A new approach to assess the capability of health facilities to provide clinical care for sexual violence against women: a pilot study

**Running Title:** Sexual violence signal functions

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**Key messages:**
- Despite the high global prevalence of violence against women, sexual violence has not received sufficient attention as an issue requiring health systems interventions.
- Several tools have been developed to collect information on health facility preparedness to provide sexual violence response services; however, little guidance exists on how this information can be used to better understand which functions a facility can perform.
- Using our proposed sexual violence signal functions framework, our findings demonstrate huge gaps in sexual violence service accessibility and availability and point to key steps that policymakers in Zambia can take to maximize coverage and ensure equity in access to care.
- Integrating our tool with ongoing cross-country health facility assessments would provide evidence for policymakers and donors on where to invest to needs of sexual violence survivors from the global to sub-national levels.

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**Ethical approval**
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ABSTRACT

Several tools have been developed to collect information on health facility preparedness to provide sexual violence response services; however, little guidance exists on how this information can be used to better understand which functions a facility can perform. Our study therefore aims to propose a set of signal functions that provide a framework for monitoring the availability of clinical sexual violence services. To illustrate the potential insights that can be gained from using our proposed signal functions, we used the framework to analyze data from a health facility census conducted in Central Province, Zambia. We collected the geographic coordinates of health facilities and police stations to assess women’s proximity to multi-sectoral sexual violence response services. We defined three key domains of clinical sexual violence response services, based on the timing of the visit to the health facility in relation to the most recent sexual assault: (1) core services, (2) immediate care, and (3) delayed & follow-up care. Combining information from all three domains, we estimate that just 3% of facilities were able to provide a comprehensive response to sexual violence, and only 16% could provide time-sensitive immediate care services such as HIV post-exposure prophylaxis and emergency contraception. Services were concentrated in hospitals, with few health centers and no health posts fulfilling the signal functions for any of the three domains. Only 23% of women lived within 15km of comprehensive clinical sexual violence health services, and 38% lived within 15km of immediate care. These findings point to a need to develop clear strategies for decentralizing sexual violence services to maximize coverage and ensure equity in access. Overall, our findings suggest that our proposed signal functions could be a simple and valuable approach for assessing the availability of clinical sexual violence response services, identifying areas for improvement, and tracking improvements over time.
INTRODUCTION

Sexual violence is defined as “any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic or otherwise directed against a person’s sexuality using coercion,” committed by any person, including an intimate partner, family member, colleague, acquaintance, or complete stranger (World Health Organization, 2012). It can be a traumatic, often stigmatizing event associated with a number of adverse mental and physical health sequelae, including depression, anxiety, alcohol use disorders, physical injuries, unwanted pregnancy, HIV, and sexually transmitted infections (STIs) (Klot et al., 2012; World Health Organization, 2013a). The World Health Organization (WHO) estimates that over one-third of women around the world and 46% of women in Africa have experienced some form of violence in their lifetime (World Health Organization, 2013a). Women’s intimate partners are the predominant perpetrators of these assaults—30% of women currently or previously in a relationship have been physically and/or sexually assaulted by their intimate partner; the estimated global prevalence of non-partner sexual violence against women is much lower at 7% (Abrahams et al., 2014). Children also face significant risk of sexual assault, with a recent meta-analysis of studies from 2000 and later estimating that 9% of girls aged below 18 years have experienced forced intercourse (Barth et al., 2013).

In 2003 and 2013, WHO outlined the clinical services recommended for sexual assault survivors, including psychosocial counselling, emergency contraception, HIV post-exposure prophylaxis (PEP), preventative STI treatment, and termination of pregnancy, where legal (World Health Organization, 2003, 2013b). In 2017, two additional guidelines were published: one on how to appropriately tailor these responses to the specific clinical needs of children and adolescents who have been sexually abused, and another providing health workers with a manual for how to design, plan, and manage services for women who have experienced violence (World Health Organization, 2017a, 2017b).

