
Towards Using Mobile Phones to Inconspicuously Report Domestic Violence in an Indian slum

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Abstract

A recent study found that over 1 in 3 women have experienced domestic violence in Dharavi, a Mumbai slum, and yet most victims do not seek help to address this issue. We are supporting a new initiative by a local community organization that aims to support victims as well as more accurately record the prevalence of

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domestic violence in the slum. One challenge is to find a way that victims can use mobile phones to inconspicuously report incidents of domestic violence. We consider different approaches and discuss their suitability for the particular conditions in Dharavi, which include: a lack of privacy; low levels of literacy and digital skills; and the basic technology levels of most mobile phones, which are often shared by a household.

Author Keywords

Domestic violence; intimate partner violence; inconspicuous interaction; India; Dharavi; slums; HCI4D

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Intimate partner violence (IPV) is defined as “behaviour within an intimate relationship that causes physical, sexual or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse and controlling behaviours” [13]. The third Indian National Family Health Survey (NFHS-3 2005-2006) indicated that nationally 33% of ever-married women aged 15-49

have experienced IPV at least once [4]. Poverty seems to increase the risk of IPV [6], as does spousal alcohol and drug use [7], and women with less education are at greater risk [8]. Women in Dharavi, an urban slum in Mumbai, reported IPV prevalence of 37% [12] and in another study in the same slum 69% women said that the likelihood of IPV was not changed during maternity, and possibly even increased [2]. A study in another Indian slum indicated that although 18% of women would seek clinical care for injuries resulting from physical IPV, it was rare for them to seek help to address the issue of IPV itself [10].

The Society for Nutrition, Education and Health Action (SNEHA) was set up in 1999 to address the needs of women and children in Mumbai's slums who are vulnerable to abuse, neglect and poor health. Its Program on Prevention of Violence against Women and Children develops high impact strategies for primary prevention, ensuring survivors' access to protection and justice, empowering women to claim their rights and mobilizing communities around 'zero tolerance for violence'.

Little Sister is a new initiative that aims to develop a crowd-sourced notification system that will not only enable victims to request help but also record IPV prevalence in Dharavi more accurately than traditional methods, such as surveys and routine data collection at service points like hospitals, which are often considered to under estimate levels of domestic violence.

As well as using 150 community activists who live in Dharavi to report incidents of domestic violence when they encounter them in their neighbourhoods, another aim of the project is to enable women to use mobile

phones to report recurrent IPV. In the past, the organization's counsellors have often lost contact with women who have experienced domestic violence and it is hoped that mobile technology could address this issue. It is very important that the application can be used inconspicuously so that it does not alert the attention of anyone else who might look at the phone or monitor the woman's activities.

A taxonomy of inconspicuous mobile reporting methods

In this section we outline a provisional taxonomy of ways that mobile phones could be used to inconspicuously report IPV.

Commercial secret texting apps

There are commercial phone apps that hide the information about whether calls and SMS have been sent to or received from specified numbers [1]. The target user group is typically people conducting clandestine relationships but the software could potentially be used to send text messages that report IPV. Although the record of sending SMS would be inconspicuous, a victim would need privacy to type in the notification message which limits the value of these commercial apps for reporting IPV in a slum context.

Sensor-based

A background application can monitor a mobile phone's sensors, for example, the accelerometers, and detect unusual movement patterns, such as the phone alternating between face up to face down three times in less than four seconds. If a pre-defined movement sequence is recognised, then the application can automatically send an alert SMS to a specified number that can be automatically processed by a system such

as FrontlineSMS [3]. Movements such as rotating the phone can be carried out inconspicuously because they do not require a user to look at the device or press any buttons. The movements could be performed out of sight under a table, but even in full view the movements could appear as though a person was absent minded playing with their phone.

Web easter eggs

There are many examples of websites that have hidden functionality, or 'easter eggs', that can only be accessed by entering key words or key press sequences. , For example, typing 'do a barrel roll' in Google's search engine causes the page to rotate, and entering 'up, up, down, down, left, right, left, right, a, b' on www.digg.org plays an 80s pop tune. A custom website could be created that ostensibly provides information about some innocuous subject, for example, TV programmes, but also contains an 'easter egg' that enables a user to report an IPV incident by entering a key sequence. The user's identity could be registered in a cookie that could be set up for them.

Phone tapping

The TapBack system [9] monitors voice calls to certain numbers and tries to detect *audio gestures* that are generated by a caller tapping the back of their phone. In an evaluation of the software, rural Indian farmers used taps to adjust the playback speed of a farming information voice site. Two and three taps compressed the playback by 25% and 35% respectively and one tap returned the playback to its default speed. The 12 day study established that the system worked with basic mobile phones and was suitable for participants with low literacy rates and minimal digital skills. A user could ring a seemingly innocuous voice site line and

then use taps to inconspicuously report an incident of IPV.

The social and technology context

In Mumbai the price of land and urban planning policies have led to the poorest groups of people living in high-density settlements of slum dwellings. Extended families live together in very small homes, which consist of a small number of rooms. Doors are kept open and there is a regular stream of visitors, so there are few opportunities for privacy. A further challenge for using mobile phones for inconspicuous reporting is that there are high levels of illiteracy and low levels of digital skills.

The low level of mobile phone technology also limits the approaches that would be effective. A study conducted in three slums in India in 2009 found that the most popular phone to be the Nokia 2600 which also has an FM radio [11]. Many phones just have call and SMS functions and most do not have internet connectivity. Given the low level of income, mobile phones are often shared within and even between households. In order to save money people often communicate by using 'missed calls' or 'flashing', rather than paying for talk time.

Proposed solution

The privacy app approach is also not viable because of the lack of privacy available to most slum dwellers who live in very close proximity to their extended family. This means it would be difficult for a woman to find opportunities to use the privacy app in private. Furthermore, privacy apps tend to only be available for smart phones.

Many mobiles owned by slum dwellers do not have sensors nor web access, so these technologies cannot be utilized for inconspicuous reporting of IPV, ruling out the sensor-based and web easter egg approaches. The latter approach also requires a level of digital skills that may be beyond many of the participants.

The phone tapping approach could be a way to inconspicuously report IPV that meets the technological and social constraints of Dharavi: the most sophisticated aspect of the technology is the software located on a server and it is compatible with basic phones; tapping a phone could be done in plain view of an extended family and seem like a non-intentional action and not rouse suspicion; and the interaction does not require any digital skills or require the participant to be literate (beyond dialing a number). For these reasons the phone tapping approach currently seems the most viable way of inconspicuously reporting IPV in Dharavi. One challenge is determining an appropriate 'innocuous voice site' that domestic violence victims could ring without arousing suspicion. A further issue is the potentially prohibitive cost of a phone call in such a low income setting. We plan to explore these issues in collaboration with Dharavi residents and assess the viability of this approach.

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