Feasibility of Establishing a Core Set of Sexual, Reproductive, Maternal, Newborn, Child, and Adolescent Health Indicators in Humanitarian Settings: Results from a Multi-Methods Assessment in the Democratic Republic of Congo

Jacques Emina

University of Kinshasa: Universite de Kinshasa

Rinelle Etinkum

Population Health Research Institute

Any Aissaoui

University of Ottawa

Cady Nyombe Gbomosa

University of Ottawa

Kaeshan Elamurugan (✉ kaeshan@norimpact.com)

Carleton University <https://orcid.org/0000-0002-4612-723X>

Kanya Lakshmi

University of Ottawa

Ieman Mona El Mowafi

University of Ottawa

Loulou Kobeissi

World Health Organisation: Organisation mondiale de la Sante

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Abstract

Background: Reliable and rigorously collected sexual, reproductive, maternal, newborn, child, and adolescent health (SRMNCAH) data in humanitarian settings are often sparse and variable in quality across different humanitarian settings. To address this gap in quality data, the World Health Organization (WHO) developed a core set of indicators for monitoring and evaluating SRMNCAH services and outcomes and assessed their feasibility in four countries, including the Democratic Republic of Congo (DRC) with the goal of aggregating information from global consultations and field-level assessments to reach consensus on a set of core SRMNCAH indicators among WHO partners.

Methods: The feasibility assessment in DRC focused on the following constructs: relevance/usefulness, feasibility of measurement, systems and resources, and ethical issues. The multi-methods assessment included five components; a desk review, key informant interviews, focus group discussions, facility assessments, and observational sessions.

Results: The findings suggest that there is widespread support among stakeholders for developing a standardized core list of SRMNCAH indicators to be collected among all humanitarian actors in DRC. There are numerous resources and data collection systems that could be leveraged, built upon, and improved to ensure the feasibility of collecting this proposed set of indicators. However, the data collection load requested from donors, the national government, international and UN agencies, coordination/cluster systems must be better harmonized, standardized, and less burdensome.

Conclusions: Despite stakeholder support in developing a core set of indicators, this would only be useful if it has the buy-in from the international community. Greater harmonization and coordination, alongside increased resource allocation, would improve data collection efforts and allow stakeholders to meet indicators' reporting requirements.

Plain English Summary

In humanitarian settings, data collection is often unreliable and not standardized – especially with regards to sexual, reproductive, maternal, newborn, child, and adolescent health (SRMNCAH). In order to address this gap in data quality, the World Health Organization proposed a list of core indicators to four countries, including the Democratic Republic of Congo (DRC). The goal was to use the findings from the DRC context to contribute to the determination of a core set of indicators.

This study had two components: a feasibility assessment and a multi-methods assessment. The feasibility assessment in the DRC focused on the relevance of the proposed indicators, the feasibility of measurement, the resources in place, and ethical issues. The multi-methods assessment included a desk review, interviews with key informants and focus groups, and facility assessments.

The findings showed that partners in the DRC supported developing a standard set of SRMCAH indicators that can be used among all humanitarian partners in the country. There are many systems in place that could be used or strengthened to improve data collection. However, the findings also showed that there must be better collaboration and coordination between the different partners in the DRC, as well as increased resources, to alleviate burden on front-line staff.

In conclusion, though there is a desire to harmonize indicators, more input and resources are needed from the international community to aid in the standardization of data collection in order to meet local reporting requirements and ease burden on local staff.

Background

The humanitarian crisis in the Democratic Republic of Congo

The DRC remains one of the most complex and long-standing humanitarian crises in the world (1). According to the United Nations High Commissioner for Refugees (UNHCR), waves of political unrest have resulted in 5.01 million internally displaced persons (IDP) between October 2017 and September 2019 (1). Tanganyika in the southeast, as well as the Kasai provinces, have also faced war and unrest in recent years (2). The origins of the unrest seen in the DRC today stem from the massive refugee crisis from the 1994 genocide in Rwanda (3). The COVID-19 pandemic has only exacerbated the situation. Along with the Ebola epidemic, which the DRC has been fighting since 2018, there is significant strain on the health care system (4).

Women and children are particularly vulnerable in volatile environments when safety is not guaranteed (5). In conflict-affected settings, sexual, reproductive, maternal, neonatal, child, and adolescent health (SRMNCAH) needs increase while available services and resources decrease (6). Evidence suggests that women in these settings are at higher risk of death and disability due to pregnancy-related causes (7), have more difficulty with accessing sexual and reproductive health and abortion services (7), experience higher rates of unintended and unwanted pregnancies, gender-based violence (8), and sexually transmitted infections, including HIV (9).

SRMNCAH data collection and indicator reporting

Reliable and timely data have a direct bearing on a country's capability to design and implement programmes effectively. Rigorous and regular data collection, storage, and analysis would contribute to measurable assessments of the objectives, goals and purpose of initiatives in terms of process, impact and intended outcome, both in organisational process and financial accountability (10–13). Furthermore, timely and rigorous collection, aggregation, and use of SRMNCAH data for services and outcomes evaluation in humanitarian settings is an important component of accountability and transparency (12, 13). This, in turn, ensures accountability to the beneficiaries – and that programs delivered by NGO partners and/or funded by donors or government improved their lives through competent, equitable and dignified approaches. The key driver in accountability is ensuring that the affected population's needs are met with dignity and humanity, by having transparent and clear SRHMNCAH data to help understand program outcomes and continuously evaluate and improve (12).

Furthermore, these data collection and indicators' reporting mechanisms would ensure that SRMNCAH service provision are meeting the global standard of care – the state/government becomes accountable by providing appropriate SRMNCAH care to its population (10). This type of data collection system could allow governments and implementing agencies to accurately monitor and assess current services and outcomes in humanitarian settings as well as evaluate the impact of programs and budget allocations (10). However, reliable and rigorously collected SRMNCAH data in humanitarian settings are often sparse and variable in quality (10). A 2012-2014 global assessment found significant gaps in information about SRMNCAH in refugee and displacement settings, irrespective of region or stage of emergency (15). A recent study estimated the score of the quality of the DRC National Health Information System (NHIS) data at 40% (16).

SRMNCAH data collection and indicator reporting in DRC

In 2014, to improve the collection, storage and accessibility of data, the Ministry of Health (MoH) of the DRC introduced the District Health Information System 2 (DHIS2), an electronic, web-based management information system, which aids with the collection, presentation, analysis and validation of health information data (17). Assessments of the DHIS2 in DRC indicate improved quality and availability of health statistics and health data, which has helped to inform action in the health system (18). However, the progress of DHIS2 was limited due to poor internet connectivity, lack of skills from data managers and other stakeholders, as well as a lack of suitable computers (19). Other challenges included the constant closing of health facilities due to political instability and a very high turnover rate of health zone data managers (19). As a result, significant gaps in quality SRMNCAH data remain, inhibiting key stakeholders from developing and implementing timely evidence-based interventions (10).

Aims and objectives

In light of the above, WHO in close coordination with local, regional, and global partners agreed to test the feasibility of a candidate set of SRMNCAH indicators for humanitarian settings in the field level in four countries experiencing different types of humanitarian crises, including DRC, to determine feasibility, relevance, and acceptability. In this article, we discuss the results of this assessment in DRC. The assessment took place in Kinshasa (the capital of DRC), and the provinces of Kasai, Kasai Central, Kasai Oriental.

