Estimating the size of the **sex worker population** in South Africa, 2013

sweat Sex Workers Education & Advocacy Taskforce

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Preface

The South African National AIDS Council (SANAC) is tasked with coordinating the country's response to HIV, TB and STIs across all government departments and civil society sectors, monitoring the implementation of the National Strategic Plan (NSP) aimed at responding to these three epidemics; as well as mobilising resources for the effective functioning of SANAC and the implementation of the NSP.

SANAC recognises that, like the rest of the South African population where 5.6 million people are estimated to be living with HIV, sex workers are at a much higher risk of HIV, TB and STIs compared to the general population. As a result, it is important for our country to have programmes specifically tailor-made to target the health needs of this sector of society. In this light, the SANAC Secretariat is working with the SANAC Sex Worker Sector and numerous organisations providing advocacy and services for sex workers to establish a national programme for HIV prevention among sex workers and their clients and partners.

Sex workers are highly vulnerable to HIV and other sexually transmitted infections (STIs) due to multiple factors, including large numbers of sex partners, unsafe working conditions and barriers to the negotiation of consistent condom use. Moreover, sex workers often have little control over these factors because of social marginalisation and the restricted legal framework under which they are forced to work. Alcohol, drug use and violence further exacerbate their vulnerability and risk.

HIV prevalence rates amongst female sex workers are thought to be as high as 59.6%1, compared to 13.3% amongst women in the general population. This calls for an urgent scaled-up, coordinated national HIV prevention programme for sex workers. However, when designing targeted interventions as part of an expanded and comprehensive response to HIV and AIDS, reliable information is required on the size of high-risk population groups such as this one.

While South Africa is able to measure the level of risk behaviour and HIV and STI infection in sex workers, there is limited data to give an indication of the absolute size of this sub-population. Recognising this as a limitation, SANAC commissioned a sex worker size estimation study, and the results are presented in this report. The work was carried out by multiple partners under the leadership of the Sex Worker Education and Advocacy Task Force (SWEAT).

Up until now, there have been various estimates of the number of sex workers in the country. The inaccuracy of these figures has proven to be a hindrance for programme planning and implementation. No concerted effort had ever been made to estimate the total size of the sex worker population in the country.

This survey marks a new chapter in South Africa's response to HIV and AIDS. It will provide the government and other stakeholders with data to make evidence-based decisions on how to create an enabling environment for the provision and accessibility of preventive services for sex workers in South Africa.

The findings of this sex worker population size estimate will lead to concerted efforts for the design of comprehensive programming, implementation and monitoring and evaluation of targeted intervention programmes.

Let us join our hands as we deepen and strengthen our response and seek innovative ways to sustain our interventions for sex workers, their clients and partners.

Dr Fareed Abdullah
Chief Executive Officer, SANAC

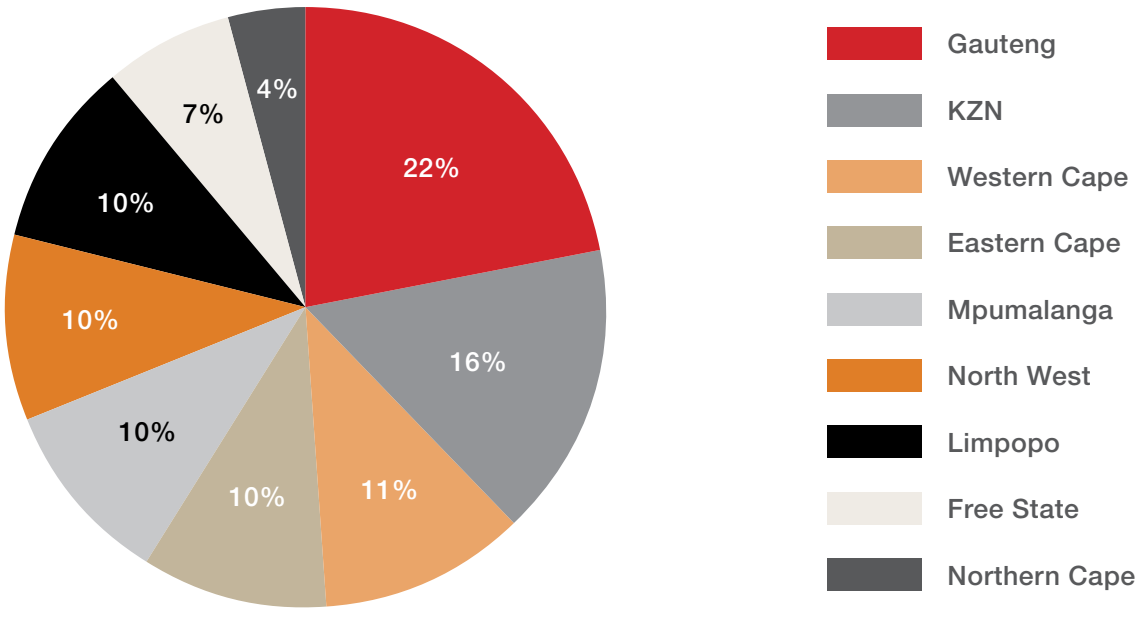
1. Baral, S., Beyrer, C., Muessig, K., Poteat, T., Wirtz, A. L., Decker, M. R., Sherman, S. G., et al. (2012). Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. The Lancet infectious diseases, 3099(12), 1–12. doi:0.1016/S1473-3099(12)70066-X

Summary of key results

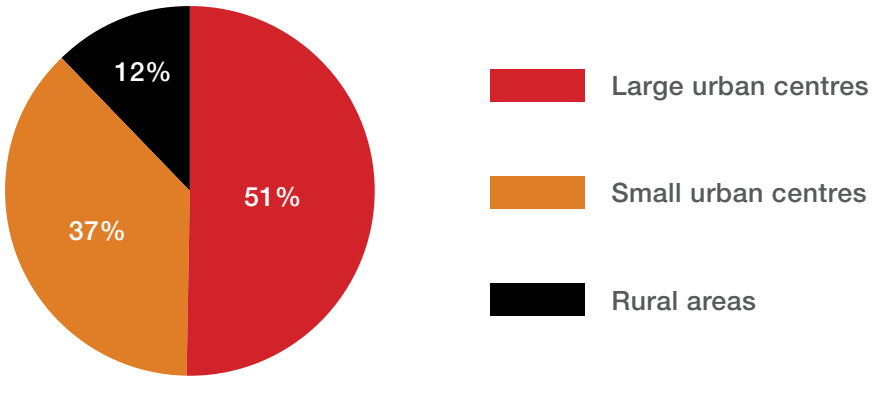
National estimates

Number of sex workers in South Africa (rounded to the nearest 1000)			
	Minimum	Intermediate	Maximum
Female sex workers	121 000	138 000	167 000
5% Male	6 000	7 000	8 000
4% Transgender	5 000	6 000	7 000
NATIONAL TOTAL	132 000	153 000	182 000
% of adult female population	(0,8%)	(0,9%)	(1,1%)

Provincial distribution for intermediate estimate



Distribution across rural and urban areas



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Acronyms

CSIR	Centre for Scientific and Industrial Research
SANAC	South African National AIDS Council
SWEAT	Sex Worker Education and Advocacy Taskforce
TLS	Time Location Sampling
UCSF	University of California San Francisco
UNFPA	United Nations Population Fund

Acknowledgements

1. Introduction

The South African National AIDS Council (SANAC) is in a process of developing a National Plan for HIV and Sex Work programming for South Africa, in order to operationalise the commitments of the National Strategic Plan for HIV, STIs and TB 2012-2016. Given that HIV prevalence rates amongst female sex workers are thought to be as high as 59.6% (Baral et al., 2012), there is an urgent need for a scaled-up, coordinated national HIV programme for sex workers.

An annotated bibliography was completed as part of this study. It was found that data relating to sex work in South Africa is inadequate; no size estimations involving field work have been done on a national scale. The only two studies which estimate population size of sex workers in South Africa are the SACEMA Mode of Transmission Study (2009), which used mathematical modelling and not fieldwork, and the Gould and Fick study "Selling Sex in Cape Town" (2008), which only deals with Cape Town. Working estimates are largely based on a study by Vandepitte et al (2006), and the key statistic on which assumptions are based is the finding by Vandepitte that between 0,3 and 4,3% of adult females are sex workers in a range of African cities, although not including South Africa. Based on this, SACEMA has based calculations on a ratio of 1% of adult females.

SANAC has therefore requested SWEAT (Sex Worker Education and Advocacy Taskforce), an organisation that addresses the health and human rights of sex workers in South Africa, to conduct a rapid assessment of the sex worker population size. The SWEAT size estimation study has also referred heavily to the Vandepitte results, and has compared ratios of between 0,6% and 2% with findings in sampled sites.

The study aims to estimate the number of sex workers in the country in order to:

- Inform the development of the SANAC Sex Work Sector Plan, linked to the National Strategic Plan for AIDS, STIs and TB 2012-2016
- Coordinate resource mobilisation
- Provide a basis upon which to improve coordination of SW programmes and avoid duplication
- Guide budgeting and investment

A reference advisory group consisting of sex workers, academics, multilateral donors, SANAC, and project implementers was set up to provide guidance and act in an advisory capacity to the research team so that they were able to effectively gather information on the numbers of sex workers and settings in which sex work takes place (e.g. brothels, hotels, street, taverns/ bars, truck stops, home-based).

2. Methodology

The methodology employed in this rapid population size estimation study was based on the "Wisdom of the Crowd" (UCSF, CDC, UCT and ANOVA, 2013; Jonas and Patel (undated)) using multiple data collection methods which included mapping (Centre for Global Public Health, 2012), focus group discussions and interviews. Figure 1 shows the process that was followed, which is then described.

