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Article

Redressing urban isolation: A multi-city case study in India

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Research Article

Redressing urban isolation: A multi-city case study in India

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ABSTRACT

Urbanization has brought in expeditious changing world trends from dispersed rural settlements to denser urban centers. Higher frequent economic activities have attracted a large in-flow of job seekers, migrant laborers, and foreign investors to urban centers, furthering the complexity. Contrary to beliefs, urban demography has not brought people together; instead, it has created a new concern, Urban Isolation. The paper tries to explain issues related to urban isolation from examples of cities experiencing it. Results from a survey to determine factors leading to urban isolation for three major cities in India, namely, Mumbai, Kolkata, and Kochi, are also presented. The study includes sensitivity analysis using ANOVA for gender, age group, and household sizes. Factor analysis resulted in two prominent factors, “Sociability” and “Acceptability.” The paper provides probable solutions to counter the adverse effects of Urban Isolation. The findings from this study may be highly demographic-centric, catering to the Indian scenario.

1. Introduction

The current world urban population stands at 55% and shall rise to 69% by 2050 (UNFPA, 2007). In 2007, the urban population overtook the rural population (The World Bank, 2020). Urbanization has been confined mainly to the past 200 years (The World Bank, 2020). Most of the world's population lived in rural settlements until the 1800s (90% of population), where the trend took a turn. People started to migrate to cities, mainly after industrialization began as it offered higher-paid, skilled jobs that generated a wealthy middle class (Langeweg et al., 2000). Cities provided more and better job opportunities, higher living standards, easier availability of services, and improved transport systems (Chen et al., 2014; Turok & McGranahan, 2013). These changes showcased urbanization as signs of progress in the modern era (Chang & Brada, 2006). However, new and improved services have also led to the creation of unprecedented consequences. One of them is isolating one from another. A sense of anonymity and togetherness is lost in the alleys of urban housing and the speeding highways.

Urban isolation is nothing new, but an evolved form, whose roots can be traced from “industrialization” Marx (2000), “mass society” Bain et al. (1951), and the “decline of community” Stein (2015), all bludgeoned by the ‘urban city.’ Urban isolation has been defined by Fischer (1972) as “the individual's low expectancy for inclusion and social acceptance, expressed typically in feelings of loneliness or feelings of rejection or repudiation.” (Fischer, 1973). Alienation and anonymity in a city lead to powerlessness, increased crime rates, and social isolation (Fischer, 1972). However, a city's environmental considerations are only suitable for harnessing a protective nature, which renders social bonds nugatory. Nearly half a century later, it invokes curiosity in one whether cities have evolved for the good or bad through their course, whether cities have taken a toll on humanity's existence or have developed them for the better.

Urban isolation is multi-dimensional. It is an imbalanced/inadequate quantity or/and quality of mutual interactions amongst people

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that can happen at an individual, group, or community scale (Smith & Lim, 2020; Umberson & Karas Montez, 2010; Zavaleta et al., 2017). It is subjective among people, and experiences can differ for different individuals. A person may feel socially isolated even with people around him. The vice-versa is also possible, i.e., not feeling isolated even if alone (Hughes et al., 2004). For such cases, the quality of social interactions, whether online or offline, plays a significant role in determining urban isolation in the 21st century.

Social isolation has existed long before forced isolation during an epidemic/pandemic or any similar event. Its effects have come into prominence now with the spread of the COVID-19 pandemic. Isolation includes a person staying in a confined space with little interaction beyond the determined limits. A deficit of social support from being isolated may lead to stress, depression, and poor compliance (Boden-Albala et al., 2005; Brooks et al., 2020). Social isolation is also an augur of consequence events post-stroke (Boden-Albala et al., 2005).

The urban form has directly impacted polarizing societies, leading to the isolation of communities primarily on socioeconomic factors (Antoniucci & Marella, 2018). As cities attract a large number of people from rural settlements, it leads to higher densities. With higher living costs in urban areas, people either started migrating towards the outskirts or ended up living in slums or ghettos (Antoniucci & Marella, 2018; Garewa, 2006; S. Wang, Kwan, & Hu, 2020). This has created polarized societies with its effects visible in housing patterns, infrastructure, and even restricted access to transportation networks leading to constrained access to resources and opportunities (Antoniucci & Marella, 2018; Benediktsson, 2018; S. Wang, Kwan, & Hu, 2020). The rise of gated communities is another symbol of economic inequality present in several cities across the globe (Grundström, 2018; Roitman & Recio, 2020). These have led to the restricted use of public spaces creating spatial inequality and reduced interaction between different communities (Benediktsson, 2018).

Jaspers and Pieters (2016) conducted a study spanning nine years with over 4200 individuals on 'Materialism across life span' shows patterns as to why individuals flock to cities for economic gains. Individuals' tendencies have shifted from happiness to a sense of achievement as a significant reason for materialism. Indexing happiness factors across age groups and materialism resulted in materialism hardly impacting an individual's satisfaction. "The idea of materialism may be conceived of as a cluster of beliefs and values" (Dittmar et al., 2014).

Every city has its unique characteristics. Urban experiences may vary depending on the cities' housing patterns, infrastructure availability, civic participation opportunities, economic statuses, and other factors (van Hoof et al., 2018). Thus, the results from this study cannot be generalized. Policymakers will have to study a city in specific to address its issues. Results from this particular multi-city case study itself prove it, which will be explored in detail in the forthcoming sections.

2. Urban isolation causes

A study by Harvard University in 2015 on neighborhood isolation of the 50 largest American cities came out with the following findings related to urban isolation (Q. Wang et al., 2018).

