.87
Education, years	3.9	4.3	4.4	3.9	0.15
Distance to the health center, minutes	28	27	26	27	0.23
Farming as main occupation, proportion	0.80	0.84	0.82	0.82	0.16
Blood sugar level, mg/dL	94.8	95.8	96.7	95.7	0.78
Blood sugar level > 110 mg/dL, proportion	0.15	0.14	0.15	0.14	0.93

Note: The p-values in column (5) are from the joint orthogonality test of the arms. The numbers here are for individuals who came to the check up.

Section 6

Empirical approach

- 1 $Y_{ij} = \beta_1 + \beta_2 \text{NudgeDis}_j + \beta_3 \text{NudgeAdv}_j + \beta_4 \text{High}_j + \delta \mathbf{X} + \epsilon_{ij}$
- 2 $Y_{ij} = \alpha + \beta_1 \text{Disadvantaged}_i + \beta_2 \text{Amount of incentive}_i + \beta_3 (\text{Amount of incentive}_i \times \text{Disadvantaged}_i) + \delta \mathbf{X} + \epsilon_j$

Section 7

Key findings

Finding 1. Disadvantaged referrals increased with differential incentives (based on initial referrals, n=2825)

	Pr(disadv referral)			# of disadv refs
	(1)	(2)	(3)	(4)
<i>NudgeDis</i>	0.138*	0.117	0.116**	3.629
	(0.082)	(0.076)	(0.052)	(3.525)
<i>RI p-value</i>	0.134	0.221	0.078	0.343
<i>NudgeAdv</i>	-0.056	-0.077	-0.006	-2.220
	(0.080)	(0.075)	(0.061)	(3.814)
<i>RI p-value</i>	0.538	0.413	0.932	0.578
<i>High</i>	-0.002	-0.008	0.037	-4.064
	(0.075)	(0.081)	(0.059)	(3.791)
<i>RI p-value</i>	0.977	0.938	0.594	0.287
R-squared	0.115	0.142	0.211	0.534

...Even based on clients who showed up, n=2403

	Pr(disadv referral)			# of disadv refs
	(1)	(2)	(3)	(4)
<i>NudgeDis</i>	0.134 (0.086)	0.122 (0.079)	0.120** (0.052)	4.094 (3.227)
<i>RI p-value</i>	0.180	0.232	0.091	0.232
<i>NudgeAdv</i>	-0.044 (0.086)	-0.059 (0.078)	0.018 (0.065)	-2.430 (3.429)
<i>RI p-value</i>	0.636	0.564	0.840	0.488
<i>High</i>	0.006 (0.082)	-0.001 (0.085)	0.050 (0.062)	-4.414 (3.216)
<i>RI p-value</i>	0.952	0.990	0.490	0.167
R-squared	0.119	0.153	0.233	0.569

Finding 2. Higher incentives → more effort at identifying sicker patients

Table: 6. Outcome: Pr(client is diabetic)

	(1)	(2)	(3)
Baseline = 0.044			
<i>NudgeDis</i>	0.025** (0.012)	0.024** (0.011)	0.032*** (0.009)
<i>NudgeAdv</i>	0.030* (0.015)	0.034** (0.015)	0.034*** (0.011)
<i>High</i>	0.010 (0.010)	0.021** (0.010)	0.026*** (0.009)
R-squared	0.002	0.005	0.012
N	2354	2354	2354

Finding 3. Total number of referrals did not change

	Total number of referrals		
	(1)	(2)	(3)
<i>NudgeDis</i>	1.225 (4.570)	1.325 (3.647)	1.356 (3.703)
<i>RI p-value</i>	0.756	0.728	0.627
<i>NudgeAdv</i>	1.419 (4.510)	1.291 (4.278)	2.261 (4.466)
<i>RI p-value</i>	0.663	0.789	0.643
<i>High</i>	-0.695 (5.526)	-3.323 (4.389)	-4.439 (4.626)
<i>RI p-value</i>	0.853	0.391	0.443
R-squared	0.043	0.236	0.280

Finding 4. Incentives to clients had no effect

Table: 7. Outcome: Pr(client showed up to the clinic)

	(1)	(2)	(3)
Baseline = 0.85			
Incentive amount, Rs	-0.0008 (0.0007)		-0.0006 (0.0008)
Disadvantaged client		-0.0511*** (0.0181)	-0.0417 (0.0444)
Incentive amount \times Disadvantaged			-0.0003 (0.0013)
R-squared	0.05	0.06	0.06
N	2,760	2,760	2,760

All models include health volunteer characteristics, health center fixed effects and health volunteer's incentive arm.

Aside:

- 11.6 pp change = incentive elasticity of about 0.2 [= (11.6/43)/150]
- P-value from randomization inference test for the main result: 0.024
- No evidence of "gaming" by HVs (i.e., opening letters)
- A number of threats to external validity (earthquake, ethnic tensions, unique setting)

- Applied for and received McNerney Award for another RCT - Winter 2014
- Spent Summer 2014 in Chitwan, Nepal for another study on nutrition
 - Learned that the RCT would not work
- Designed the current RCT and defended the prospectus, and sought approval to use the McNerney Award
- Obtained IRB approvals in Spring 2015
- Earthquake in April 2015
- Conducted RCT in August-September 2015
- Paper appearing in print in January 2022

What I Should Have Done Differently

- Spent more time in the field before designing the first RCT
- Registered the trial and prepared a pre-analysis plan
- Used better wording in the consent form
- Thought about the design and statistical power more carefully
- Sought more funding to cover local collaborators' time

Practical Suggestions on Collecting Primary Data

- Start early
 - NHRC takes longer to review proposals than university IRBs in the US, and has different requirements
 - Everything takes longer in the field
- Visit the site at least once and spend some time there
 - Stay there for most of the study period, if you can
- Be cognizant of local collaborators' time, and costs
 - Again, everything takes longer in the field (example)
 - With the new federal setup, additional approvals are required
 - Unforeseen costs (examples: HV training, data double entry)

Support You Can Get (ISER-N)

- Quality, efficient work on:
 - IRB approval, other local-level approvals
 - translation and pre-testing of survey instruments
 - logistical arrangements (hiring required staff/enumerators)
 - data collection, entry, and data dictionary
- Welcoming staff!

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Thank you.

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