

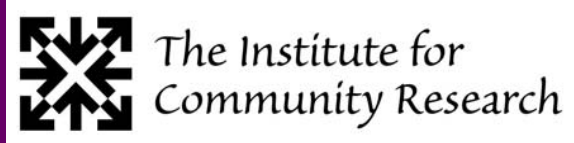
Spatial Dimensions of Research on Alcohol and Sexual Risk: A Case Example from a Mumbai Study

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Purpose

- To investigate spatial dimensions of alcohol use and sexual risk behavior among young men in low-income communities in Mumbai

Background

- Role of alcohol in unprotected sex and spread of HIV
- Focus on social and spatial contextual settings of alcohol consumption
- Complex relationships between alcohol use and drinking places
- Ecological models of alcohol use

Research Questions

- Where do young men drink and engage in other relevant leisure time activities?

Type of setting

Location

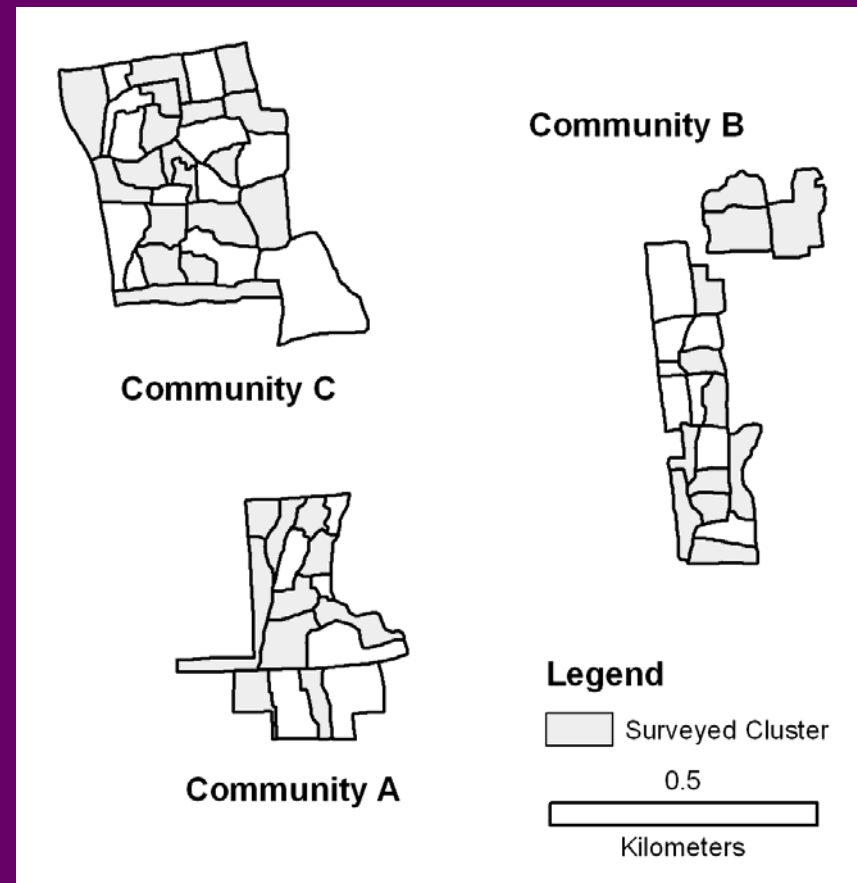
- Are there groups of men who drink and engage in the same leisure activities in the same communities?
- Do these groups of men report different alcohol consumption and sexual risk behavior?

Methods

- Multiple methods
 - Formative work with community leaders
 - In-depth qualitative interviews
 - In-person surveys with 1,239 young men 18-29
- Role of spatial methods
 - Define study community boundaries
 - Survey sampling design
 - Collection and analysis of data on drinking and leisure time activity places
 - Dissemination

Study Setting and Sample Design

- Used GIS to define boundaries
- Cluster design groups residences on lanes into 66 clusters
- Random sample of 40 clusters
- GIS used to visualize surveyed clusters to assess coverage and survey progress



Spatial Data on Activities

- Collected in three sections of the survey
- Leisure time activities – where do you usually:
 - Drink with friends
 - Roam
 - Drink in bars
 - Play cards
 - Gamble
 - Watch blue films
 - Visit commercial sex worker
 - Meet women and girls
- Last drank one of five types of alcohol – where:
 - Foreign Liquor
 - Country Liquor
 - Tadi Madi
 - Beer
 - Wine
- Database of places [ID, name, type, community, lon/lat]

Analysis of Spatial Data

- Mapped activity sites
- Identified groups of mens with similar patterns

Index of Association

$$I = \frac{2 \times (\text{Number of activity-in-community in common})}{\text{Number of activities Person 1} + \text{Number of activities Person 2}}$$