- Less exposure of minority class with non-minority or white neighborhoods
- Less exposure of minority class with mainstream areas, hence lesser involvement with others
- Not income but race mattered in settlement patterns and travel behavior

Interaction across race and class groups contributes to promoting societal interaction. Constrained mobility and increased time consumption for work commutes also seemed to be restricting people from engaging in social activities (Frantál et al., 2020).

The impacts of isolation affect the elderly the most (Cornwell & Waite, 2009). Serious health risks, living alone, and having a small social network are significant factors. Cornwell and Waite (2009) analyzed the relationship perceived isolation has on physical and mental health among the elderly and found it positively correlated.

Developed and developing countries have been experiencing a rise in their aging population (Guida & Carpentieri, 2021; van Hoof et al., 2018). The proportion of those aged 65 and above is proliferating and is expected to accelerate in the coming decades (Organisation, 2020). Though this is a sign of an improved healthcare system and facilities, it also brings challenges (Plouffe & Kalache, 2010). Are today's cities age-friendly? Is development inclusive of all the sections of the society? Are cities able to provide full access to services and spaces for everyone? When cities fail to provide the said facilities, the aged section is often the first affected (van Hoof et al., 2018). Though cities have been developing with improved facilities and infrastructure over time, little evidence exists that older people benefit from them (Clarfield, 2018). Papa et al. (2018) state that the lack of access to public spaces affects their well-being, directly and indirectly, rendering them indoors.

Most existing research on social isolation in urban areas has focused on the effects on the elderly population (Nyqvist et al., 2016). The reason may be that they may be physically weaker and have limited mobility compared to other age groups (Umberson & Karas Montez, 2010). However, when today's elderly get pushed into isolation due to restricted access to social spaces or deteriorating health conditions, the younger generation isolates themselves through less human interaction and higher social media usage (Brooks et al., 2020; Primack et al., 2019). Excessive social media usage has adversely affected today's youth (Primack et al., 2019). A study conducted among students of the age group 18–30 in Pittsburgh found that social media's heavy usage led to *isolation* or *disconnectedness*, leading to adverse health outcomes and increased mortality, including depression (Primack et al., 2019). Studies also suggest that long hours of online usage are higher in developed countries; this can be due to better availability and accessibility of technology (Perrin & Kumar, 2020). Spending more time online than offline has led to decreased social interactions (Brooks et al., 2020; Perrin & Kumar, 2020).

Another nationwide survey conducted by 'BBC Radio 4' in collaboration with 'Wellcome Collection' in London found that youngsters of the age group 16–24 years reported the highest social isolation feelings (Hammond, 2021). The survey consisted of 55000

respondents. It is the largest survey conducted to date on matters regarding social isolation and loneliness. 40% of respondents aged 16–24 responded feeling isolated often or very often compared to only 27% in the 75+ age group. People who feel more isolated ‘often’ also have more social media friends than real-life friends (Child & Lawton, 2019; Smith & Lim, 2020). The study suggests we need to find better ways to prevent social isolation from being inescapable.

With changing lifestyles and trends in the 21st century, more and more people prefer to live in smaller groups or alone. People now choose not to get married, leading to rising nuclear families causing the issue of needing physical and mental support during times of distress like illnesses, work pressure, depression, and even old-age constraints (Jamieson & Simpson, 2013; Ronald et al., 2018). The absence of fellow support due to social isolation has led to the rise in poor physical and mental health (Harasemiw et al., 2019; Usher et al., 2020).

With more and more people moving to urbanized areas for various reasons, and with the rise of the COVID-19 pandemic, the need to address social isolation needs to be probed into if it exists in a given city. Several pieces of research have shown that increased social isolation is directly related to high levels of depression, low self-esteem, decreased life satisfaction, and increased self-protective thinking, leading to harmful or hateful interaction with others (Cacioppo & Cacioppo, 2014; Harasemiw et al., 2019; Usher et al., 2020). Increased social isolation is associated with decreasing physical health (Brooks et al., 2020; Steptoe et al., 2013). These include various illnesses such as cognitive disorders, cardiovascular issues, neuroendocrine, and inflammatory disorders (Bhatti & Haq, 2017; Brooks et al., 2020; Steptoe et al., 2013; Xia & Li, 2018).

3. Methodology

Based on the literature survey discussed in this paper, a survey has been conducted for three different metro cities in India to analyze if city residents face urban isolation, namely, Mumbai (19.0760° N, 72.8777° E), Kolkata (22.5726° N, 88.3639° E), and Kochi (9.9312° N, 76.2673° E) (Fig. 1). All three cities are coastal and have a tropical climate.



Fig. 1. Study area locations.

The survey was conducted online from October to November 2020 during the COVID-19 pandemic through various social media platforms such as WhatsApp, Twitter, Facebook, and LinkedIn. Participants attended 21 close-ended questions and one open-ended question to express their viewpoints and experiences freely. The questionnaire had three parts. The first part measured the level of urban isolation experienced through multiple point-based questions based on the 'Revised UCLA Loneliness Scale' (Russell et al., 1980). The second is to select their reasons. The third is an optional comment if they want to share their experiences and possible solutions they believe are required. Literature studies helped shortlist the probable dependent variables, which formed the basis of the survey questions. The factors that are analyzed include:

- Trust issues
- Migrant unacceptance
- Level of social interaction
- Travel patterns
- Nuclear families
- Influence of social media

The study considers gender, different age groups, and household sizes and analyses their behavioral patterns.

3.1. Sampling

The selected three cities have a population count as follows.

