Measuring Housing Well-being for Disaster Victims in Japan and India: A Capability Approach

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Land Economics Foundation

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Structure of the Presentation

- Aim
- Research questions
- Theoretical framework – Capability Approach
- Case Studies – Japan & India
  - Methodology and Data
  - Results – Japan & Chennai
  - Policy recommendations
  - Generalizable principles of post-disaster reconstruction

Aim

To understand the role of housing in individual and familial wellbeing.

Research Questions

1. What are the determinants of *housing well-being*?
2. How personal characteristics of individuals impact their housing well-being?
3. What is the influence of disaster vulnerability on housing well-being?
4. How does relocation impact on housing well-being?
5. What principles may guide satisfactory post-disaster reconstruction of losses of affected persons?

Theoretical Framework – Capability Approach to Wellbeing

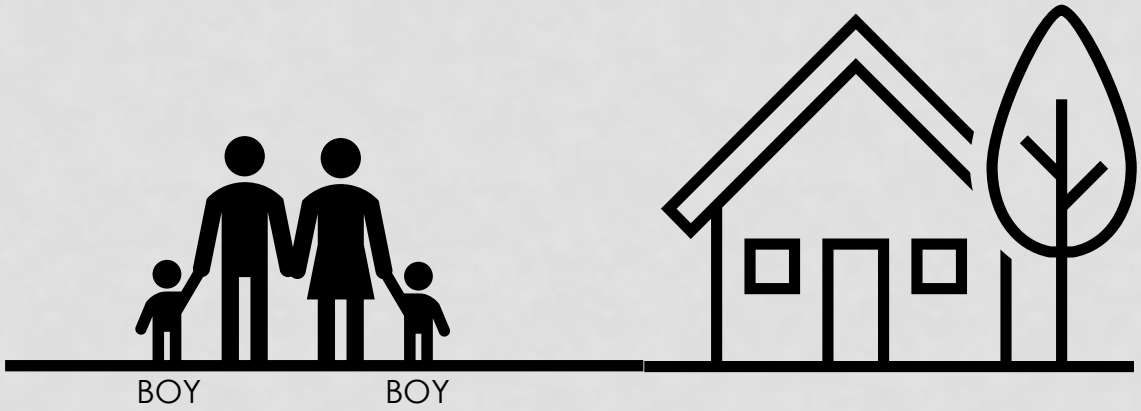
Equality of what? Sen (1979)

Wellbeing and happiness.

Equality of what? Sen (1979)

?

Equal resources = Same achievements



Cognitive ability
Capacity to reason, plan, solve problems, comprehend complex ideas, learn from experience and so on.

Physical strength and ability
Static strength, dynamic strength, gross body coordination, gross body equilibrium, and stamina.

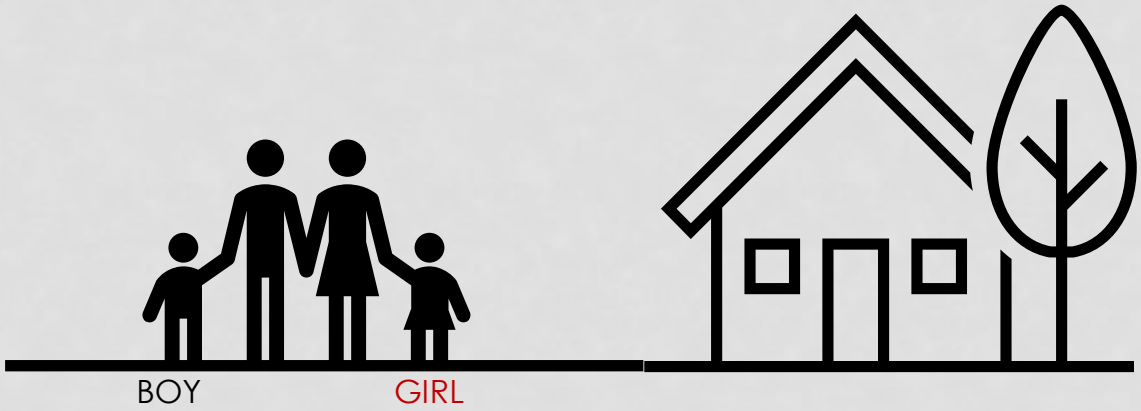
Personal characteristics of an individual will influence their ability to convert resources into achievements.

Equal resources ≠ Same achievements

Equality of what? Sen (1979)

?

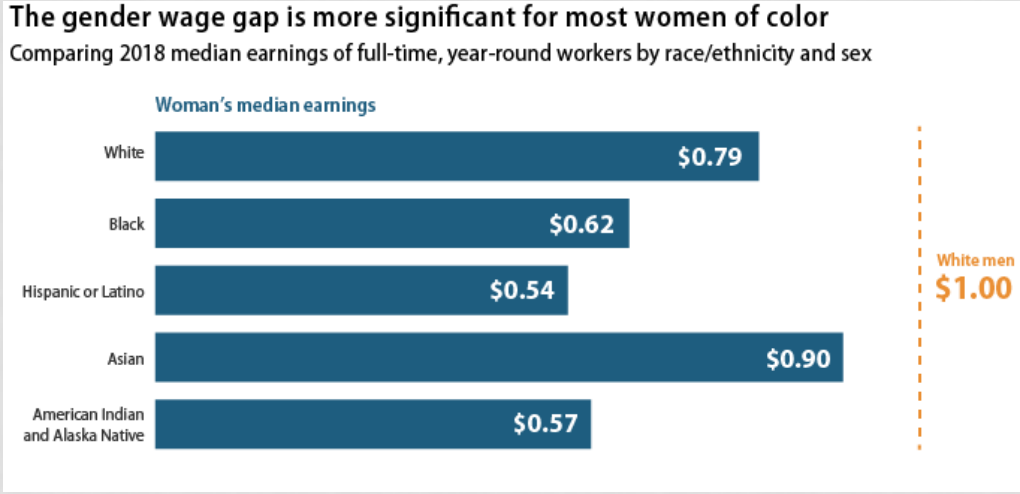
Equal resources = Same achievements



Wage Inequality

Analyzing the most recent Census Bureau data for America from 2018, women of all races earned, on average, just 82 cents for every $1 earned by men of all races.

Source: https://www.americanprogress.org/issues/women/reports/2020/03/24/482141/quick-facts-gender-wage-gap/



Equal resources ≠ Same achievements

Equality of what? Sen (1979)

Wellbeing and happiness.

Equal ability of people to convert income and resources into personal achievement depends on a variety of factors including personal characteristics and institutional environment.
(Sen,1985; Nussbaum, 2011, p. 20)

Housing and Functionings

Housing as a resource helps people in creating many *functionings*

Functioning 1: Being able to enjoy family life

Functioning 2: Financial security through rental income.

HAPPINESS

Therefore, loss of housing due to disaster affects many functionings derived from using housing.

Aim of this research is to identify determinants of wellbeing derived from housing and measure their impact on housing satisfaction.

Fundamental functionings of land (Rao, 2018)		Sub-functionings identified as relevant for housing		Functioning indicators identified based on the data available in JHPS
1	Power to take decisions on land/housing matters		Having control over ones (physical) environment.	Being able to make physical improvements - repair and remodelling; seismic retrofitting; Annual income of the household; Building type of the house (house/apartment).
2	Personal comfort and convenience		Living comfortably and conveniently in a home	Adequacy of floor space (or floor space per person); Quality of house - Age, floor number, area of yard/garden, value or rent of the house, annual income of the respondent; Size of the city; Physical improvements (repairs, remodelling, seismic retrofitting); Connectedness (or travel time to nearest public transport).
3	Familial wellbeing	a	Being able to live with others;	Living with family as opposed to living alone; Household size;
		b	Being able to live towards others and building interpersonal relationships and securities within the family	Generational contract; Inheritance; Having children (number of children); Living with or in vicinity to parents; Type of job (and time available at home).
			Disfunctioning- Congestion and lack of privacy; burden of family responsibilities in the form of physical care and financial assistance; Uncertainty of inheritance.	Household size; Living with or in vicinity to parents; Having children (number of children); Expecting inheritance in the future.
4	Secure means to basic ends		Being prepared for a disaster and being resilient	Being able to make physical improvements - seismic retrofitting; Annual income of the household; Building type of the house (house/apartment); Residence and household effects damaged by 2011 earthquake; Earthquake insurance; Fire insurance.
5	Financial security	a	Being able to store value in a house	Value of house (per unit area); City Size; Have inherited or expect inheritance of property in the future.
		b	Disfunctioning - Financial stress	Job security; Age of the household head (i.e. main income earner).
6	Self-identity	a	Having self-identity with house as memorabilia	Duration lived in the current house; Living in an inherited property (house or plot).
		b	Having self-identity in familial identity and status	Owning (as opposed to renting) a house; Living in an inherited house; Value of current house.
7	Social equity		Being empowered and receiving equitable treatment as a female member of the society	Gender of the household head.
8	Psychological wellbeing		Dis-functioning: Being unsafe and vulnerable to disaster	Residence and household effects damaged by 2011 earthquake; Inundation rate; Exposure to dangerous level of radiation; Region;
9	Social capital		Building social capital through locational stability	Length of stay in the current house; Tenure of current house.
10	Political empowerment		Being locationally stable	Length of stay in the current house; Tenure of current house.

Case Study 1: Japan

- Japan Household Panel Survey (JHPS) data 2011 to 2018.
- JHPS was initiated in 2009 with 4,000 respondents and asks a wide range of repeated question each year on households' characteristics, education, employment, income and liabilities, housing, health.
- From 2011 onwards, the JHPS asked respondents to indicate their satisfaction with housing (and other dimensions of life) on a scale of 0 to 10.

1. OLS model

Through using OLS model above, we identify relevant indicators of housing functionings and their impact (positive/negative) on people's perception of satisfaction with housing:

$$HS_{it} = \alpha + \beta_1 X_{itf} + \beta_2 Z_{if} + \beta_3 X_{itp} + \beta_4 Z_{ip} + u_i + e_{it}$$

Indicators of functionings

Person centric variables

Stochastic error term

2. FE model

Individual level fixed-effect model helps us to correct for intercept-heterogeneity and to specifically identify time-varying determinants of housing satisfaction:

$$HS_{it} - \overline{HS_{it}} = \alpha + \beta_1 (X_{itf} - \overline{X_{itf}}) + \beta_3 (X_{itp} - \overline{X_{itp}}) + e_{it}$$

To account for slope heterogeneity among homeowners and renters', we undertake a sub-group analysis for owners and renters in both OLS and FE models.

1. Power to take decisions on land/housing matters
   - The implementation of remodeling and seismic retrofitting increases satisfaction with housing, especially among owner-occupied households.
   - Income has a positive effect on satisfaction, and the effect is larger for renter than for owner.

   ⇒ Having control improves people's satisfaction with housing. Especially seismic retrofitting is crucial.

   ⇒The ability to improve the house is significantly impacted by labour income.

2. Personal comfort and convenience/Familial Wellbeing
   - While living alone reduces the satisfaction, especially for renter, it also decreases as household size increases.
   - Compared to households that do not work (e.g., retired households), the satisfaction level of working households is lower.

   ⇒Congestion and lack of privacy is another negative externality of living with parents and children that negatively impacts people's housing satisfaction.

   ⇒Familial wellbeing is also affected by time available for the family.

3. Secure means to basic ends
   - Households who do not have an earthquake insurance but intend to have one are relatively less satisfied with their housing.
   - Housing satisfaction of respondents who neither have insurance nor intend to take one in the future is not affected by insurance status.