Figure 1. Methodology for the sex worker population size rapid estimation study

Selection of sites

- Identification of sites in each province with already established access to sex workers
- identification of different "types of areas" using geo-mapping statistics

Data collection

- Mapping focus group with local sex worker informants to map out area, identifying all hotspots and their "operating times"
- Plot route along map for data collection exercise
- Rapid interviews with as many informants as possible along the route
- Re-mapping focus group with key informants to compare estimates at visited hotspots with hotspots not visited and extrapolate total numbers for the site

Data extrapolation

- Using key statistical information about cities and towns in South Africa, and primary data collected, develop a set of assumptions and formula to extrapolate data to rest of the country
- test and revise these assumptions with a group of experts, based on their and other existing knowledge
- apply revised formula to all towns in SA to develop a national and provincial estimates.

2.1 Selection of sites

Determined by budget and time limitations, 12 sites around South Africa could be visited. Convenience sampling was used for the site selection, with the key criterion of access into a sex worker network in the study area, through a partner organisation or colleague. This connection provided access to local knowledge about sex work for access to sex workers and other relevant informants for the study.

The following criteria were also applied:

- A site in each of the nine provinces of South Africa
- Sites that ranged from low to high population density
- Places that had high levels of "mobile men" (i.e. men living away from home) such as truck routes and mines
- Various "types of places" as per the categorisation used by the Built Environment Unit at the Centre for Scientific and Industrial Research (CSIR):
    - city
    - city region
    - regional centre
    - service town
    - small service node
    - local or niche town
    - rural
    - rural node.

The 12 sites and rationale for selection are shown in Table 1 below:

Table 1. List of study sites and some characteristics

Province	Town surveyed	Population Census 2011	CSIR classification	Geographic character and rationale for selection as a study site
Gauteng	Johannesburg	4,434,816	City region	• Largest metropolitan area • Partner organisation (WrHI) • Hillbrow –highest known density in the country (outlier)
North-West	Rustenburg	399,931	City	• Mining area and trucking route • Partner organisations (Lethabong Legal Assistance Centre) • To get mining figures and explore numbers for mine surrounded by dense rural nodes
Mpumalanga	Witbank	299,213	Regional centre	• Mining area and trucking route • Partner organisation (HDA) • Explore numbers in mining areas in a city region
Eastern Cape	East London	512,418	City region	• Metro, trucking route and port • Partner organisation (ELHTA) • Smaller (coastal) town on a truck route
Western Cape	Cape Town (including township areas)	3,736,199	City region	• Study sites included township areas • Partner organisation (SWEAT and TB/HIV Care) • City, and explore township areas surrounding a large city
	Beaufort West	32,887	Service town	• Trucking route • Partner organisation (PSH) • Small local/service town on a major trucking route
Northern Cape	Kimberley	226,554	Regional centre	• Trucking route • No partner organisation, but Cape Town peer has contacts with sex workers there • Service town surrounded by sparse/rural areas on major trucking route
KwaZulu Natal	Durban	3,442,388	City region	• Partner organisation (TB/HIV Care and Lifeline Durban) • Have detailed count from TB/HIV Care for comparison
	Pongola	31,982	Service town	• Border town on trucking route, surrounded by dense rural area • Sisonke knows area, recent mapping by DOH
Limpopo	Musina	40,973	Service town	• Border town on trucking route • Partner organisation (CPC)
	Thohoyandou	140,821	Regional centre	• Partner organisation (TVEP)
Free State	Bloemfontein	474,105	City	• No partner organisation, but a SWEAT peer educator is well networked there and knows area

2.2 Data collection

The data collection phase involved a three step process:

1. A 'mapping' focus group
2. Onsite interviews at a sample of sites
3. A 're-mapping' focus group.

2.2.1 Preparation and the field team

Four field workers were recruited for the study, based on researchers' past experience working with vulnerable groups, past experience as researcher, ability in a range of languages, gender balance and availability.

Piloting the methodology

The method was tested in Cape Town with the help of sex worker peer educators, who participated in a mapping exercise, on-site interviews at various hotspots around Cape Town (on a Friday night to ensure access to as many sex workers as possible) and a re-mapping session with sex worker peer educators. Tools and methods were amended based on the experiences from the pilot.

Field research training

Field researcher training was then conducted in Cape Town with the research team coordinators, three of the fieldworkers (the fourth received training in Gauteng) and SWEAT peer educators who acted as guides. Researchers were trained in:

- Overview of the study and introduction to mapping
- Brief information about SWEAT and the sex work industry
- Communication skills (including interviewing and probing techniques)
- Methodology and protocol
- Safety in the field
- Map reading and map making techniques
- Forms and how to fill them out
- Data collation
- Documentation

The training was practical – after some background information and discussions, the field researchers participated in a mapping exercise with the guides, plotted a route and then conducted interviews along this route that evening with the key researchers and guides. The next day, a re-mapping exercise was undertaken, and a debriefing session highlighted further necessary revisions to tools and the methodology.

Fieldwork support

Each fieldworker was assigned to one of the research coordinators, who acted as the main contact for the field researcher and his/her allocated sites. The researcher provided support to the fieldworker with regards to data collection preparation and whilst in the field. Each researcher attended a data collection visit to at least one site visit with the fieldworker. Other support was provided via cellphone and email during the data collection period.

In each of the study sites, SWEAT arranged field support and participation from their partnering organisations or Sisonke members. Sex worker peer educators and/or Sisonke members assisted with mapping and re-mapping, access to sex worker networks, and they acted as guides during data collection for both access and security reasons.

2.2.2 Mapping

As illustrated in Figure 2, a group of sex worker peer educators and Sisonke members used a map of the area and surrounds to:

- Identify all the known sites where sex work takes place
- Note the times in each area when it is busiest in terms of sex work (e.g. the beach is only between 11h00 and 16h00 as the clients are workers from the factory nearby, the girls only arrive outside the clubs after midnight, etc.)
- For large areas (e.g. Johannesburg, Cape Town): identify which hotspot sites are similar to which others and approximate sizes.

Sampling strategy

A method based on time location sampling (TLS) was used to select venues at each study site at which to conduct interviews. TLS is a probability-based method for enrolling members of a target population at times and places where they congregate (UCSF, CDC, UCT and ANOVA, 2013). TLS is a procedure in which venues (e.g. bars, parks and brothels) and the time at which they are used are the primary sampling units. The sampling process is:

- The map developed in the mapping stage is used to develop a sampling frame
- Venues are selected from the sampling frame of the universe of potential venues
- A specified day and time period associated with the venue is then selected
- Selected venues are visited by fieldworkers during the specified period.

While TLS recommends sampling these venues and times randomly and then counting sex workers at the randomly selected venues, in this study we selected sites purposively as we had a limited number of hours in which to conduct the fieldwork. Sites that were busiest and which formed an efficient route, coinciding with the timing of most active sex work were selected.

At each site in the study, the mapped sites were used to plot a route for the fieldwork over a few hours (usually from the afternoon into the early hours of the morning). For example, the route could be to start at Site B, move to Site C, continue to Site A, then to Site D (Figure 3).