- Mumbai – 18.4 million
- Kolkata – 14.1 million
- Kochi - 0.67 million (Commissioner, 2014)

The survey follows a confidence level of 95% with a 5% margin of error for all three cities. The formula used for calculating the sample size is as follows:

$$\text{Sample size} = \frac{z^2 p(1-p)/e^2}{1 + \left(\frac{z^2 p(1-p)}{e^2 N}\right)}$$

'N' is the population size, 'e' is the margin of error, and 'z' is the z-score corresponding to the desired confidence level. For a substantial population, the survey count does not vary significantly, and hence the minimum required sample size for each city calculates at 385 valid responses per city. In a total of '1318' responses, '1260' were considered valid responses. The study assessed 420 responses from each city, and the survey was closed once this target count had reached.

To achieve authenticity and higher participation rates, the survey was also distributed in local languages, Hindi, Malayalam, and English. The survey followed a reward-based system wherein three random participants would be rewarded Amazon gift vouchers. The survey was open to all city residents regardless of age or gender, with the only condition of having at least a year's stay in the city. ANOVA was used to identify significance in differences in age, household size, and gender. Factor analysis helped identify the significant factors of urban isolation.

4. Results

4.1. Level of urban isolation experienced

Respondents were enthusiastic and supported the study by submitting long texts and audio clips on urban isolation experiences. The survey included questions asking respondents if they had ever experienced urban isolation through a multi-question format that included questions from the 'Revised UCLA Loneliness Scale' (Russell et al., 1980). The resulting answers were then converted into a 5-point measurement Scale (Never, Seldom, Sometimes, Frequently, and Always).

Respondents in Mumbai showed more significant levels of experiencing urban isolation, with 76 responses (18%) corresponding to 'Always' and 155 responses (37%) corresponding to 'Frequently'. The levels were moderate in Kolkata, with 53 responses (12%) corresponding to 'Always' and 107 responses (25%) corresponding to 'Frequently.' In Kochi, however, responses to high levels of urban isolation experienced were much lower, with 13 answers (3%) corresponding to 'Always' and 55 answers (13%) corresponding to 'Frequently' (Fig. 2).

Using ANOVA (Table 1), gender-related differences were found to be insignificant for Mumbai and Kolkata. However, there are significant differences for the city of Kochi, with more females responding to 'Always' and 'Frequently' levels of Urban Isolation

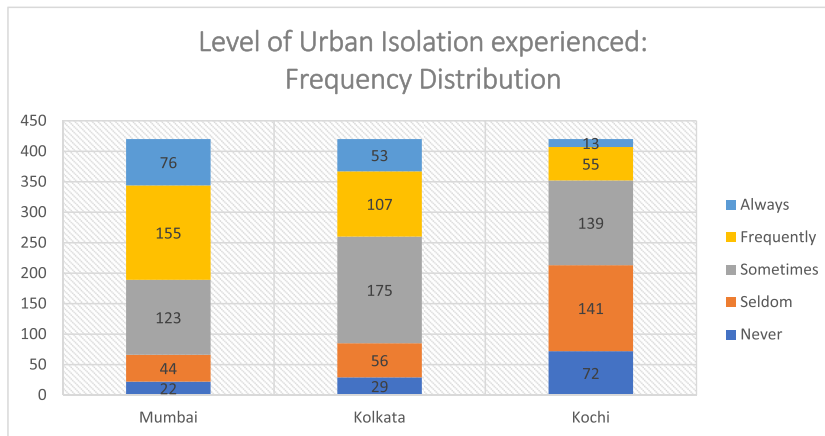


Fig. 2. Frequency of Level of Urban Isolation experienced between respondents from Mumbai, Kolkata, and Kochi.

Table 1
Level of Urban Isolation - Gender-related differences (ANOVA).

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Kochi					
Between groups	7.1328	1	7.1328	6.93724	0.008755
Within groups	429.7815	418	1.0282		
Total	436.9143	419	–		

experienced as compared to males. The statistical mean value of Females is ‘2.63’ compared to ‘2.37’ of Males for Kochi (Closer to 1 means ‘Never’ and closer to 5 means ‘Always’ for “level of urban isolation experienced”), meaning females in Kochi experience higher levels of urban isolation.

From Table 2, age-related differences showed no significant differences in Mumbai and Kolkata; however, Kolkata showed significant differences where people of the age groups ‘36–45’ experienced more significant depression with a mean value of ‘3.323’ closely followed by the age group ‘26–35’ with a mean value of ‘3.222’. The age group ‘16–25’ saw the least mean value of ‘2.67’.

From Table 3, all three cities showed significant differences under household size-related differences. For Mumbai, people who lived alone reported the highest levels of depression with a mean value of ‘3.7’; the least was in the household size of ‘7+’ with a mean value of ‘2.9’. In Kolkata, individuals who lived alone reported the highest mean value of ‘3.4’; and the least mean value of ‘1.6’ for household

Table 2
Level of Urban Isolation - Age-related differences (ANOVA).

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Kolkata					
Between groups	17.4219	4	4.3555	4.01456	0.00331
Within groups	450.2424	415	1.0849		
Total	467.6643	419	–		

Table 3
Level of Urban Isolation – Household size-related differences (ANOVA).

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Mumbai					
Between groups	19.4828	4	4.8707	4.41994	0.001649 (Significant)
Within groups	457.3243	415	1.102		
Total	476.8071	419	–		
Kolkata					
Between groups	43.0079	4	10.752	10.50748	0.00001 (Significant)
Within groups	424.6564	415	1.0233		
Total	467.6643	419	–		
Kochi					
Between groups	19.8283	4	4.9571	4.93227	0.00068 (Significant)
Within groups	417.086	415	1.005		
Total	436.9143	419	–		

sizes of ‘7+’. The same trend followed in Kochi with the highest mean value of ‘3.8’ for those who lived alone than ‘2.2’ for those whose household size was ‘7+’.