Although these documents emphasize the importance of monitoring and evaluating the implementation of these guidelines, there has been no global effort to assess their uptake.
Several models to improve health systems responses to violence against women have been developed in response to these guidelines, including but not limited to, integrating intimate partner violence screening with other health services; training health workers on how to appropriately respond to violence against women; improving referral linkages between the health sector and police, legal, and social services; creating one-stop crisis centers where women can access all services related to violence prevention and response; and providing health facilities with pre-packed rape kits to facilitate collection of forensic evidence (Keesbury and Askew, 2010; García-Moreno et al., 2014; Colombini, Dockerty and Mayhew, 2017). Despite these efforts to optimize response mechanisms for violence against women, evidence on whether health facilities are prepared to provide clinical care for sexual violence is lacking. A recently published systematic review of the barriers and facilitators to effective health systems responses to intimate partner violence in low- and middle-income countries, which includes sexual violence within intimate relationships, found that a number of studies used qualitative methods to examine health facilities' readiness to provide responses services; however, none examined this quantitatively (Colombini, Dockerty and Mayhew, 2017). While some sexual violence intervention studies have reported on key indicators related to health facility infrastructure and quality of care, none have used this to examine the types of care that facilities can provide (Christofides et al., 2005; Khan et al., 2008; Kassa, Hiwot and Abdella, 2009; Kim et al., 2009).

A number of tools have been developed that can be used to collect information related to the health sector’s response to sexual violence. For example, USAID proposed ten indicators for evaluating the impact of health programs addressing violence against women and girls (Bloom, 2008). A 2005 report from a WHO study on sexual- and gender-based violence in Liberia contains a 26-item checklist for health centers and a 44-item checklist for referral hospitals (Omanyondo, 2005). In 2017, the WHO published a 27-item checklist to assess availability of essential equipment, medicines, and other supplies for examining and caring for women who have experienced violence (World Health Organization, 2017b). The WHO also created a 15-item job aid for health facility in-
charges to assess whether their facilities meet the minimum requirements for providing care for
women who have experienced violence (World Health Organization, 2017b). More recently, Jhpiego
and the United States Centers for Disease Control and Prevention (CDC) developed a comprehensive
42-page tool with more than 200 items to assess the availability, readiness, and quality of gender-
based violence services in health facilities (Jhpiego et al., 2018).

Together, these resources provide a compendium indicators on service readiness inputs; however,
they do not offer a framework for distilling and synthesizing this data for the purpose of assessing
health facilities’ capacity to deliver sexual violence response services (World Health Organization,
2017b; Jhpiego et al., 2018). Faced with a similar challenge of how to best monitor global progress in
maternal health, in 1997 the United Nations developed process indicators to monitor the availability
of emergency obstetric care (EmOC) (UNICEF, WHO and UNFPA, 1997), characterized by the ability
to provide certain “signal functions,” or essential services that define a health facility’s capacity to
provide care. Since then, EmOC signal function data have been collected all over the world and used
to track progress towards improved availability of services and advocate for increased investment in
maternal care. This approach has also been extended to several additional service areas, including
abortion, antenatal care, postnatal care, emergency newborn care, and child health (Ntoburi et al.,
2010; Gabrysch et al., 2012; Nesbitt et al., 2013; Campbell et al., 2016).

Our study proposes a set of signal functions that can be used to describe health facilities’ readiness
to provide clinical care for sexual violence. To illustrate the potential insights that can be gained
from using the proposed signal functions, we piloted the approach to assess the availability of sexual
violence services in Central Province, Zambia. We also estimated women’s proximity to health and
police services to examine physical accessibility of multi-sectoral sexual violence services.

MATERIALS AND METHODS

Defining sexual violence signal functions
We reviewed the WHO guidelines for the clinical management of sexual violence and the Zambian National Guidelines for the Multidisciplinary Management of Survivors of Gender-Based Violence to develop practical indicators for each essential component of care (World Health Organization, 2003, 2013b, 2017a; Government of the Republic of Zambia, 2011). In Table 1, we outline the resulting list of indicators and signal functions for the clinical care of sexual violence survivors. We defined three key domains of clinical sexual violence response services, based on the timing of the visit to the health facility in relation to a penetrative sexual assault.

