



Welcome to the first issue of GenderTalk from the NCAER-NDIC's Gender Data Hub. Our first issue discusses about the challenge of women's safety in public spaces. We bring you articles by researchers that highlights some of these challenges, followed by conversation with a practitioner who is working towards providing solutions.

Photo: Dinodia Photos

In this edition, we bring you the following:

- a) How Reliable are the Statistics on Sexual Harassment by Dr. Pallavi Choudhuri, NCAER
- b) Perceived Risk of Street Harassment and College Choice of Women in Delhi by Dr. Girija Borker, World Bank
- c) Gendered Violence and Gender disparity at Work by Dr. Tanika Chakraborty, Indian Institute of Management (IIM), Kolkata
- d) Conversation with Ms. Kalpana Viswanath, CEO of Safetipin, who is working towards providing crowd-sourced real-time crime and safety data for making informed choices on mobility.

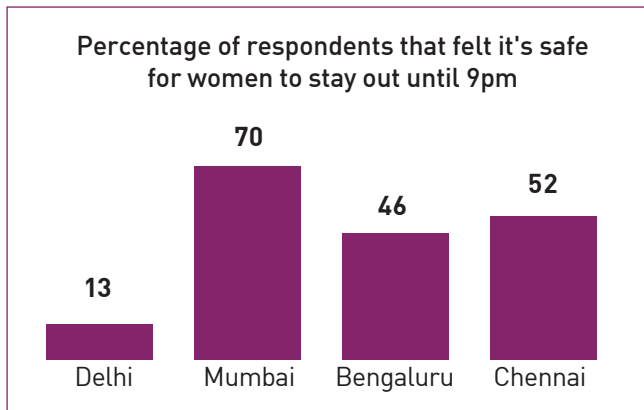


I. How Reliable are the Statistics on Sexual Harassment?

Pallavi Choudhuri, NCAER

Recent statistics from a variety of sources highlight assaults on women's safety in public spaces and women's precautionary withdrawal from public spaces as a result of these assaults. Overall, registration of crime against women increased by a sharp 15.3 percent in 2021 as compared to a year ago, according

to the recent National Crime Research Bureau (NCRB) report. Delhi registered the highest increase in crimes against women across all metropolitan cities, surging by 41 percent during the period, including crimes against women in public places.



Source: Computed using data from SATARC (Safety Trends and Reporting of Crime), IDFC (2017).

However, administrative data do not capture all incidents of crime, even for routine crimes like theft where reporting carries a little stigma. A 2017 IDFC report, of a randomly surveyed representative adult population in metro cities, found that less than half the respondents (41%) who experienced theft approached the police and fewer still lodged an FIR (7%). Such a gap in reportage is also evident when one compares the NCRB data on domestic violence against women in 2020 with the number of complaints received by the National Commission for Women (NCW) – while the former registered a 19% dip in cases of domestic violence during the pandemic, the latter observed an uptick in the complaints by 79% during the same period. Sexual harassment, molestation, and rape are often underreported due to the potential for additional victimization of women during the process of filing a complaint.

The gap between reporting and actual occurrence of crime makes it imperative to examine alternate sources of data, such as survey data on the experience of crime and perception of safety or media reports of occurrences, for a more comprehensive view of public safety for women. Data from the SATARC (Safety Trends and Reporting of Crime) by IDFC (2017) indicate that only 13% of respondents consider Delhi to be safe for women to go out on their own after 9 pm, compared to 46% in Bengaluru,

52% in Chennai, and 70% in Mumbai. Delhi also has one of the lowest female labor force participation rates.

Household survey data also show an increase in crime against women over time. Between 2004-05 and 2011-12, data from the Indian Human Development Survey (IHDS) suggest that the percentage of respondents that feel unmarried girls are harassed ‘often’ in their neighbourhood increased from 4.3% to 7.85%, while those claimed ‘sometimes’ rose from 15.2% to 22%. However, it is important to treat this increase with caution as individuals can be particularly sensitive to media reports on gender-based violence in public spaces, and such concerns can get amplified by reports of high-voltage cases (Zahra Siddique, 2019), with far-reaching implications.