By assessing feasibility, we aimed to explore the potential impact of the intended data collection and analysis, whether or not national and non-governmental monitoring and evaluation systems have the needed resources to collect SRMNCAH indicators, and the ability of the system to adhere to ethical practices and safeguard clients' confidentiality and privacy (20). The results of DRC's country-level assessment will be eventually aggregated with the results from Afghanistan, Bangladesh, and Jordan's field-level assessments in order to reach a global consensus on a minimum set of core SRMNCAH indicators for services and outcomes evaluation in humanitarian settings among donor agencies, United Nations (UN) agencies, and international non-governmental organizations (NGOs) working in humanitarian settings.

Methods

Study Design

This multi-methods assessment consisted of five main components: 1) a desk review of published articles and reports as well as internal documents (in English and French); 2) key informant interviews (KIs) with representatives from government entities, health zones directorates, international and national non-governmental organizations, and staff members from health care clinics and hospitals; 3) facility assessments in primary and secondary facilities in the three Kasai regions that provide services to internally displaced and refugee populations; 4) observation sessions focused on the logistical, ethical, and privacy practices associated with data collection and storage at select facilities; and 5) focus group discussions (FGD) with frontline workers at primary, secondary, and tertiary health centers (see figure 1).

Sampling

For the KIs, we compiled a list of key individuals from government entities, international and national organizations that worked in the field of SRMNCAH and data collection at the different provincial levels in Kinshasa, the capital of DRC, and in the three Kasai provinces. We interviewed key informants (KIs) individually or in small groups in the four study sites. For the FGDs and facility assessments, a list of facilities was compiled for each of the Kasai provinces that provided SRMNCAH services to internally displaced and refugee populations (primary, secondary, and tertiary facilities). Each facility was informed, and the WHO country office in DRC facilitated the needed authorization prior to the evaluation. The facilities that were selected were identified as the largest subsidized providers for SRMNCAH services for internally displaced refugee populations in their respective provinces. Informed consent was obtained from each participant.

Characteristics of Study Participants

Key informant interviews took place between December 2019 and February 2020. We conducted **30 key informant interviews** with **33 representatives** from government entities, health zones directorates, international and national non-governmental organizations, and staff members from health care clinics and hospitals. We conducted **nine facility assessments** at primary, secondary, and tertiary facilities that provide services to refugees in the three provinces in the Kasai region; observation sessions focused on the logistical, ethical, and privacy practices associated with data collection and storage at select facilities. Finally, we conducted **nine focus group discussions** with **49 frontline workers** at primary, secondary, and tertiary health centers (See Figure 1).

Desk review

The project was initiated with a comprehensive review of peer-reviewed literature, existing published and unpublished data, including institutional and donor reports that focused on SRMNCAH indicators' reporting and analysis in DRC and specifically in the Kasai region; coupled with an in-depth examination of the

national SRMNCAH indicators' list that organizations are required to report against on the DHIS2. Representatives from both governmental and non-governmental organizations in the DRC provided the study team with a set of key documents after each in-depth interview.

Key Informant Interviews (n=30, 33 participants)

Using a semi-structured interview guide developed specifically for the overarching study, we focused on KIs' perceptions and attitudes towards: SRMNCAH issues in the DRC and specifically in the Kasai region, SRMNCAH service provision for refugee and internally displaced populations, current reporting practices on SRMNCAH indicators, and the feasibility of reporting on the candidate set of core SRMNCAH indicators. We also explored stakeholders' perceptions and attitudes of current challenges in documenting and resources needed to successfully report against these indicators. We further explored the necessary buy-in needed among donor, governmental, and non-governmental agencies to enable the success of this effort.

Facility assessments (n=9)

We conducted nine facility assessments at primary, secondary and tertiary health facilities in the Kasai provinces (three in each selected province). These assessments aimed to determine the nature and extent of SRMNCAH services offered, the ways in which patient information was collected, logged, stored, and safeguarded, and the types of human and technological resources used in data capture.

Facility observation sessions (n=9)

In conjunction with the facility assessments, observational sessions were also carried out in all nine facilities. These observational sessions aimed to assess existing resources currently being employed to collect data and additional resources needed to collect additional needed data for the core set of SRMNCAH indicators.

Focus group discussions (n=9; 49 total participants)

Nine FGDs were conducted with 49 frontline workers from nine clinics and hospitals across the Kasai region. Participants provided verbal consent at the beginning of each FGD, which lasted an average of 90-120 minutes and took place in French. With consent, we audio-recorded all nine FGDs, debriefed as a team after each discussion, and wrote analytic memos to capture group dynamics and identify early themes.

Analytic approach

An iterative, multi-phased approach was employed to analyse the data (21, 22). All KIs and FGDs were analysed for content and themes, using both inductive and deductive techniques, which were then combined with results from the facility assessments. Validation discussions with KIs, and feedback from the WHO led to the final recommendations.

Research Ethics

The Research Project Review Panel (RP2) of the WHO's Department of Sexual and Reproductive Health reviewed and approved this study. Additionally, we obtained authorization to conduct this study from the WHO's Country Office in DRC and the DRC Ministry of Health (MoH). Additionally, we also obtained ethical approval to conduct this study from the national ethical committee of DRC (n°144/CNES/BN/PMMF/2018 on 2/11/2019). Furthermore, we received authorization from the MoH at the national and provincial levels. The Social Sciences and Humanities Research Ethics Board of the University of Ottawa provided ethical approval (Protocol number: S-08-18-1029).

Findings

The results of this assessment focused on the four core elements highlighted in the study objectives: 1) feasibility of collecting the proposed core set of SRMNCAH indicators; 2) relevance and usefulness of SRMNCAH data management mechanisms; 3) available existing resources and systems for national and humanitarian SRMNCAH data collection; and 4) ethical considerations. We first start by outlining the feasibility of collecting the proposed SRMNCAH indicators, then we move to describing the current and potential advantages as well as challenges with SRMNCAH data capturing, followed by outlining the available data collections systems for the proposed indicators by the different humanitarian agencies. The findings section will conclude by discussing the different enforced measures in DRC to protect data privacy and confidentiality among the different implementing agencies.

1) Feasibility

The findings of the study show that of the proposed indicators, 70% were deemed feasible and relevant, in domains including contraception (75%), maternal health (76%), newborn health (88%), child health (60%), sexual and gender-based violence (43%), prevention of mother-to-child transmission (100%), and sexually transmitted and blood-borne infections (100%) (see Table 1). Of the indicators deemed feasible and relevant, 73% are currently being collected (see Tables 1 and 2). The findings also show that some proposed indicators are deemed unfeasible and irrelevant, such as adolescent health-related indicators (33%) and comprehensive abortion care (40%). Table 2 gives an overview of the included and excluded list of indicators, the reported percentage of agencies who are currently collecting the indicator; site of data collection; their respective facilitators and barriers for routine data collection; any necessary modifications and resources for routine data collection.