1. **Core services**

These core care functions should be available whenever an individual presents to a health facility for services related to sexual assault, regardless of the timing of the visit relative to the assault. This domain includes basic counselling and first-line support, physical examination, and injury care.

2. **Immediate care**

Immediate care functions are time sensitive and focus on preventing infection with HIV and other STIs and unwanted pregnancy. Immediate care should be available to eligible individuals who present to a health facility within zero to five days of a sexual assault involving oral, vaginal, or anal penetration. HIV post-exposure prophylaxis (PEP) is effective up to 72 hours after the assault, and the emergency contraceptive pill is effective up to 120 hours after the assault, though both interventions should be provided as soon as possible (World Health Organization, 2013b, 2017a). Although presumptive STI treatment does not have clear guidelines regarding the timing of administration, it is recommended to be provided at the same time as emergency contraception or HIV PEP in settings where individuals are unlikely to return for follow-up care (World Health Organization, 2013b, 2017a).

3. **Delayed and follow-up care**
Delayed and follow-up care functions focus on managing unwanted pregnancy via terminations (to the extent possible under the law), and testing and counselling for HIV and STIs. Delayed and follow-up care should be available to individuals who either (a) first present to a health facility more than five days after experiencing sexual assault or (b) return to the facility for follow-up care after their initial visit.

Within each domain, we identified indicators for the ability to perform key functions (Figure 1, Table 1). Although the core services functions should be available whenever immediate care or delayed and follow-up care are provided, we present the results separately for each domain. We defined a facility able to perform all of the functions in each of the three domains as being able to provide “comprehensive care”.

**Data sources**

*Health facility census*

We conducted a health facility census in Central Province, Zambia using the Ministry of Health’s master list of all public and private sector health facilities in the province as a preliminary sampling frame. Combining the 191 functioning facilities on the master list and an additional 26 eligible facilities identified through local medical officers, we had a total of 217 facilities eligible for inclusion in the study. Of these, 11 facilities could not be reached by car due to the condition of the roads during rainy season and 13 declined to participate, leaving a total of 193 facilities.

From March to May 2016, trained interviewers assessed each of these facilities using a tablet-based structured questionnaire covering topics related to general infrastructure, staffing, equipment and supplies, and the facility’s capacity to perform various clinical functions. We obtained geographic information system (GIS) coordinates for all included health facilities.

As the main purpose of this census was to collect information on capacity to provide termination of pregnancy and post-abortion care services (Cresswell *et al.*, 2018), we reviewed the instrument for
questions overlapping with our proposed sexual violence signal functions and added questions as needed to allow us to also study capacity to provide sexual violence response services. Table 2 outlines our ability to assess these signal functions using the study’s facility census data. Given that the majority of households in Zambia own mobile phones, it is likely that even if there was no facility-owned phone, the health workers had access to a mobile phone that could be used in case of emergency (Central Statistical Office, Ministry of Health and ICF International, 2014). Thus, although the health facility census asked if the facility had a landline or mobile phone, we excluded this question from our analysis as we felt that the phrasing of the question did not adequately assess the facility’s capacity to communicate for referrals. Additionally, in the health facility census, we asked if the facility had any staff member trained on how to provide care for sexual violence survivors but did not ask specifically about psychosocial counselling. We were therefore unable to assess the availability of counselling services. The health facility census asked if facilities had a delivery bed rather than a general examination bed or couch; as more than 80% of facilities at all levels had a delivery bed, we used this as a proxy for having an examination bed. Finally, we unintentionally omitted a question on the availability of the hepatitis B vaccination, so we were unable to include this indicator in our analysis of immediate care availability.

