Original Contributions

Exploring the heuristic value of non-personal data for sexual- and gender-based violence research and prevention in South Africa

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ABSTRACT

Research and media reports indicate that most incidents of sexual and gender-based violence (SGBV) in South Africa, as well as globally, are not reported to the police because of victims' fears of retaliation, intimidation, stereotyping, secondary abuse and stigmatisation. As a result, there is a lack of accurate data available to the South African public and a certain level of ignorance to the realities of the incidence of SGBV across all sectors of society. The purpose of the study is to explore how non-personal data obtained through mapping the distress calls received on TEARS Foundation's "Help-at-your-fingertips" service line can be used for SGBV research and prevention purposes. Given that in South Africa the death of women at the hands of an intimate partner has been estimated at six times the global average, the urgent need for alternative SGBV prevention strategies is unquestionable. The study shows how the calls received on the "Help-at-your-fingertips" service line across South African provinces and towns were analysed to identify trends, and visually represent the number of SGBV distress calls over two periods, namely July 2013 to August 2014 and September 2015 to October 2016. The key trends identified include times of year, times of day, highest call volumes in terms of provinces and differences in times of calls in different areas in South Africa as examples of the kinds of information that can be deduced from non-personal data.

The study shows how non-personal data can be used as a powerful tool to make SGBV data visible and to raise public awareness of its incidence in South Africa.

Keywords: Sexual and gender-based violence (SGBV), geographic mapping, crime mapping, communication, SGBV prevention, TEARS Foundation, "Help-at-your-fingertips"

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INTRODUCTION

It is generally known, as Sigsworth (2009) shows, that the exact prevalence of SGBV in South Africa is not known because only a very small percentage of incidents are reported to authorities (Jewkes & Abrahams, 2002; Gender Links, n.d.). Current findings suggest that increasing emphasis is being placed on prevention programmes that involve multiple stakeholder participation, among other things (Ellsberg, Arango, Morton, Gennari, Kiplesund, Contreras & Watts, 2014). Several sources such as Seedat, Van Niekerk, Jewkes, Suffla and Ratele (2009) and Gevers, Jama-Shai and Sikweyiya (2013) propose that evidence-based prevention should be advocated among South Africans. In this article, we propose that the analysis of non-personal data and the visual representation of live non-personal data relating to the distress calls made by victims of SGBV can provide useful information that can be used to corroborate or challenge other data sets.

This article therefore focuses on the SGBV distress calls made to a unique service helpline known as "Help-at-your-fingertips", which is provided by a non-government organisation (NGO) called TEARS (Transforming Education About Rape and Sexual abuse) Foundation. While the non-personal data obtained through analysing these calls do not specify the exact kind of SGBV suffered by the caller, it can be used to: 1) represent the number of SGBV distress calls received; 2) enable communication about SGBV through showing its prevalence in specific areas; 3) compare different data sets, i.e. disclosed and location-based services; 4) identify trends in incidents of SGBV, i.e. changes in times of calls; and 5) present new ideas for further technological innovation and collaboration, i.e. collating different kinds of personal and non-personal data.

Seedat et al. (2009) reiterate that collaborative efforts from all stakeholders are imperative. Yet, as is portrayed in the People Opposed to Women Abuse (POWA) campaign of 2014 (Independent Online, 2014), South Africans typically avoid getting involved in domestic and intimate partner violence incidents, arguably because all forms of SGBV remain stigmatised (Jewkes & Dartnall, 2017). The video clip in this campaign shows a white male in a typical apartment complex in a seemingly affluent residential area making a tremendous noise while playing a set of drums to loud music. Several neighbours are seen knocking at his front door and objecting profusely to the noise. The next scene depicts the same man, in the same residential complex at another time playing a recording of a domestic violence scene, with sounds of a woman screaming and objects breaking in the background. The camera, focused on the front door, shows that not one neighbour comes to object to the obviously violent abuse. South Africans' tendency to resort to silence in response to incidents of SGBV is well captured in this video clip. It supports the premise that silence is also communication and that in the case of SGBV, it communicates apathy and ignorance.

The existing literature on SGBV in South Africa, in particular, has dubbed South Africa the "rape capital of the world" (Gordon & Collins, 2013, p.93). The scope of SGBV in South Africa includes the high prevalence of child sexual abuse (Jewkes, Penn-Kekana & Rose-Junius, 2005), child prostitution and human trafficking (Thelwell & Van der Merwe, 2014), child pornography (SABC News, 2016), and rape on South African university campuses (Corke, 2016). The continuous theme emerging from research reports is one of silence that manifests itself in the low report rate and consequently the low conviction rate of perpetrators of SGBV, i.e. 7% to 13%, according to Jewkes and Abrahams (2002). This silence, which seems to perpetuate and propel SGBV, appears to communicate an almost stoic consent or, even worse, as Jewkes, cited in Capp (2006, p.719), in reference to South Africa states: "A lot of the population, a lot of the time, doesn't think rape is a problem".

The necessity for effective SGBV communication and, therefore, for scholarly collaboration is indisputable, as Jewkes and Abrahams (2002) implore when they underscore the need for genuine partnerships and the adoption of a strategic approach to SGBV intervention and the promotion of zero-tolerance approaches to sexual coercion in communities. The sentiment has been echoed by Walby, Towers and Francis (2014), for example, in their case for the adoption of multidisciplinary and interdisciplinary approaches towards SGBV. However, at present, research publications on SGBV are still predominantly found in health journals, addressed as a public health concern with the anonymity of respondents secured through rigorous ethical guidelines. The need to protect victims' identities is unquestionable. At the same time, it means that SGBV remains invisible, as shown by Russo and Pirlott (2006). It also means that victims remain isolated and excluded because abuse, most often, occurs within marriages, dating relationships and families (Jewkes & Abrahams, 2002) where perpetrators assume power roles and victims feel compelled to conform to these expectations and demands.

Current research findings suggest that SGBV remains more prevalent in low- and middle-income countries (Jewkes & Dartnall, 2017) where victims are more excluded from public health, legal and other support structures (Stauffer, 2015). However, current findings also suggest that more educated and more affluent victims of SGBV are even more isolated, as they are less likely to report incidents of SGBV (Gass, Stein, Williams & Seedat, 2011).