   ⇒ Earthquake insurance plays a crucial role in households' satisfaction with housing.

4. Financial security
   - The positive coefficient of inheritance and house value per unit area indicate that those who have inherited a house or live in a house with higher value report greater satisfaction with housing.

   ⇒ House serves as a store of value.
   - The coefficient for 'future housing inheritance' dummy variable is negative and significant.

   ⇒This is largely due to uncertainty of timing associated with future inheritance.

5. Self-identity
   - A positive relationship between housing satisfaction and length of stay in the house.

   ⇒ House also serves as a physical repository of memories built over time.

6. Social equity
   - Female household heads associate higher housing satisfaction compared to male.

   ⇒ Positive role of housing/homeownership in economic empowerment, autonomy, and decision-making power of women.

7. Pyschological Wellbeing
   - Households who have experienced damage by the Great East Japan Earthquake and are in areas with high inundation rate report a lower satisfaction with housing.

   ⇒Sense of unsafety and vulnerability induced due to housing located in a disaster-prone region reduces households' satisfaction with housing. Also the negative psychological impact of experience of disaster hampers households' satisfaction.
   - The positive impact of nuclear contamination on housing satisfaction.

   ⇒The negative impact of nuclear contamination is offset by financial for social infrastructure, and economic opportunities in the region.

1. Quick recovery of housing ownership and stable income (jobs) are important for people's wellbeing and post-disaster recovery.

2. Encouragement to seismic retrofitting of houses and earthquake insurance is crucial to individuals' disaster resilience.

3. Earthquake insurance, in particular, is a major policy issue because the wellbeing of those who do not have it is low, while the rise in insurance premiums has recently become a problem.

4. Given the especial role of homeownership in granting social and familial equity to women, policy attention is demanded to ensure equity in case of loss of home due to disasters.

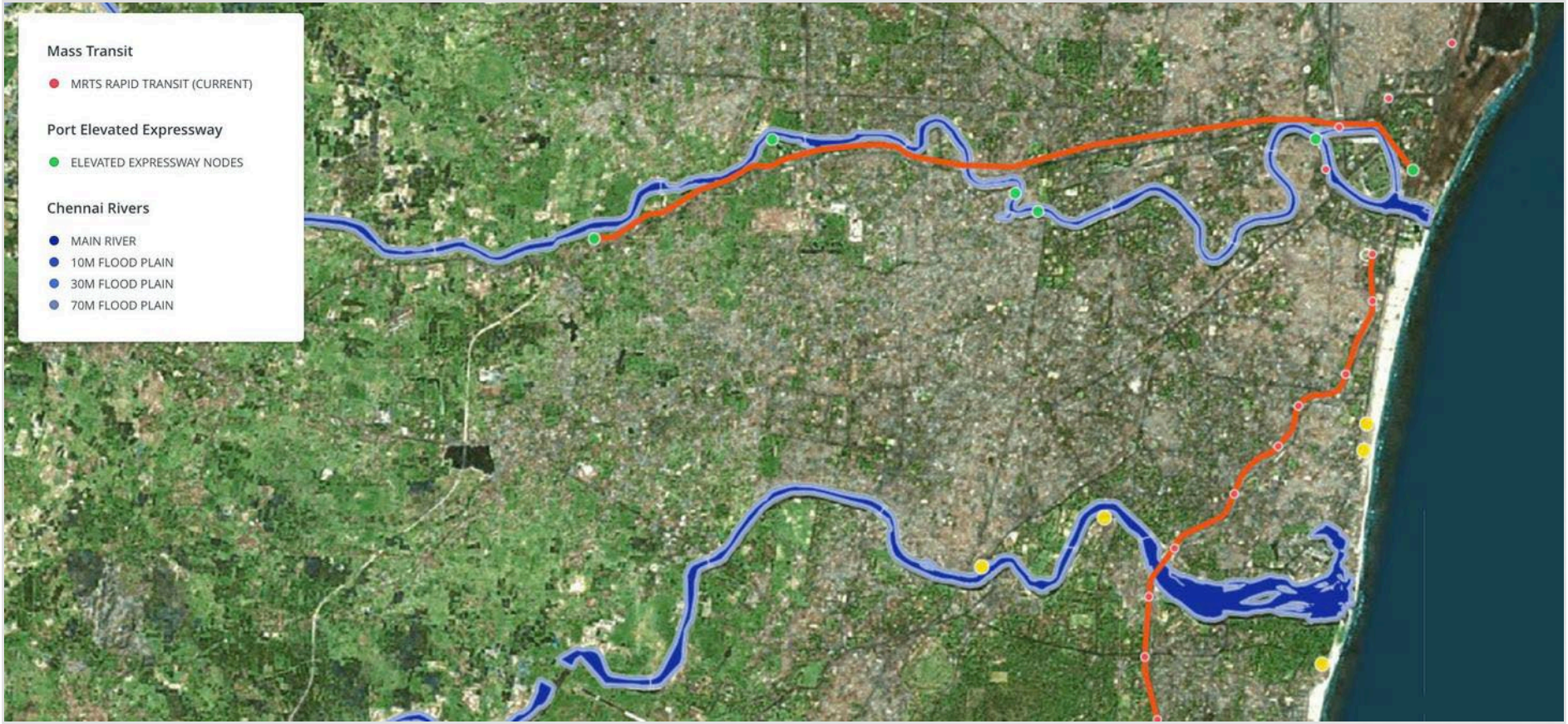
5. Reducing the sense of unsafety and vulnerability and improving psychological wellbeing of residents in disaster-prone areas through strengthening social connectedness.

6. Further research to understand how to improve housing satisfaction of renters living in areas of high radioactive contamination.

7. A focused effort to create opportunities for social networking for those who have lost their existing connections post-disaster to improve their psychological health and involvement in social and civic life.

Case Study 2: India

Chennai and its slums



Source: Ramanan, S. (2017). Informality in Chennai – Settlement Patterns and Trends. https://due-parsons.github.io/methods3-fall2017/projects/informality-in-chennai-settlement-patterns-and-trends/

Timeline of disasters

- Tsunami 2004, which killed nearly eight thousand people and affected more than a million.

- Floods in 2015, affected more than six million people were affected, and 1.5 million houses were damaged.

- Cyclone Vardha in 2016 and Cyclone Gaja in 2018, left people and infrastructural systems stranded.

Resettlement colonies

Perumbakkam Resettlement Colony

Kanagi Nagar

Structure

- Ground + 1 floor built in 2000 with shared toilets,
- Ground + 2 floors built in 2004, and Ground + 3 floors built in 2005 with separate room, kitchen and bathroom.

Size: 195 square feet to 310 square feet.

Ezhil Nagar

Structure

- Four storey, each comprising 96 to 176 tenements per block.

Size: 390 square feet with a hall, bedroom, kitchen and attached bathroom with toilet.

Perumbakkam

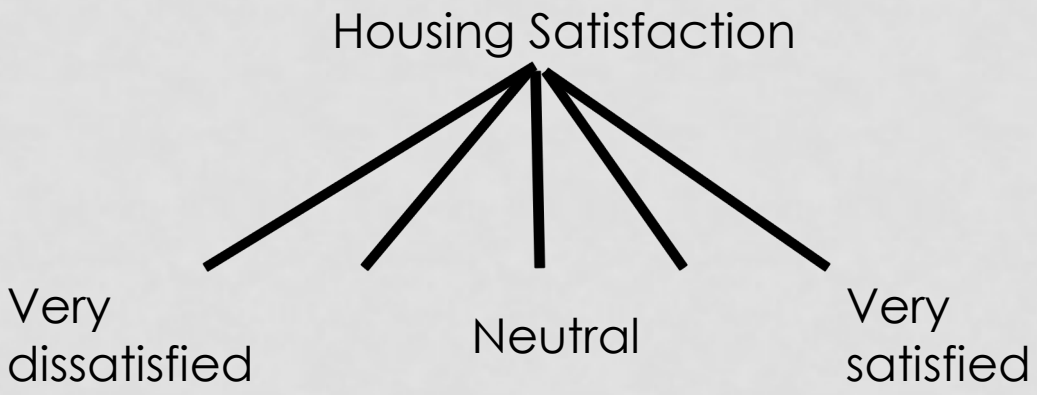
- Type A design covers 32 blocks each containing 192 tenements. Type B design covers 156 blocks with 96 dwellings in each block.

Data

Name of resettlement site	Number of families surveyed
Kannagi Nagar	150
Ezhil Nagar	158
Perumbakkam	150

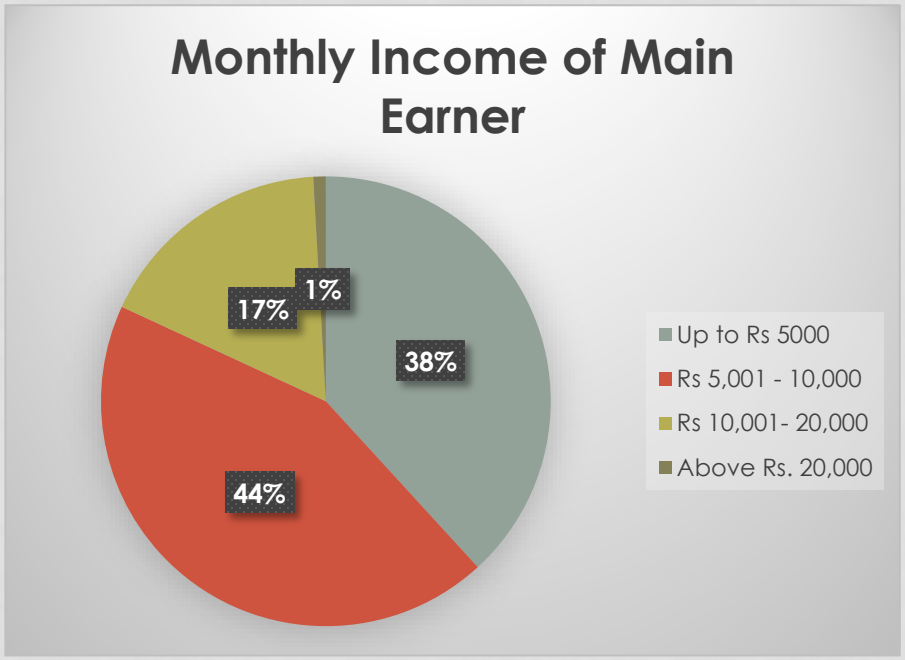
Empirical strategy

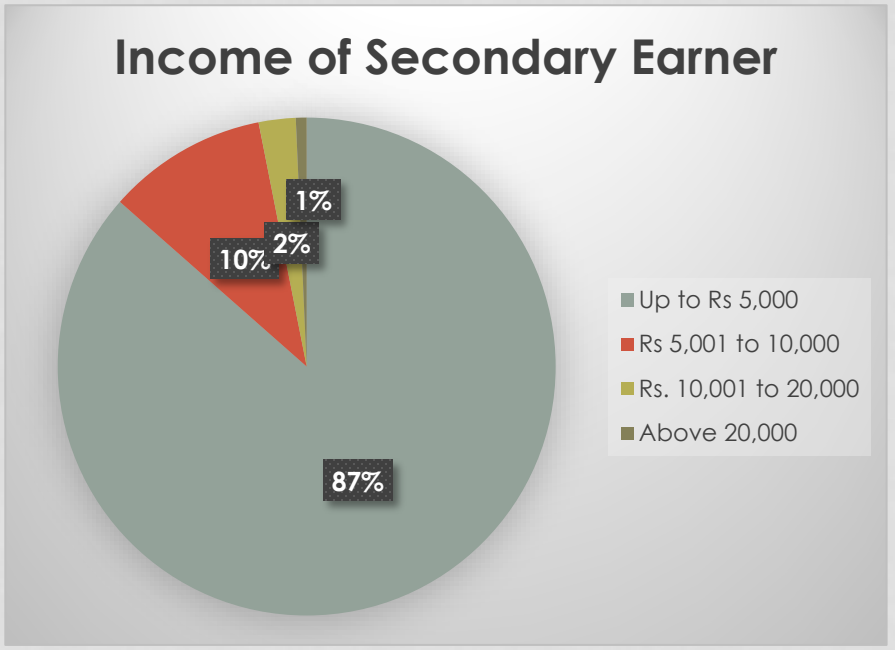
A multinomial logit model that calculates probability of housing satisfaction choice conditional on functionings that the housing creates for the household.