Police stations

We also collected GIS coordinates for police stations in Central Province to assess women’s proximity to police services after an assault. We are missing coordinates for one or more police stations in two districts (Serenje and Chibombo), and therefore only present analyses on geographic access to all ten police stations in four districts (Kabwe, Kapiri Mposhi, Mkushi, and Mumbwa).

Population & geospatial data

We obtained population numbers from the 2010 Zambian Census of Population and Housing and applied growth rates to estimate ward populations for 2016. Geospatial shape files describing the
2010 administrative boundaries (Eubank, 2014) were edited to reflect the revised boundaries at the time of data collection in 2016.

**Data analysis**

We used Stata 14 to assess the proportion of facilities capable of providing clinical sexual violence response services disaggregated by level of care. The Zambian health system is organized into five levels of care: tertiary (national) hospitals, second level (provincial) hospitals, first level (district) hospitals, health centers, and health posts (Ministry of Health, 2012). For the purposes of our analyses, the category “hospital” refers to all three types of hospitals and includes referral facilities that should offer specialized clinical care. While health centers provide preventative and curative primary health care services, health posts primary focus on basic first aid and community-level health promotion.

We used ArcGIS 10.2 to calculate the distances between facilities and assess the theoretical coverage of health services and police stations. Shapefiles with the administrative boundaries of the province were combined with census data on population size per ward. We plotted the facility and station GIS coordinates on the map and drew circular catchment areas around each location with radii of 5 km and 15 km. We then calculated the proportion of women in each ward living within the catchment areas of the facilities and stations, assuming that the female population was evenly distributed across each ward.

Less than 1% of data were missing for all variables included in this analysis. We coded any item with missing information as being unavailable.

**RESULTS**

Health facility capacity to provide clinical care for sexual violence
We successfully interviewed 193 (89%) of the 217 health facilities in Central Province, including 10 hospitals, 143 health centers and 40 health posts. One hospital and 24 health centers were privately owned faith-based or for-profit facilities; the remaining 163 facilities were government-owned.

Only 6% of health facilities were able to perform all of the signal functions in the core services domain. While 90% of hospitals could perform all the core services functions, only 2% of health centers and no health posts were able to offer these services. Most facilities had one or more health professional on call 24 hours per day and 7 days per week, a private room, and could provide physical examination services; however, very few lower level facilities were able to provide sutures, or stitches for injuries (Table 3).

Sixteen percent of health facilities were able to provide all three time-sensitive services in the immediate care domain (70% of hospitals, 16% of health centers, and 0% of health posts). The majority of facilities at all levels were able to provide presumptive treatment for a range of common STIs; however, emergency contraception and HIV PEP were less frequently available, particularly in health centers and health posts (Table 3). HIV PEP was available in all hospitals, but only in 55% of health centers and 28% of health posts. Availability of the emergency contraceptive pill was most limited, and the commodity was in stock in only 70% of hospitals, 22% of health centers and 5% of health posts.

Less than 8% of health facilities (70% of hospitals, 6% of health centers, and 0% of health posts) were able to provide all three delayed & follow-up care functions. While HIV testing and counselling services were nearly universally available, termination of pregnancy services and STI testing and counselling were each only available in 14% of all health facilities (80-90% of hospitals, 13% of health centers and 0% of health posts).

Combining information from all three domains, we estimated that just 3% of all facilities (50% of hospitals, <1% of health centers, and 0% of health posts) were able to provide a comprehensive response to sexual violence, comprising core services, immediate care, and delayed & follow-up
care. If we applied stricter signal functions criteria and required each comprehensive care facility to also have a health worker trained in providing clinical sexual violence response services on staff, only one facility was classified as being capable of providing comprehensive services. Further, we found that sexual violence services were largely concentrated at the hospital level, with 81% of health centers and all health posts unable to completely fulfil any of one the three domains of clinical care for sexual violence (Table 4).