It has been shown in previous studies that the dominating narrative of patriarchy in South Africa (Jewkes, et al., 2005) remains the key driver in the perpetration of SGBV. In terms of SGBV, patriarchy facilitates the trans-cultural construction of masculinities that legitimises the use of violence to control and punish women (Abrahams, Martin, Mathews, Vetten & Lombard, 2009; Mathews, Jewkes & Abrahams, 2014) and that it inadvertently ratifies the use of alcohol, among other factors, that promote such forms of SGBV. We therefore argue

that until patriarchy and its constitutive dimensions, namely subordination, male dominance and sexual entitlement are eradicated, the culture of silence cannot and will not change, since, as Coetzee (2001) shows, patriarchy assumes religious status, views reality in a reductionist way, adversely affects every aspect of society and adjusts norms to suit its purpose.

OVERVIEW OF EXISTING SGBV RESEARCH FINDINGS

South Africa has been characterised by an almost unorthodox sense of sexual entitlement (Jewkes et al., 2005) that has problematised gender equality and has perpetuated a culture of silence. It is the victim, rather than the perpetrator, of SGBV who bears the stigma (Russo & Pirlott, 2006). It seems as though fear of stigma exceeds the fear of SGBV itself. The intersubjective relationship between SGBV and stigma is complex as it includes gender traits, expectations, norms, values, roles, environments and institutions (Russo & Pirlott, 2006) that are intertwined with class, race and gender.

In summary, the key drivers of SGBV in South Africa are patriarchy (Coetzee, 2001; Jewkes et al., 2005), definition of masculinities, religious dogma (Stauffer, 2015), possession of guns, alcohol abuse, poverty, absence or failure of social support structures (Jewkes & Abrahams, 2002; Seedat et al., 2009), cultural dynamics, mistrust of police and legal systems (Stauffer, 2015), and low levels of education (WHO, 2014; Matzopoulos, Bowman, Mathews & Myer, 2010).

Other than the high femicide rate in South Africa (Mathews, Abrahams, Jewkes, Martin, Lombard & Vetten, 2009; Abrahams et al., 2009; Mathews, Abrahams, Jewkes, Martin & Lombard, 2013; Abrahams, Mathews, Martin & Jewkes, 2013; Mathews, Jewkes & Abrahams, 2014), there has not been sufficient information on the actual incidence of intimate partner violence (IPV) to enable successful prevention and intervention programmes (Seedat et al., 2009; Jewkes & Dartnall, 2017). It is generally understood that because these relationships are personal, victims prefer to disclose their experiences anonymously and confidentially, if at all. The shame and stigma associated with SGBV referred to earlier cannot be underestimated. Therefore, as these research reports indicate, in most cases, such disclosures occur retrospectively in surveys or in-depth interviews and are based on what survivors can recall. In the worst cases, the data is obtained from mortuary-based records. We aim to show that non-personal data can indicate more accurately when and where incidents of SGBV occur, assuming that victims typically seek help within hours rather than days, weeks or months of such incidents.

At present, existing research methods such as in-depth interviews and health surveys (Jewkes & Abrahams, 2002; Jewkes et al., 2005) and mortuary-based data (Mathews et

al., 2009; Abrahams et al., 2009; Mathews et al., 2013; Abrahams et al., 2013; Mathews et al., 2014) are based, in many cases, on personal data such as race, gender, age, place of residence and personal experiences of SGBV. However, as Jewkes and Abrahams (2002, p.1240) state: "...national data on rape in South Africa is highly sensitive to the sources of information, the way in which the questions are framed and the definition of rape". Further, a higher number of studies seem to have been conducted among vulnerable groups such as poor, uneducated or rural communities. Fewer studies such as Jewkes, Sikweyiya, Dunkle and Morrell (2015), Meinck, Cluver, Boyes and Loening-Voysey (2016), and Gass, Stein, Williams and Seedat (2011) indicate nationally representative, randomly selected or natural samples, for example. There is little or no information on the kinds of SGBV that occur in more affluent neighbourhoods and towns.

We aim to show in the section below how the use of non-personal data can provide some information that is not available because of the low reporting rate, and because of some of the obstacles such as recall bias, for example, when dealing with people and their personal data. We aim to show that non-personal data can maintain the anonymity of victims and perpetrators, while informing authorities and other stakeholders, such as communities.

CRIME MAPPING AND THE USEFULNESS OF NON-PERSONAL DATA

Crime mapping was introduced in the United Kingdom in 2014 and it is thus a relatively new concept. It is defined by the Information Commissioner's Office (ICO) as "the process of producing a geographical representation of crime levels, crime types or the locations of particular incidents" (ICO, 2014, p.3). The rationale is that crime maps can give citizens a readily accessible means of understanding the patterns of crime in their residential areas. In terms of the UK Statistics Authority Code of Practice for Official Statistics, it is a clear requirement that official statistics do not reveal the identity of an individual or any private information relating to them. E.G. Bascerano (personal communication, October 19, 2016) indicates that a similar regulation applies in South Africa under the Protection of Personal Information (POPI) Act, as it probably does in most other democracies. The ICO's conceptual paper was published in the UK under the umbrella of the Data Protection Act 1998.

By its definition, crime mapping is primarily concerned with the geographical aspects of criminality and its purpose is to raise awareness among the public for many obvious reasons. It is also important to note that crime mapping has implications for the types of crimes shown on the map. In the case of domestic violence (DV), it includes intimate partner violence (IPV) and child sexual abuse (CSA). For example, we argue that information on the location and prevalence of different kinds of SGBV can help members of the public to be more alert and to become more sensitised to the issue. We further argue that the publication

of information about the scale of DV, based on actual data rather than assumptions, can encourage victims to report incidents and to feel less isolated. The ICO (2014) reiterates that crime mapping is a relatively new and innovative area, and states that it may take some time for the exact benefits and privacy risks to emerge. It is therefore clear that a continuous evaluative process is required. In this regard, use of the "Help-at-your-fingertips" service line can contribute to further research and development of this technology.