Figure 2. Example of a sex worker hotspot mapping exercise

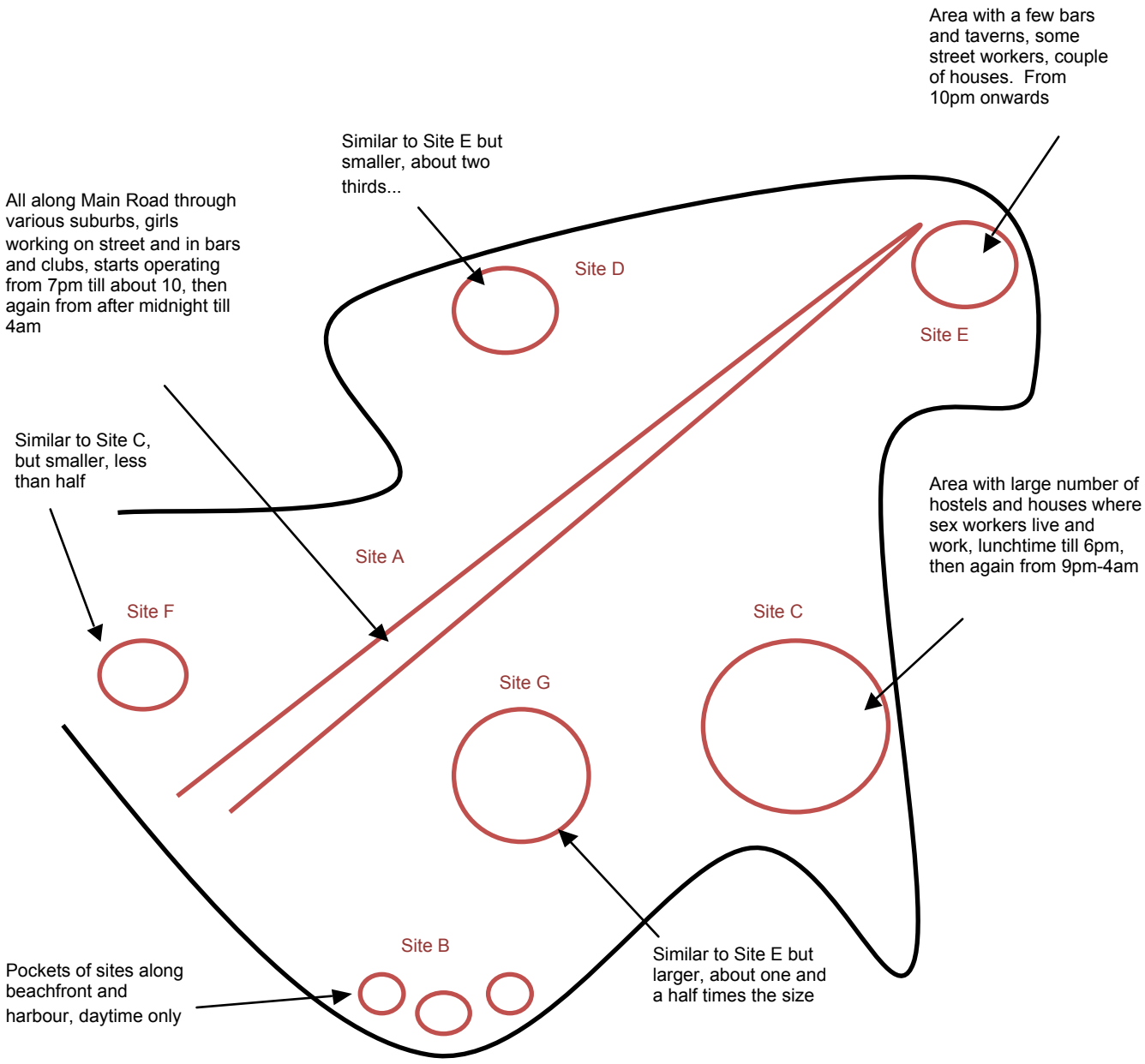
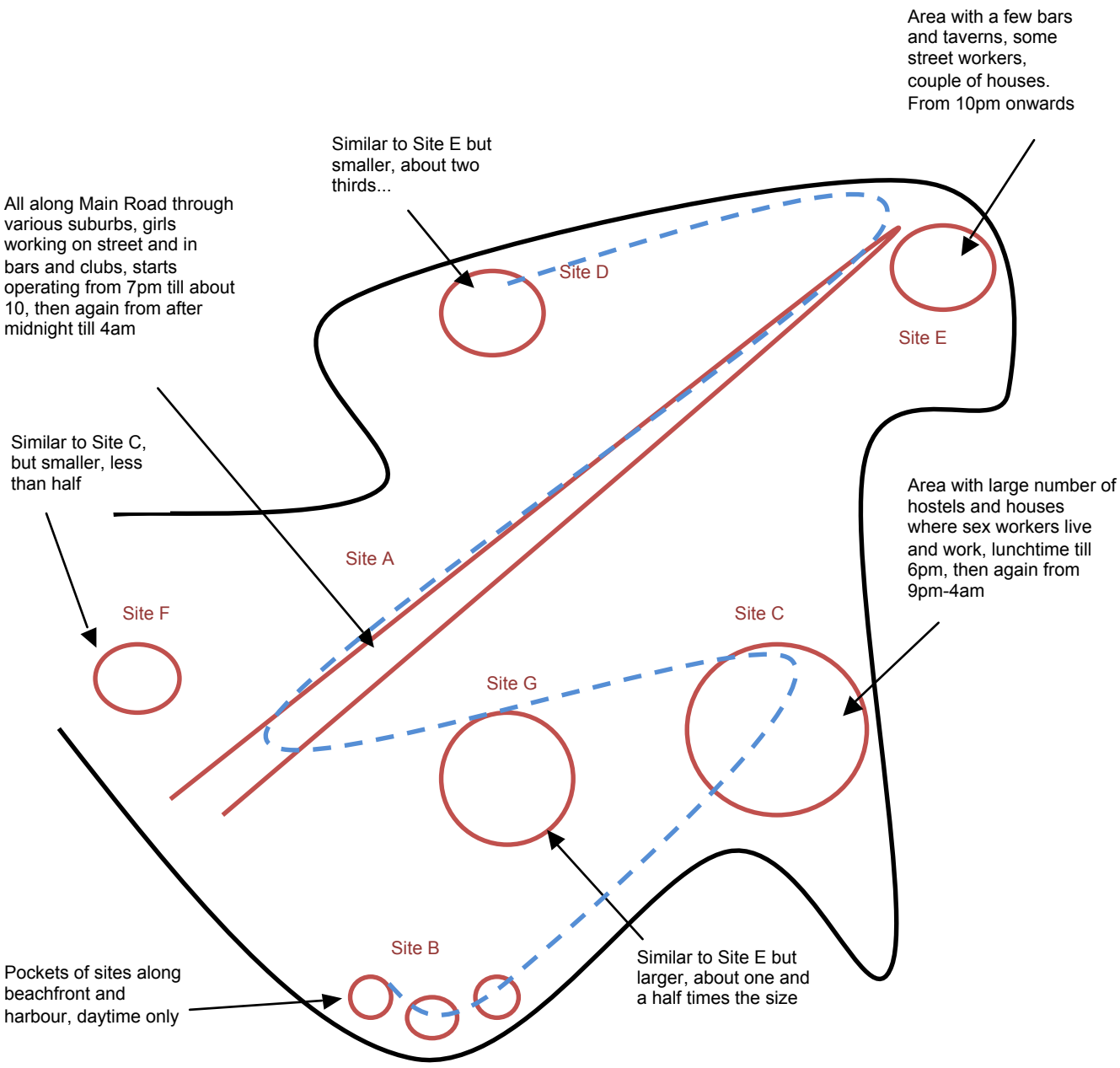


Figure 3. Example of a fieldwork route using a sex worker hotspot map



2.2.3 Onsite interviews

The method used was a Modified Delphi method, also called the "Wisdom of the Crowds Method", where informants are asked for their best estimate of the size of their population in their location (UCSF, CDC, UCT and ANOVA, 2013; Jonas and Patel (undated)).

Accompanied by a group of sex workers, the research team followed the planned route, ensuring that venues were visited at peak sex work times. The guides assisted to identify sex workers and other possible key informants along the way and initially approached them to participate in the study.

All of the site visits were conducted during peak sex work times – during pay week (between the 25th of the month and the 1st of the month after) and on Friday and Saturday nights.

Informants who were engaged during the study included sex workers, brothel managers, barkeepers, club and bar bouncers, police officers, shop keepers, controllers and so on. Informants were asked:

- To estimate the number of sex workers at that particular venue
- To identify other venues where sex workers can be found in the area, and to estimate how many were in these other venues
- To clarify whether the sex workers from that venue worked in different sites as well (e.g. do the same women work in the bars and on the street? Do the women in the truck stop work anywhere else?) so as not to double-count
- To mention other possible types of places that sex workers could be found (e.g. houses, brothels, street, clubs) or any other leads.

A typical interview began with the core question posed to all respondents, "How many sex workers do you know of work in and around this street/bar/area?" The exact area is then ascertained: "Do you mean 20 from here to the corner 2 streets away?" Important follow up questions included, "Where else do you know that sex workers work?" "How many work in each of those locations?" "Where do male/transgender/female sex workers operate?"

The field team spoke to as many informants as they could find and as many different types of sources (e.g., bouncers and sex workers) and did not move away from a venue until they felt very confident about the estimated number of sex workers in that area.

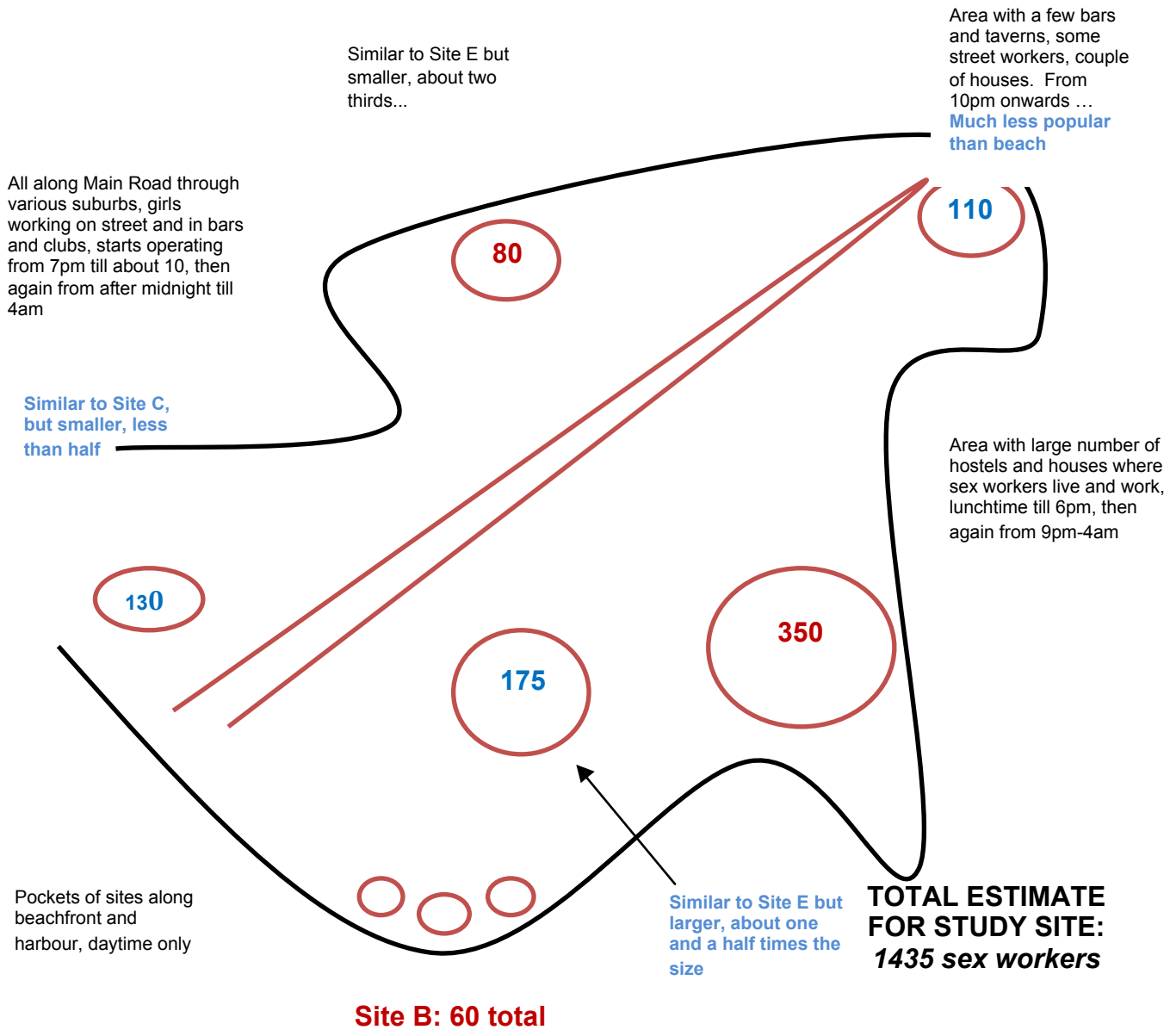
2.2.4 Re-mapping

At smaller study sites (e.g. East London, Pongola), the field team visited all identified hotspots and then checked the final estimated numbers with peers during or at the end of the fieldwork. In larger areas with a higher density of sex workers, an extrapolation session was held to obtain a figure for the whole area. Using convincing numbers for the venues at different scales (e.g. per hotel / per suburb), knowledgeable peers estimated numbers for all known sex work areas by comparing each venue on the map with the sites that had been sampled during the fieldwork. Examples of re-mapping questions:

- We know that Rosebank has 5 houses, are there more houses in Sandton than Rosebank?
- Are the three bars in Midrand the same size as those in Times Square?
- How many floors are there in the three hotels in Brakpan?
- Are there more or less girls who work the streets in Parow than Bellville?
- Do the other townships have a similar number of sex workers operating within in the township?