Physical accessibility of health and police services

We estimated that 85% of women in Central Province lived within 15km of a health facility of any level (regardless of its ability to provide sexual violence response services), and 31% lived within 5km. Despite the majority of women living within 5km or 15km of a health facility, only 11% and 23% lived within 5km and 15km of comprehensive clinical sexual violence health services, respectively (Table 5). Immediate care was the most commonly available domain; still, only 38% of women lived within 15km of these services. Approximately 29% and 31% of women lived within 15km of a facility offering core services and delayed & follow-up care, respectively.

In the four districts with geographic coordinates for police stations, 41% of women lived within 15km of a police station, and 25% lived within 5km (Table 5). Availability of clinical sexual violence services in these four districts appeared to be higher than in Central Province as a whole, with 33% of women living within 15km of a facility offering comprehensive care; 40% living within 15km of core services; 48% living within 15km of immediate care; and 43% living within 15km of delayed & follow-up care.

In terms of physical access to multi-sectoral sexual violence services, we found that 33% of women in the selected districts lived within 15km of both a police station and comprehensive clinical sexual violence services, and only 17% lived within a 5km radius of both services. Additionally, nearly 40% of women in these districts lived within 15km of a police station and either core services, immediate care, or delayed & follow-up care.
In terms of proximity of police stations to health services for referrals, we found that while the median distance from a police station to any health facility was 0.5km, the median distance to a facility capable of providing comprehensive services was 5.9km (Table 6). The median distance between a police station and a facility capable of fulfilling the signal functions for any of the individual core services, immediate care, and delayed and follow-up care domains was between one to two kilometers.

DISCUSSION

This paper (a) proposes a set of signal functions that can be used to evaluate health facilities’ readiness to provide clinical care for sexual violence and (b) demonstrates how they can be applied by presenting the results of a pilot study conducted in Central Province, Zambia using this framework. In this discussion, we will first give an overview of the findings and policy implications of the study in Zambia then use our experience from the pilot to discuss the value and challenges of this methodological approach as well as recommendations for improvement.

Availability and accessibility of sexual violence response services in Zambia

Previous studies in Zambia and other low- and middle-income countries suggest that sexual violence survivors often fail to receive timely and adequate health and police services following an assault due to a number of barriers, including poor provider attitudes, fear of stigma, low quality of care, lack of transportation, and unofficial fees (Christofides et al., 2005; Omanyondo, 2005; Keesbury, Zama and Shreeniwas, 2009; Casey et al., 2011; García-Moreno et al., 2014; Zama et al., 2015; Mathur et al., 2018). Despite this growing literature on the barriers to using clinical sexual violence services, there is comparatively less research that systematically examines whether health facilities are adequately equipped to provide high quality care and which services are geographically accessible to survivors of sexual assault. The few studies that have reported on various aspects of health facility preparedness for sexual violence response services found that health facilities often lack fundamental components for quality care such as clear protocols; a private space for
examination; providers trained in the management of sexual violence cases; commodities including emergency contraception and HIV PEP; and tools for forensic evidence collection (Christofides et al., 2005; Omanyando, 2005; Khan et al., 2008; Kassa, Hiwot and Abdella, 2009; Casey et al., 2011). These challenges are exacerbated in conflict areas, where risk of sexual violence tends to be high, availability of sexual violence response services is limited, and access general health care is compromised (Rybarczyk et al., 2011; Tunçalp et al., 2015). This study builds upon this body of work by synthesizing information on the availability of these inputs to assess which sexual violence response service functions a health facility can perform, and pairing this information with geospatial data to examine the geographic distribution of sexual violence response services and population-level access to care. Our findings from Central Province, Zambia suggest that even if a woman overcomes all of the barriers to seeking medical care after a sexual assault, she will have difficulty in accessing services as recommended due to inadequate facility preparedness, particularly at the lower levels of care, and the limited geographic availability of time-sensitive post-sexual violence services.