It is highlighted again that the "Help-at-your-fingertips" service line is the first of its kind in South Africa, and to our knowledge, in the world. At this stage, the POPI Act is the only currently accessible guideline for the processing of this kind of information in South Africa, according to E.G. Bascerano (personal communication, October 19, 2016). TEARS Foundation was established in 2012 by M.E. Glennie who personally experienced IPV and found that victims of SGBV had no knowledge of where to go in the event of IPV or DV when she attempted to seek help from the police on a Friday afternoon in 2002. She was told to return to that particular police station the following Monday morning (Glennie, 2016). This experience of trauma and being unable to find help in a state of despair, inspired the establishment of TEARS Foundation and the "Help-at-your-fingertips" service line. The heuristic value of this service only emerged through the analysis of the data with the use of Microsoft technology and software. In the following section, we describe the process of gathering non-personal data through the TEARS "Help-at-your-fingertips" service line.

METHOD

While it emerged through the collection of non-personal data recorded from calls to the "Help-at-your-fingertips" service line that this data could be analysed and mapped, this was never the initial purpose or objective of the service when it was launched. Therefore, conventional research parameters such as methodological orientation (which is quantitative in this case), population and sampling method, for instance, can be deduced retrospectively since there was no research design from the outset. Under these circumstances, the non-personal data discussed in this article is by no means representative of the South African population, but is clearly confined to victims of some form of SGBV who had in some or other way received the information provided by TEARS and who had access to a mobile device. Calls to this number could not be made from a landline and, initially, not via a computer. Africanews (2016) shows that in terms of the latest AMPS data for South Africa, 37% of South Africans use smartphones, 52% use ordinary mobile phones, while as little as 10% do not use, or do not have access to, mobile phones. Mobile phones are therefore viable instruments for SGBV response purposes.

DATA COLLECTION

The information we present has been developed through the use of Microsoft software. In simple terms, this helpline for victims of SGBV is a mobile phone portal linked to a database of service providers that send information via a mobile phone, using simple prompt-based technology, which tracks the location of the caller within 45 seconds and sends details of the nearest care facility to the caller. Typically, this includes the nearest police station, medical facility, or other emergency support units. The information received from the geographical location of the phone calls is drawn into a Microsoft Excel data model where it is analysed and reworked to fit the criteria required for analytics. Critical Performance Indicators (CPIs) are used to indicate anomalies in patterns. From there it is sent to Power Business Intelligence in the Microsoft Office 365 Enterprise Cloud. These steps have to be followed because information is drawn from different intersections. The use of a combination of technologies enables the identification of exceptionally high numbers of events.

The data processing involves the use of Unstructured Supplementary Service Data (USSD) to place the calls received on a map of South Africa as they occur over the two thirteen-month periods that cannot be accurately displayed in print format.

When this service line was first publicised in March 2013, with the number *120*7355#, its primary purpose was to provide instant support to victims of rape and sexual abuse; this information was clearly stated in the first TEARS brochure. It is therefore unlikely that calls to this line would be made for any purpose other than some kind of SGBV, such as rape, sexual assault, IPV, DV or some other experience that victims may interpret as fitting within the scope of abuse. In other words, other than perhaps testing the service, people who had been in a car accident or mugged, for example, would have had no reason to call the "Help-at-your-fingertips" service line. Prior to its official launch on 9 August 2013, information on this service line was publicised through media such as Radio 702, M-Net television channel, websites, social media and brochures. Since TEARS is a non-government organisation it did not have the resources to market and publicise the service through mainstream media.

At first, calls to this line were not free, but the primary objective of this privately funded initiative was to provide victims of SGBV with a helpline they could call for information on the nearest support service within their vicinity, at any time of day. Figure 1 below illustrates the sequence of information provided and responses received when a call is made to the service line.

Figure 1: Illustration of prompts presented on the Help-at-your-fingertips service line
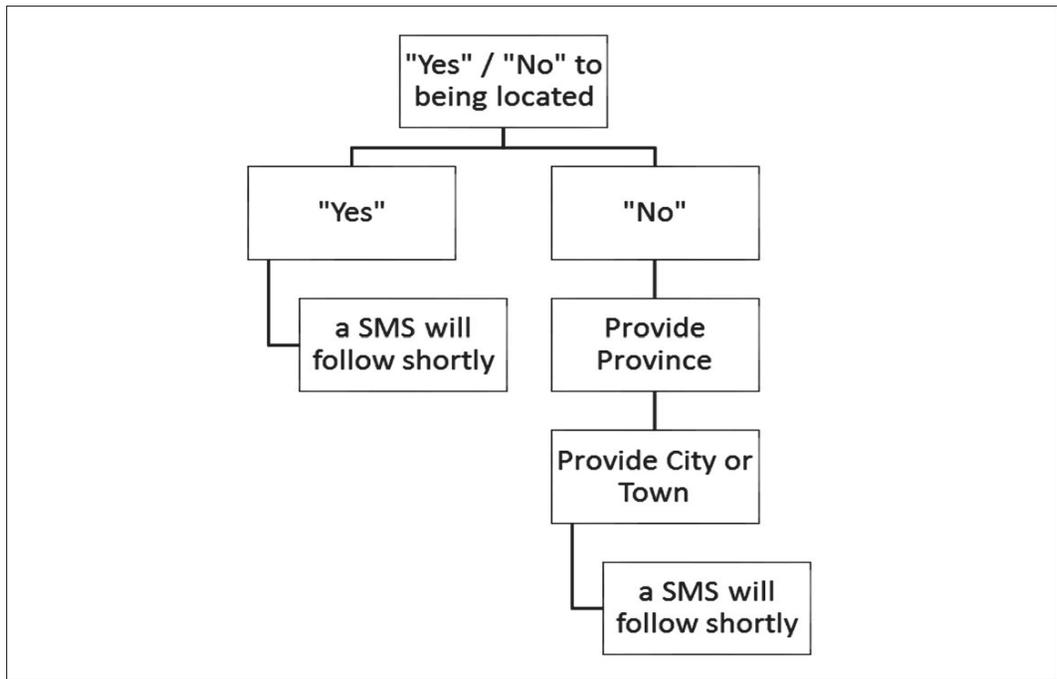
In spite of funding and marketing constraints, and the challenges these present, a toll-free service line *134*7355# was introduced in August 2014. The increase in calls since the introduction of the toll-free line can possibly be attributed to calls to the service being free of charge, although this cannot be concluded with absolute certainty.

DATA ANALYSIS

The analysis of the calls received on this service line revealed that by using Microsoft technology, the calls received could be distinguished in terms of the following criteria:

- Times of calls
- Location of calls
- Frequency of calls from the same number
- Prevalence of calls during certain times of year, such as school holidays or public holidays.
- The data was filtered in terms of completed calls, (calls that received instant messages with information on the nearest support services), the removal of duplication of calls from the same number (for geo-mapping purposes), and a distinction between calls that used location based services (LBS), and those that opted for disclosure of location.

