Health & Well-Being in Poverty
A case of slum rehabilitation, India

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Annual Public Health@Cambridge Network Showcase 2019: Planetary Health

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Urban forms in transition
Study area

**Cross type**

**Double loaded corridor type**

**Single loaded corridor type**

Legends:  
- Corridor,  
- Courtyard,  
- Vertical circulation (Staircase)
In-between buildings

SLUM  CROSS DESIGN  DOUBLE LOADED CORRIDOR TYPE  SINGLE LOADED CORRIDOR TYPE
Health & design – case of tuberculosis

Studying the association between structural factors and tuberculosis in the resettlement colonies in M-East ward, Mumbai

Final Report
15th March 2018

Dr. Ravikant Singh
Doctors For You

http://www.mmmreis.org.in/images/research/TB_research_Final_submission_report_18_03_18_revised.pdf
Health & design – case of tuberculosis

Daylight

Tuberculosis reported after shifting
1% (n=498)
8% (n=1785)
10.1% (n=1797)
Indoor air quality among Mumbai’s resettled populations: Comparing Dharavi slum to nearby rehabilitation sites

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Indoor air quality – Natwar Parekh
Indoor air quality – Natwar Parekh

- Completed 2008
- 59 buildings
- 4,800 occupied dwellings
Household air pollution & design - experiment

\[ \ln \left( \frac{C_{in,t} - C_{out}}{C_{in,t=0} - C_{out}} \right) = -\lambda t \]

\[ C_{in,t} = C_{in,t=0} e^{-\lambda t} + \frac{P \lambda C_{out}}{\lambda + k} (1 - e^{-(\lambda + k)t}) \]

Concentration on PM$_{2.5}$

PM$_{2.5}$ concentration in breathing zone

PM$_{2.5}$ concentration on shelf above stove
PM2.5 plume
Household air pollution & design

- Indoor PM$_{2.5}$ consistently between 150-300 μg/m$^3$
- Logged data- daily spikes exceeding 1,000 μg/m$^3$
- Cleanest fuel did not meet recommended levels

Gender, domestic energy and design of inclusive low-income habitats: A case of slum rehabilitation housing in Mumbai, India

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Sentiment analysis as tool for gender mainstreaming in slum rehabilitation housing management in Mumbai, India

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Wellbeing among women

The research aims to:

a) understand elementary slum rehabilitation housing typologies in Mumbai.

b) how female occupants’ cooking, thermal comfort, entertainment, childrearing and working practices have transformed since the relocation.

c) how that affects domestic energy use and d) which factors influence these practices.

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<th>25 Households</th>
<th>3 Policy planners</th>
<th>9 participants</th>
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Transect walk

Data Analysis
Grounded theory – Systems analysis
Wellbeing among women - narratives

“.... we have to reduce the household cost and that’s why I prefer not to use fan for my own comfort....we only use fan when kids and my husband are home...and I only turn on the TV when kids want it.. ”

(Interview 1-A)

“.....my eyesight is very weak now... as I have to work in dark...sometimes I do some of the household works outside (in corridor) when it is very dark inside.....but anyways we cannot do all the works outside, we have a lot to do inside and cannot afford to put on lights all the time...”

(Interview 5-B)

“...we know that girl’s education is also important, but when it comes to choosing between girl and boy’s education, as we cannot afford both, we decided to send our boy, as girl will go to another house after marriage, but boy can take care of us in our old age...”

(Interview 8-B)
6. Findings on the systems analysis

- Poor building design influences women's poverty trap directly (e.g. need for electronic appliances, lack of communal space, increased costs) or indirectly (e.g. lack of social capital, lack of information).
Interview 1-C, a graduate female, lack of childcare forces her to work in informal economy from home restricting time availability and income

Interview 9-B, a graduate female in a female-headed household, childcare support gives her time and access to information, NGO employed and children in private school
Comfort practices a trade-off between income and energy expenditure

- Increased energy consumption:

*Previous house (slum):* INR100 per connection  
[total (avg.) INR 400]

*SRA building:* Min. INR 600 (upto INR1500)

- Majority of the surveyed low income group are energy poor spending more than 10% of their disposable income on electricity and cooking fuel.

- All the houses have fan, and it is the most used appliance.
Proof of concept

Thank you