The results show that overall, facilities in the DRC have implemented the collection of indicators related to contraception and recommend the inclusion of indicators 1.1 to 1.3 (see table 2). Stakeholders overwhelmingly noted the regional and institutional variability of the availabilities of commodities and types of contraception, which at times hinders the feasibility of collection. Other facilities have noted the selective collection of emergency contraception-related indicators, which in some cases is limited to individuals that require the clinical management of rape. Due to the legality of abortion in the DRC, the post-abortion care indicator (1.4) was suggested for removal.

The findings show that a vast majority of agencies and health facilities included in this study do not collect indicators related to abortions. Though the legal framework in the DRC allows for abortions in select instances, potential repercussions from government officials and the rarity of these situations render indicators suggesting elective abortions (2.1 to 2.3) are not collected, or that they are concealed under other health care services. As stated by an FGD participant in Kasai Oriental, “First of all, 2.1 which says, ‘number of clients requesting an abortion’. We know that our deontology prohibits abortion, first of all because everyone has the right to life, and also outside of that, abortion is performed only for therapeutic reasons and when it is truly needed to save the life of the mother. Since these are rare cases, we do not collect these indicators.” Indicators related to post-abortion care (2.4 and 2.5) would be feasible to collect provided certain measures for anonymity.

Facilities collect the majority of the proposed maternal health indicators as part of routine data collection, including comprehensive pre-natal and post-natal consultations up to 42 weeks post-partum, as the DRC has made significant investments into this domain. Some indicators that have variable levels of collection but are feasible include maternal deaths (3.1 to 3.3) due to perceived risks of sanctions, as any maternal death registered triggers an audit on the health facility. A medical coordinator concisely stated, “... Sanctions, the technical platform, also play a role in newborn health.” Indicators that are not feasible include the availabilities of post abortion care (PAC) (3.9), basic emergency obstetric care (BEmOC) (3.10), comprehensive emergency obstetric care (CEmOC) (3.11), and skilled personnel (3.12), as a result of service mapping exercises needed at the provincial level.

In the same vein as maternal health, most indicators on newborn health are collected during post-natal consultations. Indicators recommended for exclusion here revolve around the need for service mapping exercises, namely the availabilities of kangaroo mother care (KMC) (4.6) and neonatal resuscitation (4.7). Some variability exists in the feasibility of child health indicators, as they have not yet been integrated into routine service delivery as a specific area of their own, including for data collection. Though there is a lack of collection of these indicators, significant resources and training would allow for greater capabilities in this domain. Indicators that have been deemed unfeasible include those with population-level denominators, namely the under-5 mortality rate (U5MR) (5.2), percentage of children under 5 with suspected pneumonia taken to an appropriate health facility (5.3), and percentage of children under 5 who are wasted (5.5).

Adolescent health is another domain that has not been integrated into routine service delivery, and as such, sees an even greater lack of data collection. Indicators that are deemed not feasible include the adolescent birth rate (6.1), sexual violence against children (6.2), the adolescent mortality rate (6.3), and suicide rate (6.6) – primarily due to impractical population-level denominators. Of all proposed indicators, percentage of adolescents living with HIV receiving antiretroviral therapy (6.4) remains feasible due to the existing infrastructure in place for HIV surveillance. Immunization coverage rate (6.5) could also be a feasible indicator with significant training and capacity development for frontline staff.

Gaps exist in the domain of sexual and gender-based violence. Significant resources would need to be provided to increase the feasibility of collecting these indicators across the countries. Indicators that are feasible and relevant include the number of rape survivors (7.1) provided they are anonymized, and rape survivors receiving HIV post-exposure prophylaxis (PEP) (7.3) and emergency contraception (7.4) with increased collaboration with government departments and community leaders. Indicators deemed unfeasible include the percentage of health facilities with clinical management of rape services (7.2) which would need a service mapping exercise, rape survivors requesting or receiving abortions (7.5 and 7.6) due to legality, and availability of LIVES (7.7) as this service is not routinely provided.

All of the indicators within the domains of HIV, prevention of mother-to-child transmission, and STI & RTI were deemed feasible and relevant. Though regional differences exist in the current collection of these indicators, they would all be feasible following training on the clinical management of HIV, availability of resources and materials, capacity building of staff for service delivery, and training on how to identify and report STI/RTIs.

Many proposed barriers to feasibility exist at the facility level, where factors such as the availability of resources and training impede the ability of local providers at the health centre and general referral hospital level to collect indicators. The lack of both human and financial resources at the facility level plays a significant role in the collection of indicators, and in turn, the length of proposed indicators. Notably, participants stated that facility-based and contextually relevant data are more feasible to collect when compared to indicators that included a population-level denominator.

2) Relevance and usefulness of humanitarian SRMNCAH data management mechanisms

Perceived advantages with current and proposed SRMNCAH indicator reporting

The findings from our study indicate that KIs at the different levels of the health system were all in consensus that accurate and reliable SRMNCAH data provide opportunities for implementing evidence-based programming, improving service provision and the outcomes of its population, and ensuring that the service provision meets the global standard of care. Participants noted that SRMNCAH data collection allowed provinces to monitor and evaluate their progress in meeting their provincial health rate goals. As proudly stated by a KI, “[If] the objective is 20% and at times the health zone has reached up to 25%. The objective for reproductive health is 20%. As in we have to manage to cover 20% of the times between births...we are around 25%. We can see that we exceeded the objectives”. The majority of our participants also noted that the collection and reporting of SRMNCAH indicators’ purpose is to enable the MoH in their allocation of funds to the different health zones and to define and/or amend health priorities.

In general, stakeholders from all agencies and across the health system supported the general contours of the proposed core set of SRMNCAH indicators and noted that many of the proposed indicators are currently being collected through their centralized NHIS. A number of participants noted that the formation and use of DHIS2 allows for population-level reporting; however, given infrastructural and socio-cultural barriers, the reliability of these indicators is impugned. Even if indicators were not currently being collected, KIs and FGD participants could generally envision how to incorporate this information into facility-level

data collection systems and/or extract from the data in DHIS2. Finally, a number of our participants noted the importance of ensuring that the set SRMNCAL indicator list mirror the set of SRMNCAL indicators selected by the MoH to avoid parallel systems, and in turn, ensure greater buy-in among key actors in the field.

Perceived disadvantages with current SRMNCAL indicator reporting

In contrast to KIs at the national and provincial level, health zone level participants were unable to identify the relevance and utility of SRMNCAL data outside from program evaluation requirements. As noted by many of our FGD participants, staff at health facilities are performing most of the labour with the least resources in addition to receiving little to no training on the purpose of SRMNCAL data collection exercises. Our findings also indicate that there are a number of disadvantages with capturing certain SRMNCAL indicators, specifically surrounding maternal and newborn health, and sexual and gender-based violence (SGBV). As noted by many of our stakeholders and FGD participants, a multitude of barriers contribute to the significant underreporting for maternal, newborn, abortion and SGBV cases in the DRC. The findings suggest that the pressure arising from the politicization of SGBV, abortion, maternal, and newborn health indicators may lead certain facilities to underreport the number of cases.