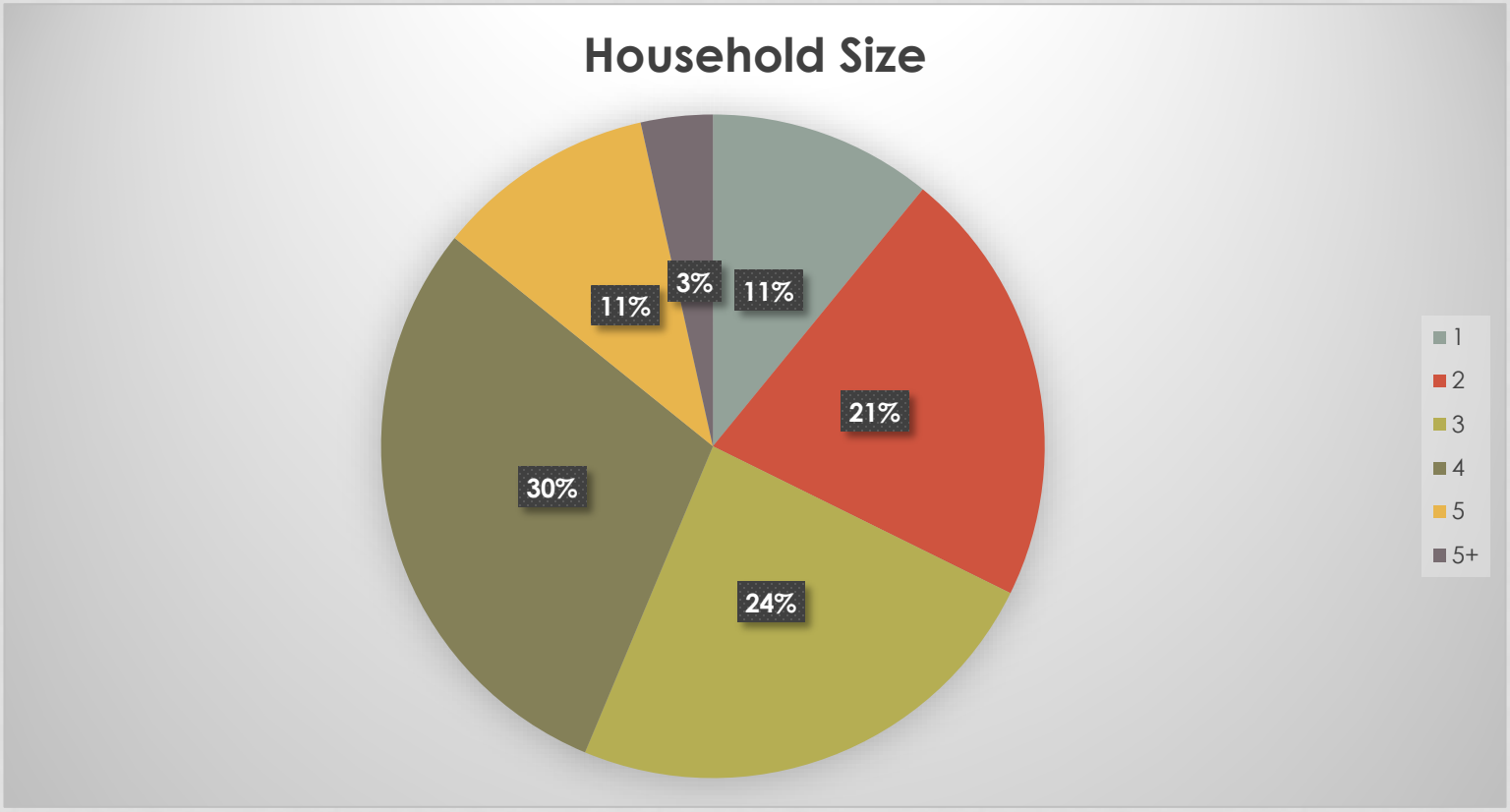
Household Characteristics

Household Characteristics - Income



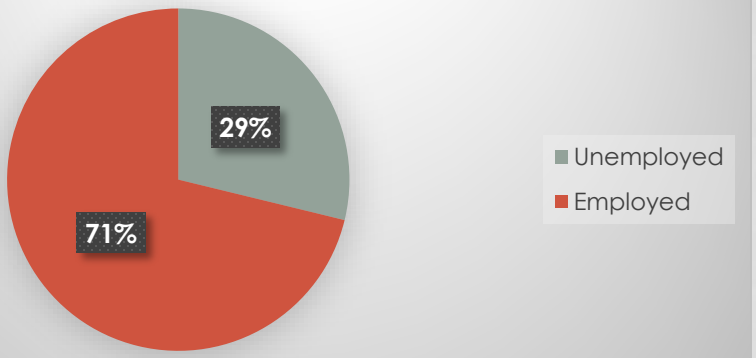


Household Characteristics - Composition

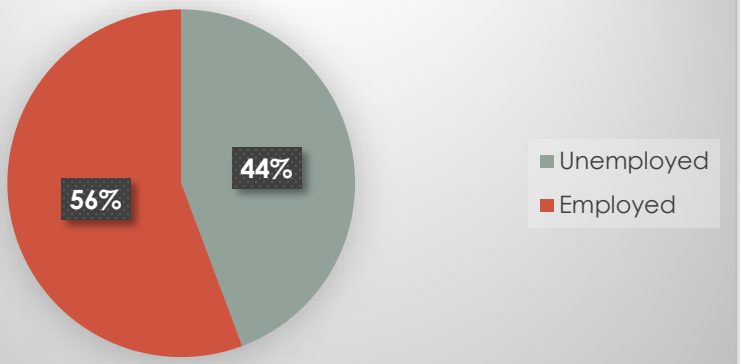


Household Characteristics - Employment

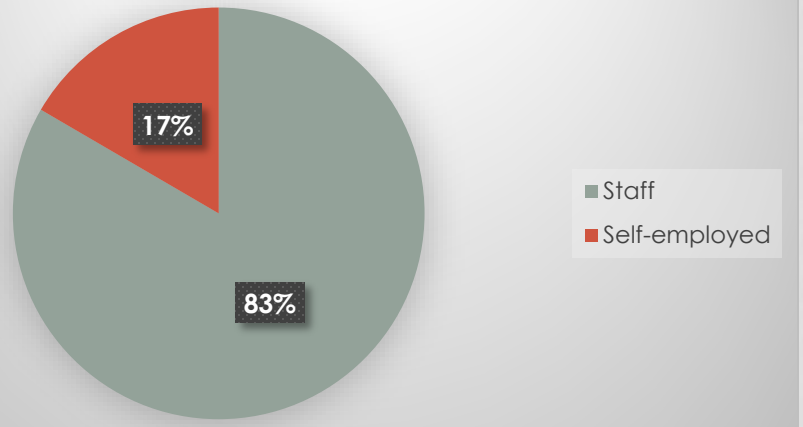
Current Employment Status



Previous Employment Status



Type of employment



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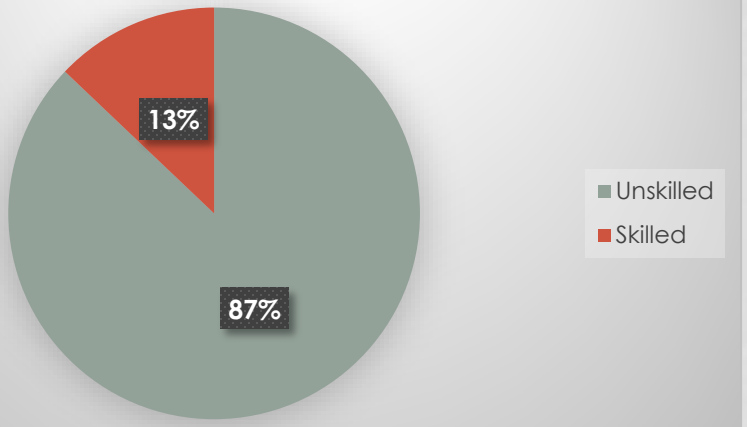
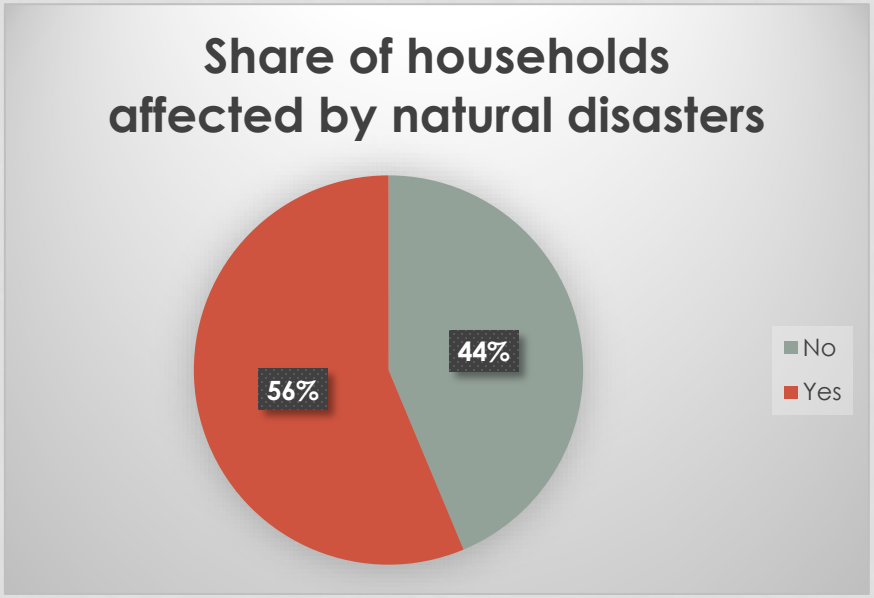
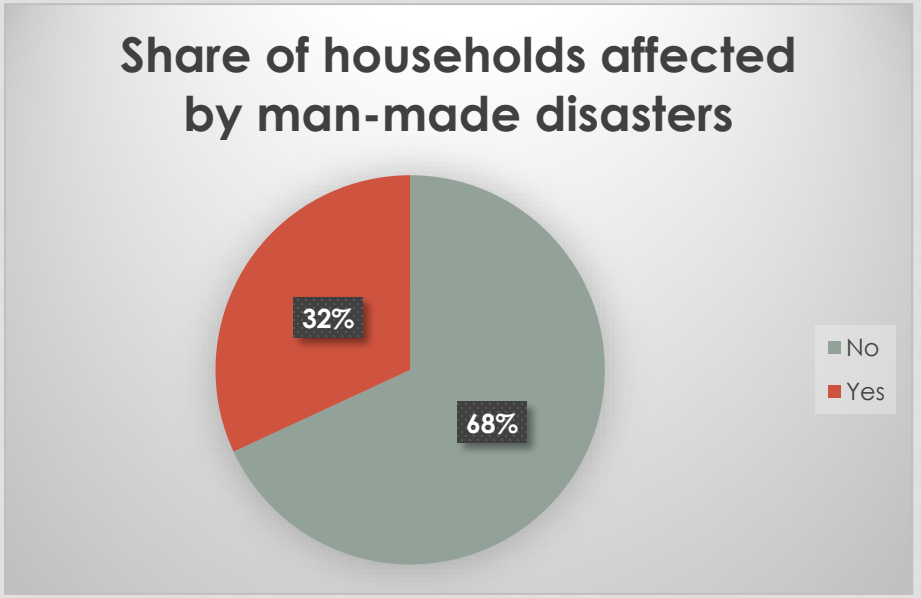