As much as possible, during re-mapping, we engaged additional sex worker peer educators to those peers who had been involved in mapping and guiding in order to gain additional knowledge about venues and any other data sources that they might suggest. We also checked our initial estimates with them. Error! Reference source not found. shows an example of re-mapping (known numbers in red, extrapolated numbers in blue).

Figure 4. Example of a re-mapping exercise



Challenges in the data collection phase

Some of the challenges encountered included:

- The time constraints for this study meant that only one day/evening was spent per site, limiting the area that could be covered. This was sufficient time for all smaller sites, but did not permit exhaustive coverage in Durban, Cape Town or Johannesburg.

- The identification of hotspots was based mainly on the sex worker peer educators' knowledge. Researchers did attempt to snowball during fieldwork by asking all informants about any other spots that they knew where sex workers operated. It is nevertheless likely that there are unknown spots that have not been included in initial estimates.

- Although sex worker guides facilitated access to places which would otherwise have been closed to researchers, they could not always access informants at all venues. For example, some of the higher end escort agencies and some bars would not engage with Sisonke and the peer educators. The research team was unable to access all venues and any estimates for these were very rough.

- Male sex workers were not adequately captured through this methodology. It was found that they operate differently to the females; they are reported to be more "undercover" and many work online. Bouncers and managers at gay clubs were also more hesitant to speak to the field teams, even if accompanied by a male sex worker.

2.3 Data extrapolation

The CSIR provided the research team with a table of all towns in South Africa, with the following data for each town:

- Town type
- Total population size (Census 2011)
- Number of women between the ages of 15 and 64 (Census 2011)
- Number of men employed in the mining industry
- Total number of men employed in the transport industry

The full research team (researchers, field researchers and SWEAT coordinator) gathered to discuss findings from all 12 study sites and identify similarities and trends across the sites. The group used the numbers gathered in the data collection phase, along with key factors that increase the likelihood of sex workers (levels of urbanisation, high numbers of mobile men, population size), to extrapolate numbers of female sex workers for other cities, city regions and some of the local and service towns for which we had first-hand knowledge.

We were able to manually estimate numbers for about 60 sites in this way. This information was then used to calculate a percentage of the female population aged 15-64 that could be expect to be sex workers in the different types of areas (city, city regions, service towns, local towns etc.). These estimates were then compared with the data provided by Vandepitte (2006), and a range of assumptions and ratios prepared.

The process of extrapolating numbers for all South African towns was to:

1. Apply a sex worker percentage (according to the type of area) to each town to get the minimum estimate number of female sex workers in that town
2. Add numbers of sex workers if the town is on a major transport route (depending on population size and number of males employed in the transport industry), with a minimum of 10 and a maximum of 150 per town
3. Add numbers of sex workers depending on the number of miners. A ratio of sex worker:miners was calculated from the Rustenburg fieldwork and other sources, as follows: 80% of miners live in hostels, and there are 200 sex workers / 12,000 hostel miner (Rustenburg data), and a minimum of 20 sex workers per mining town.
4. The total, all inclusive ratio used for border towns was based on estimates from Pongola and Musina. This high ratio was assumed to include the trucking weighting and was used without adding.

Additionally, sex workers who advertised on the largest websites (http://www.sextrader.co.za and www.cumtree.co.za) were counted. The research also found that male sex workers (those who have sex with men and those who have sex with women) operate from a certain adult store, with branches all over the country. For each of the 66 branches, 10 male sex workers were assumed.

As it was difficult to find estimates for male and transgender sex workers using the "Wisdom of the Crowd" methodology. Male and transgender estimates were therefore based on the ratio of respondents in the SWEAT survey of October 2012, at 5% of female sex workers for males and 4% for transgender (SWEAT and Impact Consulting, 2012).

2.4 Confirming assumptions and extrapolation process with a panel of experts

Raw statistics and indicative calculations were presented for further analysis and interrogation in a data analysis meeting with SWEAT and an expert panel including representatives from SANAC, UNFPA, UCSF, TB/HIV Care, SWEAT and Sisonke Sex Worker Networker. Initial assumptions and figures were verified and experts provided guidance to revise formula and estimates, and to apportion the population to different regions of South Africa.

All discussions and agreements from the meeting were implemented to the calculations again, and four estimates were produced based on a progressively interrogated set of assumptions. These assumptions, and the reasons for adjusting them, are described in Table 2 below:

Table 2. Assumptions guiding the four estimates

Assumptions for estimate 1 (unrealistically high)	
Assumption 1: Large metropolitans	J Vandepitte, etal. (2006) reported female sex worker rates in capital cities to range between 0.7% and 4.3% of adult women (aged 15-64). Based conservatively on this range, cities were estimated at 2% of adult female population for estimate 1. Places with populations of over 1 million are considered equivalent to capital cities.
Assumption 2: Local or niche towns	The estimation study gave a minimum of 0,3% of adult women, and evidence that this is undercounted by about half. Supported by Vandepitte, the minimum local or niche town percentage is estimated at 0,6%.
Assumption 3: Rural areas	Rural areas have particularly low sex worker populations based on the estimate study, and 0,3% of adult women was applied.
Assumption 4: Large cities and major towns	Vandepitte provides an average for provincial towns of 1%. The same ratio is applied to areas around large cities (city regions) and smaller towns with a strong tourism industry.
Assumption 5: Mining sector	The number of people employed in the mining sector in each location is known (CSIR data). These are assumed to be men for the purposes of the study. 80% of mine employees are assumed to live in hostels. According to the estimate study each 12 000 hostel dwelling men are served by 200 sex workers. This ratio is calculated and added to the basic number - using a minimum of 20 sex workers for smaller mine populations. Mine populations of under 100 are excluded as being likely to be resident and non mobile.
Assumption 6: Trucking	Vandepitte found a ratio of 2,7% sex workers to adult female population at major truckstops. With trucking dispersed along all major South African routes and major truckstops not mapped, this statistic is not used. Instead an additional 0,3% of adult women is added to all sites on an N route or another known major trucking transport route or harbour, with a minimum of 10 and a maximum of 150 sex workers. This is based on the estimate data for trucking towns. This addition in not applied to the places classified as cities, since the 2% total is expected to include trucking trade. The trucking weighting is also not included for border towns, which are dealt with separately under Assumption 7.
Assumption 7: Borders	The estimate study provided a ratio of 4,5% of adult women from confirmed statistics in Pongola. Ndola on the DRC/Zambia border only has 2,4% of adult females (Vandepitte). It is possible that in South Africa there is a higher proportion of unregistered residents than elsewhere, accounting for the higher ratio observed in SA. A ratio of 4% is used for border towns in SA.
Assumption 8:	Hidden, home-based and high cost sex workers are not captured in the estimate method, and are assumed to represent an additional 5% to the female sex worker estimate.
Assumption 9: Male and transgender	Male and transgender are calculated as a ratio of female sex workers, at 5% and 4% respectively. This is based on the proportion of respondents in the SWEAT survey in October 2012.
The detailed geographic study and comparison with the estimate study research results suggested several under and over estimates for data based primarily on the Vandepitte results. Estimate 2 reconsiders the data and is considered a more likely number.	

Assumptions for estimate 2 (maximum estimate)	
Underestimates	Using the research data collected and reported for each site in the full report, regional centres or large towns that have unusually high tourism, students or commerce for a small resident population are given a basic ratio of 1%. Some of these remain possible underestimated. Towns with particularly high drug and alcohol challenges, and/or large numbers of seasonal farm workers are also underestimated if we use the 1% ratio.
Adjustment to Assumption 6: Trucking	The trucking addition is increased for estimate 2 (although still with a range of 10 to 150) in an attempt to inflate some of these high interaction sites. This assumes that many of these centres are also nodes on major trucking routes.
Overestimates	Other regional centres, however, are known to have ratios of far less than 1% from the estimation study. There are a great deal more 'ordinary' regional centres than these exceptional sites, and it is hoped that overall most under and over estimates even out.
Adjustment to Assumption 1: Large metropolitans	The Vandepitte average of 2% for capital cities resolves to 26,000 sex workers in Cape Town and 31,000 in Johannesburg. These numbers are far too high. Our estimates of approximately 5000 in each city are known to be underestimates, but having visited the most popular sex worker hotspots, we cannot support the 2% calculation. Further research may raise the number, but for Estimate 2 we would suggest using a ratio of 1% for metros.
Assumption 10: Large provincial cities of population between 200 000 and 1 000 000.	1% of larger, concentrated cities also produces figures that raise scepticism - East London at 1200 (compared with a thorough research count of 200), Pietermaritzburg at 2000, and Port Elizabeth at over 3000, we would suggest are excessive. The research also showed that townships on the outskirts of cities have far lower numbers of sex workers, who often live in townships and prefer not to work as sex workers around their home areas. Our results estimate only 30—50 sex workers in a township the size of Khayalitsha. A ratio of 0,6% for all provincial city sites, including surrounding suburban areas is used for Estimate 2.
Based on the observations in the estimate study, 1% and 0,6% still seem high for many places, and particularly for cities. There are however notable places where these ratios are probably low. While we assume that the under-estimates balance the over-estimates, our observations suggest that the basic numbers remain on average a slight over-estimate, and that a third, more conservative estimate is advised. These will benefit from better data to support more accurate ratios in the future.	