Perceived gaps in the proposed SRMNCAL indicators

Indicators that should be removed from the core set of SRMNCAL indicators

Both KIs and frontline workers identified a number of the proposed SRMNCAL indicators as not relevant and/or useful for the humanitarian and developmental context of the DRC. Stakeholders from Kinshasa and across the Kasai region believed a sub-set of indicators should be removed because: 1) the indicator relates to a service that is not (routinely) provided in the DRC context (i.e., number of children who are wasted, adolescent suicide and the LIVES^[1] intervention in cases of intimate partner violence); 2) national regulations and protocols restricting the provision of care and therefore the collection of information on the subject; and/or 3) the indicator would not have any practical or actionable applications (see Table 3).

All of our stakeholders in the DRC raised concerns regarding the inclusion of abortion-related indicators. Our key informants explained that due to cultural and regulatory barriers, the abortion-related indicators should be removed to safeguard health zones, health care providers and women seeking abortions. A number of our KIs explained that although DRC acceded to the Maputo Protocol^[2] in 2006 and published this decision in the country's official journal in 2018, acceptance of comprehensive abortion care (CAC) has yet to occur due to the absence of amendments to the national penal code and institutional policies, compounded with socio-cultural norms. These participants believed that given the lack of adoption of the protocol into national regulations, health care providers and women seeking abortions are still at great risk of criminalization and community rejection, and health centres and provinces could be at further risk of sanctions.

Additional indicators that should be added to the core set of SRMNCAL indicators

Stakeholders in the DRC indicated that although the proposed list SRMNCAL indicators is comprehensive, there remains a need to include a number of indicators in the core list; including indicators relating to supply-chains, commodities/stock outs, and coordination. Our participants believed that the indicators on commodities/stock outs would enable the health facilities in ensuring commodity availability and for the national government and funders to accurately predict the volume of commodities needed in each health zone. Table 4 provides a list of additional indicators; the percentage of organizations currently collecting the proposed indicator; and the recommended resources and training needed for routine collection; recommended by the study participants to be added to the core list of SRMNCAL indicators.

3) Existing systems and resources for collecting SRMNCAL indicators

The findings from our study indicate that systems used by international organizations are distinct from those of the health information systems (HIS) used by local organizations. Our results suggest that there is a harmonized nationally endorsed reporting system for collecting SRMNCAL indicators in the DRC for services that are implemented at the national level. We provide a list of the available data collection systems by level of the health system structure and its use, reported by our stakeholders and frontline workers in Table 3.

The health zone, provincial level, national level, and organizations in the Kasai provinces report on a harmonized HIS, DHIS2, to capture information for certain SRMNCAL components. The findings also reveal that the structure of the health system and the well-defined roles of the national, provincial, health zone and facility levels, has enabled for a structured streamline of information and feedback loops. However, distribution of resources (i.e., internet, computers, infrastructure, data collection tools such as papers and pens) at the different levels of the hierarchy varied significantly. Due to scarcity of resources and weak infrastructure at the facility and health zone levels, upstream quality data distribution becomes more challenging. Finally, there are significant gaps in resources and systems that impede the input and analysis of timely and reliable SRMNCAL data (See Figure 2).

4) Ethical Considerations

The findings from this assessment suggest that across the health care system in DRC and among implementing agencies, data protection and confidentiality surrounding SRMNCAL data and research is prioritized, however, due to limited resources, data protection cannot always be assured. Health care facilities

have basic protocols in place for data logging and protection, especially surrounding SGBV and HIV/AIDS data. Many of the agencies had adopted the requirements of the DHIS2; however, stakeholders at the provincial level vocalized concerns regarding data duplication, specifically concerning the indicators surrounding SGBV. Participants from all levels noted that reported cases of sexual violence are anonymously collected and coded at both the health center level and at the Ministry of Justice (if the case is brought there), as these two systems work in silo when addressing cases of sexual violence, leading to data duplication. As explained by a KI in Kinshasa, “We need to create a harmonized tool so we can all speak the same language. For example, in the field of violence, it’s multisectoral, the people from the protection sector are collecting, the health care people are collecting, the justice people are collecting. So, all of these domains, they are [collecting] about the same person. When someone is raped, they need psychological support, this is all centered around the same person. So, it takes [a harmonized system] .... the same person then makes a complaint, the justice department who is helping them, who managed their case, it’s all about the same person. So, a tool is really needed. A tool and active data collection.”

The findings from our interviews with both KIs and FGDs suggest that although there is both demand and supply for abortions (through illegal channels), primary care providers mask/underreport indicators related to abortion care in fear of retribution. As a stakeholder explained, “Complete abortion care... you can have it partially. Since, first of all, abortion is illegal. As it’s illegal, I would say that this information is concealed, since if we trace this information back to the source, we could identify the person who logged it as being complicit [in the abortion]. I believe that this is information that is still being masked, I would say.” Thus, if abortion-related indicators are incorporated, a degree of anonymity must be given to staff at the health facilities and coded through the DHIS2 to protect primary care providers and women from potential retribution. Our findings also indicate that values clarification and attitudes transformation (VCAT) sessions and training on the IAFM are warranted.

Discussion

The findings from our multi-methods assessment suggest that the DRC has a robust and dynamic HIS system that can be leveraged and improved to ensure the feasibility of collecting a core set of indicators for monitoring and evaluating SRMNCAH services and outcomes in the humanitarian context in the Kasai provinces and across DRC more broadly. The NHIS data quality score increased from 25% in 2018 to 40% in 2021 (16). However, results from our assessment, and supported by the literature, indicate that despite having a centralized HIS system and recent improvement of data quality, there lacks a harmonized list of indicators for agencies to report against (10). Much of this burden falls onto low resourced health facilities at the local level (17,23). In order to mitigate this, overwhelmingly, the stakeholders felt it was important to develop an evidence-based, context-specific, core set of SRMNCAH indicators to be collected in DRC in conjunction with strengthening and investing in health facility data management systems at the health zone or district level to ensure widespread coverage and needed granularity of information (24).

A harmonized list of a core set of SRMNCAH indicators would alleviate the reported manual and human resource (HR) burden from the health facility, health zone and community levels (25,26), and also improve data analysis and reporting at the provincial and operational level (17). However, this shift requires a multi-pronged effort and buy-in across trans-disciplinary agencies working towards the same goal with horizontal and transparent communication channels. The outlined recommendations are steppingstones for SRMNCAH services and outcomes monitoring and evaluation in humanitarian settings. The recommendations also highlight work that can be done by data managers, communities, donors, and humanitarian actors in creating an enabling environment for quality SRMNCAH data and evidence-based decision making. In Figure 2, we outline factors that are supported by the literature that need to be implemented and addressed at the global, national, programmatic and facility levels to increase the feasibility of current indicator reporting practices and the quality of SRMNCAH data reporting (27–32).

The findings from this assessment indicate that continued armed conflict and looting, limited budgets and ownership, infrastructure challenges, and varying, incompatible policies prohibit the development of national priorities and guidelines for improving the reporting of SRMNCAH indicators. This issue is exacerbated in refugee and internally displaced populations more specifically, which has proven to be challenging across the Kasai provinces. Reports suggest that donors reacted by creating and implementing projects in search of rapid results and data to document them (33). The findings of this assessment validated that this led to multiple donor coordination mechanisms and project management units and, critically, a duplication and waste of resources for supervision, training, and technical assistance (33). This created a significant burden on the time of staff at district and health facility levels to attend training seminars, respond to supervisory visits, and meet reporting requirements (33). Further, many humanitarian agencies are financially supporting health zones under a performance-based contracting scheme (34), with clear emphasis on health facility reporting (25).