Causes of Relocation

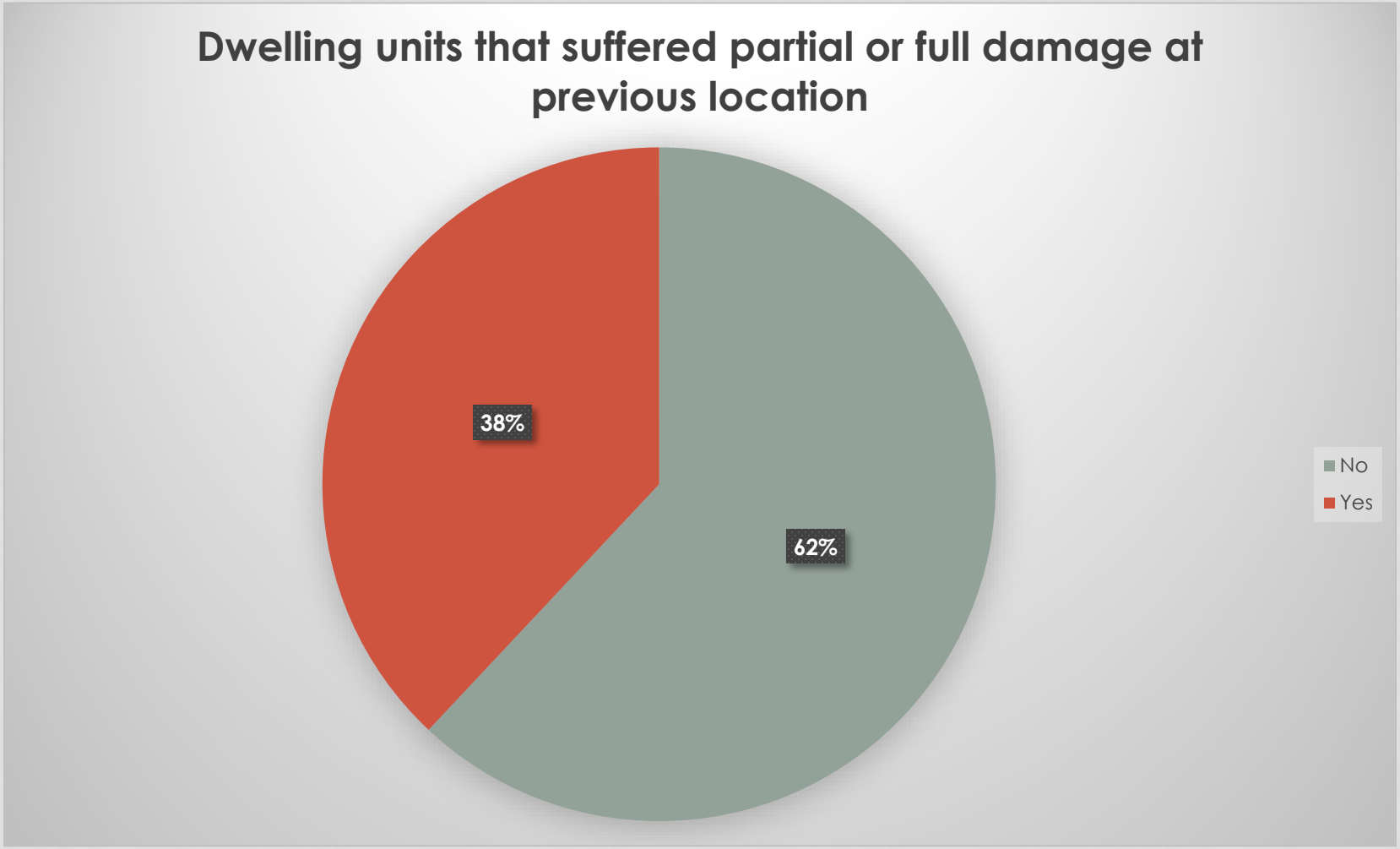
Causes of relocation



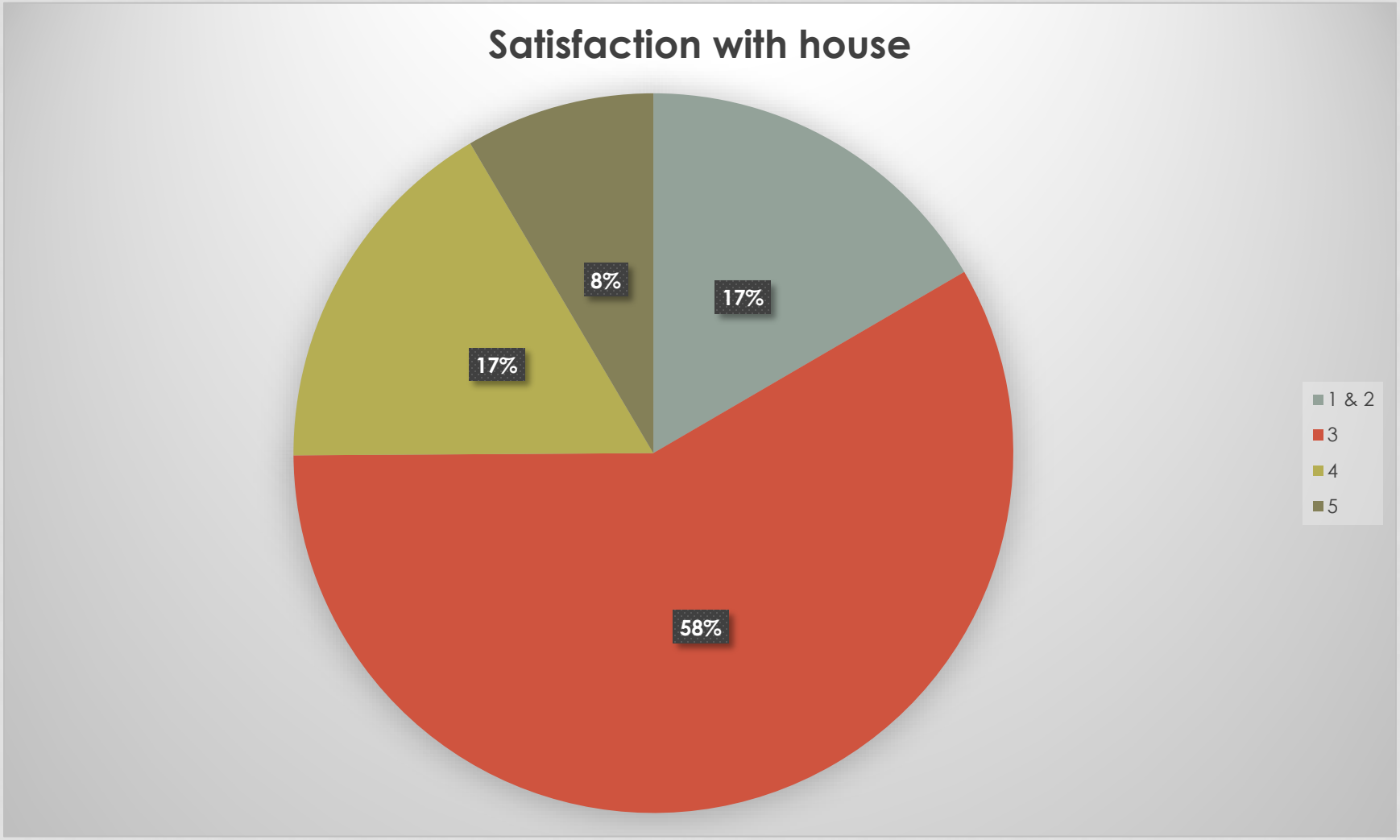


Resettlement colonies – location and microenvironment (Satisfaction and Fears)