The increase in cases of harassment endured by unmarried girls in public spaces between the two rounds of IHDS (2004-05 and 2011-12) could imply an actual increase in harassment in public spaces; they could also reflect higher reporting in the wake of several high profile cases, or a net effect of both.

It needs to be noted further, that while women’s safety in public spaces remains a concern, the biggest sources of crimes against women are linked to domestic violence (DV) and intimate partner violence (IPV), i.e. from sources known to women, with such crime often perpetuated indoors – this is true across countries, including India (Deshpande, 2022). Hence, while this newsletter highlights some of the challenges linked to safety in public spaces, issues linked to DV and IPV also need to be addressed, so that women are empowered to lead a life of dignity and self-respect both indoors and outdoors.



II. Perceived Risk of Street Harassment and College Choice of Women in Delhi

Girija Broker, Development Impact Evaluation (DIME), World Bank

Street harassment, or sexual harassment in public spaces, is a serious problem around the world. However, there is limited evidence on the economic costs of daily harassment (Aguilar et al. 2021).

One potential cost of an environment in which street harassment is prevalent is that women may avoid opportunities that would otherwise be available to them. In Delhi University (DU), for example, women attend

lower quality colleges than men, even though on average they do as well or better than men on the national high school exams. In Borker (2021), I ask whether women choose to attend lower-quality colleges in order to avoid sexual harassment while travelling to and from college. I answer this question in a context where 71 percent of the enrolled students live at home with their families and travel to college every day, mostly by public transport, and where over 89 percent of female students have faced some form of harassment while travelling in the city. I find that women's college choices can be explained in part by their concerns about exposure to street harassment.

Estimating perceived safety for travel routes in a commuter university

To assess if women students choose a low-quality college because it is located on a “safe” route, I evaluate the difference in female and male students' willingness to pay for travel safety in terms of college quality, travel costs, and travel time in a model of college choice. The difference captures the cost of street harassment for women since men in Delhi do not face such harassment but are expected to have similar concerns about other forms of safety.

To do so, I assemble a unique dataset. DU is composed of 77 colleges that are spread across Delhi. The colleges vary in quality, with each college having its own campus, classes, staff, and placements. Admissions at DU are strictly based on students' high school exam scores. I infer students' comprehensive choice set of colleges using detailed information on 3,800 students from a survey that I conducted. Using the mapping capabilities of Google Maps and an algorithm that I developed, I map students' travel routes by travel mode, including both the reported travel route and the potential routes available to students for every college in their choice set. Finally, I combine the information on travel routes with crowd-sourced safety data from two mobile applications. The first mobile application, [SafetiPin](#), provides perceived spatial safety data in the form of safety audits conducted at various locations across Delhi. The second mobile application, [Safecity](#), provides analytical data on harassment rates by travel mode. Together, the route and safety data allow me to assign a safety score to each travel route.

Women choose lower-quality colleges, lose wages, and spend more money on commuting, relative to men, to feel safer

To estimate the magnitude of the students' willingness to pay for travel safety, I use a discrete choice model.

The analysis uses spatial variation in students' location, destination colleges, route choices, mode choice, and area safety.

Poor College Quality: I find that women choose a college that is in the bottom half of the quality distribution over a college in the top 20 percent for a route that is perceived to be one standard deviation (SD) safer. Men on the other hand go from a top 20 percent college to a college in the top one-third of the distribution for an additional SD of perceived travel safety. To help put that into perspective I use district-level data on rape from the Indian National Crime Records Bureau. A SD of perceived safety while walking is equivalent to a 3.1 percent decrease in the rapes reported annually.