To improve SRMNCAH services and outcomes in humanitarian settings, WHO, in collaboration with partner agencies, supported the development of a ‘Data and Accountability Roadmap for Improving Data, Monitoring and Accountability for SRH in Crises’ (30). This Roadmap responded to the need for collecting, aggregating, making accessible, using clear and consistent data. The response aligns with the SDGs, the ‘Every Women Every Child Strategy’, and the commitments made at the 2017 Family Planning Summit to address data gaps. The roadmap combined with data literacy and indicator management awareness, digital aid frameworks and amendments of laws and regulations should be prioritized at the national and programmatic level to create an enabling environment to reduce duplicity, and improve communication channels and overarching SRMNCAH data quality (35).

The results from our assessment also indicated that the infrastructure in the Kasai provinces and access to resources is weak and varied by health zone. This finding is consistent with lack of human, financial and material resources observed at the country level, where 4 out of 10 health facilities do not have staff designated for data verification; and staff of more than 90% of health facilities have not been trained in recording, compiling and/or reviewing the quality of data (16). A functioning HIS requires skilled and motivated personnel, access to basic information and communication technologies, electricity, and roads (18). All these factors are likely to be negatively impacted by armed conflict, through direct attacks and looting, as well as indirectly due to insecurity, reduced mobility, and limited availability of financial and human resources (36). Strategies to improve routine facility data gathering and reporting that are

tailored to conflict affected settings can contribute to improve the effectiveness of the system (17), including investing in innovative solutions to overcome the barriers associated with weak infrastructure and limited resources (37). It would also be important to ensure that those at the facility-level have the needed training and skills necessary to provide services associated with the minimum initial service package (MISP) and have the training to reliably capture and insert the data. The findings also indicate that there needs to be some level of reflection on the principle of data minimization^[1] to protect this population (38).

Stakeholders were clear that collecting the SRMNCAH indicators that required a population-level denominator may not be often feasible, particularly in conflict affected areas in the DRC. A recent study found that data completeness and accuracy of reproductive, maternal, newborn and child health (RMNCH) data and difficulties of calculating population denominators were among the most common concerns among RMNCH key stakeholders in the DRC (17). Furthermore, the country's most recent census was organised in 1984 and its civil registration system too weak to provide reliable population-level denominators (19). Investing in characterised health facility data can potentially provide crucial disaggregated and timely information for program planning purposes and for evidence-based resource allocation in conflict settings that complement nationwide population-based surveys conducted on average every five years (26,39).

The findings from our study indicates that facilities need to recruit staff with a data collection and processing background (demographers, statisticians, data scientists) as well as provide regular significant pre-service and in-service training of HIS staff in DRC (from health centers to the central level). It is important to identify ways to support organizations that are currently providing SRMNCAH services with their data collection methods through additional staffing or training of existing staff. Given that all capacity building occurs through the MoH, training efforts should also occur through the MoH. Our findings indicate that given the prevalence of staff recycling, increasing staffing and training specifically for data collection and supervision at the health facility level is paramount to alleviate burden and enhance motivation among staff members to improve quality of data. Finally, the proposed indicators should be introduced with a toolkit that facilitates data collection by explaining the link between reporting and program improvement to enhance buy-in across staff members tasked with data collection. The trainings, policy changes, and resources described above would work to ensure accurate and quality data collection across the DRC.

Findings from this study reveal also needs to standardize definition and categorization of strata, digitalisation of data collection from health centres as well as to develop a multi-sectoral integrated data system. For instance, age group categories in the current HIS vary sometime by indicators (< 5 years, 5 years and above; <14, 15 years & above, etc). Such categorization might not allow analysing some adolescent SRH-related indicators or factors associated with maternal health such as the use of mosquito nets among adolescent pregnant women, intermittent preventive treatment of malaria in pregnancy, etc. Likewise, current paper-based data collection at the health centre level might introduce data entry errors at the health zone level.

Strengths and Limitations

The strategies recommended by Guba (40) were used for evaluating the trustworthiness of the data in this assessment. Prolonged engagement, triangulation, member checks, peer-debriefing with the study team in both DRC and Canada were used to ensure the credibility of the data (41). The mixed-methods design of this study enabled the integration of data from multiple sources, allowing the study team to validate and outline discrepancies between the data. Qualitative data was used to explore and explain the quantitative findings, with the findings from the facility assessments also validating (or in some cases dispelling) key themes identified in analyses of FGDs and KIs. The facility assessments provided important findings relating to current management SRMNCAH monitoring and evaluation systems as well as the availability and distribution of specific resources. Despite these strengths, however, our study was limited by challenges with language and translations, documentation, and infrastructural challenges. For example, all interviews were conducted in the local French language and translated by researchers in Canada, saying or words might have been mistranslated/misinterpreted. The positionalities of the research team members undoubtedly influenced the participant-researcher interaction as well as our interpretation of data collected. Through memoing and regular debriefings, we attempted to reflect on and understand these dynamics, thereby enhancing the credibility and trustworthiness of the findings.

Conclusion

The findings from this multi-methods feasibility assessment suggest that vast differences in feasibility exist in collecting the proposed list of core SRMNCAH indicators across the different Kasai provinces and different levels of the health system. Representatives from a variety of institutions noted that leveraging and further investing in current national systems and resources, such as the DHIS2, to ensure the feasibility of collecting this core set of indicators for monitoring and SRMNCAH services and outcomes in humanitarian settings in the DRC. The majority of the participants were in consensus that multi-pronged, transdisciplinary interventions and investments at the national and international levels would be required to increase the feasibility of collecting quality and timely SRMNCAH data. Indeed, stakeholders in the DRC were clear that this core set of SRMNCAH indicators can only be useful if buy-in from the global community to harmonize and coordinate data collection efforts and relevant indicators' reporting requirements is ensured.

Abbreviations

BEmOC Basic emergency obstetrical care

CEmOC Comprehensive emergency obstetrical care

DHIS2 District Health Information System 2

DRC Democratic Republic of Congo

FGD Focus Group Discussions

HIS Health Information System

HIV/AIDS Human Immunodeficiency Virus/Acquired immunodeficiency syndrome

IAFM Inter-Agency Field Manual on Reproductive Health

IDP Internally Displaced Persons

KI Key Informant

KII Key Informant Interview

KMC Kangaroo mother care

MISP Minimum Initial Service Package

MoH Ministry of Health

NGO Non-governmental organization

NHIS National Health Information System

PAC/CAC Post abortion care/Comprehensive abortion care

PEP Post-exposure prophylaxis

RMNCH Reproductive, maternal, neonatal, and child health

RP2 Research Project Review Panel

SRH Sexual and reproductive health

SRMNCAH Sexual, reproductive, maternal, neonatal, child, and adolescent health

U5MR Under-5 mortality rate

UN United Nations

UNHCR United Nations High Commissioner for Refugees

UNICEF United Nations Children's Fund

VCAT Values clarification and attitudes transformation

WHO World Health Organization

Declarations

Ethics approval and consent to participate

See Methods

Consent for publication

Not applicable

Availability of data and material

Available upon request

Competing interests

The authors declare that they have no competing interests. The authors alone are responsible for the views expressed in this article and they do not necessarily represent the views, decisions or policies of the institutions with which they are affiliated.