Assumptions for estimate 3 (intermediate estimate)	
Adjustment to Assumption 1: Large metropolitans and Assumption 10: Large provincial cities of population between 200 000 and 1 000 000	The estimate study provided direct estimate data for many of the country's major centres. We know that these are under-estimated by approximately half because the peer estimate of 250 in Pongola compared with clinical register data at a sex worker wellness clinic of 500. The 1% and 0,6% ratios in large centres still produce numbers substantially more than those found through the research. We have therefore taken our research numbers (doubled for the known undercount) as a known, reasonable minimum sex worker population in the largest centres, and extrapolated these to similar large centres, as this impacts most on the total count. This exercise has only been applied to the large sites, and no manual manipulation of data has been applied to smaller towns
In reflecting on known smaller cities such as Kimberley and East London, the use of estimate data for metros did not address the over-estimates considered to be given using the 0,6% and 1%. There was concern that this exaggeration is likely to apply to unknown towns also, and an estimate based on more cautious ratios was calculated. Interestingly, once the 9% for male and transgender sex workers is included in this minimum estimate, a total of 132 000 is produced. This is exactly the estimate given by the SACEMA study. The results serve to demonstrate how this estimate might arise, and how it is likely to be partitioned among genders, provinces and town types.	

Assumptions for estimate 4 (minimum estimate)	
Adjustment to Assumption 10: Large provincial cities over 200 000	Known large towns remain unrealistic at 0,6%. The average percentage in known sites is 0,54%. We produce an absolute minimum by applying this percentage to all towns of population over 200,000,
Adjustment to Assumption 4: Large cities and major towns	This over-estimate is extended to smaller towns, where results are also seen as excessive by peers, by reducing the maximum for any site to 0,6%.
Assumption 11: Hamlets and villages	Also, data were received from local informants in 2 towns of less than 4000, which stated that transactional sex took place, but professional sex workers were not present. Locations of population under 4000 are assumed to have no sex workers under Estimate 4.

Summary of assumptions

	Basic % of adult female population used for different location types, before addition of weightings for mining or trucking					% of adult female population added to some places'		Standard ratio used for border towns
	Metros	**Cities > 200,000**	**Cities < 200,000 or other major centres**	**Niche or local towns**	**Rural areas**	**% Added to basic for trucking**	**% Added to basic for mining**	**Inclusive % used for border towns**
Estimate 1 - Not realistic	2,0%	1,0%	1,0%	0,60%	0,3%	0,3% (capped 10-150)	Formula: 200 sex workers/ 12,000 miners in hostels, (if 80% of people employed in mining live in hostels), for mine popula-tions > 100	4,0%
Estimate 2 - Maximum	1,0%	0,6%	1,0%	0,60%	0,3%	0,6% (capped 10-150)		4,5%
Estimate 3 - Probable	Based on estimate research	0,6% or research numbers at known sites	1,0%	0,60%	0,3%			4,5%
Estimate 4 - Minimum		0,54% or research numbers at known sites	0,6%	0,6% (or 0 if under 4000)	0,3% (or 0 if under 4000)			4,5%

3. Findings

The results are shared in a series of tables, followed by some interpretation. These begin with the totals for the country. In each table the total population and the population of adult females aged 15-64 is included. The adult female population is used as the denominator for all of the sex worker percentages as the convention used by Vandepitte (2006). For each set of results, the four estimates are presented. The number of female sex workers is given. Male and transgender ratios are used to calculate the total number of sex workers in these genders. Together, these provide a total. This total is reported as a percentage of the adult female population.

Each table also gives the distribution of sex workers between large urban cities, smaller urban areas and rural areas as resolved in the four estimates.

In the pages that follow each province is described in similar detail. In addition, the original findings for each of the study sites is tabulated, and a brief description of the observations on sex worker numbers in the study sites provided.

3.1 National results

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
National							
All Areas			Female sex workers	240 857	167 009	137 641	120 986
Population 2011	51 770 097		5% Male	12 043	8 350	6 882	6 049
Adults females	17 389 307	34%	4% Transgender	9 634	6 680	5 506	4 839
			National Total	262 534	182 040	150 029	131 875
As a % of adult female population				(1,51%)	(1,05%)	(0,86%)	(0,76%)
Urban>=100,000			(51%)	71%	57%	48%	51%
Adult females			(35%)				
Urban<100,000			(27%)	23%	34%	41%	37%
Adult females			(33%)				
Rural			(23%)	6%	9%	11%	12%
Adult females			(31%)				
All areas				100%	100%	100%	100%

Figure 5. Provincial distribution of female sex workers based on Estimate 3

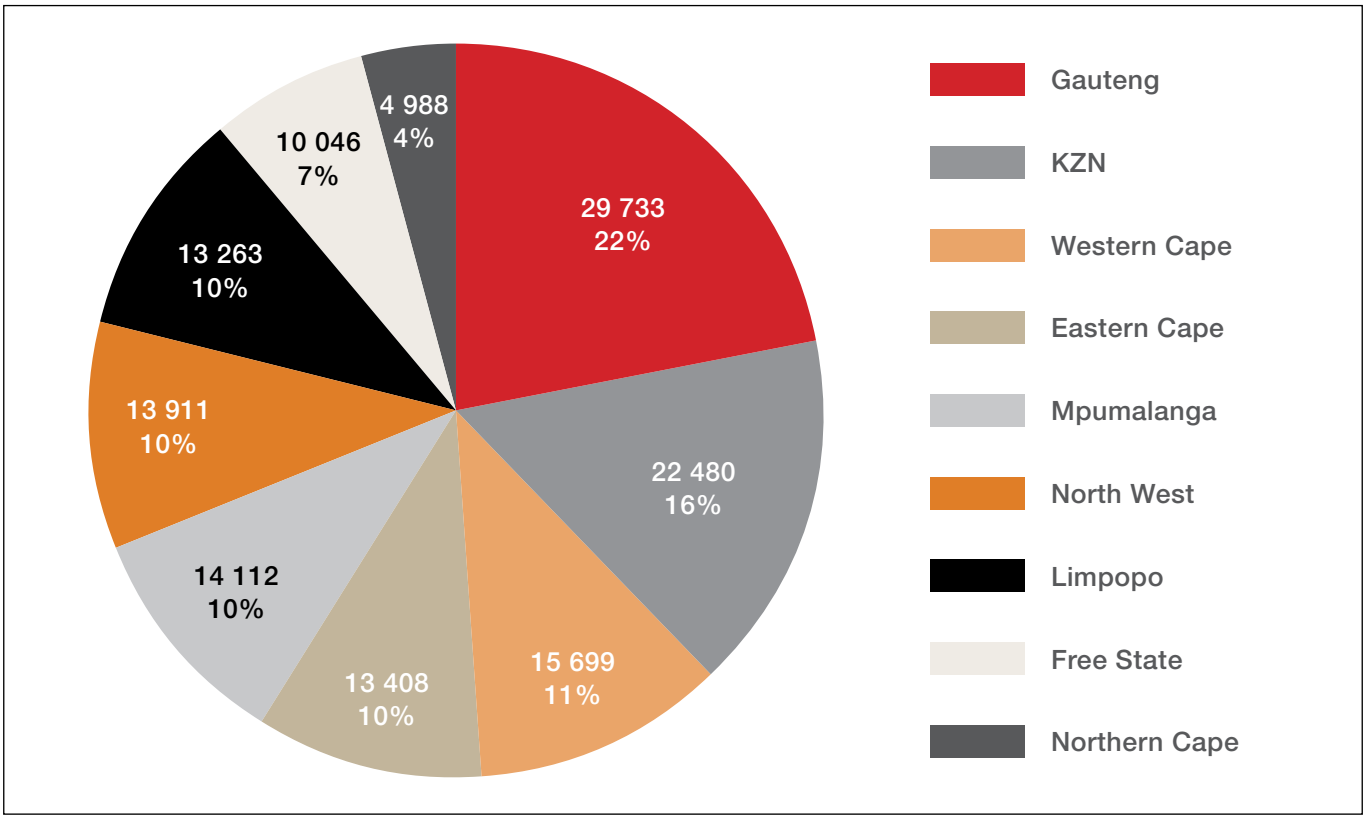
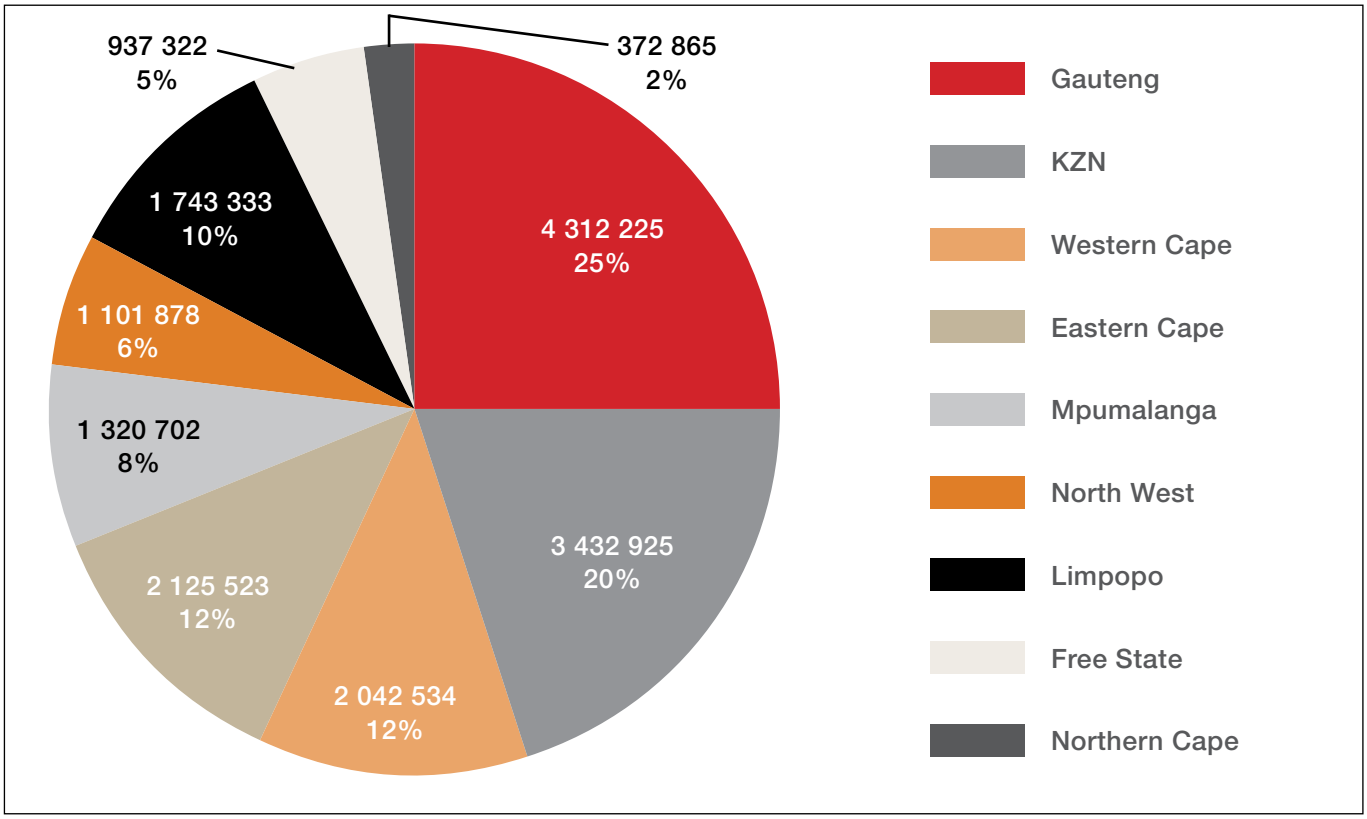