4.2. Causes of Urban Isolation

The second part of the questionnaire asked respondents what they believe are reasons for urban isolation. Literature studies helped determine the initial list of causes (Fig. 3), and respondents were also allowed to add their reasons if not found in the list. The list included ‘nuclear families’, a ‘lack of work-life balance’, ‘trust issues’ with fellow community members, ‘lack of social interaction’, ‘non-native/migrant unacceptance’, and ‘greater social media involvement’ when time spent on socializing is greater on social media than time spent face-to-face.

“Lack of Social Interaction” seemed to be the most prominent response from Mumbai and Kolkata (Tables 4–6). In Kochi, however, “Non-native/Migrant unacceptance” had the highest answers. Almost all stated causes had at least 40% of responses. All three cities’ responses were similar. Gender, age, and Household related significance are given from Tables 10-18 (in appendix).

Factor analysis of the above question resulted in two factors for all three cities (Fig. 4). The factor loadings for both components were the same for the three cities with variations in factor loading values. Hence, the study conducted a cumulative factor analysis with 1260 samples (see Table 7).

The first factor is named “Sociability,” and items loaded under it are “Lack of Social Interaction,” “Lack of Work-Life balance,” “Nuclear Family,” and “Greater Social Media involvement/Influence of Social Media.” The second factor is named “Acceptability.” Items loaded under it include “Non-native/Migrant unacceptance” and “Trust Issues.”

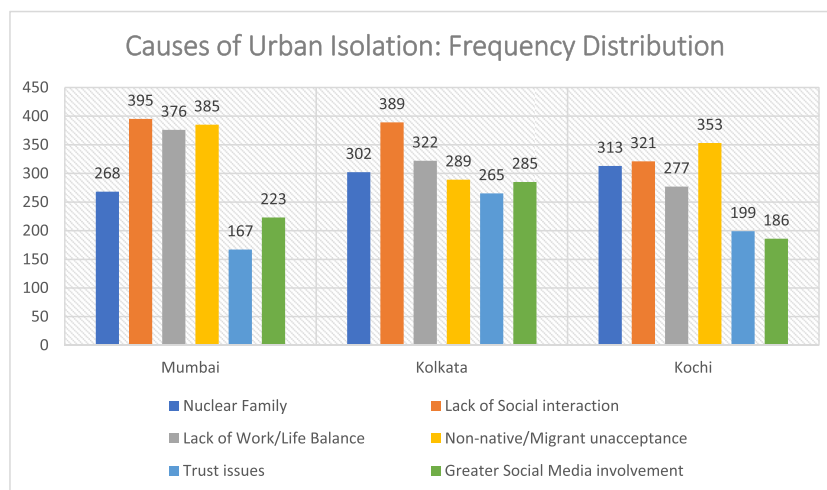


Fig. 3. Causes of urban isolation: Frequency distribution for Mumbai, Kolkata, and Kochi.

Table 4
Causes of Urban Isolation in Descending order (Mumbai).

City	Causes (In Descending Order)	Frequency (Max 420)	Percentage
Mumbai	1. Lack of Social Interaction	395	94.0 %
	2. Non-native/Migrant unacceptance	385	91.6 %
	3. Lack of Work/Life Balance	376	89.5 %
	4. Nuclear Family	268	63.8 %
	5. Greater Social Media involvement	223	53.0 %
	6. Trust Issues	167	39.7 %

Table 5
Causes of Urban Isolation in Descending order (Kolkata).

City	Causes (In Descending Order)	Frequency (Max 420)	Percentage
Kolkata	1. Lack of Social Interaction	389	92.6 %
	2. Lack of Work/Life Balance	322	76.6 %
	3. Nuclear Family	302	71.9 %
	4. Non-native/Migrant unacceptance	289	68.8 %
	5. Greater Social Media involvement	285	67.8 %
	6. Trust Issues	265	63.0 %

Table 6
Causes of Urban Isolation in Descending order (Kochi).

City	Causes (In Descending Order)	Frequency (Max 420)	Percentage
Kochi	1. Non-native/Migrant unacceptance	353	84.0 %
	2. Lack of Social Interaction	321	76.4 %
	3. Nuclear Family	313	74.5 %
	4. Lack of Work/Life Balance	277	65.9 %
	5. Trust Issues	199	47.3 %
	6. Greater Social Media involvement	186	44.2 %



Fig. 4. Scree plot of Factor Analysis.

Table 7
Causes of urban isolation: Factor deduction.

Causes	Factor Components	
	Sociability	Acceptability
Lack of Social Interaction	0.88	
Lack of Work-Life balance	0.85	
Nuclear Family	0.76	
Greater Social Media involvement/Influence of Social Media	0.69	
Non-native/Migrant unacceptance		0.75
Trust issues		0.63
Total Variance explained (%)	32.3	19.2

The study considered all factor loadings of 0.4. Principal Component Analysis was the extraction method used—rotation method: Varimax (Kaiser normalization) with Bartlett's Test of Sphericity conducted (see Table 8).

4.3. Suggestions and open answers

Out of the 1260 responses collected, more than 150 respondents gave constructive suggestions often enunciated in long sentences. Answers that conveyed similar meanings have been clubbed together (see Table 9). Fig. 5 shows the urban-suburban classification for Mumbai, Kolkata, and Kochi, respectively. The study does not cover rural areas.

The most common suggestion was to provide 'easily accessible public spaces' which is true especially, well-lit spaces in night time which assure a sense of safety and security. Ample open spaces and a balanced 'built to open area' are necessary to achieve this.