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Authors' contributions

LK, MS, KM, IM, AF developed the study protocol, carried out the literature search, cleaning and data management and analysis, MS, IM, AF led the data collection processes in the field. JE, KA, KE, AA, CD, IM, LK assisted with data analysis. Both JE and AA serve as first co-authors to this paper because they contributed equally to this work. JE, IM, LK, KA, KE, AA and CG and were major contributors in writing the manuscript. All authors, JE, IM, LK, KA, KE, AA and CG edited, read and approved the final manuscript.

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Tables

Table 1

Summary and percentage of the indicators by domain that were perceived relevant and feasible to the Congolese context, by number and percentage respectively

	Number of indicators by domain (n)	Number of indicators relevant to the Congolese context (n)	% of indicators that are feasible
Contraception	4	3	75%
Comprehensive Abortion Care	5	2	40%
Maternal Health	17	13	76%
Newborn Health	16	14	88%
Child Health	10	6	60%
Adolescent health	6	2	33%
Sexual and gender-based violence	7	3	43%
HIV	3	3	100%
Prevention from Mother to Child	4	4	100%
Sexually transmitted infections (STIs) & reproductive tract infections (RTIs)	1	1	100%
Total	73	51	70%

Table 2

Summary findings of the feasibility of collecting the following proposed SRMNCAH indicators in the humanitarian context of the Democratic Republic of the Congo

No.	Indicator name	Overall % of Agencies Reporting	Overall % of Agencies Reporting	Overall % of Agencies Reporting	Place of Collection	Facilitators to Routine Collection	Barriers to Routine Collection	Necessary Modifications	Resources Need for Routine Collection
		Kasai	Kasai Central	Kasai Oriental					
Contraception									
1.1	Number of clients initiating contraception	100%	56%	89%		National System for Health Information paper registers DHIS2	Low and unreliable availability of commodities Need for different contraception modalities	<i># of clients accepting a new modern contraceptive method, by method</i> Should be coupled with indicators covering use, discontinuation and trained staff on provision of modern contraceptive methods	Training for all primary care providers on the different modalities of contraception
1.2	Number of clients receiving emergency contraception	100%	44%	78%		National System for Health Information paper registers DHIS2	Low and unreliable availability of commodities Need for different contraception modalities	Should be coupled with an indicator tracking the number of resources available in clinic and indicator on number trained staff on provision of modern contraceptive methods	Training on the new IAFM guidelines Train primary care providers on the different contraceptive modalities that can be used for EC
1.3	Percentage of clients adopting modern contraceptive method after delivery	100%	56%	89%		National System for Health Information paper registers DHIS2	Low and unreliable availability of commodities Need for different contraception modalities	N/A	N/A
1.4	Percentage of clients adopting modern contraceptive method after abortion	100%	11%	78%		N/A	Legal status of abortion in DRC Service not provided Potential risk for patient and primary care provider	N/A	N/A
Comprehensive abortion care									
2.1	Number of clients requesting an abortion	0%	0%	11%		N/A	Legal status of abortion in DRC Potential risk for patient and primary care provider Insufficient data encryption	N/A	N/A
2.2	Number of clients receiving an abortion referral	38%	0%	44%		N/A	Legal status of abortion in DRC Potential risk for patient and primary care provider Insufficient data encryption	N/A	N/A
2.3	Number of clients receiving an	38%	0%	44%		N/A	Potential risk for patient and primary care provider	N/A	N/A

	induced abortion					Induced abortions are illegal in the DRC except in limited situations according to the Maputo Protocol; however, this exception has yet to be written into national law. Though care can be provided to clients presenting with having self-induced an abortion, due to its rarity and potential repercussions, this indicator is not collected Insufficient data encryption		
2.4	Number of clients presenting for post-abortion care (PAC)	88%	0%	89%	National System for Health Information paper registers DHIS2	Only secondary and tertiary health facilities are equipped and trained to provide comprehensive PAC	N/A	Training on the new IAFM guidelines DHIS2 create anonymity for the indicator (code) Service mapping of abortion providers who provide abortion services to the fullest extent of the law
2.5	Number of clients receiving PAC	100%	22%	78%	National System for Health Information paper registers DHIS2	Only secondary and tertiary health facilities are equipped and trained to provide comprehensive PAC	N/A	Training on the new IAFM guidelines DHIS2 create anonymity for the indicator (code) Service mapping of abortion providers who provide abortion services to the fullest extent of the law
Maternal health								
3.1	Number of maternal deaths	100%	44%	78%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries Perceived risk of sanctions on health facilities if a maternal death is reported	<i># of maternal deaths in the facility, by cause of death</i> Should be disaggregated by cause and coupled with indicators that capture maternal death in the community	Increased transparency in auditing practice surrounding maternal death Resources will need to be developed and implemented at the community level to capture the indicators for the maternal deaths in the community
3.2	Number of maternal deaths, disaggregated	38%	44%	44%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries Perceived risk of sanctions on health facilities if a maternal death is reported	<i># of maternal deaths¹, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i>	Training for data collectors on the different causes of maternal death and how to encode for each Develop detailed manuals for frontline workers and data collectors Training and capacity building for community health workers Increased transparency in auditing practice surrounding maternal deaths

3.3	Percentage of maternal death reviews	75%	11%	89%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries Perceived risk of sanctions on health facilities if a maternal death is reported	<i># of maternal deaths in the facility that were audited and reviewed</i> French wording should be changed to "revue" as this is how it is reported in DHIS2.	Training and capacity building for staff to review maternal death cases Training and capacity building for community health workers Increased transparency in auditing practice surrounding maternal deaths
3.4	Number of clients receiving antenatal care (ANC)	100%	44%	67%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	N/A	Accessibility to commodities and supplies
3.5	Number of deliveries	100%	44%	89%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	<i># of clients delivering in facility, including both live and stillbirths</i> Should be coupled with indicators to capture births occurring in the community	Frontline worker will need training on reporting on stillbirths Leveraging systems to capture stillbirth for community births (UNICEF) Training and capacity building for community health workers
3.6	Number of deliveries, disaggregated	63%	22%	78%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	<i># of clients delivering in facility, including both live and stillbirths, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i>	Frontline worker will need training on reporting on stillbirths Leveraging systems to capture stillbirth for community births (UNICEF) Training and capacity building for community health workers
3.7	Number of clients receiving post-natal care (PNC)	88%	22%	78%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	N/A	N/A
3.8	Number of caesarean section deliveries	88%	11%	67%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	Coupled with an indicator on the number of referrals for cesareans	Might not be useful outside of hospital setting.
3.9	Availability of PAC	100%	22%	67%	N/A	Service mapping exercise at the provincial level	N/A	N/A
3.10	Availability of basic emergency obstetric care (BEmOC)	88%	33%	89%	N/A	Service mapping exercise	N/A	N/A
3.11	Availability of comprehensive emergency obstetric care (CEmOC)	88%	22%	78%	N/A	Service mapping exercise	N/A	N/A