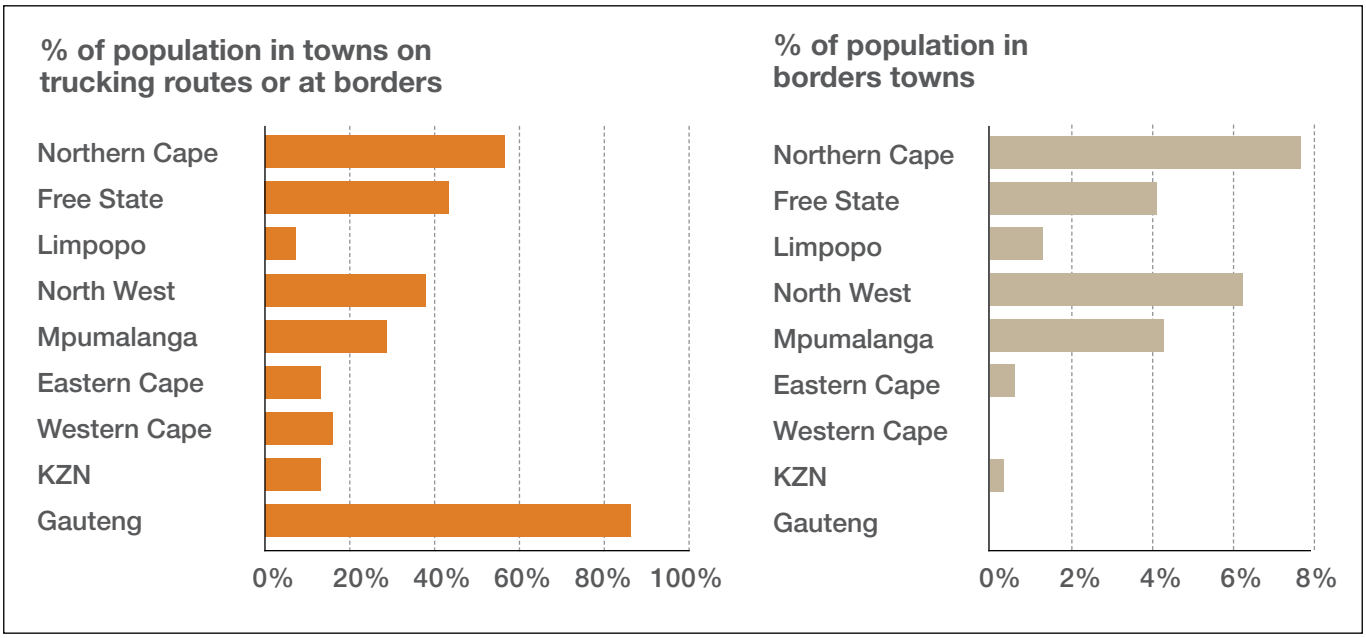
Figure 6. Provincial distribution of the adult female total population



The provincial data show populations of sex workers (Figure 5) are estimated to be high relative to the populations of adult females (Figure 6) in Northern Cape, Free State and Mpumalanga, due to the number of border towns and several trucking routes (Figure 7). In North West the very large mining industry contributes to a sex worker estimate substantially higher than the proportion of adult females.

Figure 7. Provincial statistics for population and factors influencing sex work

Figure 7.



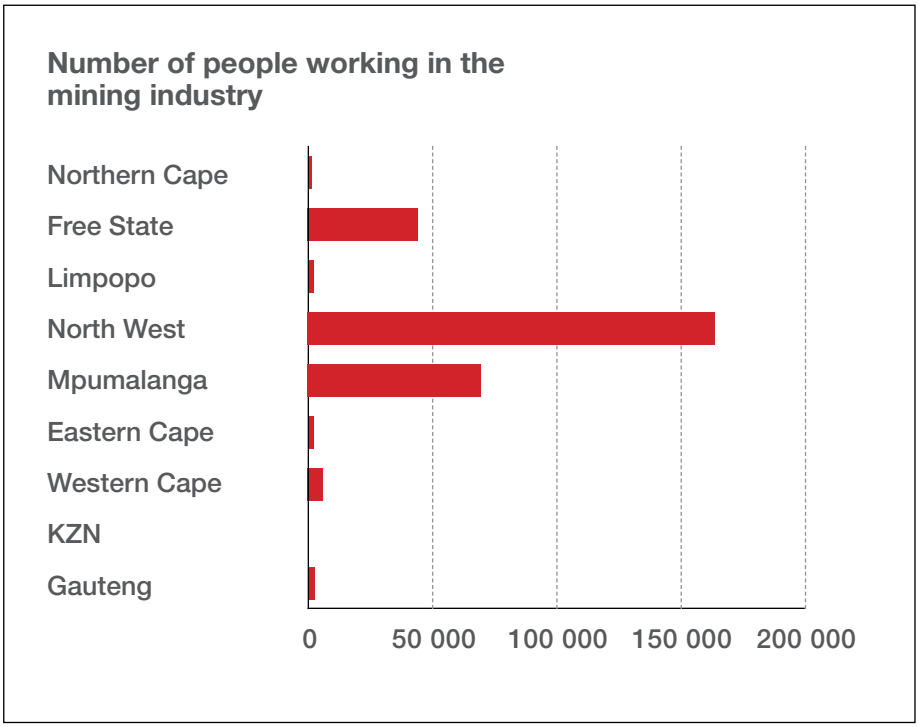
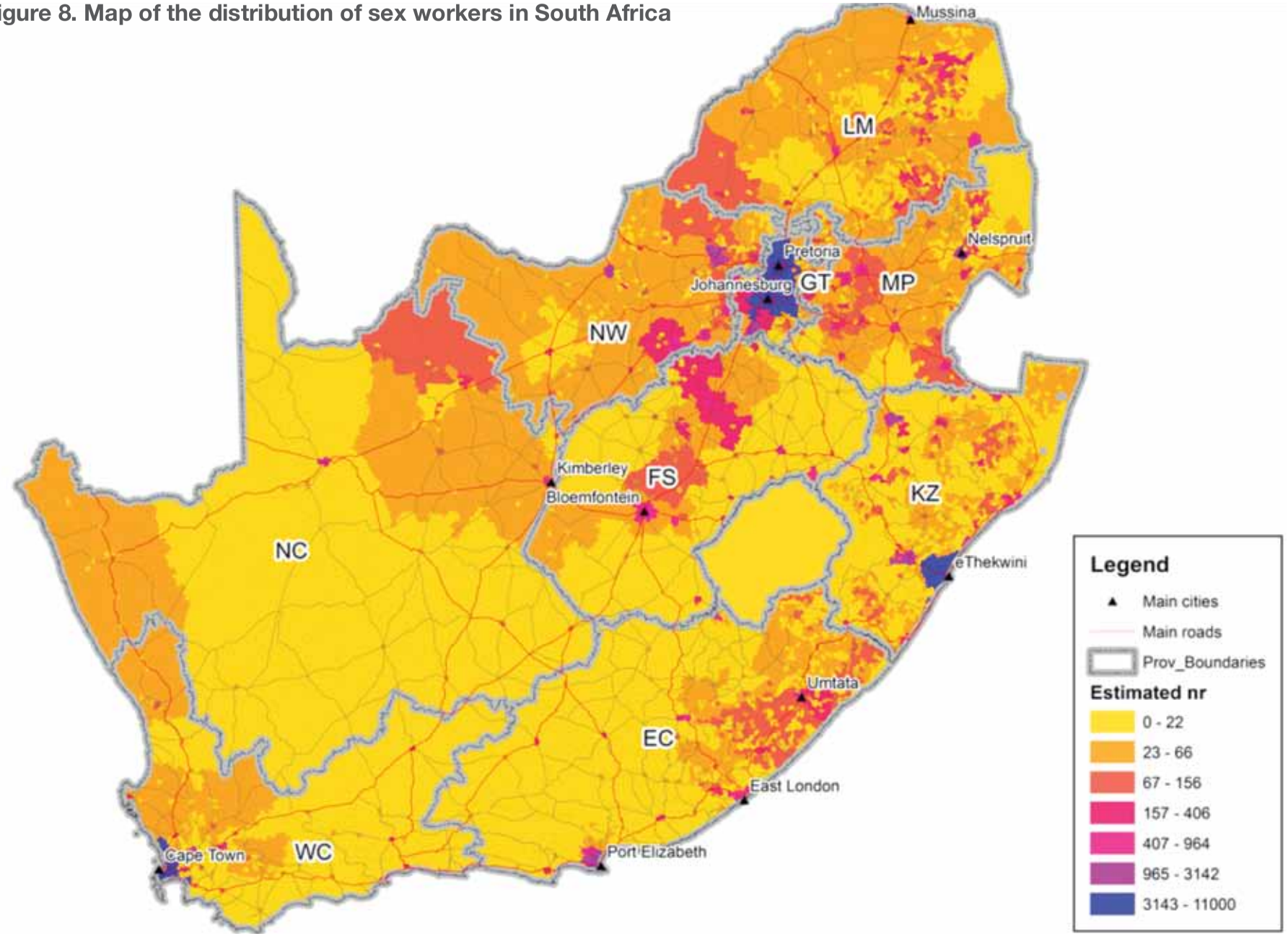