WHO guidelines highlight the importance of providing all-inclusive clinical sexual violence response services within the same health facility and, to the extent possible, the same visit, given the high likelihood of loss to follow-up if multiple facility visits are required (World Health Organization, 2013b, 2017a). Similarly, the Zambian national guidelines state that care should preferably be provided within the same facility; however, they also recommend that women should be referred to higher-level facilities for psychosocial counselling, surgical procedures, pediatric services, and obstetrical or gynaecological care as needed (Government of the Republic of Zambia, 2011). We found that while all hospitals in Central Province were equipped to provide some sexual violence response services, only half could provide comprehensive care as suggested by guidelines. Additionally, all health posts and 81% of health centers could not fulfil the criteria necessary for any of the sexual violence service domains. Although the basic care functions of the core services
domain should ideally be available in all facilities at all times, very few lower level facilities were able
to injury care requiring sutures, or stiches.

We also found that very few women lived within close proximity to any clinical sexual violence
response services. Less than one in four women lived within 15km of comprehensive services, and
60-70% of women lived further than 15km away from a facility offering at least one domain of
clinical sexual violence services. Our results therefore suggested that in order to receive appropriate
clinical care, most sexual violence survivors in the province must bypass the health facilities closest
to them and instead seek care at a tertiary facility. In addition to the distance and transportation
barriers associated with hospital-based care, seeking sexual violence response services at tertiary
facilities may also present survivors with increased costs, longer waiting times, and challenges
navigating a larger facility. Additionally, even in facilities with the theoretical capability to provide
comprehensive sexual violence response services, health providers were unlikely to have received
any training in the medical management of such cases. This implies that when women seek care
from facilities well equipped to provide sexual violence response services, they may still encounter
poor quality services and incomplete care due to lack of appropriate training.

The scarcity of the emergency contraceptive pill in health centers and health posts is particularly
concerning, considering that it can be administered by lower-level providers and would help to avoid
unwanted pregnancies and subsequent abortions in a setting where pregnancy terminations are
restricted, often sought from unsafe sources, and lead to high rates of severe abortion-related
complications (Owolabi et al., 2017).

These disparities in service capability by facility level bring into question the feasibility of existing
global guidelines, and whether they should be adjusted to better align to the reality of health
systems constraints in many low- and middle-income settings. To avoid loss to follow-up and ensure
that sexual violence survivors receive all of the services that they need, the WHO recommends that
facilities at all levels should ideally be equipped to provide a complete package of services equivalent
to our domains of core, immediate, and delayed & follow-up care (World Health Organization, 2013b, 2017a). However, in contexts similar to our study province, comprehensive care is concentrated at the hospital level, and it may be infeasible to improve all facilities to this standard with limited resources. Overall, our findings point to a need for these global guidelines to be tailored to these resource-constrained settings by involving a diverse set of country-level policymakers in the guideline development process and using available evidence from health facility assessments in low- and middle-income countries to assess which sexual violence services can realistically be provided at different levels of the health system. The conceptual groupings of core, immediate, and delayed & follow-up care may be particularly useful for health systems that are far from achieving comprehensive capacity in all facilities, and offer useful information for developing a phased approach to facility upgrades. Given the low availability of injury care services, one priority for decentralizing care might be to ensure that all lower level facilities are capable of performing all of the functions in the immediate care domain as well as the staffing, privacy, and physical examination functions of the core services domain with referral to higher level care for treatment of injuries and other services as needed. Similarly, although emergency contraception and HIV PEP commodities can be stored and provided at health posts and centers with accompanying clinical algorithms for administration by lower-level health workers, they are often absent. Another decentralization strategy might therefore be to prioritize making these services available in lower-level facilities with referral to hospitals for additional laboratory testing or more advanced treatment protocols as needed.