3.12	Availability of skilled personnel	88%	22%	67%	N/A	Service mapping exercise	N/A	N/A
3.13	Number of antenatal care clients with tetanus vaccination	100%	33%	89%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	N/A	N/A
3.14	Number of ANC clients receiving preventive therapy for malaria	88%	44%	89%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	N/A	N/A
3.15	Number of ANC clients receiving syphilis screening	50%	22%	33%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries Shortage/absence of diagnostic screening tests for Syphilis	N/A	N/A
3.16	Number of ANC clients receiving urinary tract infection screening or treatment	88%	33%	67%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	N/A	N/A
3.17	Number of clients with identified maternal morbidities during post-natal care (PNC)	75%	33%	78%	National System for Health Information paper registers DHIS2	Weak infrastructures around national registries	N/A	N/A
Newborn health								
4.1	Number of neonatal deaths	75%	44%	67%	National System for Health Information paper registers DHIS2	Perceived risk of sanctions on health facilities if a neonatal death is reported	<i># of neonatal deaths (0-28) at the facility level</i> Should be coupled with an indicator tracking neonatal death within the community	Increased transparency in auditing practice surrounding neonatal death audits. Training and capacity building for community health workers
4.2	Number of stillbirths	75%	44%	67%	National System for Health Information paper registers DHIS2	Perceived risk of sanctions on health facilities if a neonatal death is reported Infrastructural barriers; lack of roads, electricity, and reliable internet connection	N/A	N/A
4.3	Number of babies born low birth weight	75%	44%	78%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	Should be coupled with an indicator tracking malnutrition among pregnant women.	N/A
4.4	Number of small and sick newborns receiving care	50%	22%	78%	National System for Health Information	Infrastructural barriers; lack of roads, electricity,	N/A	N/A

					paper registers DHIS2	and reliable internet connection		
4.5	Number of newborns receiving post-natal care	63%	22%	67%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	<i># of newborns receiving post-natal care within 7-10 days</i>	N/A
4.6	Availability of KMC	88%	22%	78%	N/A	Service mapping exercise	N/A	N/A
4.7	Availability of neonatal resuscitation	75%	33%	78%	N/A	Service mapping exercise	N/A	N/A
4.8	Number of neonatal deaths, disaggregated	63%	11%	67%	National System for Health Information paper registers DHIS2	Perceived risk of sanctions on health facilities if a neonatal death is reported	N/A	When reviewing data and making recommendations for health programs, consider the disaggregated indicator. Leverage system that capture newborn death and review these cases for cause of death Training and capacity building for of primary care providers
4.9	Percentage of perinatal death reviews	25%	22%	67%	National System for Health Information paper registers DHIS2	Perceived risk of sanctions on health facilities if a neonatal death is reported	French wording should be changed to "revue" as this is how it is reported in DHIS2.	In urban settings national system would need to be established to capture newborn death and review these cases for cause of death Training and capacity building of primary care providers Will need to be added to the DHIS2
4.10	Number of newborns receiving Hepatitis B vaccine	0%	0%	22%	National System for Health Information paper registers DHIS2	Absence/shortages of the diagnostic screening test for Hepatitis B	N/A	Will need to be added to the DHIS2 Extensive training and capacity building will need to be implementing for scale-up at the national level
4.11	Number of newborns initiating breastfeeding early	75%	33%	56%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	N/A	N/A
4.12	Number of infants weighed at birth	75%	11%	56%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	<i># of newborns weighed at delivery</i>	N/A
4.13	Number of babies registered	63%	22%	67%	National System for Health Information paper registers DHIS2	Civil registry is unreliable	Distinguish between registration at the facility level and at the state level.	Civil registries to be integrated into hospitals and clinics Significant training and resources will need to be implemented

4.14	Number of newborns receiving treatment for possible severe bacterial infection (PSBI)	63%	0%	56%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	N/A	Significant training and resources will need be implemented
4.15	Number of newborns admitted	25%	11%	44%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	N/A	N/A
4.16	Number of newborns with morbidities identified during PNC	38%	0%	44%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	N/A	Resources for primary care providers on the definitions for morbidity type Will need to be added to the DHIS2 Extensive training and capacity building of primary care providers
Child health								
5.1	Number of deaths of children under 5	88%	0%	44%	National System for Health Information paper registers DHIS2	Lack of integration of child health into routine service delivery as a category of its own	N/A	Training and outreach programs will need to be implemented at the health facility and community level Child health indicators to be integrated into routine service delivery as a specific area of focus, including for data collection
5.2	Under 5 mortality rate	25%	0%	33%	N/A	Population-level indicator with impractical denominator	N/A	N/A
5.3	Percentage of children under 5 with suspected pneumonia taken to appropriate health facility	50%	14%	33%	N/A	Population-level indicator with impractical denominator	N/A	N/A
5.4	Coverage of diarrhea treatment	50%	14%	44%	National System for Health Information paper registers DHIS2	Lack of integration of child health into routine service delivery as a category of its own	N/A	Child health indicators to be integrated into routine service delivery as a specific area of focus, including for data collection.
5.5	Percentage of children under 5 who are wasted	38%	0%	44%	N/A	Low burden of disease, population-level indicator with impractical denominator	N/A	N/A
5.6	Percentage of children under 5 who are registered	25%	0%	56%	N/A	The denominator of this indicator is not feasible since population level metrics are often unreliable in the DRC.	N/A	N/A

5.7	Number of children presenting with fever tested for malaria in endemic settings	50%	14%	56%	National System for Health Information paper registers DHIS2	Reported solely for donors; not integrated into national HIS	<i># of children under 5 who have been administered outpatient malaria tests, by age</i>	Child health indicators to be integrated into routine service delivery as a specific area of i own, including fi data collection.
5.8	Number of confirmed cases of malaria in endemic settings	50%	14%	56%	National System for Health Information paper registers DHIS2	Reported solely for donors; not integrated into national HIS	N/A	Child health indicators to be integrated into routine service delivery as a specific area of i own, including fi data collection.
5.9	Percentage of confirmed malaria cases treated	50%	14%	56%	National System for Health Information paper registers DHIS2	Reported solely for donors; not integrated into national HIS	N/A	Child health indicators to be integrated into routine service delivery as a specific area of i own, including fi data collection.
5.10	Coverage of DP3	50%	14%	56%	National System for Health Information paper registers DHIS2	Lack of integration of child health into routine service delivery as a category of its own	N/A	Child health indicators to be integrated into routine service delivery as a specific area of i own, including fi data collection.
Adolescent health								
6.1	Adolescent birth rate	25%	14%	33%	N/A	Population-level indicator with impractical denominator	N/A	N/A
6.2	Sexual violence against children	63%	25%	33%	N/A	Lack of integration of adolescent health services tailored to this population's unique needs	N/A	N/A
6.3	Adolescent mortality rate	0%	0%	11%	N/A	Population-level indicator with impractical denominator	N/A	N/A