- Women choose a college that is in the bottom half of the quality distribution over a college in the top 20 percent for a route that is perceived to be safer.
- Women are willing to spend INR 7,500 more per year than men for a route that is perceived to be safer.
- Women's willingness to pay for safety amounts to a decline of INR 82,000 or 27 percent in average graduating salary in DU.

—Girija Borker, World Bank

More Money on Travel: Using the travel cost method, I find that women are willing to spend INR 7,500 (USD 250) more per year than men for a route that is perceived to be one SD safer. This is a significant sum of money, equal to over 70 percent of the annual tuition at DU.

Lower Post-College Salaries: Using data on placement offers at the time of graduation, I estimate that women's willingness to pay for safety amounts to a decline of INR 82,000 or 27 percent in average graduating salary in DU.

Broader Implications

Using estimates from Sekhri (2019), I estimate that women's willingness to pay for safety translates to a 17 percent decline in the present discounted value of their post-college salaries. The findings speak to the long-term consequences of everyday harassment – perpetuating

gender inequality in both education and lifetime earnings. While my paper focuses on the effects of street harassment on women's choice of college, these findings are relevant for other economic decisions made by women as well. For instance, the propensity to avoid street harassment could impact women's employment decisions and in part explain India's low levels of female labour force participation.

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III. Gendered Violence and Gender disparity at Work

Tanika Chakraborty, Indian Institute of Management (IIM), Kolkata

It is now widely acknowledged that labour force participation (LFP) of women in India is strikingly low. The [International Labour Organization](#) (2019) places India at the 179th position among 185 countries on women's LFP. While gender disparity in India shows up right at birth and manifests in most socio-economic indicators through one's life, what is puzzling about women's LFP is that it has remained one of the lowest in the world, despite significant improvements in women's educational attainment and a decline in fertility rates. For instance, there is equal representation of men and women in higher education as per the 2019 [All India Survey on Higher Education](#) and yet the share of women in the labour force hovers around 20%.

In addition to the low and falling LFP rates of women, crimes against women in India have attracted much public as well as media attention. The infamous [Nirbhaya](#) gang rape case that happened in Delhi in 2012 was one such

shocking case that shook the collective conscience of the civil society in India and led to mass protests across India. A careful study of the data, however reveals an alarming trend in sexual crimes against women — driven either by an increase in reporting or by an increase in actual crimes, or both. In a [2012-survey](#) of adolescent girls in Delhi, 92% reported having experienced some form of sexual violence in public spaces in their lifetime.

A large body of research documents that in response to the pervasive fear of rape, women often adopt the strategy of avoidance by modifying their lifestyle. In my [research](#) (Chakraborty, Mukherjee, Rachapalli, and Saha, 2018) with my co-authors, we extend their position by arguing that in India, the fear of sexual crime may induce women to quit the workforce as an avoidance strategy. Women's LFP can be considered a rational choice that depends on the relative expectations of benefits and costs associated with work. We argue that an increase in perceived crime

- Analysis using IHDS data show that women are less likely to work outside of their homes in regions where households have a higher perceived threat of sexual harassment.
- Moreover, this negative relationship is found to be stronger for women in households that are more conservative.

—Tanika Chakraborty, IIM-Kolkata

against women increases the cost of travelling to work. This implies that women are less likely to participate in the labour force when the perceived threat of crime against women is high. In addition, the trauma from any form of sexual harassment is a function of the stigma society attaches to a victim of sexual crime. While all forms of crime that happen outside the house are likely to increase the ‘cost’ of travelling to work, sexual crimes are presumably much costlier for women in a society that attaches a high stigma to victims of such crimes. The extent of stigma is likely to be high in conservative societies that value women's purity strongly. Hence, in conservative societies, sexual crimes are expected to be a stronger deterrent to women's labour force participation than in less conservative societies.