WHO guidelines also advocate for coordinated action and linkages between sectors when responding to cases of sexual violence (World Health Organization, 2013b, 2017a). The Zambian national guidelines have operationalized this by stipulating police officers should accompany sexual violence survivors who have not received any health services to the nearest health facility. Using data from four districts in Zambia (with relatively higher geographic coverage of clinical sexual violence response services compared to the province at large), we found that less than 40% of
women lived within 15km of a police station and a health facility offering at least one domain of sexual violence care. It appears that police stations tend to be geographically situated near health services; thus, it is important for hospitals to be well prepared to provide clinical services for sexual violence survivors, and for police officers who handle sexual violence cases to routinely refer them to the nearest hospital for care. However, because both police stations and hospitals tend to be located in the district centers, women living in more rural and inaccessible areas likely face greater challenges accessing sexual violence services.

Lastly, given our finding on the low proportion of facilities with providers trained on how to respond to cases of sexual violence, this study also highlights a critical need to conduct national in-service trainings on the guidelines for existing health workers as well as to incorporate the training materials into pre-service training curricula.

**Methodological insights: using the signal functions approach to assess health facilities’ readiness to provide sexual violence services**

To our knowledge, this is the first study to apply the signal functions approach to clinical care for sexual violence, and the first to assess women’s proximity to health facilities and police stations for sexual violence response services. Our experience with implementing the pilot study in Zambia suggests that our sexual violence signal functions offer a practical and simple approach to monitoring availability and accessibility of sexual violence response services that could easily be integrated with more general, routine health facility assessments. Although a number of tools have been developed to evaluate health facility preparedness to provide sexual violence services, there are limited available examples of such tools being implemented in practice and lack of guidance on how the large amounts of data generated from these assessments can be transformed into useful information for decision-making (Omanyondo, 2005; Bloom, 2008; World Health Organization, 2017b; Jhpiego et al., 2018). In developing these signal functions, we carefully selected a subset of all necessary inputs that would be indicative of a health facility’s capability of providing essential
sexual violence response services. This concise, comparatively short list of indicators provides a feasible option for monitoring changes over time, especially in the context of routine data collection. Additionally, rather than tracking individual inputs, such as the proportion of facilities that have latex gloves in stock, our approach instead proposes a framework for using information on these inputs to better understand each facility’s potential readiness to perform certain functions, such as providing basic injury care. By reporting on women’s geographic access to both health facilities and police stations and the distances between these services, our study also provides new, multi-sectoral insights into the spatial distribution of sexual violence response services.

While the pilot helped us to demonstrate the rich information that this approach can generate, we also identified key issues that must be reconsidered and refined in future iterations of this sexual violence signal functions framework, perhaps through a Delphi exercise to gain expert consensus (Hsu and Ohio, 2007). Developing signal functions can be challenging, as it requires achieving a careful balance of measuring essential components of care and providing information that is interpretable and actionable. For instance, when deciding on the final composition of our signal functions, we debated whether having a health provider trained in the medical management of sexual violence cases should be a core function. While this is an essential element for good quality sexual violence response services in theory, we felt given the reality that very few providers in our setting have been exposed to this type of training, including it as a component of our signal functions would be less informative than examining the availability of human resources more generally. This is because the findings would simply show that no facilities were prepared to offer core services, and does not point to any clear recommendation apart from the need to train more health workers. As the need for additional training is given in this context, we thought it would be more useful to assess the proportion of facilities that have already have the necessary staffing to provide sexual violence response services and should be prioritized for health worker trainings.
In addition to helping refine which components of care should be included in the sexual violence signal functions framework, an expert review process and/or a future validation study would also be helpful for refining how we measure the included indicators. For example, we ultimately chose to exclude referral capacity from our analysis, as we felt that the way we asked the question in the health facility census did not adequately capture what we were really interested in measuring. Having additional input on this and other included measures would help to strengthen the framework.