In reference to Figure 1, it should be clarified that if the caller chooses to disclose their location, they would typically indicate "Johannesburg", for example. The caller will, typically, not indicate from which suburb in Johannesburg the call is being made. This means that such a call cannot be mapped in terms of the actual location of the caller and cannot position the call in an exact location in Johannesburg, for example. It also means the service line, in such cases, provides the location of service providers closest to the centre of Johannesburg and not necessarily closest to the caller. This may explain, for instance, why more than one call from the same number is often recorded within minutes, as the same caller may provide a more exact location in subsequent calls. If the caller indicates that she/he can be located, the LBS can be used. This means the exact position of the individual can be used to identify the closest service provider and gives the exact coordinates of the call. However, within the scope of legislation in South Africa (the POPI Act), the physical addresses and identities of callers may not be traced or disclosed, and callers may not be contacted. At this stage, based on the information provided on the TEARS platforms, the communication to callers is based on the assumption that they do not want their identity known. It was shown earlier that very few cases of IPV, in particular, are reported to the police which explains why so little is known about this form of SGBV and why much more research is required (Jewkes & Dartnall, 2017). The SGBV distress calls recorded on the "Help-at-your-fingertips" service line gives some insight into callers who would probably not report such abuse to the police.

RESULTS

The calls received on the two service lines for the periods July 2013 to August 2014 and September 2015 to October 2016 were recorded for further analysis, as indicated in Table 1 below. It is noted at this point that TEARS could not use or analyse the data recorded between September 2014 and August 2015. Due to a lack of resources, there were insufficient funds to pay the service provider who had initially recorded the incoming calls, since Glennie personally funded the service (Glennie, 2016). As a result, there was no caller information data before September 2015, when the service was reinstated with some aid from AVON Cosmetics. Table 1 provides an instant overview of the call volumes over the two indicated periods.

Table 1: Calls received on TEARS "Help-at-your-fingertips" service lines over the two indicated periods

Period	Paid line *120*7355#	Free line *134*7355#	SMS messages sent
July 2013 to August 2014	8 172		Unknown
September 2014 to October 2016	695	17 985	10 782

In the 2013 to 2014 period, the software technology had not yet advanced to a point where the SMS messages that were sent (in other words, the completed calls) could be recorded. Therefore, it is unknown how many callers received SMS messages in the first period. It can be seen in Table 1 that 10782 messages were sent to callers, while 7898 calls were not completed. Since 2015, further developments in Microsoft software have enabled far more in-depth data gathering and analyses of which disclosure is prohibited in terms of the previously mentioned legislation.

The analysis of the data enables the representation of non-personal data, such as the calls per province in relation to its population, indicated in Table 2 below.

Table 2: The percentage of calls for each province compared to the percentage of population per province over the two indicated periods of data collection, (Statistics South Africa, 2014)

Province	Help Calls %	Population %
Eastern Cape	7%	13%
Western Cape	6%	11%
Gauteng	28%	24%
KZN	13%	20%
Free State	5%	5%
Northern Cape	1%	2%
North West Province	7%	7%
Mpumalanga	14%	8%
Limpopo	18%	10%

Table 2 shows the percentage of calls for each province compared to the percentage of population per province over the two indicated periods of data collection, based on the latest data published by Statistics South Africa (2014). While it is obvious that the highest volume of calls would come from Gauteng, the higher call volumes from Mpumalanga and Limpopo, for example, stand out. Figures 2 and 3, based on the same population count, visually represent the different call patterns recorded on the "Help-at-your-fingertips" service line over the two indicated periods referred to in this article.

Figure 2: Calls received per province on the "Help-at-your-fingertips service line from 2013 to 2014
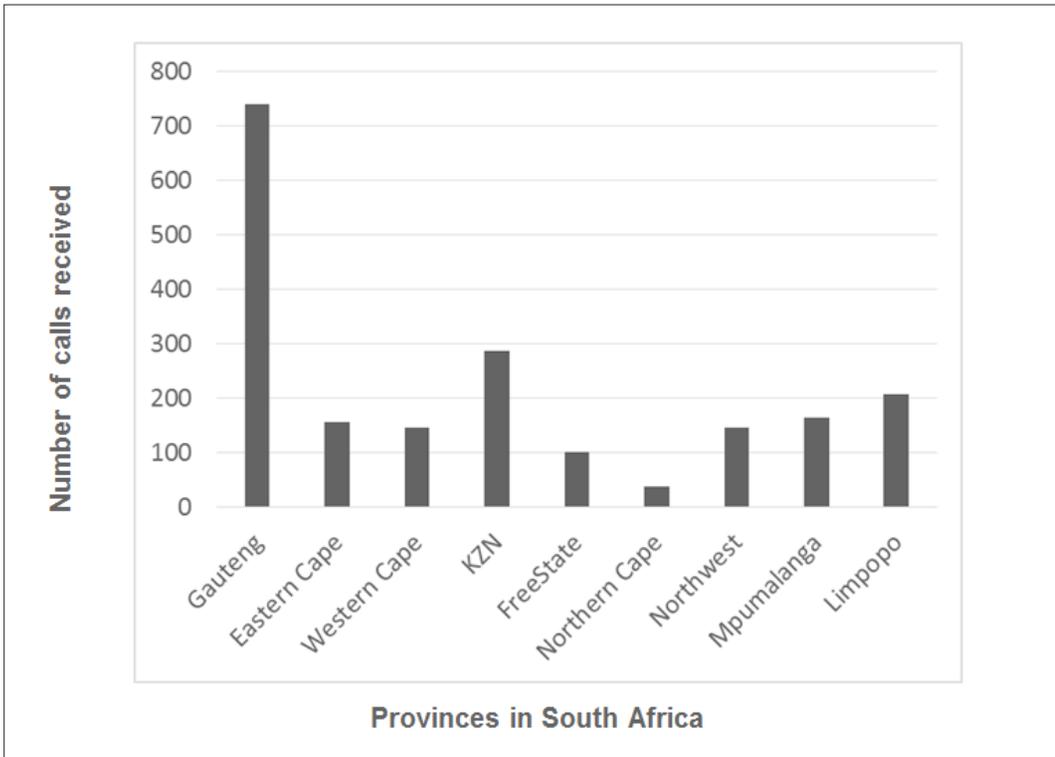
The change in call patterns in the different provinces can be seen in Figure 3, which indicates how the volume of calls to the "Help-at-your-fingertips" service line increased in the second period.