Impact of disasters

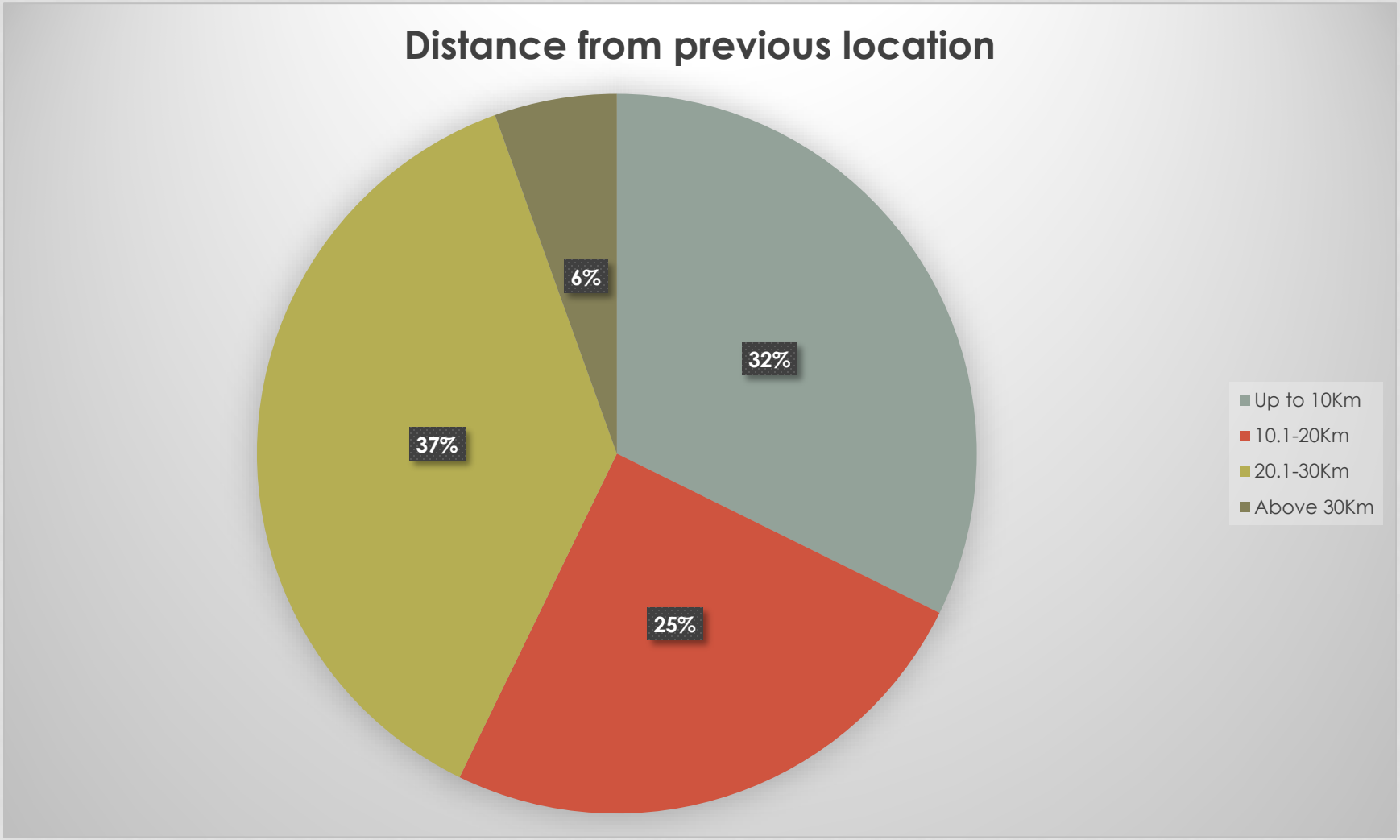


Satisfaction with house at current location

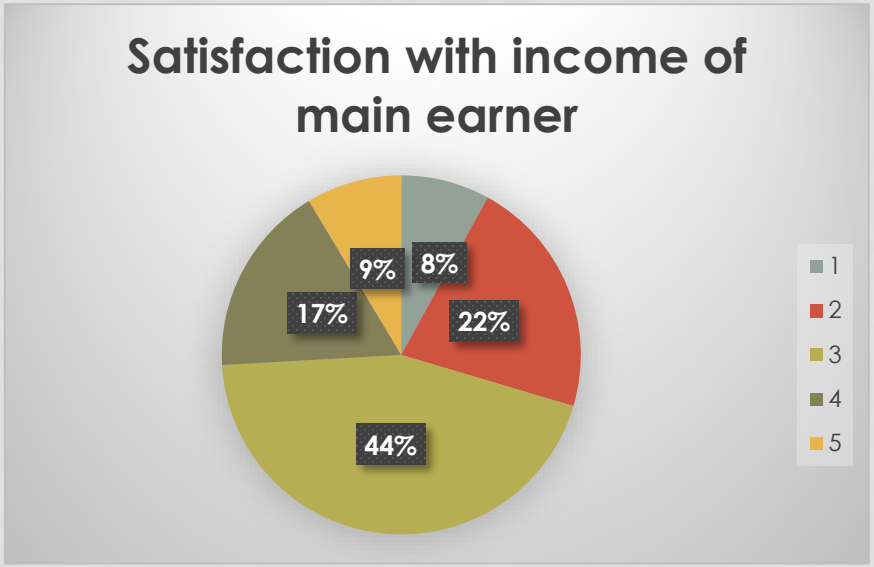


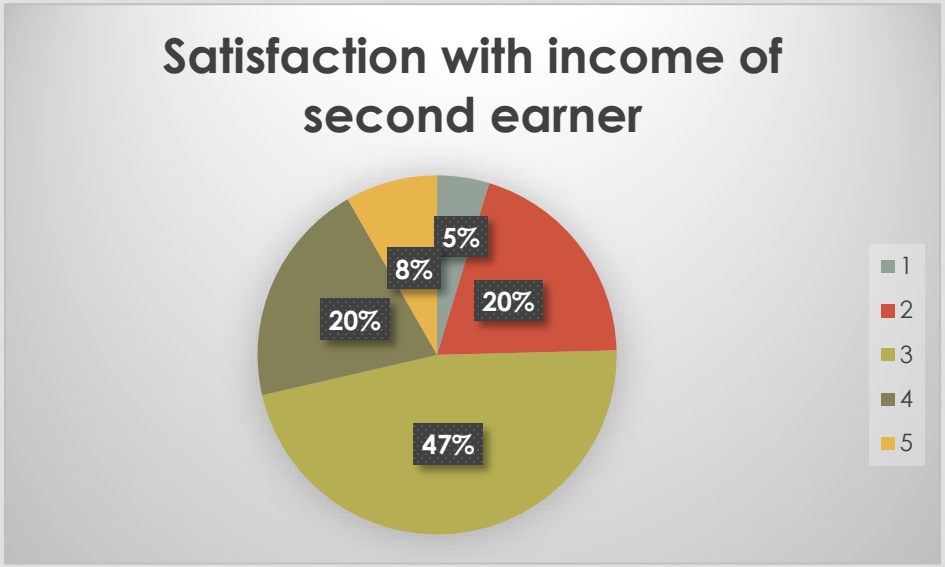
5 = Very satisfied; 1 = very dissatisfied

Location of resettlement colonies



Satisfaction with income





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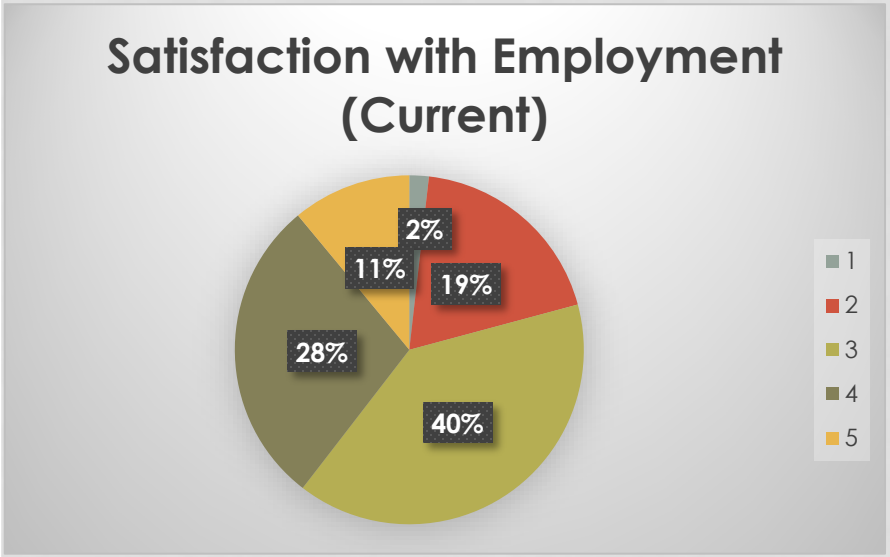
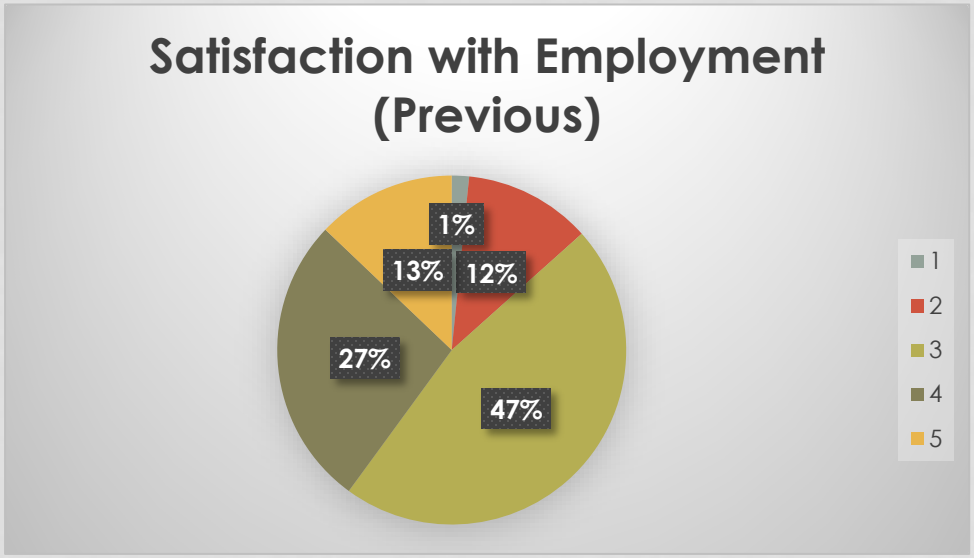
Satisfaction with employment





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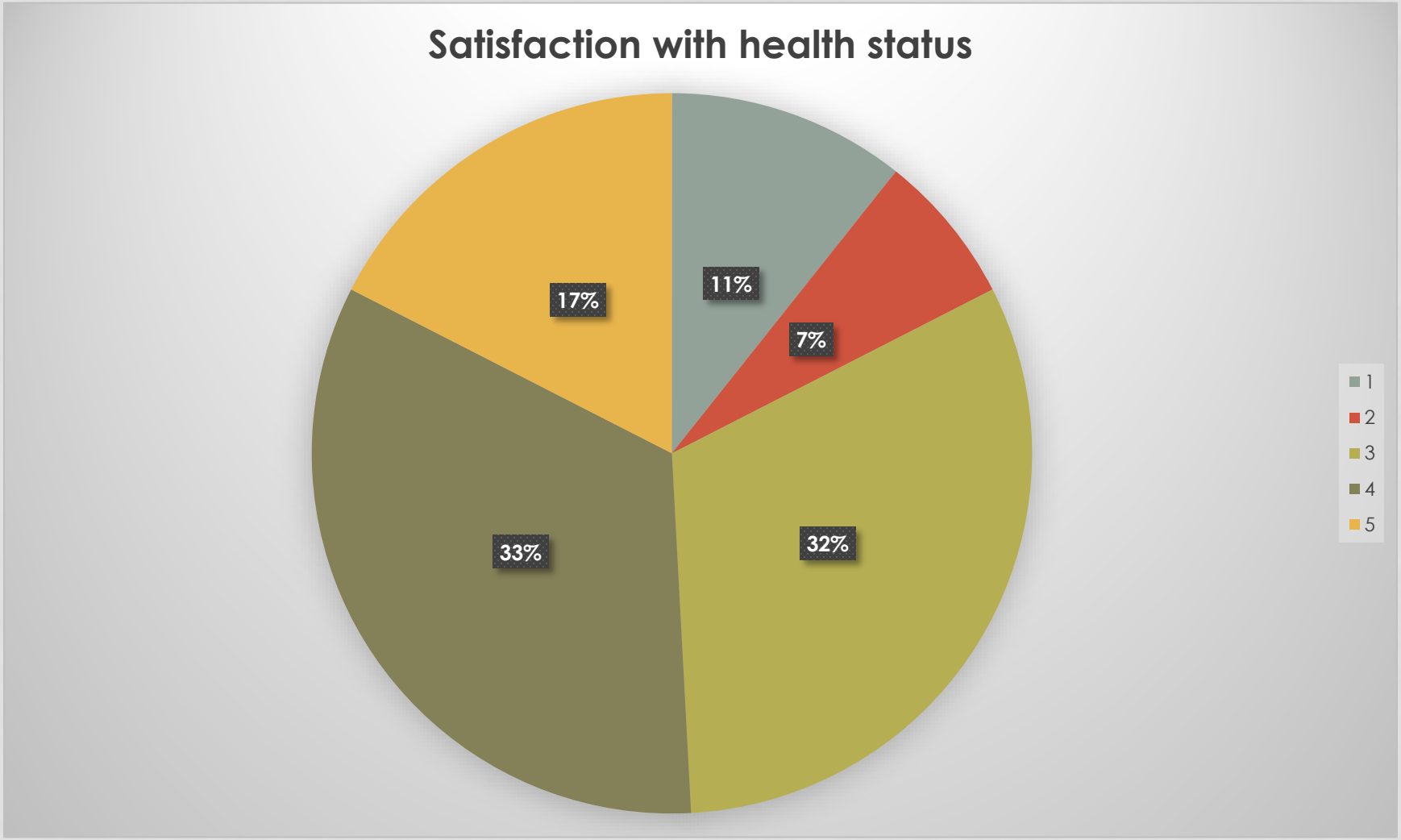
Satisfaction with health