Figure 8. Map of the distribution of sex workers in South Africa



3.2 Sex worker population estimates for each province

3.2.1 Gauteng

Table 3. Results for Gauteng

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Gauteng							
All Areas			Female sex workers	86 376	44 576	29 733	28 696
Population 2011	12 236 363		5% Male	4 319	2 229	1 487	1 435
Adult females	4 312 225	(35%)	4% Transgender	3 455	1 783	1 189	1 148
			Provincial Total	94 150	48 588	32 409	31 278
As a % of adult female population				(0,77%)	(0,40%)	(0,26%)	(0,26%)
Urban>=100,000		(96%)		97%	96%	94%	94%
Adults females		(35%)					
Urban<100,000		(3%)		2%	4%	6%	5%
Adults females		(33%)					
Rural		(1%)		0,3%	0,5%	0,8%	0,8%
Adults females		(33%)					
All areas				**100%**	**100%**	**100%**	**100%**

The intermediate estimate for Gauteng suggests that around 32,000 sex workers operate in the province, around 80% of whom work in the cities of Johannesburg, Ekurhuleni and Tshwane.

Table 4. Findings for the Gauteng estimate study sites

Site	City of Johannesburg	
CSIR classification	City region	The Estimation Study included mapping of Hillbrow, CBD and Rosebank, and remapping extended to Kempton Park, Midrand, Rosettenville, Thembisa and Booysens. Soweto was estimated separately by peers who knew of 92 female sex workers at known locations. In a PHRU study of Soweto one brothel and 400 taverns were counted, with taverns said to support relatively regular sex workers. The estimate in 2000 quoted by Rees et al, was between 5000 and 10 000 for Hillbrow and CBD.
Population	4 434 816	
Adult females	1 590 499	
Mine employees	9 005	
Mapping and remapping	5000	
Estimate 3	11000 (0,69%)	Reasoning - Double the count +10% for Soweto

3.2.2 KwaZulu Natal

Table 5. Results for KwaZulu Natal

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
KwaZulu Natal							
All Areas			Female SWs	42 994	28 760	22 480	19 335
Population 2011	10 266 056		5% Male	2 150	1 438	1 124	967
Adult females	3 432 925	(33%)	4% Transgender	1 720	1 150	899	773
			Provincial Total	46 864	31 348	24 504	21 075
As a % of adult female population				(1,37%)	(0,91%)	(0,71%)	(0,61%)
Urban>=100,000		(47%)		73%	60%	48%	51%
Adults females		(35%)					
Urban<100,000		(23%)		20%	29%	38%	33%
Adults females		(33%)					
Rural		(31%)		7%	11%	14%	15%
Adults females		(31%)					
All areas				100%	100%	100%	100%

While the metropolitan centre of Ethekwini accounts for around 28% of KZNs estimated sex workers, the majority are dispersed among the vast number of smaller towns in the province. More than 20 towns are estimated as being home to a minimum of 100 sex workers, and even these account for only 65% of the total sex work population. Sex work support needs to be dispersed across the great many towns and settlements in the province if it is to reach the majority of those in need of services.

Table 6. Findings for KZN estimate study sites

Site	eThekwini Metropolitan (Durban)	
CSIR classification	City region	The estimation study provided a count of around 3000, with some sites being inaccessible.
Population	3 442 388	
Adult females	1 227 539	
Mine employees	2 895	
Mapping and remapping	3000	Reasoning - Double the estimate based on normal undercounting and add 10% for harbour hotspot
Estimate 3	6300 (0,51%)	
Site	**Uphongolo Local Municipality (Pongola)**	
CSIR classification	Service town	The mapping and remapping produced a result of 250. A key informant interview with sex worker services at a wellness centre had registered records of 500 sex workers. This result provided a reliable ratio for border towns, as well as insight into the degree of under-counting inherent to the method.
Population	31 982	
Adult females	10 362	
Mine employees	0	
Border or trucking	Border town	
Mapping and remapping	500	
Estimate 3	500 (4,8%)	Reasoning - Accept the estimate - Wellness Centre data

3.2.3 Western Cape

Table 7. Results for Western Cape

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Western Cape							
All Areas			Female SWs	35 328	21 793	15 699	13 670
Population 2011	5 822 666		5% Male	1 766	1 090	785	683
Adult females	2 042 534	(35%)	4% Transgender	1 413	872	628	547
			Provincial Total	38 507	23 755	17 112	14 900
As a % of adult female population				(1,89%)	(1,16%)	(0,84%)	(0,73%)
Urban>=100,000		(70%)		83%	71%	60%	65%
Adults females		(35%)					
Urban<100,000		(24%)		15%	27%	37%	32%
Adults females		(34%)					
Rural		(6%)		1%	2%	3%	3%
Adults females		(33%)					
All areas				**100%**	**100%**	**100%**	**100%**

While around half of the Western Cape's sex workers are thought to operate in the city of Cape Town, a further 20 substantial towns have estimated sex work populations of over 100. Together these major centres constitute the majority of the approximately 16 000 sex workers in the province.

Table 8. Findings for Western Cape estimate study sites

Site	City of Cape Town Metropolitan	
CSIR classification	CityRegion	Due to training and piloting taking place in Cape Town, the city was far more thoroughly mapped than any other site. Townships were consistently found to have far lower sex worker populations than commercial areas, at between 25 and 40 in each township. This suggests caution in extrapolating numbers for commercial or industrial municipalities to neighbouring municipalities that may be low-cost residential areas. Gould and Fick (2006) suggested around 1200 sex workers in Cape Town.
Population	3 736 199	
Adult females	1 327 630	
Mine employees	1 737	
Mapping and remapping	5000	
Estimate 3	7500 (0,56%)	Reasoning - Well known population, add 50% to the count
Site	**Beaufort West**	
CSIR classification	ServiceTown	The mapping exercise estimated 170 female sex workers. The Estimate 3 assumptions of a basic percentage of 1% + 0,6% weighting for trucking routes aligns well with this site.
Population	32 887	
Adult females	10 888	
Border or trucking	Trucking route	
Mapping and remapping	170	
Estimate 3	170 (1,6%)	Accept the estimate. Small town, and accurate count achievable.

3.2.4 Eastern Cape

Table 9. Results for Eastern Cape

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Eastern Cape							
All Areas			Female SWs	15 989	14 022	13 408	11 410
Population 2011	6 563 148		5% Male	799	701	670	571
Adults females	2 125 523	(32%)	4% Transgender	640	561	536	456
			Provincial Total	17 429	15 284	14 615	12 437
As a % of adult female population				(0,82%)	(0,72%)	(0,69%)	(0,59%)
Urban>=100,000		(28%)		45%	33%	30%	32%
Adults females		(36%)					
Urban<100,000		(25%)		37%	46%	48%	43%
Adults females		(33%)					
Rural		(47%)		18%	20%	21%	23%
Adults females		(30%)					
All areas				**100%**	**100%**	**100%**	**100%**

In a distribution similar to KwaZulu Natal, around 60% of the Eastern Cape's sex workers are dispersed across around 25 towns, each with a minimum of 100 female sex workers. The remaining 40% work across the vast number of local centres in the province.

Table 10. Findings for Eastern Cape estimate study sites

Site	Buffalo City (East London)	
CSIR classification	City	East London is small enough for direct interviews in all sites known to peers, and of snowball references to other sites by respondents. The team had a high level of confidence in a count of 200 female sex workers. The Vandepitte ratios of 2% and 1% produce results of 2400 and 1200 respectively. Peers and researcher consider these to be impossible, and suggest that the ratios are not reliable for other cities similar to East London. Results such as this motivate Estimates 3 and 4.
Population	321 074	
Adult females	120 400	
Mine employees	148	
Mapping and remapping	200	
Estimate 3	500 (0,41%)	A high quality, comprehensive count gave 200, with a doubling for undercounting only providing 400. Pressure from the literature suggests that we use the highest justifiable number and 500 is recommended.