Figure 3: Calls received per province on the toll-free "Help-at-your-fingertips" service line from 2015 to 2016
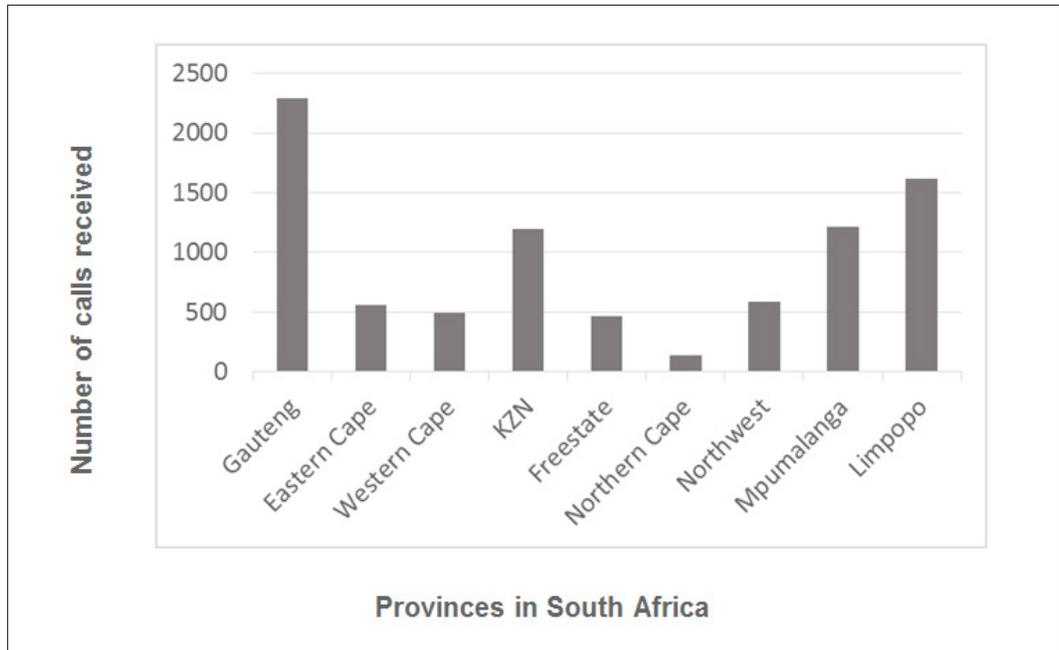

While the precise reasons for this increase cannot be pinpointed, we can indicate that 4 025 calls were received during the 16 Days of Activism for No Violence Against Women and Children from 25 November until 10 December 2015 (personal communication with C. Roberson, 9 January 2017), when the TEARS "Help-at-your-fingertips" service line was publicised on M-Net television channel. Another study that shed some light on the prevalence of SGBV in different provinces was the Gender Links study, referred to as the "War @ home: GBV Indicators research project". It involved a survey among 5621 South Africans in four provinces that were initially released on the eve of the 16 Days of Activism in 2012 (Gender Links, 2015). The study shows 77% of women in Limpopo reported experiences of SGBV in their lifetime, while only 48% of men admitted to committing such offences. Surprisingly, 78% of men in Gauteng admitted to being perpetrators of SGBV, while only 51% of women in Gauteng reported such experiences (Gender Links, 2015). In the Western Cape 45% of women reported experiences of SGBV and 35% of men admitted to being perpetrators; in KwaZulu-Natal 36% of women reported experiences of SGBV and 41% of men admitted to being perpetrators. While the TEARS data is not representative of the population in different provinces, and can therefore not be correlated with the Gender Links surveys, closer comparison of these data sets could be of value. For example, the high percentage of women in Limpopo who reported experiences of SGBV and the high

volume of "Help-at-your-fingertips" calls received from Limpopo province relative to the size of its population indicates the need for stronger intervention campaigns in this province, among others.

Figure 4 shows the average prevalence of calls received on the "Help-at-your-fingertips" service line over the different months of the year for the two periods.

Figure 4: Peak times of year for distress calls received on the "Help-at-your-fingertips" service line
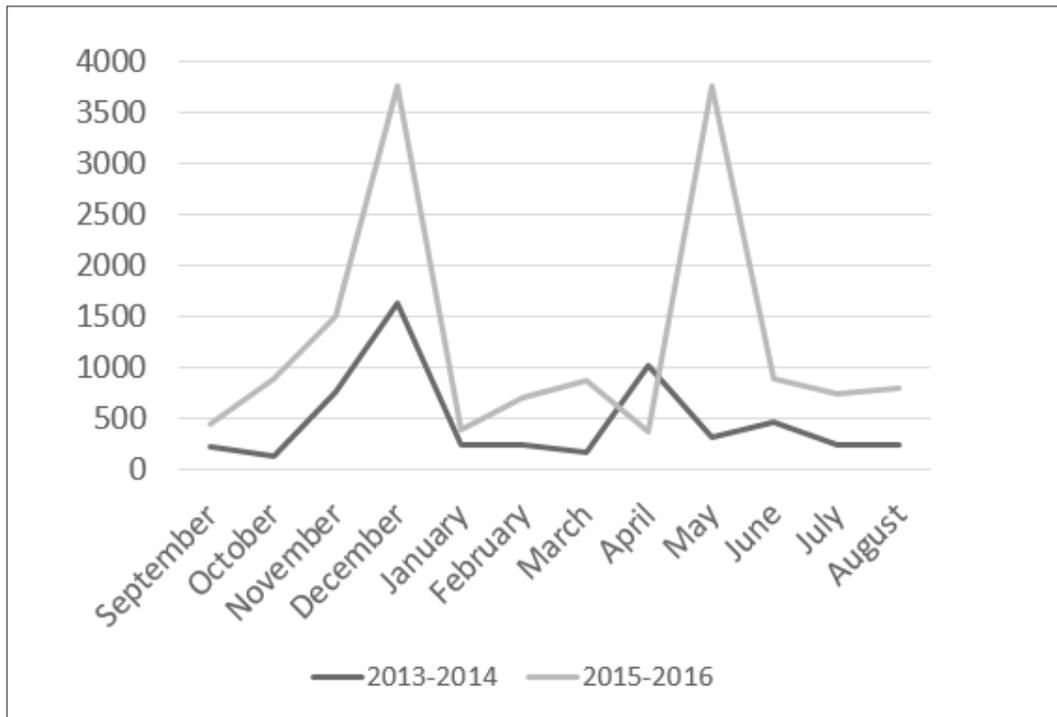
Given that these peaks appear to overlap with school holiday periods, a number of questions arise that require further investigation. Current findings suggest, for example, that high levels of alcohol and drug consumption (Seedat et al., 2009) over holiday periods in this case, increase the prevalence of SGBV incidents. Other evidence suggests that in many cases, SGBV acts are committed by learners in secondary school (Meinck, Cluver, Boyes & Loening-Voysey, 2016). Therefore, it cannot be assumed that SGBV incidents increase because parents are at home during school holiday periods, for example. As we show throughout this discussion, it is imperative that there is a comparison between different data sets to get further clarification on this trend in particular.