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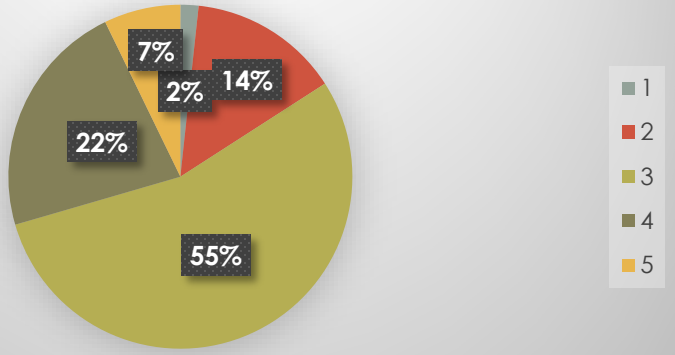
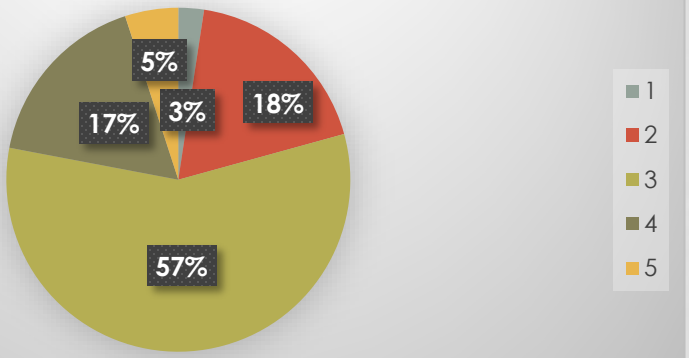
Social environment - neighbourhood

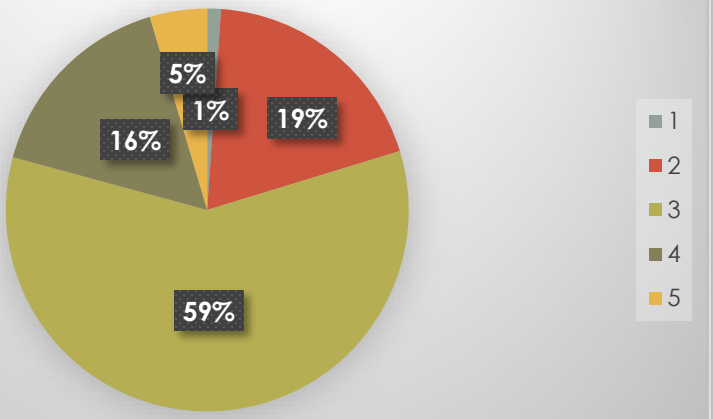
Presence of family/friends in neighbourhood



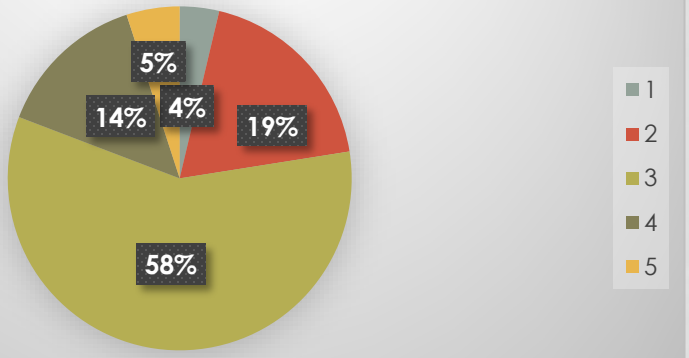
Household's participation in social events



Neighbour interaction level



Household's willingness to help neighbours during disasters



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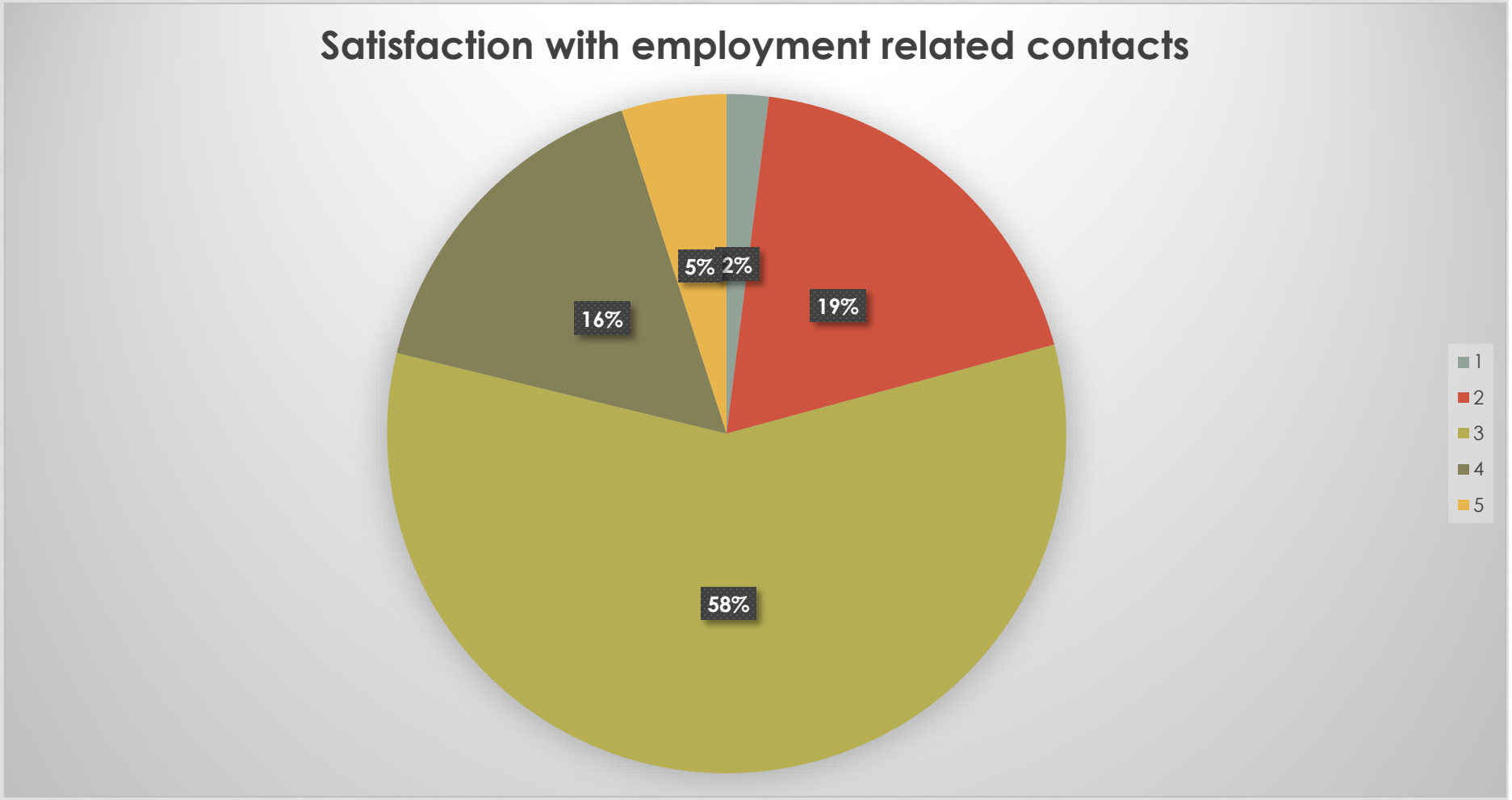
Social environment – employment contact



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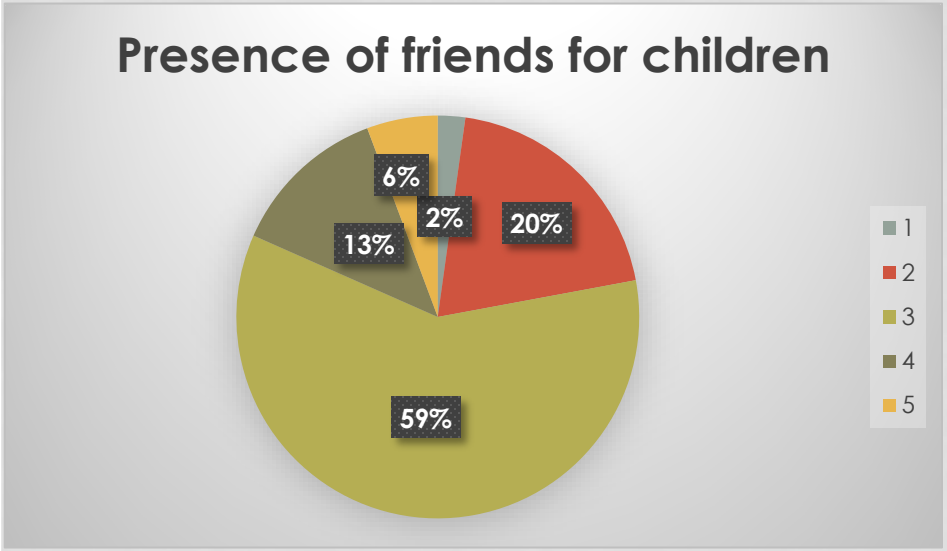
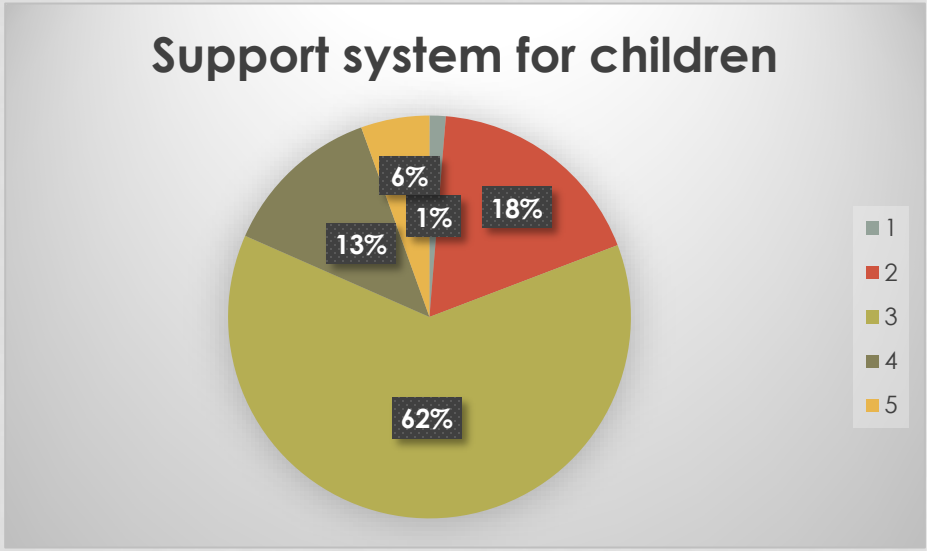
Social environment – children