"Inclusive public events for all, small events in neighborhood-level, etc., will attract people. Social does not mean verbal only; it can be anything that soothes your mind. Even parks are the inevitable example in an urban area, helping to relax from the hectic life. The question is how it is connected, accessible, and comfortable for all. People are different with their filters and ideas. So, providing different opportunities to avoid urban isolation is the best. Like green spaces, large-scale events, neighborhood-level events, etc., helps to activate themselves. Some needed private exploration in public and vice-versa. Like different seating typologies in the restaurant. It can be single, couple, or group." (Male respondent, Kolkata urban, 46–55 age group)

"Well-lit and Connected common neighborhood open spaces" (Female respondent, Mumbai suburban, 36–45 age group)

Table 8
KMO and Bartlett's test.

Tests		Value	Remarks
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.744	No sample size issue (needs to be >0.5)
Bartlett's Test of Sphericity	Approx. Chi-Square df Sig.	2007.863 15 0.000	Significant

Table 9
Open answers frequency count.

Suggestions	Respondent count
Multi-functional public spaces/More open spaces	96
Pedestrian-friendly streets	59
Mixed-Housing	37
Adapt, improvise, overcome	13

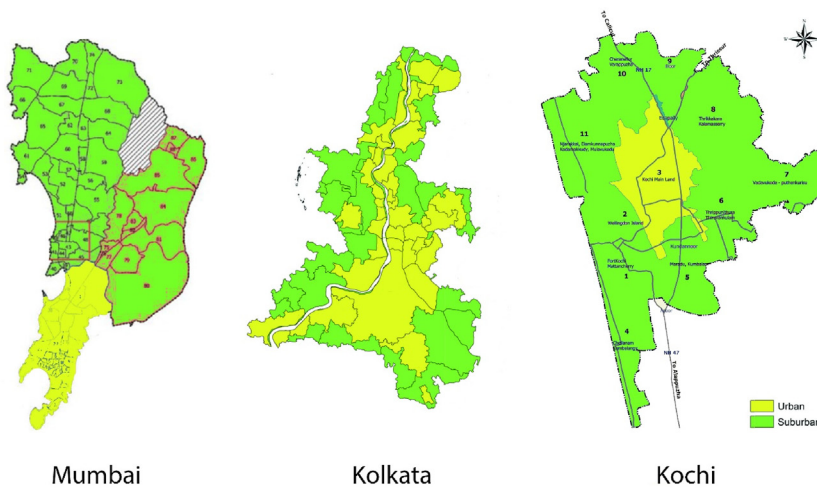


Fig. 5. Urban(yellow) and suburban(green) regions of Mumbai, Kolkata, and Kochi city. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Public spaces need to be inclusive for all, regardless of age, gender, caste, or race, creating less tension between strangers, especially for new city dwellers.

“Amp up creating public space with prescribed spaces (parks for everyone, play areas for children, outdoor exercise equipment. For men, women, maybe? Transgender washrooms so they will not be sidelined? A Stage for activities, an arena for seating an audience; that way, everybody gets a bite of the social space and activities they deserve as members of the society. More landscaping and maintenance, so people of all ages have access to those spaces.” (Female respondent, Kochi urban, 26–35 age group)

“Pedestrian-friendly streets so that more people can come in close contact with one another.” (Male respondent, Mumbai urban, 36–45 age group)

“Need more open spaces for gathering, especially which is comfortable for ladies.” (Female respondent, Mumbai urban, 26–35 age group)

Some respondents have suggested that urban isolation was unpredicted. It is an unsolicited entity that needs to be dealt with seriously.

“My thoughts on this issue is that the main cause of urban isolation is the gradual unrealized change in social constructs and being ignorant about the same. Today the issue has become more complex.” (Male respondent, Kochi suburban, 55+ age group)

A change in the conservative mind-set of the people is another social aspect needs addressing according to some respondents. In some cases, those who voluntarily want to socialize cannot do so, because they are ignorant as to how to socialize. People get comfortable with digital modes of communication where anonymity prevails. On the contrary real-life conversation require transparency and communication skills.

“I have always wanted people to have a broader mindset and encourage themselves and their children to be more social, give them the freedom to go out, talk to people, and play in groups. Safety reasons for girls, especially children, obstruct this vision. Hope people in neighborhoods take initiatives to ensure safety and maintain coordination with each other so that everybody keeps an eye for one another.” (Male respondent, Kolkata urban, 26–35 age group)

“The city should have an association. Everyone should be a member of that, and nobody should be alone. Parents should leave their children to play and interact with others instead of saying to study and not go out of the house and play with other children claiming that his behavior is terrible, which is a major of the kids’ life or they will ruin their life by sitting in front of a pc or mobile phone and front of a book. In my opinion, this is the primary thing a city should implement because, in my whole life, I have been experiencing difficulty interacting with others. No neighborhood should be starved; everyone should have a helping mentality. Everyone should live together happily peacefully.” (Male respondent, Kolkata urban, 26–35 age group).

Some respondents believe urban isolation is a result of excess competitiveness. People have become highly career-oriented. Socializing which takes time, hinders their career growth and is thought to be a distraction.

“My home is on the outskirts of Kolkata. I have completed my graduation and post-graduation side of the city. While traveling to my college, I have experienced that the connectivity provided by a city is beneficial for the people. The city people can access transportation, go to malls and supermarkets for buying stuff, and cinema for leisure. However, the social gathering for a person only takes place with parents, spouse, or girlfriend/boyfriend. The competitive lifestyle of a person also makes him isolated in a city. In the meantime, the old friends are forgotten. In a nuclear family structure, a person can only take care of their parents but does not know about their uncle-aunt. The person lives in a box called “Apartment / Flat” in a city, and it does not provide them a chance to know about the neighbors. In the name of exploring the world, a person can join social media, which makes him devoid of having any real emotion for others. Social media is always helpful, and removing social media addiction entirely from life may be harmful. To carve urban isolation, a person can join with his friends and colleagues to explore the countryside, travel places, and do tracking. A person can manage his time to join and indulge in some cultural festivals, community work, and NGOs.” (Male respondent, Kolkata suburban, 26–35 age-group)

Ineffective space utilization is yet another issue that cities need to address. Urban planners need to identify urban voids and put them to use for the people.