Figures 5 and 6 provide a summary of the average time of day for all of the provinces over the two periods indicated in this article.

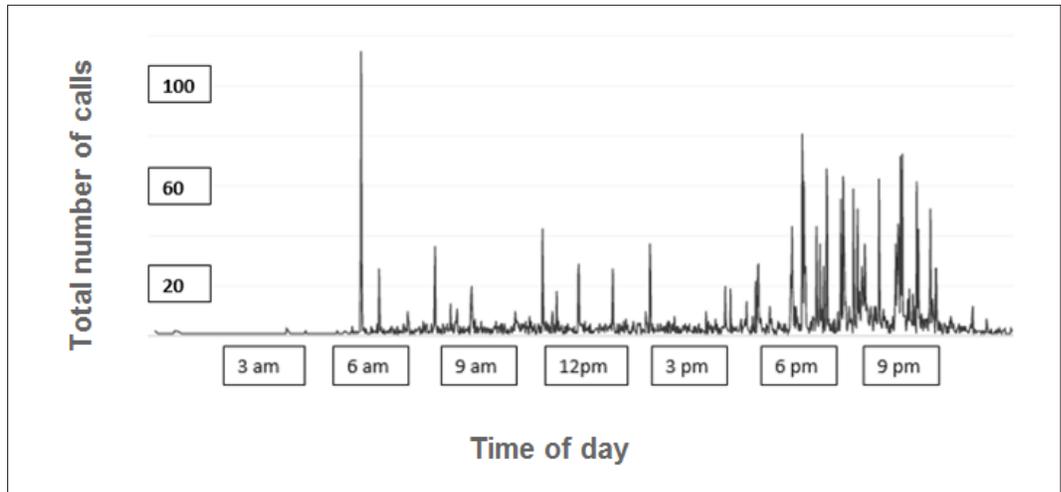**Figure 5.** Time of day calls peak: July 2013 to August 2014
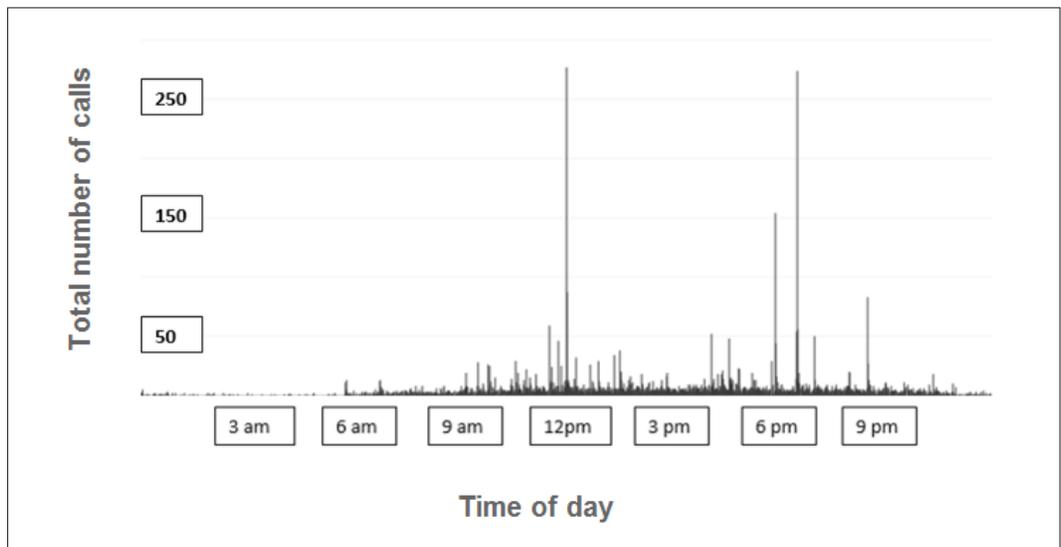

Figure 6. Time of day calls peak: September 2015 to October 2016

It is immediately apparent that the "Help-at-your-fingertips" service line was used far more frequently at night (between 6pm and 10pm) during the 2013 to 2014 period. Interestingly, this was also the period indicated by Jewkes and Abrahams (2002), who also indicated that a higher number of calls were received on Saturdays. It is also noted that the call centre

Jewkes and Abrahams (2002) refer to involved telephone calls being answered and not non-personal messages being provided on the screen of a mobile device, based on the location of the caller. The software we are using does not show the day of the week as a key variable. However, there is a big change in this pattern during the second period for reasons we can only speculate on and cannot verify at this stage of our analysis. Further cross-correlation with other qualitative and quantitative data will most certainly enable verification and more informed conclusions pertaining to the patterns indicated by the non-personal data we presented.

Figures 7, 8 and 9 show how different call patterns for different times of day can be developed from non-personal data for three provinces in South Africa, namely Eastern Cape, North West Province and Mpumalanga, over a combination of both periods (July 2013 to August 2014 and September 2015 to October 2016).