3.2.5 Mpumalanga

Table 11. Results for Mpumalanga

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Mpumalanga							
All Areas			Female sex workers	15 130	14 424	14 112	11 758
Population 2011	4 039 569		5% Male	756	721	706	588
Adults females	1 320 702	(33%)	4% Transgender	605	577	564	470
			Provincial Total	16 491	15 722	15 382	12 816
As a % of adult female population				(1,25%)	(1,19%)	(1,16%)	(0,97%)
Urban>=100,000		(21%)		22%	18%	16%	16%
Adults females		(33%)					
Urban<100,000		(57%)		67%	71%	72%	71%
Adults females		(33%)					
Rural		(22%)		10%	11%	11%	13%
Adults females		(31%)					
All areas				**100%**	**100%**	**100%**	**100%**

The results table shows how the majority of the population of Mpumalanga is found in small towns of fewer than 100 000. The great majority of sex workers are also found in these centres, with almost 30% of the provinces population living in small towns along trucking routes.

Table 12. Findings for Mpumalanga estimate study sites

Site	Emalahleni Local Municipality (Witbank)	
CSIR classification	RegionalCentre	The direct estimate produces 250. The 1% ratio of 988 seems a little high by peers and researchers. Conservative numbers of Estimates 3 and 4 are suggested until more accurate methods are applied.
Population	299 213	
Adult females	98 838	
Mine employees	1363	
Border or trucking	Trucking route	
Mapping and remapping	250	
Estimate 3	500 (0,51%)	Double the estimate

3.2.5 North West

Table 13. Results for North West

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
North West							
All Areas			Female sex workers	14 667	14 023	13 911	12 292
Population 2011	3 509 933		5% Male	733	701	696	615
Adults females	1 101 878	(31%)	4% Transgender	587	561	556	492
			Provincial Total	15 987	15 285	15 163	13 398
As a % of adult female population				(1,45%)	(1,39%)	(1,38%)	(1,22%)
Urban>=100,000		(30%)		49%	50%	49%	48%
Adults females		(33%)					
Urban<100,000		(42%)		39%	37%	37%	37%
Adults females		(31%)					
Rural		(29%)		12%	13%	13%	14%
Adults females		(30%)					
All areas				**100%**	**100%**	**100%**	**100%**

North West has around 40 towns with at least 100 miners. Together these towns account for around 63% of all sex workers in the province. While mining is an important force, the results show that a substantial proportion of the population is found in towns, trucking centres and border areas.

Table 14. Findings for North West estimate study sites

Site	Bojanala Local Municipality (Rustenburg)	
CSIR classification	City	The estimate study resulted in 400 identified female sex workers. Accounts from one of the mining hostels produced the ratio of 200 sex workers in a hostel accommodated 12,000 workers. This statistic is used as the basis for mining calculations until more accurate data are made available. The mining ratio suggests an additional 730 be added to the basic number. The ratio of 1,2% results where trucking and mining are both driving factors. Interviews in the rural area of Lethabong near Rustenburg suggested that sex work was minimal in even densely population rural areas, and particularly where the Bojanala traditional leadership has authority. This justifies the estimate for rural areas of 0,3%.
Population	399 931	
Adult females	126 335	
Mine employees	54 655	
Border or trucking	Trucking route	
Mapping and remapping	400	
Estimate 3	1530 (1,2%)	Double the peer estimate and add according to the mining formula

3.2.6 Limpopo

Table 15. Results for Limpopo

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Limpopo							
All Areas			Female SWs	14 059	13 802	13 263	11 150
Population 2011	5 404 790		5% Male	703	690	663	558
Adults females	1 743 333	(32%)	4% Transgender	562	552	531	446
			Provincial Total	15 325	15 044	14 457	12 154
As a % of adult female population				(0,88%)	(0,86%)	(0,83%)	(0,70%)
Urban>=100,000		(9%)		15%	15%	13%	11%
Adults females		(34%)					
Urban<100,000		(44%)		60%	59%	60%	57%
Adults females		(33%)					
Rural		(47%)		24%	24%	25%	31%
Adults females		(32%)					
All areas				100%	100%	100%	100%

As in the predominantly rural and small towns provinces of KZN and Eastern Cape, sex work in Limpopo is very widely dispersed.

Table 16. Findings for Limpopo estimate study sites

Site	Thulamela Local Municipality (Thohoyandou)	
CSIR classification	RegionalCentre	The peers and mapping exercise provided a number of 65 in a few locations in and around Thohoyandou. As a town without particular industrial, mining, transport or tourism interest, even the minimum ratio of 0,54% gives an overestimate at around 260 sex workers. It is towns such as this that suggest that the conservative numbers reflected in Estimate 4 be considered in a national extrapolation.
Population	140 821	
Adult females	48 703	
Mine employees	0	
Border or trucking	No	
Mapping and remapping	65	
Estimate 3	130 (0,27%)	Double the estimate
Site	**Musina**	
CSIR classification	ServiceTown	The estimation study counted 250. Once doubled for known undercounting, the results give a ratio of 3.5%, which is somewhat less than the ratio suggested for border towns of 4,5%.
Population	40 973	
Adult females	14 139	
Mine employees	629	
Border or trucking	Border town	
Mapping and remapping	250	
Estimate 3	500 (3.5%)	Double the estimate

3.2.7 Free State

Table 17. Results for Free State

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Free state							
All Areas			Female SWs	11 299	10 501	10 046	8 357
Population 2011	2 781 733		5% Male	565	525	502	418
Adults females	937 322	(34%)	4% Transgender	452	420	402	334
			Provincial Total	12 316	11 446	10 950	9 109
As a % of adult female population				(1,31%)	(1,22%)	(1,17%)	(0,97%)
Urban>=100,000		(41%)		40%	32%	29%	28%
Adults females	396 260	(35%)					
Urban<100,000		(49%)		54%	61%	64%	64%
Adults females	452 280	(33%)					
Rural		(10%)		6%	6%	6%	(0,7%)
Adults females	88 782	(32%)					
All areas				**100%**	**100%**	**100%**	**100%**

The top 20 towns in the Free State, with an estimated 100 sex workers in each, account for around 75% of sex workers in the estimate.

Table 18. Findings for Free State estimate study sites

Site	Mangaung (Bloemfontein)	
CSIR classification	City	In the absence of locally experienced peers, the visiting peers and researcher networked with informal sex work contacts and mapped a total of 360 women. The result of 720 may be an underestimate, with the numbers produced by Estimate 4 being around 900.
Population	474 105	
Adult females	167 178	
Mine employees	0	
Border or trucking	No	
Mapping and remapping	360	
Estimate 3	720 (0.43%)	Double the estimate

3.2.8 Northern Cape

Table 19. Results for Northern Cape

Geography and population				Number of sex workers			
				Estimate 1	Estimate 2	Estimate 3	Estimate 4
Northern Cape							
All Areas			Female sex workers	5 014	5 108	4 988	4 318
Population 2011	1 145 839		5% Male	251	255	249	216
Adults females	372 865	(33%)	4% Transgender	201	204	200	173
			Provincial Total	5 465	5 568	5 436	4 707
As a % of adult female population				(1,47%)	(1,49%)	(1,46%)	(1,26%)
Urban>=100,000		(20%)		20%	13%	11%	13%
Adults females	78 309	(35%)					
Urban<100,000		(56%)		67%	73%	75%	72%
Adults females	207 290	(32%)					
Rural		(24%)		13%	13%	13%	14%
Adults females	87 266	(31%)					
All areas				100%	100%	100%	100%

Fewer than 10 Northern Cape centres are estimated to have over 100 sex workers. Of the 5000 sex workers estimated for the province, 80% seem to work in around 40 towns, half of which are on major trucking routes.

Table 20. Findings for Northern Cape estimate study sites

Site	Sol Plaatjie (Kimberley)	
CSIR classification	RegionalCentre2	Like Bloemfontein, no established sex work support or network exists in Kimberley. Cape Town based peers were able to initiate conversations through informal contacts. The result of 175 is likely to be more severely undercounted than better known sites. A further 20 are included as the mining addition.
Population	226 554	
Adult females	78 309	
Mine employees	761	
Border or trucking	Trucking route	
Mapping and remapping	175	
Estimate 3	370	Double the estimate

4. Conclusion

The primary purpose of the enumeration study has been to justify a number against which indicative plans and budgets can be prepared. As a rapid study that drew on an extremely small sample of sites, the field element has been most useful in interrogating the percentages that are shared in the limited available literature. Much of this study has referred to the African data published by Vandepitte (2006). The main results are that the ratios for large urban centres may not be as high as those found by the Vandepitte team. National totals, however, accumulate from the large total populations in smaller centres, and particularly in high concentration towns where the identified factors of trucking, mining and borders create work for large numbers of sex workers.

This study provides a conservative starting point from which future more accurate, resourced and time-consuming studies can depart. It provides insights into methodology, and a process by which mapping, peers and wisdom of the crowds can be combined. We would suggest that the study be extended to more sites in order to expand knowledge of the economic and geographic factors that influence sex work. Field work would also benefit from an increased number of nights, until the sample reaches saturation. With these investments we recommend that this method is likely to produce highly reliable results.

Based on the field experience we would also strongly recommend that no research be attempted without the active involvement of peers. One of the key service-oriented recommendations that emerges is that the expansion of networks such as Sisonke, and the provision of peer-based partner NGO or similar sites in all centres is critical in terms of access to services as basic as free condoms and HCT, as well as the optimal vehicle for access to constructive engagement with this key inadequately served population.

5. Sources

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