“Conversion of urban voids into public spaces/ parks, integration of pedestrian pathways into the city plan, plant more trees/expand the green belt.” (Female respondent, Kochi urban, 16–25 age group)

Not all city dwellers feel urban isolation is something that needs adhering to. For some, it is a boon, especially for introverts. They see cities as an opportunity to enjoy their loneliness.

“If isolation is indeed the root of depression, then probably seeking out new experiences will help. Otherwise, many introverts find isolation to be blissful.” (Male respondent, Mumbai suburban, 26–35 age-group)

“Well, it is more of a subjective choice; some people prefer to be isolated, and I am one of them, but still, everyone has hobbies. If kind of events related to their hobbies occurs in a city or neighborhood, maybe one would love to go and might find fun and regularly go to other social activities.” (Male respondent, Kochi urban, 26–35 age-group)

For some respondents, urban isolation is something that one needs to accept. It would always be part of city life; hence, one must adapt to today's cities' growing changes.

“One should read books and be able to spend time for themselves so that he can understand himself better and that in turn may help one to manage most of the daily life routines effectively.” (Male respondent, Kochi suburban, 46–55 age-group)

“I think self-manifestation is important. I have stayed in a place like Pakyong, where I used to see beautiful sunrise and sunset every day, but being a city girl frustrated me after a point in time. It may sound weird, but the place has nothing to do with mental peace. A person has to find peace within.” (Female respondent, Mumbai urban, 46–55 age-group)

5. Discussion

Urban isolation indeed seems to exist in all three cities in some form or the other. Significant differences were present amongst people of different age groups, gender, and even in the household size category for all three cities. Lack of social interaction seems to be the most prominent issue in common. It was especially prevalent among the low-income class of people due to forced social exclusion. People from this section of society find it difficult to access public transit systems and commercial establishments. It may very well be due to the absence of mixed housing among city residents (H. Wang, Kwan, & Hu, 2020). A diverse housing system helps the low-income sections of society and is also very favorable for aged people. They get improved social support, and feelings of loneliness are drastically reduced (Keene & Ruel, 2013). Another major issue that is particular for cities is the inflow of migrants. Residents of a city find it difficult to trust newcomers. Affordable housing helps promote social integration among migrants. It helps develop a sense of belongingness to a place, resulting in more participation of migrants in the local activities of a city (Zheng et al., 2020).

Suggestions from city residents focus on the need for multi-functional public spaces to cater to every age group's needs. The need for neighborhood interaction gets highlighted here. It promotes self-organization, reduces redundancy, increases efficiency, and supports collaborative capacity (Boon & Farnsworth, 2011; Sharifi, 2019). Cities need to provide attractive neighborhood parks, public gardens, restaurants that provide open-air dining, and pedestrian-friendly streets (Ambrose et al., 2020; Chiesura, 2004; Moulay et al., 2017).

Being an active member of a social group also reduces social isolation as social identification facilitates and keeps one engaged in activities (Cruwys et al., 2014). Shacham et al. (2012) conducted a study on how recovery rates of HIV patients living in urban areas can be accelerated. The author suggested urban farming as an engaging activity that helps bring people together, not just for economic purposes but also for social causes. The study reported how participants reported better overall health conditions and fewer disease symptoms. The author states how people undergoing distress can engage themselves in community-based activities that are beneficial for all and, at the same time, meaningful.

Age-related differences in experiencing social isolation were much higher for people aged 25–44 than those aged 45 and above in all three cities, which is in line with the findings of Nyqvist, who found that young adults experienced greater loneliness than older adults (Nyqvist et al., 2016). Social isolation is associated with life satisfaction. Previous findings point out that general life satisfaction is inversely proportional to the quality of a person's social connections (Hawton et al., 2011; Mellor et al., 2008; Xia & Li, 2018).

A small section of respondents even highlighted the fact that urban isolation need not necessarily be an issue. Not everyone needs to be socially active. Some prefer isolation, especially introverts. To them, urban isolation is a boon to rejoice. Eriyanti (2020) shares her experience of living alone in a city and claims that city activities are interdependent. Realizing this fact protects one from the ill effects of social isolation even if the person is physically staying alone (Eriyanti, 2020). Some people desire a peaceful space based on personal preferences (Park-Cardoso & Silva, 2021). It might not be possible for them to achieve this if they are socially active. Hence, they prefer to be isolated (Park-Cardoso & Silva, 2021).