The India Human Development Survey (IHDS) provides a unique opportunity to empirically test these possibilities. On the one hand, it provides information on women's work; on the other, it elicits perceptions about crimes against women. Using neighbourhood-level aggregation on the perception of crime from the 2005 round of IHDS, we ask whether women are more or less likely to participate in the labour force in communities where the perception of crime against women outside the household is higher. To allow for the possibility that regions reporting a higher perception of crime against women are likely to be inherently different from regions reporting a lower perception of crime against women, we

compare communities within a district to arrive at our estimates. The rich nature of the IHDS data allows us to further control for a range of co-variates at the individual and neighbourhood levels. In addition, the IHDS includes various questions that help measure the extent of conservatism in a community. Our findings show that women are less likely to work outside of their homes in regions where households have a higher perceived threat of sexual harassment. Moreover, this negative relationship is found to be stronger for women and in more conservative households, proxied by the practice of *Purdah*. In a [follow-up work](#) where we estimate the extent to which crime against women deters their LFP, we find that for every additional crime in a district, 75 women pull out of the labour force.

Our findings underline the importance of accounting for the crimes against women while designing policies to increase women's labour force participation. The economic benefits in terms of potential increases in women's labour supply are over and above the ethical and social imperatives that primarily drive policies to reduce crimes against women.

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IV. Conversation

with Kalpana Vishwanath, CEO, Safetipin

Inadequate access to safe and reliable public transport poses challenges for both women and girls every day as they navigate public spaces, constraining access to quality education, and limiting women's social and economic freedom. The COVID-19 pandemic has further exposed women's vulnerabilities, increasing gender inequality in education and employment. It is important to develop gender-responsive and gender-inclusive safe public spaces to encourage women's participation in economic activities and boost girls' educational outcomes. However, administrative data on crime rate often suffer from measurement error due to underreporting by women of crime/violence faced by them, which makes it difficult to collect data on local crime. Ms. Kalpana Vishwanath, CEO of Safetipin, joins us to talk about some of the interventions that Safetipin has developed to address this gap.

1. What kind of intervention has been introduced by Safetipin to address this challenge? How does Safetipin collect the data on women's perception of safety?

Safetipin's technology platform has been designed to bring a gender lens to urban infrastructure to enable girls and women to access public spaces more freely. Safe public spaces and ease of mobility enable women to fully exercise their right to the city by expanding their access to opportunities for employment and education and improve their sense of wellbeing.

Safetipin is aimed at generating data that complements the official statistics collected and inspire action to address the issue of making cities safer for women and girls. At the core of our technology platforms is the Safety Audit, a tool to assess safety at a particular location. The audit measures parameters are linked to physical infrastructure (lighting, walk path, transport, built environment etc.) and social usage of a space by people, especially women and children. The data is collected using a set of mobile and web applications to generate geo-tagged data points supported by photographs and user comments. The datasets are shared with urban stakeholders, including the city governments and transport departments, to improve

public infrastructure, thereby enhancing the overall perception of safety in the city.

2. What are the interesting tools that Safetipin has developed from the data that gets collected, and can other people beyond Safetipin use it?

The Safetipin technology platform has three applications:

My Safetipin: a free crowdsourcing app available on the Play Store and App Store. The app specifically focuses on providing women and girls with an interactive tool to navigate public spaces. It helps users to make informed choices about their mobility. The tracking feature in the app lets the users share their live location with friends and family in case they feel unsafe while traveling alone. The Safest route feature suggests a safer route between two locations based on Safetipin's existing safety audit data in that area.

[Safetipin](#) is a social enterprise and a technology platform that works to make cities safer by collecting and providing safety-related data on a large scale. Since its inception in 2013, Safetipin has worked across 45 cities in Asia, Latin America and Africa. With a mission to build a world where everyone can move around without fear, Safetipin has collaborated with government and non-government stakeholders in using big data to improve infrastructure and services in cities.