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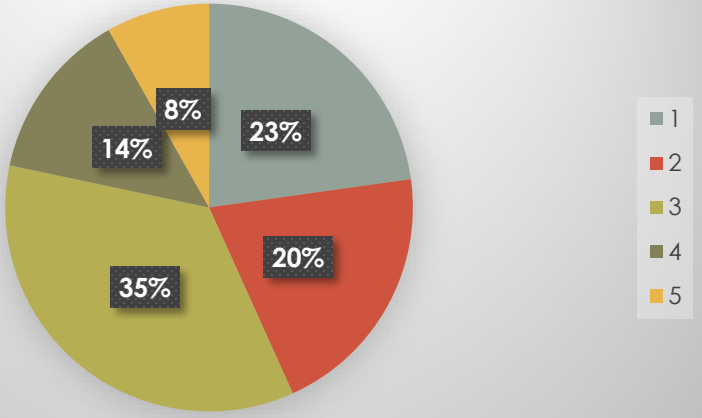
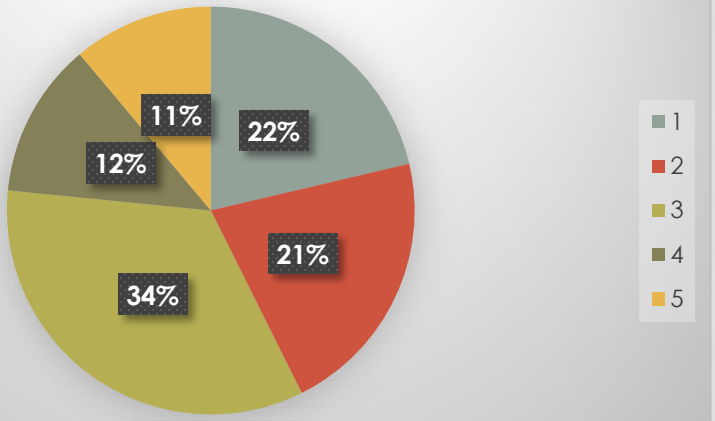
Causes of fear/anxiety

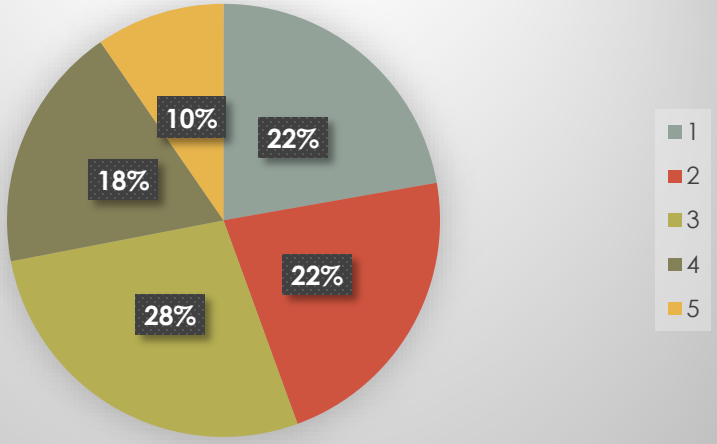
Fear of disasters



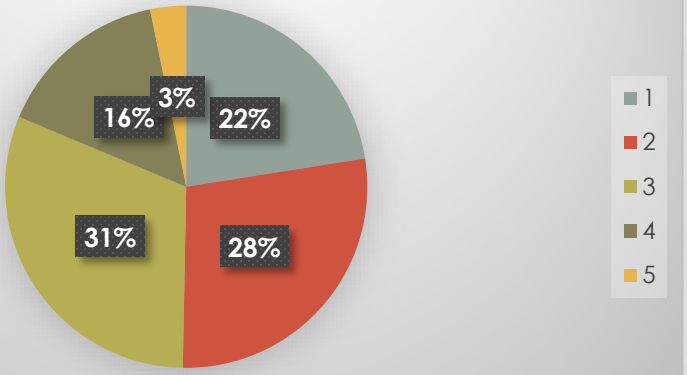
Fear of loss of life



Fear of loss of house/assets



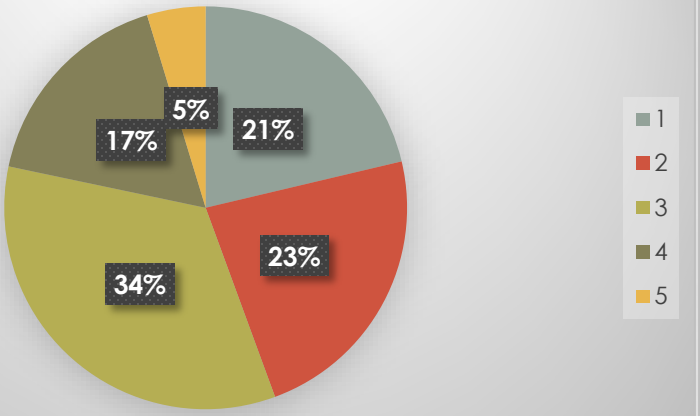
Fear due to lack of food security



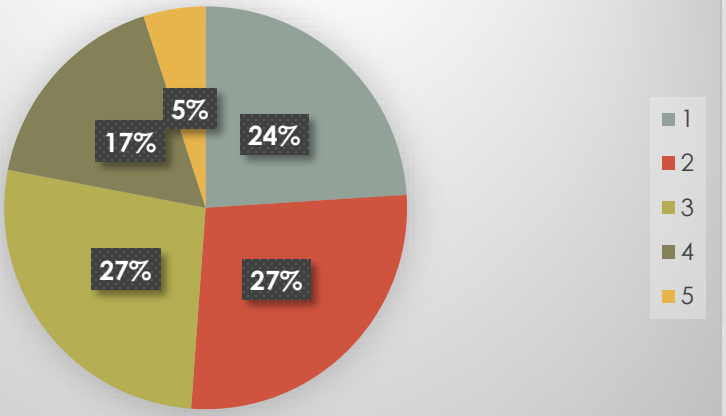
5 = Not at all fearful; 1 = Extremely fearful

Causes of fear/anxiety

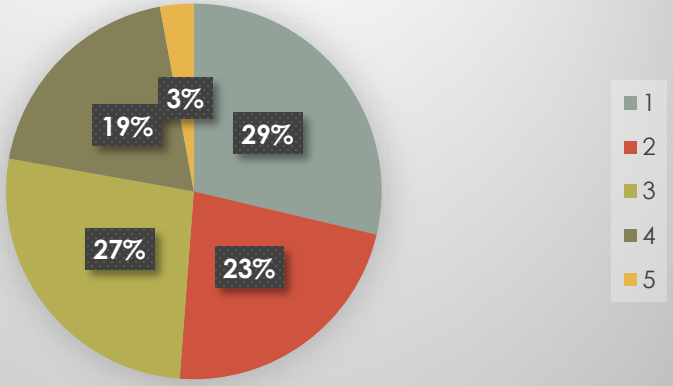
Fear of social disorder



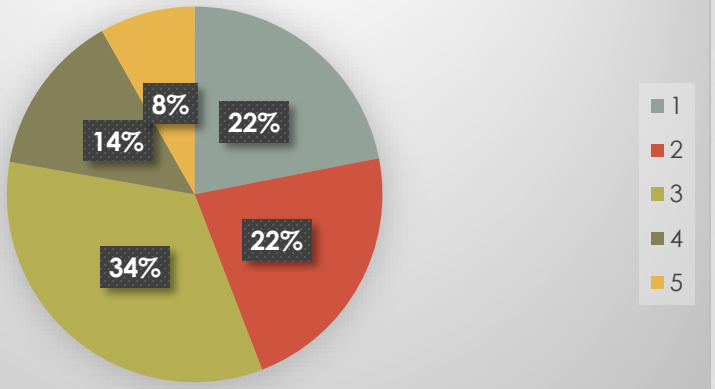
Fear of loss of education



Fear of loss of income/employment

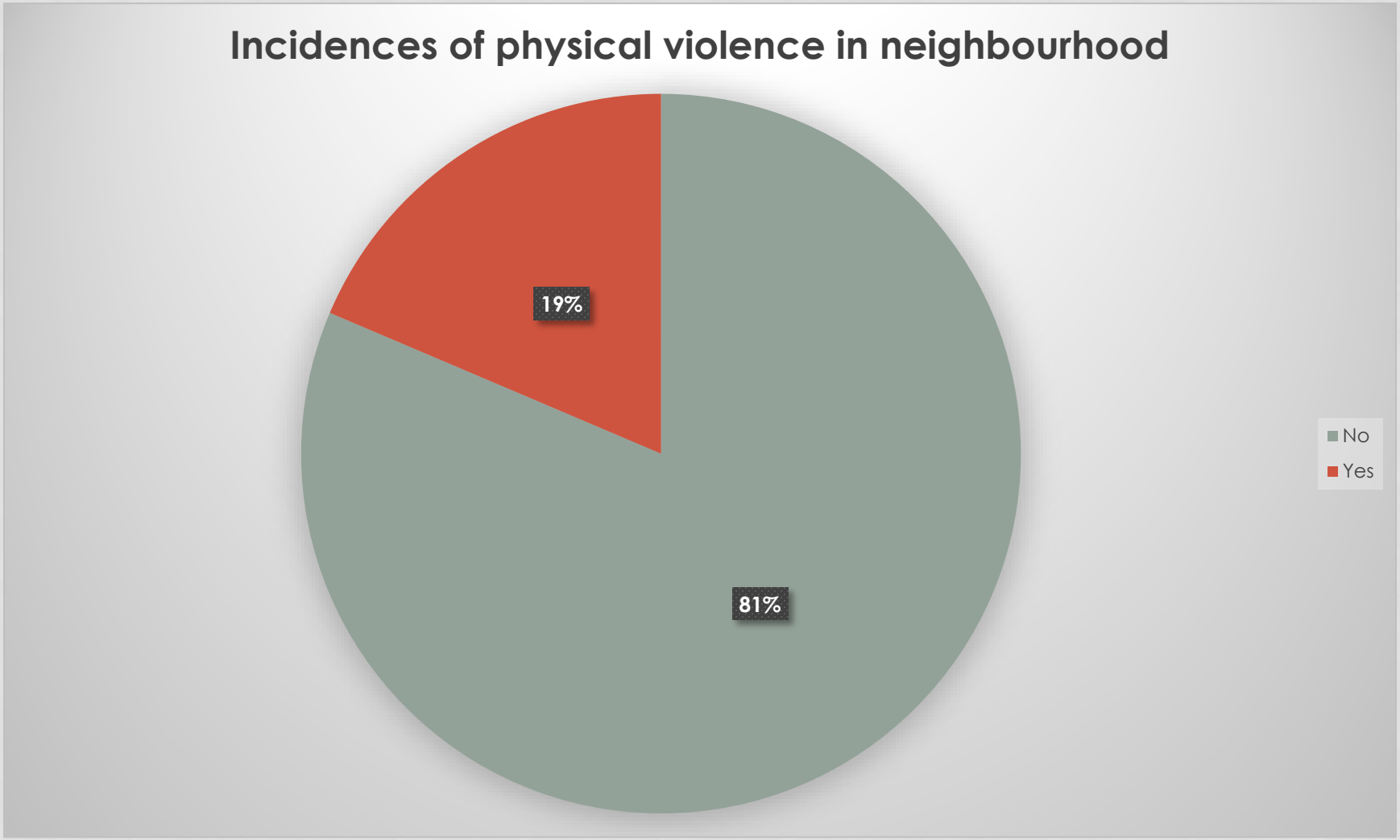


Fear of injuries caused by disasters



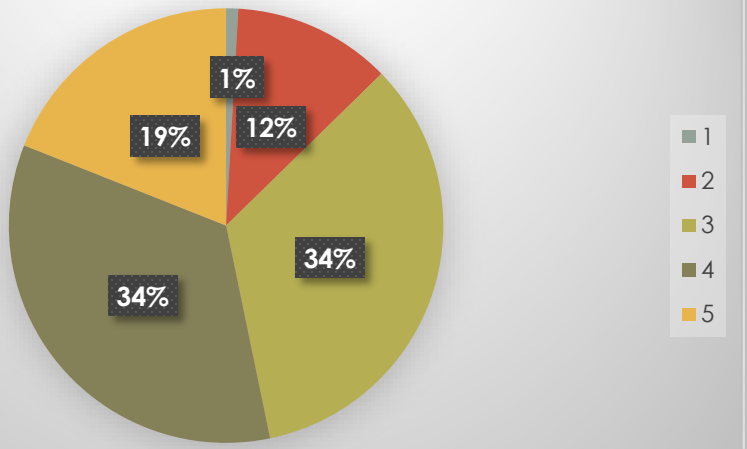
5 = Not at all fearful; 1 = Extremely fearful