A Harvard study that started in 1938, with 724 boys as test subjects, analyzed the relationship between social connections and health

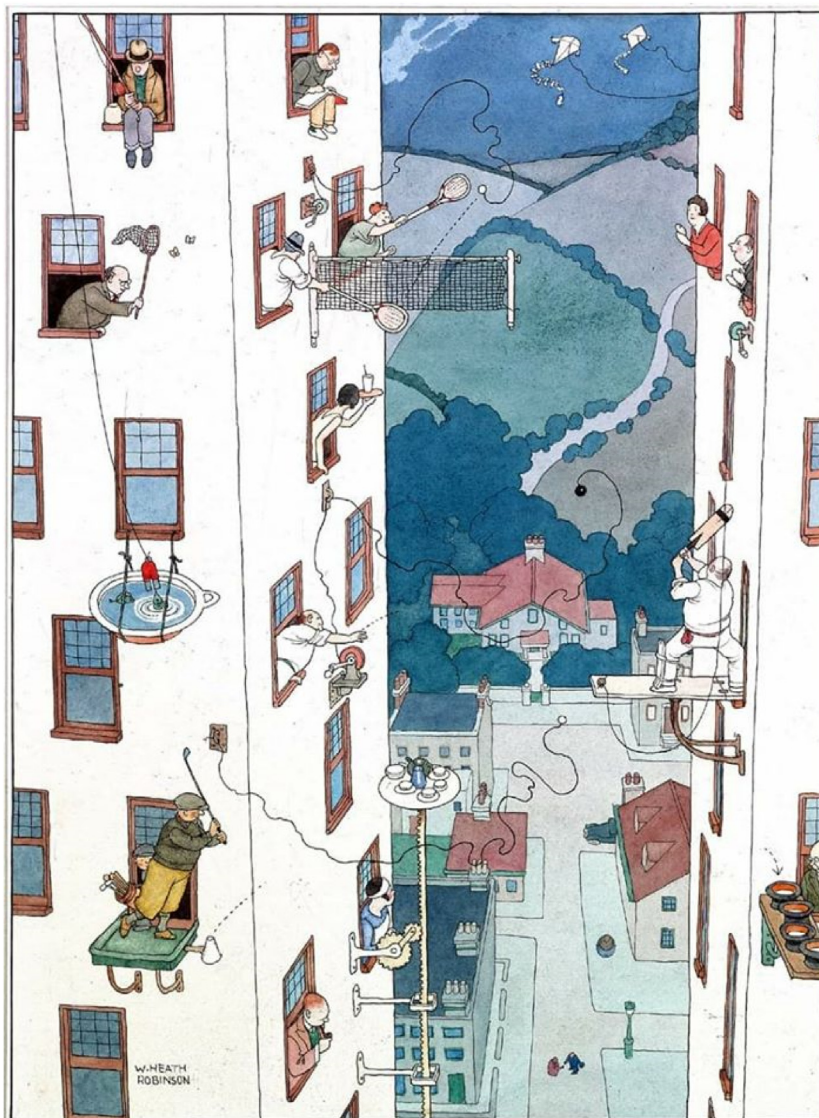


Fig. 6. The “ideal house” according to Robinson (1933).

(Vaillant, 2008). The research which is still running has spanned more than 80 years. Most programs do not last this long due to the program's length and many other research constraints. The study called 'Harvard Study of Adult Development' runs to date with those remaining initial participants presently in their 90's. This study's primary outcome shows social connections as a vital part of one's health and happiness. Other conclusions also showed that those who maintained *warm relationships* lived longer and were relatively happier in their endeavors than their counterparts. The study has now started second-generation research on the kids of the initial participants and plans to continue the research on similar objectives of social connections (School, 2020).

Humans are social species. Wilson et al. (2009) conducted a study in neighborhood communities where participants' cooperative tendencies were directly related to neighborhood environment quality. Using behavioral economic 'games,' cooperative offers were low when neighborhood resources were inadequate (resources included visual cues, odors, sound). It shows the importance of active and neighborhood-friendly spaces to interact positively and share intimate feelings. The decline in local public investment across several cities globally is another factor leading to poor neighborhood environment quality (Antoniucci & Marella, 2018).

Factor analysis on the reasons for Urban Isolation resulted in two prominent factors. The first was named "Sociability," which includes all loadings that deal with the community's social involvement. The second was named "Acceptability," which contains loadings that deal with the society's levels of accepting migrants or other residents of a city. These two factors seem to be significant in eradicating urban isolation in the three cities studied. People living in a city need to be socially active participants, including people of different ethnicities, castes, and races. Local authorities, policymakers, and government officials will need to implement policies that promote inclusivity and better urban accessibility (Gagione et al., 2019; Guida & Carpentieri, 2021; Pan et al., 2018). But to achieve genuine 'Sociability,' the public needs to be involved in the policy-making process, which will only then reflect in the policies to be implemented (Gao et al., 2020; Levenda et al., 2020).

As suggested by Robinson (1933), even though almost a century old, the 'ideal house' still highlights the relevance of people's need to be socially active where gender, race, religion, and economic status should not prevent people from interacting with one another (Fig. 6).

6. Conclusion

Urban isolation conditions of three cities, namely Mumbai, Kolkata, and Kochi, have been studied in this paper. The results of the study may not be the same throughout the world. Every city has its unique characteristics, and hence, if residents in a city experience urban isolation, they may need to be explicitly addressed. City authorities will need to focus on issues that pertain to their jurisdictions. For example, in Kochi, urban dwellers had major problems with 'migrant unacceptance' (84% survey respondents). Still, it was not so in the case of Kolkata (92.6% of respondents selected social isolation as the significant factor). However, a substantial proportion of the respondents did experience urban isolation of some form. The case was similar in Mumbai, with 94% of respondents selecting social isolation as the most prominent factor. Factor analysis for causes for urban isolation resulted in two factors, namely, "Sociability" and "Acceptability". Suggestions to address social isolation resulted in 46.8% of respondents insisting on more "Multi-functional public spaces/open spaces" followed by 28.7% of respondents wanting "Pedestrian-friendly streets", 18% for "Mixed housing", and 6.3% even suggesting that we need to "adapt" to the changing times. The situation may be the same in several cities in India and even globally, given how Globalization has affected the world. The most constructive approach would be to engage the public in planning. Negative impacts of forced isolation could be due to poor planning of events. Experience from previous outbreaks of unprecedented events is precious and should be used to design a better program to address similar issues.