Figure 7: Peak times of day for completed calls in the Eastern Cape over the two periods
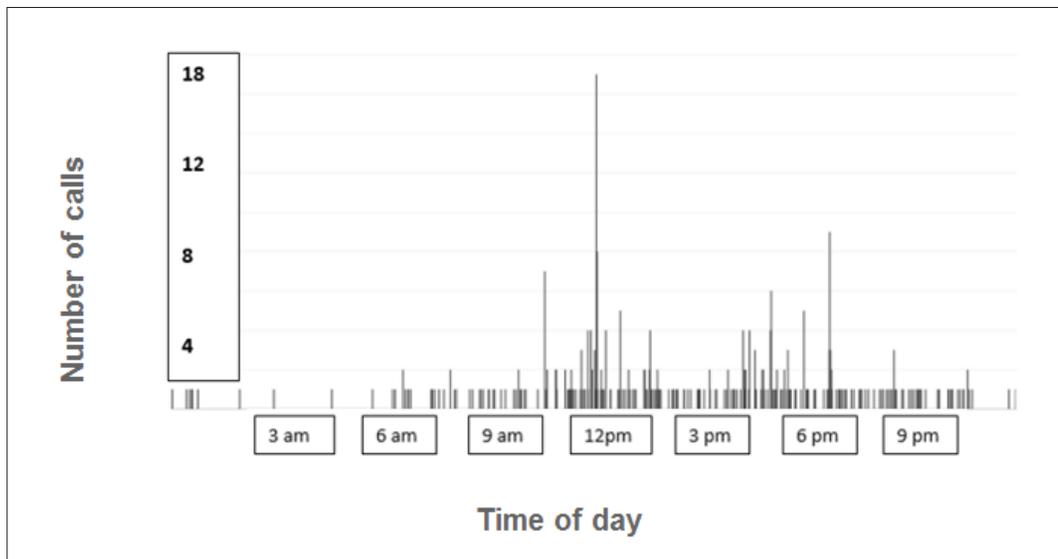
Figure 8: Peak times of day for completed calls in the North West province over the two periods
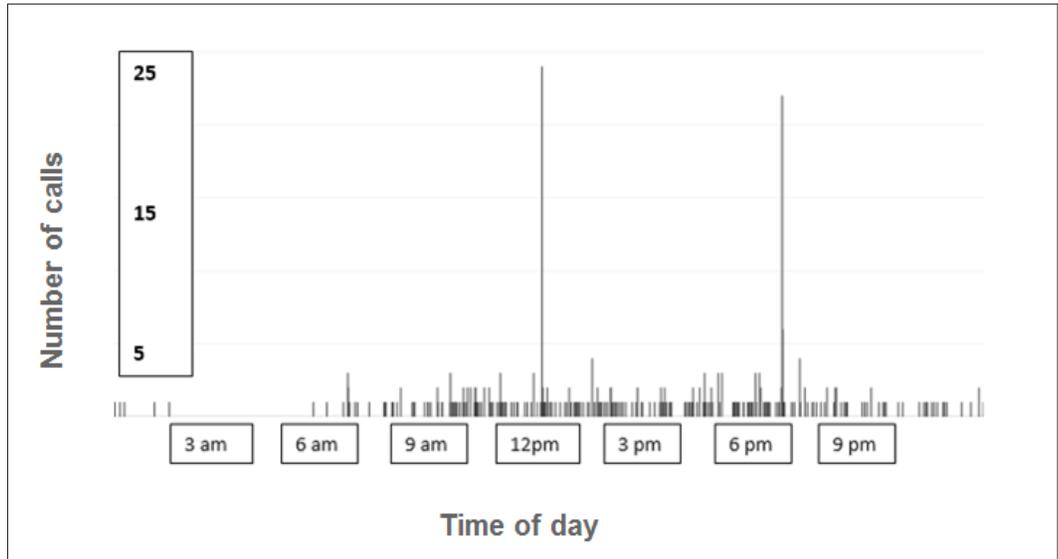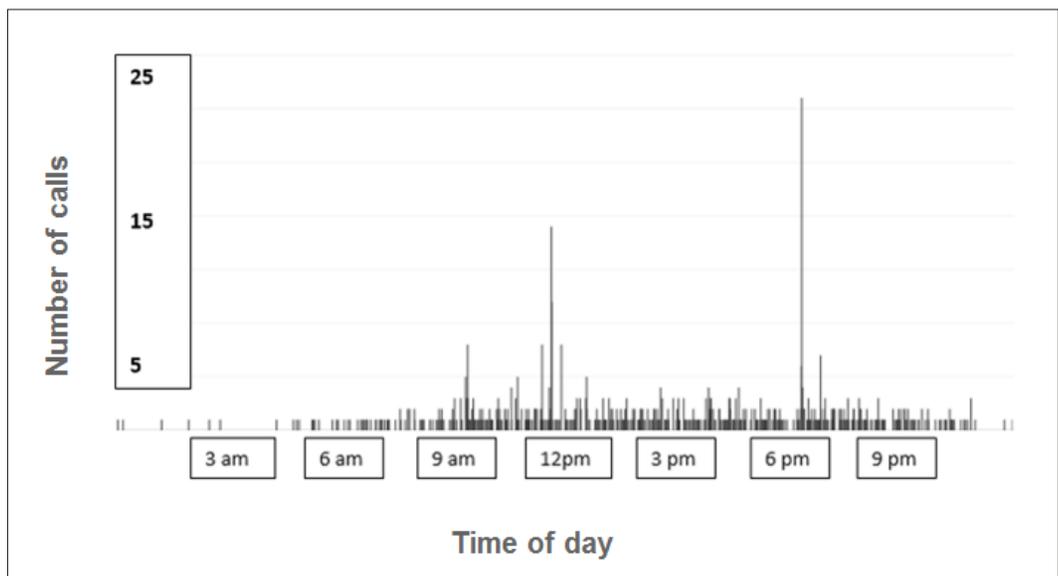

Figure 9: Peak times of day for completed calls in the Mpumalanga over the two periods

Interestingly, all three provinces show similar patterns with particularly high call volumes occurring around 12pm and 6pm. Further investigation is required in this regard as the common pattern has implications for tailoring prevention efforts. Figure 10 below offers a glimpse of the potential for analysis and intervention that mapping live data can offer.

Figure 10: Towns in Gauteng that indicate a significant volume of calls for 2015 to 2016

Although we stated earlier that three-dimensional live data cannot be displayed accurately or effectively because the columns on the maps change continuously, Figure 10 provides a snapshot of the calls mapped in the Gauteng area at the end of 2016. This map shows the volumes of calls from towns in Gauteng as it accumulated in the 2015 to 2016 period. In its live format, this map is played as a video clip that shows how the columns develop and increase for each town over the 13 month period. The value of live data such as this would lie in its accessibility for all stakeholders so awareness of incidences of SGBV can be increased. We reiterate that TEARS Foundation's mapping of live data is unique and cannot be compared to other studies using mapping technology, such as the study conducted by Ernest (2002), for example, that mapped static data.