Multidimensional scaling of similarity matrix

- Analyzed group characteristics using descriptive statistics and discriminant analysis

Results: Types of places

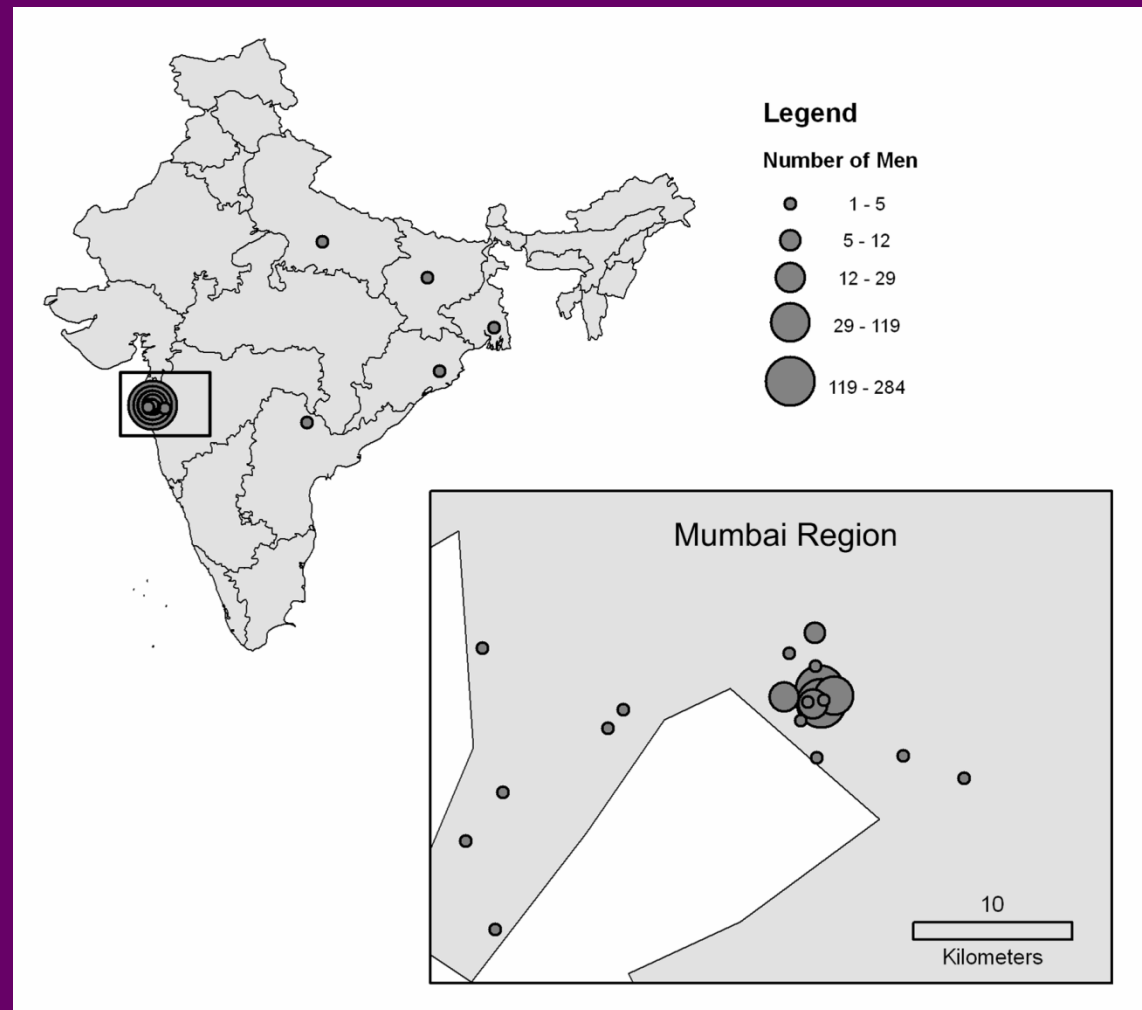
- 751 men drank with friends
- Not all places commercial establishments

Table 1 Types of places where men usually drank with friends

Type of place	Places		Men	
	Number	Percent	Number	Percent
Bar/Restaurant	39	8.2	285	37.9
Tadi Madi Center	1	0.0	1	0.0
Wine Shop	2	0.0	2	0.0
Country Liquor Shop	1	0.0	10	0.1
Daru Ka Adda	5	0.1	9	0.1
Home	248	52.0	248	33.0
Friend's Home	104	21.8	104	13.8
Other Indoor	49	10.3	52	6.9
Outdoors	28	5.9	40	0.5
Total	477	100.0	751	100

Results: Drink with friends locations

- Community centroids
- 640 drank in one of three study communities
- 111 drank in other widely-dispersed locations