Violence in neighbourhood

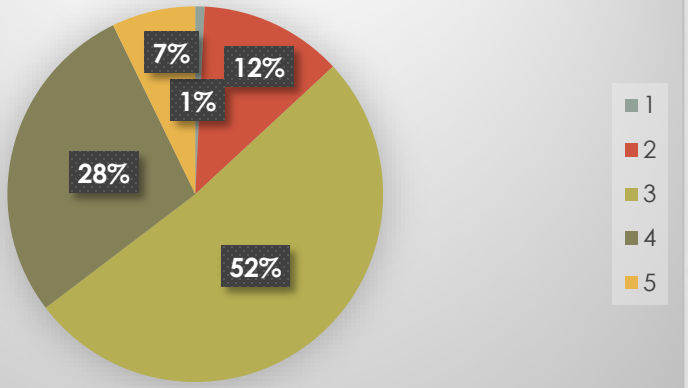


Safety concerns - women

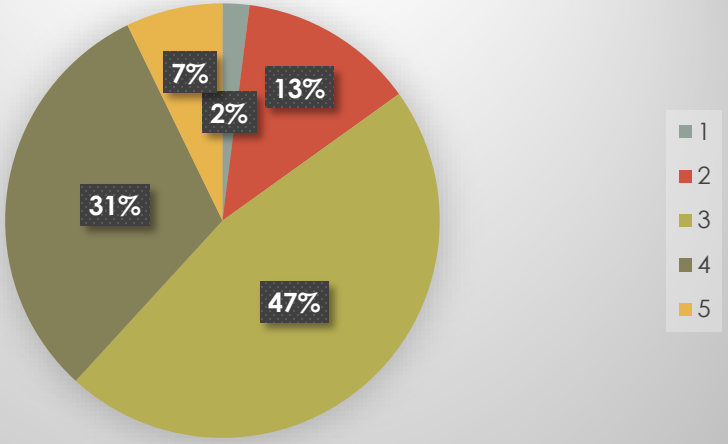
Safety with in house



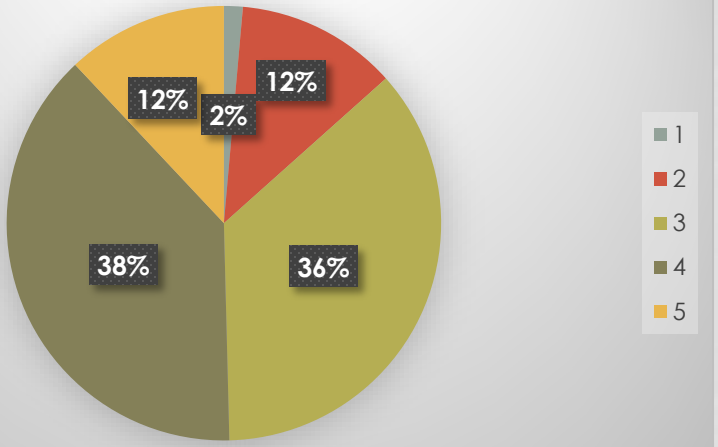
Safety on roads, bus stops, public transport



Safety in current neighbourhood

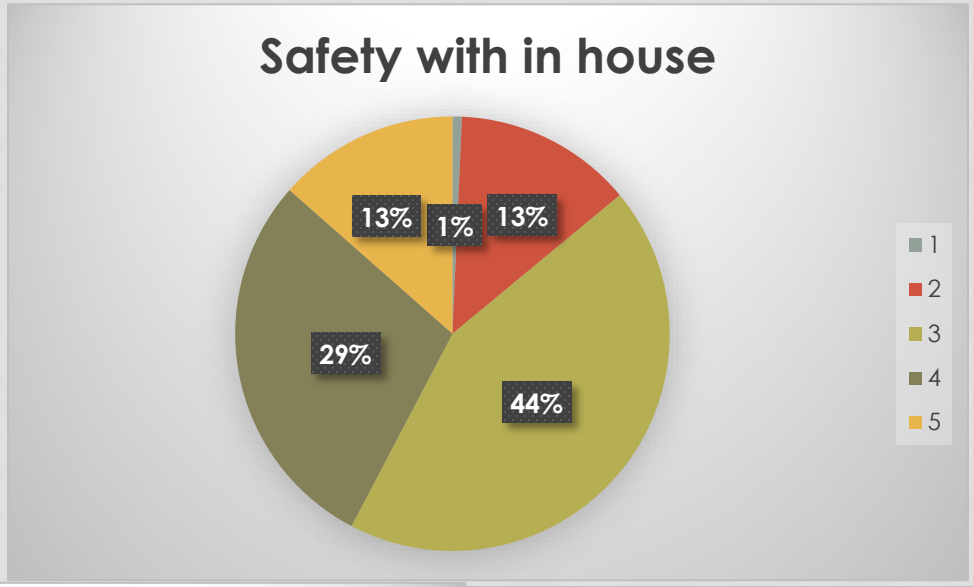


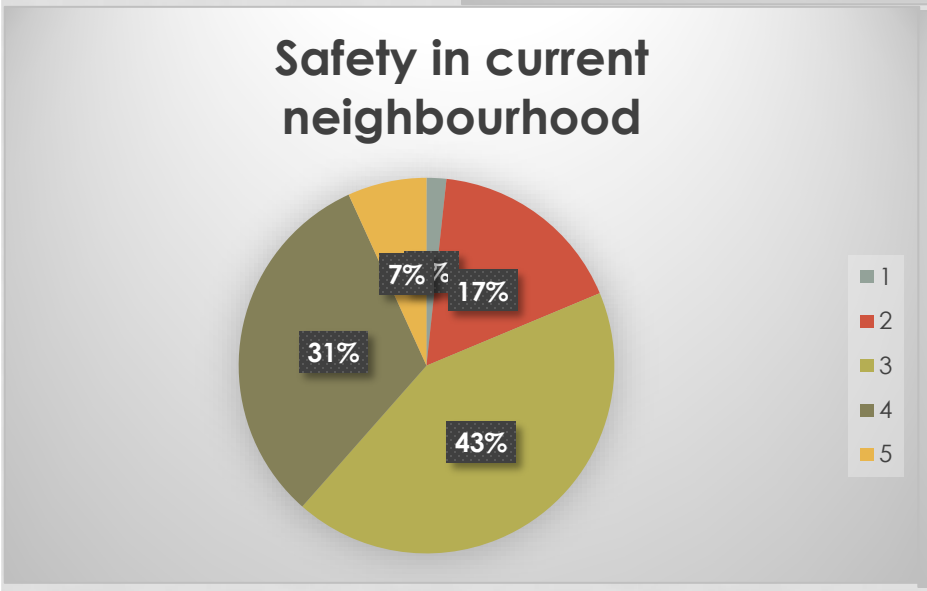
Safety in previous location

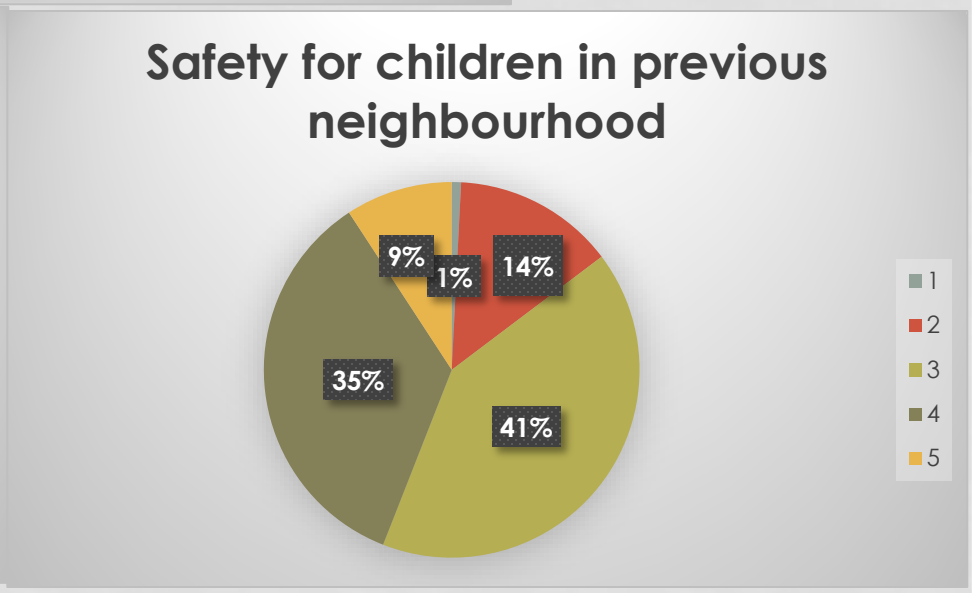


5 = Very satisfied; 1 = very dissatisfied

Safety concerns - children







5 = Very satisfied; 1 = very dissatisfied

Key findings

- Opportunities for higher household income are not equally distributed.
- Importance of neighbourhood security and social capital is underscored.
- Safety level in the neighbourhood and access to an informal/social system for childcare are important.
- Relocations which weaken social and economic associations, negatively affect housing well-being.
- The cultural inappropriateness of housing constructed for post-disaster resettlement is an issue.
- Flooding and the consequential fear of losing asset/house still persists.
- Satisfactory level of protection from disasters (adds to the wellbeing of these households.
- Social equity and empowerment of female is necessary for housing well-being.
- Safety and wellbeing of children and women needs to be addressed.

Policy Recommendations

- Focus on in-situ redevelopment of housing where housing was destroyed and is possible to rebuild.
- Carefully crafted insurance policies for income and property (land and housing) loss.
- Insurance policies for the loss of life due to disaster may speed up the recovery process.
- Immediately after disaster, mitigating the negative effect of loss of income would require approaches like direct cash transfers.
- Long-term plans for guaranteeing income security would require restitution of jobs and employment.

Recommendations (cont …)

- Connectivity of resettlement colonies through public transport to employment, and accessibility to health and other services are of utmost importance.
- Poor design and quality of housing and neighbourhood environment that does not meet cultural and social expectations can aggravate post-disaster trauma.
- It may be worth exploring the opportunity for people (community) -led planning and development that is incremental and inclusionary in nature.
- It is important to take design and non-design steps to create positive social perception about resettlement colonies, which are currently viewed as ghettos of impoverished.
- Social capital is an important contributor to housing well-being for vulnerable communities in resettlement colonies.
- Social and economic infrastructure should precede resettlement.

Generalisable principles for post-disaster reconstruction

1. Relocation should not be detrimental for households in securing income opportunities.

2. Housing should respond to the requirements of households.

3. Avoid disrupting social systems which are based on trust and care for each other and particularly for children.

4. Ensure social equity and empowerment of women.

5. Devise mechanisms for protection of assets/houses and income of low-income households through public insurance.

6. Resettle households which does not disadvantage them through social stratification or affect their self-identity.

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Questions and feedback are invited.

Thank you.