Beyond the need to further validate and gain expert consensus on the composition of the sexual violence signal functions, there are additional limitations to consider. First, central to the signal functions method is the assumption that given the availability of a certain set of inputs, a facility should be capable of providing a particular service or set of services. The selected indicators do not represent every individual input recommended for the provision of clinical sexual violence response care, but rather a carefully selected group of indicators that can provide a snapshot assessment of whether a facility is capable of providing care. While some indicators are verified by the presence of certain equipment and commodities, others, such as the functions in the delayed and follow-up care domain, are only reported by the staff member being interviewed. Further, the availability of commodities does not necessarily mean that they will be made available in the event that a sexual violence survivor presents at a facility. Thus, in practice, a facility’s theoretical capability to offer services as measured by the presence of signal functions does not necessarily mean that appropriate care is actually provided when needed. We are therefore likely overestimating the proportion of women with access to sexual violence services. Additionally, our geospatial analysis relies on the assumption that the population of women is evenly spaced within each ward. In rural wards where populations tend to be concentrated in certain areas, this may mean that we have over- or underestimated the proportion of the population within 5km or 15km of a health facility or police station. We also estimated proximity to health facilities and police stations using straight-line distances, which may underestimate actual travel time given that often routes are less direct.
Finally, due to data availability, we only included police stations in our geospatial analyses and excluded police posts, which tend to be located in less central areas of a district. Although police posts may expand the geographic reach of police services, they tend to be much smaller, sparsely staffed, and less likely to have a victim support unit or any private space to deal with sensitive matters compared to police stations. Thus, while excluding police posts from our analysis may underestimate access to police services generally, we feel that in most cases, sexual violence survivors are likely to bypass their local police post or have their case referred to the nearest police station for processing.

Despite these challenges, experiences from our pilot of the proposed sexual violence signal functions suggest that the framework is useful and has the potential to inform the development of health systems guidelines and improve monitoring of service capability and access. Additionally, our analysis of the physical locations of both police and health services demonstrates how geospatial data can be used to monitor the accessibility of sexual violence services and feasibility of referrals across multiple sectors. Much of the information required to use the proposed sexual violence signal function indicators is already captured in existing tools for routine multi-purpose health facility readiness assessments, such as the Service Provision Assessment (SPA) and Service Availability and Readiness Assessment (SARA), which have been conducted across a number of low- and middle-income countries (MEASURE DHS, 2012; World Health Organization, 2013c) (Appendix 1). Adapting these instruments to capture information on sexual violence signal functions would facilitate comparisons between countries and over time. Our findings on the geographic distribution of sexual violence response services also highlight the value in using geospatial data to monitor equity in physical access to care. Geographic coordinates are routinely collected for the SPA and SARA; however, these often survey a sample of facilities rather than all facilities in a country. To ensure that this information is available and up-to-date for all health facilities, governments could consider incorporating the collection of geographic coordinates and reporting on indicators related to the
provision of sexual violence responses services through their health management information systems.

CONCLUSIONS

Using signal functions appears to be a simple and valuable approach for assessing the availability of clinical sexual violence response services and identifying areas for improvement. Much of the relevant information is already captured on routine multi-purpose health facility assessment tools such as the SPA and SARA; however, facilities’ capacity to provide sexual violence care is not currently tracked or reported. Given the usefulness of this approach, we recommend that these instruments be modified to enable more accurate assessment of sexual violence service availability. Extensive changes are not needed: a few minor changes and additions to these tools, such as asking about the availability of psychosocial counselling and the hepatitis B vaccination, will allow for better tracking of sexual violence service availability globally and over time. It will also provide additional evidence where needed on the importance in investing in the health systems to adequately meet the needs of sexual violence survivors.

ABBREVIATIONS

EmOC: emergency obstetric care
GIS: geographic information system
HIV: human immunodeficiency virus
PEP: post-exposure prophylaxis
SARA: Service Availability and Readiness Assessment
SPA: Service Provision Assessment
STI: sexually-transmitted infection
SV: sexual violence
WHO: World Health Organization
REFERENCES


MEASURE DHS (2012) *Service Provision Assessment Survey: Inventory Questionnaire*. Rockville, Maryland, USA.


World Health Organization (2013c) ‘Service Availability and Readiness Assessment (SARA), an annual