DISCUSSION

Given how little is known about incidents of IPV and the prevention of femicide in South Africa, further developments in non-personal data technologies need to be explored. While there is no specific evidence relating to the impact of the "Help-at-your-fingertips" service line, besides the records of the number of victims that received information on support services, it is imperative to recognise its potential to have a significant heuristic value in the future. With more resources, the time patterns in the different provinces can be analysed more closely to establish, for example, if the majority of day-time calls are made from business areas or from residential areas. Further research can be conducted to establish why call patterns change; for example, whether interventions in certain towns or suburbs lead to higher call volumes during the intervention period. Non-personal data and geographic mapping are powerful tools for presenting statistical information in

visual formats that can be easily understood by anybody, should it be made available. Matzopoulos, Bowman, Mathews, and Myer (2010) suggest multiple interventions for violence prevention, some of which can be supported by the use of non-personal data; for instance, through contributing to campaigns to increase awareness of child maltreatment, IPV and DV in particular communities, for example. Even though this service provides no personal information about the callers, it can pinpoint specific areas where more specific victim-focused prevention strategies could be deployed in terms of the LSM specifications for each area. For example, the three-dimensional live data indicates very high call volumes for Sandton in Gauteng. Sandton includes multiple suburbs, but the disclosure of the prevalence of calls from these more affluent areas certainly could be eye opening. Further development of the "Help-at-your-fingertips" service line can distinguish between test calls, indicate time of calls in relation to the occurrence of the incident, specific service required, i.e. physical, psychological or emotional, or even a request for emergency assistance in the event of a life-threatening situation. If victims can be informed about, and encouraged to allow the use of LBS, the geo-mapping component of the service can provide much more detailed information for prevention purposes. On the other hand, as we mentioned earlier, a primary objective of the "Help-at-your-fingertips" service line is to assist victims wherever they are, which may not be near their residence. It is therefore possible that victims who do not have life-threatening injuries may wish to identify support services within the vicinity of their place of work or their place of residence. In such cases, using LBS would not provide them with the correct information.

With regards to Matzopoulos et al.'s (2010) suggestion that IPV offenders should be "named and shamed", current legislation will in all likelihood continue to constrain the mapping of convicted perpetrators' places of residence or work, for example. On the other hand, community policing could be encouraged by alerting residents to the occurrence of violence in their neighbourhoods. Such alerts may also caution people about alcohol abuse, as Matzopoulos et al. (2010) also suggest, as it may highlight its consequences within their immediate surrounding areas.

In summary, based on the representation of the actual calls received and the analysis of these calls, we suggest that further software development in non-personal data technology and its geographic mapping can revolutionise SGBV prevention and intervention programmes through its potential to:

- Provide a more accurate picture of actual volumes, locations, timing of SGBV distress calls in South Africa that can inform prevention strategies
- Facilitate communication between victims and support services through sensitisation and awareness pertaining to where and how frequently SGBV data can be made accessible to stakeholders

- Assist police to foster relationships between Family Violence and Sexual Offence Unit officers and community members
- Increase the provision of support services in higher income communities that are identified as particularly vulnerable
- Promote community interventions through developing active bystander approaches that can change norms about SGBV
- Increase support for NGOs such as TEARS Foundation whose capacity to develop life-changing technology is constrained by funding
- Provide data for the continuous monitoring of prevention and intervention strategies
- Support other research initiatives that can correlate personal and non-personal data.

LIMITATIONS

The reach of the "Help-at-your-fingertips" service remains constrained by a shortage of funds, as it is not publicised and advertised frequently enough. It was this shortage of funding that interrupted the data analysis for the period 2014 to 2015. It is also acknowledged that non-personal data probably raises more questions than answers, but as we have aimed to demonstrate, the visualisation of SGBV incident patterns can have a profound effect on public awareness and understanding of its incidence and trends.

It has to be noted that the high cost of data in South Africa, which has been raised in the "#Data-must-fall" campaign seen in social media towards the end of 2016, further limits and constrains the provision of this essential service and excludes victims who reside in rural and less affluent areas from access to mobile phones, technologies and support services (Sitto, 2016). While South Africa has a very high level of access to mobile phones, and the "Help-at-your-fingertips" service provides a toll-free line, follow-up services and access to cloud-based supportive data and information for victims and survivors is still limited by the cost of and access to data.

CONCLUSION

The purpose of this article was to explore how non-personal data obtained through mapping the distress calls received on TEARS Foundation's "Help-at-your-fingertips" service line can be useful for SGBV research and prevention purposes. The data in this study shows a high number of calls are received in spite of marketing and funding constraints that limited the publicising of this service. The cost of SGBV and its consequences has been estimated at R28.4-R42.4 billion for South Africa in 2014 (Khumalo, Msimang & Bollbach, 2014) or perhaps even as high as R112 billion, at current conversion rates, as suggested by K. Dalal, who is a senior advisor for the World Health Organization and an expert for cost and injury prevention and safety promotion, relating to SGBV (personal communication on

May 4, 2015). The detail of the cost calculation method for SGBV can be seen in Dalal and Dawad (2011). Geo-mapping and other kinds of non-personal data collection do not entail a fraction of those costs and could therefore be funded by both the government and private sector in South Africa, as Seedat et al. (2009, p.1019) suggest when they state: "Successful violence and injury prevention is contingent on the identification by the government of these issues as strategic priorities; … and development and implementation of a prevention and containment plan that is intersectoral, strategic, and evidence based." We conclude that the non-personal data we have introduced can be further explored and developed to contribute to meeting these requirements.

At a societal level, the publicising of the high prevalence of SGBV in South Africa in a three-dimensional live data format could present reality in an unmistakable format for all South Africans to see. Should such data be made available, it can serve to encourage South Africans to rethink the sentiment of "family" where SGBV is perpetrated, cultivated and perpetuated through silence, stigma and, ultimately, exclusion. Live three-dimensional data can be used as a powerful tool for society to see the magnitude of SGBV not only in South Africa but across the world.

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