Declaration of competing interest

The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Appendix

Table 10
Causes of Urban Isolation – Gender-related differences for Mumbai (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Lack of Social Interaction					
Between groups	0.8112	1	0.8112	14.938	0.000129
Within groups	22.7007	418	0.0543		
Total	23.5119	419	–		
Non-native/Migrant unacceptance					
Between groups	1.0534	1	1.0534	14.19076	0.000189
Within groups	31.0299	418	0.0742		
Total	32.0833	419	–		

Table 11
Causes of Urban Isolation – Gender-related differences for Kolkata (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Lack of Social Interaction					
Between groups	0.3487	1	0.3487	5.13963	0.023896
Within groups	28.3632	418	0.0679		
Total	28.7119	419	–		
Lack of Work-Life Balance					
Between groups	3.2304	1	3.2304	18.77933	0.000018
Within groups	71.903	418	0.172		
Total	75.1333	419	–		
Non-native/Migrant unacceptance					
Between groups	2.0876	1	2.0876	9.91022	0.001761
Within groups	88.0529	418	0.2107		
Total	90.1405	419	–		

Table 12
Causes of Urban Isolation – Gender-related differences for Kochi (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Nuclear Family					
Between groups	7.395	1	7.395	42.72723	0.00001
Within groups	72.3455	418	0.1731		
Total	79.7405	419	–		
Non-native/Migrant unacceptance					
Between groups	2.0306	1	2.0306	15.63689	0.00009
Within groups	54.2813	418	0.1299		
Total	56.3119	419	–		

Table 13
Causes of Urban Isolation – Age-related differences for Mumbai (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Lack of Social Interaction					
Between groups	1.5319	4	0.383	7.23073	0.000012
Within groups	21.98	415	0.053		
Total	23.5119	419	–		
Non-native/Migrant unacceptance					
Between groups	2.6603	4	0.6651	9.3808	0.00001
Within groups	29.423	415	0.0709		
Total	32.0833	419	–		
Greater Social Media involvement					
Between groups	3.4097	4	0.8524	3.49599	0.008008
Within groups	101.188	415	0.2438		
Total	104.5976	419	–		

Table 14
Causes of Urban Isolation – Age-related differences for Kolkata (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Nuclear Family					
Between groups	6.0687	4	1.5172	7.99238	0.00001
Within groups	78.7789	415	0.1898		
Total	84.8476	419	–		
Lack of Social Interaction					
Between groups	1.6606	4	0.4152	6.369	0.000056
Within groups	27.0513	415	0.0652		
Total	28.7119	419	–		
Lack of Work-Life Balance					
Between groups	2.99	4	0.7475	4.29989	0.002028
Within groups	72.1434	415	0.1738		
Total	75.1333	419	–		
Trust Issues					
Between groups	6.2939	4	1.5735	7.56102	0.00001
Within groups	86.3632	415	0.2081		
Total	92.6571	419	–		

Table 15
Causes of Urban Isolation – Age-related differences for Kochi (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Nuclear Family					
Between groups	10.3746	4	2.5937	15.62829	0.00001
Within groups	68.873	415	0.166		
Total	79.2479	419	–		
Lack of Social Interaction					
Between groups	3.6739	4	0.9185	5.29463	0.000362
Within groups	71.9904	415	0.1735		
Total	75.6643	419	–		
Lack of Work-Life Balance					
Between groups	9.9419	4	2.4855	12.22552	0.00001
Within groups	84.37	415	0.2033		
Total	94.3119	419	–		
Non-native/Migrant unacceptance					
Between groups	4.7213	4	1.1803	9.49475	0.00001
Within groups	51.5906	415	0.1243		
Total	56.3119	419	–		
Greater Social Media involvement					
Between groups	5.1051	4	1.2763	5.37592	0.000314
Within groups	98.5235	415	0.2374		
Total	103.6286	419	–		

Table 16
Causes of Urban Isolation – Household size-related differences for Mumbai (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Nuclear Family					
Between groups	2.6914	4	0.6729	2.96119	0.019669
Within groups	94.299	415	0.2272		
Total	96.9905	419	–		
Non-native/Migrant unacceptance					
Between groups	1.5765	4	0.3941	5.36152	0.000322
Within groups	30.5068	415	0.0735		
Total	32.0833	419	–		

Table 17
Causes of Urban Isolation – Household size-related differences for Kolkata (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Lack of Social Interaction					
Between groups	1.032	4	0.258	3.86831	0.004251
Within groups	27.6799	415	0.0667		
Total	28.7119	419	–		
Lack of Work-Life Balance					
Between groups	1.7313	4	0.4328	2.44709	0.045835
Within groups	73.402	415	0.1769		
Total	75.1333	419	–		
Non-native/Migrant unacceptance					
Between groups	3.1811	4	0.7953	3.79537	0.004814
Within groups	86.9593	415	0.2095		
Total	90.1405	419	–		

Table 18
Causes of Urban Isolation – Household size-related differences for Kochi (ANOVA)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Nuclear Family					
Between groups	3.1079	4	0.777	4.20762	0.002376
Within groups	76.6326	415	0.1847		
Total	79.7405	419	–		
Lack of Social Interaction					
Between groups	2.9674	4	0.7418	4.23489	0.00267
Within groups	72.6969	415	0.1752		
Total	75.6643	419	–		
Lack of Work-Life Balance					

(continued on next page)

Table 18 (continued)

Level of Isolation	Sum of Squares (S.S.)	Degrees of Freedom (df)	Mean Square (M.S.)	F-value	Significance
Between groups	2.1508	4	0.5377	2.42131	0.047793
Within groups	92.1611	415	0.2221		
Total	94.3119	419	–		

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