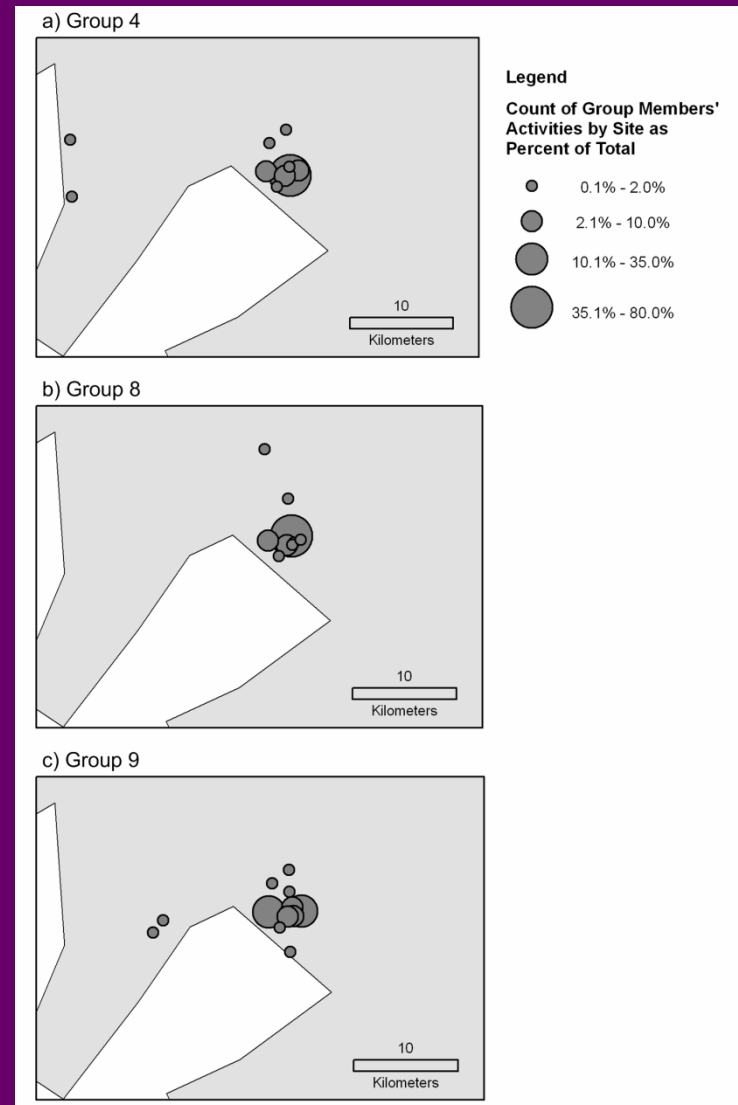
Results: Groups of men

Table 2 Group characteristics

	1	2	3	4	5	6	7	8	9	10	All
Number of Men	99	201	117	202	157	112	117	99	74	61	1,239
Community A	27	0	18	130	5	0	102	0	9	21	312
Community B	31	0	29	55	0	112	7	0	44	30	308
Community C	41	201	70	17	152	0	8	99	21	10	619
Age (mean)	23	24	24	24	24	25	24	25	23	24	24
Number of Leisure Activities (mean)	0	2.2	1.3	2.7	1.1	1.8	1.4	1.6	2.3	1.9	1.7
Alcohol Consumption (mean drinks over last month)	0	5.2	2.3	12.1	3.9	8.4	4.2	6.6	4.6	3.4	5.6
Never married (percent)	47	42	44	44	38	21	35	20	49	36	38
Number of Non-Wife Partners (mean over last year)	0.0	0.3	0.1	0.6	0.1	0.2	0.2	0.3	0.6	0.2	0.3
Number of Times Unprotected Sex (mean over last year)	0.0	1.3	0.1	2.0	0.1	0.5	1.3	0.3	5.0	1.3	1.1

Results: Spatial activity patterns

- Group 4) High number of leisure activities focused one study community
- Group 8) Drank with friends at home and roamed in adjacent community
- Group 9) Leisure activities outside of three study communities with focus in one nearby community



Results: Discriminant analysis

- Stepwise analysis of nine variables
- Four variables entered
- Classification function correctly classified group for 21.5% of men

Variables

Age moved to Mumbai

Marital status

Index of alcohol self-efficacy

Number of drinks over last month

Number of non-wife sex partners over last year

Number of times unprotected sex with non-wife partner over last year

Ever had unprotected sex

Index of condom use risk

Index of television/move exposure

Conclusions

- Geospatial data to ground behavior in place are of enormous importance in health research
 - Study area definition
 - Spatial sampling
 - Data collection
 - Spatial analysis
 - Dissemination
- Exploratory study provides support for ecological models emphasizing importance of behavioral settings in research on alcohol use and sexual risk behavior
- Study findings have implications for design of research studies and venue-based interventions