Safetipin Site- It is a customizable web application used to collect information on selected public places or public services. For e.g., the condition of public toilets,

bus terminals, safety assessment inside the buses, last mile connectivity through metro/bus/auto/taxi, etc. Safetipin also maintains and runs the application providing in-depth analytical reports as required. Safetipin Site can also be used to monitor and evaluate the effects of certain projects or changes that the city has instituted. This tool can be used both to diagnose safety issues and monitor public spaces, particularly those where interventions have taken place.

Safetipin Nite- This is Safetipin's proprietary app and is used for large-scale or city-wide data collection in cities and public spaces. The app is used to map the city's streets through photographs. To collect data using this app, phones will be mounted on the windshield of cars/taxis. As the car moves, the app shall automatically take photographs, recording the location coordinates. Once started, the app takes photographs every 50m in landscape mode. This is not a public app and is shared with project partners and the data collection team only.

The pictures thus taken are accessed on Safetipin portal and coded on a wide range of parameters linked to public safety. Further an analysis of the data is conducted to provide recommendations on how to improve the inclusion and use of public spaces.

The evidence-based data collected using the Safetipin applications is made available to various urban stakeholders including city governments, transport departments, researchers, local NGOs, and civil society organizations for carrying out improvement works and for advocacy and decision-making purposes.

3. How is the safety audit data used in safety scores? Is the information received from the crowdsourced data and the Safety audit consistent with one another?

The safety score of an area is calculated based on the average ratings of the safety audits conducted in that area.

The Safety Score is a reflection of the perception of safety in a particular location. For each audit point, the Safety score is a numeric value between 0 and 5 where 0 is poor or very unsafe and 5 is good or very safe.

The information collected through the Safety audit feature on the My Safetipin app (crowdsourced data) is consistent with the safety audit ratings generated using other Safetipin applications. An in-house team of trained

data scientists and image analysts review the safety audits to ensure the accuracy of the collected data.

4. Does the Safety Audit show any relation between the socio-economic conditions of an area with the safety score?

The Safety audit ratings or the safety score do not always show a direct correlation with the socio-economic conditions of the area. However, the safety audit data in many cities show that the physical infrastructure- the condition of lighting, walking path, and availability of public transport is usually better in central parts of the city as compared to the outer peripheral areas/ rehabilitation settlements. On the other hand, sometimes low-income areas are safer because there are more people in public spaces and more natural surveillance.

5. Is there a way to identify the demography from where the crowdsourced data is coming?

The My Safetipin app collects users' information on age and gender while signing up on the app. The safety audits conducted using this crowdsourced app are geo-tagged; thus, it is possible to get their location.

6. How does Safetipin plan on expanding the awareness of this app to make for a greater reach?

Safetipin has forged several partnerships in India and across the world to sustain the impact of its work. We collaborate and work closely with city governments, media, think tanks, NGOs, CSOs, and researchers to use our applications for collecting evidence-based data on safety, walkability, and accessibility in cities.

Safetipin is active on social media platforms and promotes the use of its applications to help urban stakeholders make cities safe and inclusive.

7. What is the future vision for Safetipin? How can we build an ecosystem where we can respond to violence against women?

Safetipin's mission is to build a world where everyone, especially women, can move around without fear. We at Safetipin believe that data and technology can be enablers for change. Our vision is to provide credible data and build vibrant ecosystems for safe, inclusive, and accessible cities. To achieve this, we work with a wide range of city

stakeholders, including governments, community groups, civil society organizations, urban planning institutions, media, and policy think tanks to build their capacities to generate credible data and indicators and form active local ecosystems for creating safe and inclusive cities

Safetipin has prepared a knowledge framework **SheRISES** to help urban stakeholders understand the different elements and their importance in building a

responsive, safe, inclusive and equitable city that cares for all its residents.

For enabling change and for truly transforming cities capacity development of different urban actors and stakeholders is imperative. Towards this end, Safetipin is developing training materials and workshops at different levels to help in mainstreaming this framework in city planning and management.



READS...from around the web

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Our website can be found at <https://ndic.ncaer.org/research-theme/gender-talk/>.

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