6.4	Percentage of adolescents living with HIV who are currently receiving antiretroviral therapy, disaggregated	Could be collected			Organizations in the DRC do not actively collect disaggregated data yet the information could be extracted from the HIS	Lack of integration of adolescent health services tailored to this population's unique needs	<i># of adolescents living with HIV who are currently receiving antiretroviral therapy, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i> Removal of the denominator	Significant training and capacity development for frontline staff or adolescent health indicator reporting Will need to be added to the DHIS2
6.5	Immunization coverage rate	Could be collected			Organizations in the DRC do not actively collect disaggregated data yet the information could be extracted from the HIS	Lack of integration of adolescent health services tailored to this population's unique needs	<i># of adolescents receiving the nationally mandated immunization, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i> Removal of the denominator	Significant training and capacity development for frontline staff or adolescent health indicator reporting Will need to be added to the DHIS2
6.6	Suicide rate, disaggregated	0%	0%	22%	N/A	Population-level indicator with impractical denominator Low burden of disease	N/A	N/A
Sexual and gender-based violence								
7.1	Number of rape survivors	88%	50%	78%	National System for Health Information paper registers DHIS2	Current indicators do not capture the cultural and community interventions surrounding SGBV	N/A	An anonymous code should be assigned to each survivor to avoid duplication of data.
7.2	Percentage of health facilities with clinical management of rape services	63%	43%	67%	N/A	Service mapping exercise	N/A	N/A
7.3	Percentage of rape survivors receiving HIV post-exposure prophylaxis	63%	29%	67%	National System for Health Information paper registers DHIS2	Current indicators do not capture the cultural and community interventions surrounding SGBV	Should be coupled with indicators capturing referrals and availability of supplies	Significant training for the entire health care team Training on the new IAFM Inclusion of community leaders Inclusion of judicial system Training and outreach for community leaders Changes in the DHIS2 will need to be made to avoid

								duplicity in the data reporting Training in clinical management of HIV Increased availability/suppl of PEP kits Coordination with the Justice System
7.4	Percentage of rape survivors receiving emergency contraception	88%	38%	67%	National System for Health Information paper registers DHIS2	Current indicators do not capture the cultural and community interventions surrounding SGBV	Should be coupled with indicators capturing referrals and availability of supplies	Significant training for the entire health care team Training on the new IAFM Training and outreach for community leaders Inclusion of judicial system Changes in the DHIS2 will need be made to avoid duplicity in the data reporting Coordination with the Justice System
7.5	Number of rape survivors requesting abortion	13%	0%	11%	N/A	Though it is technically legal to receive an abortion due to rape according to the Maputo Protocol, this exception has yet to be written into national law. As such, this indicator is not collected.	N/A	N/A
7.6	Number of rape survivors receiving induced abortion care or referral	25%	0%	44%	N/A	Though it is technically legal to receive an abortion due to rape according to the Maputo Protocol, this exception has yet to be written into national law. Though care will be provided to clients presenting with abortion, due to its rarity and potential repercussions, this indicator is not collected.	N/A	N/A
7.7	Availability of intimate partner violence front line support (LIVES)	25%	13%	44%	N/A	Service is not routinely provided	N/A	N/A
HIV								
8.1	Antiretroviral therapy coverage among people living with HIV, disaggregated	38%	38%	56%	National System for Health Information paper registers DHIS2	Supply and training shortages	N/A	Training in clinic management of HIV
8.2	Percentage of exposed individuals receiving post-exposure prophylaxis	38%	38%	56%	National System for Health Information paper registers DHIS2	Supply and training shortages	N/A	Training in clinic management of HIV

8.3	Percentage of donated blood units screened for HIV in quality assured manner	38%	13%	56%	National System for Health Information paper registers DHIS2	Supply and training shortages	N/A	Training in clinic management of HIV Might not be useful outside of hospital setting
Prevention of mother-to-child transmission								
9.1	Percentage of antenatal care clients receiving syphilis screening and treatment	50%	25%	44%	National System for Health Information paper registers DHIS2	Shortage/absence of diagnostic screening tests for Syphilis	N/A	Training in clinic management of HIV Might not be useful outside of hospital setting
9.2	Percentage of antenatal care clients offered testing for HIV	50%	25%	56%	National System for Health Information paper registers DHIS2	Supply and training shortages	<i># of first-time antenatal care clients who received pre-testing counselling for HIV</i>	Training in clinic management of HIV
9.3	Percentage of HIV-positive pregnant people receiving antiretroviral therapy	63%	25%	44%	National System for Health Information paper registers DHIS2	Supply and training shortages	N/A	Training in clinic management of HIV
9.4	Percentage of all deliveries to HIV-positive mothers receiving antiretrovirals	50%	25%	44%	National System for Health Information paper registers DHIS2	Supply and training shortages	<i># of HIV-positive mothers who receive ART according to national protocol</i> Should be coupled with an indicator for the infant also receiving ART	Training in clinic management of HIV
Sexually transmitted infections (STIs) & reproductive tract infections (RTIs)								
10.1	Percentage of STI/RTI cases managed	75%	15%	78%	National System for Health Information paper registers DHIS2	Infrastructural barriers; lack of roads, electricity, and reliable internet connection	<i># of patients with STI/RTI accessing services who are diagnosed symptomatically, and counselled according to protocol</i> Distinguish between the number of cases and the number of cases "managed". STI and RTI cases need to be formulated as separate indicators.	Training on how to identify and report on STI/RTI Training on the clinical management of STI/RTI cases

Table 3

List of indicators that should be excluded according to our stakeholders, with primary rationale

	Indicator number and name	Rationale for exclusion
Contraception	1.4: Percentage of clients adopting modern contraception method after abortion	Service not provided Potential risk for patient and primary care provider
Comprehensive abortion care	2.1: Number of clients requesting an abortion	Potential risk for patient and primary care provider Legal status of abortion in DRC Insufficient data encryption
	2.2: Number of clients receiving an abortion referral	Legal status of abortion in DRC Potential risk for patient and primary care provider Insufficient data encryption
	2.3: Number of clients receiving an induced abortion	Potential risk for patient and primary care provider Induced abortions are illegal in the DRC except in limited situations according to the Maputo Protocol; however, this exception has yet to be written into national law. Though care can be provided to clients presenting with having self-induced an abortion, due to its rarity and potential repercussions, this indicator is not collected Insufficient data encryption
Maternal Health	3.9: Availability of PAC	Service mapping exercise at the provincial level
	3.10: Availability of basic emergency obstetric care (BEmOC)	Service mapping exercise
	3.11: Availability of comprehensive emergency obstetric care (CEmOC)	Service mapping exercise
	3.12: Availability of skilled personal	Service mapping exercise
Newborn Health	4.6: Availability of KMC	Service mapping exercise
	4.7: Availability of neonatal resuscitation	Service mapping exercise
Child health	5.2: Under 5 mortality rate	Population-level indicator with impractical denominator
	5.3: Percentage of children under 5 with suspected pneumonia taken to appropriate health facility	Population-level indicator with impractical denominator
	5.5: Percentage of children under 5 who are wasted	Low burden of disease, population-level indicator with impractical denominator
	5.6: Percentage of children under 5 who are registered	The denominator of this indicator is not feasible since population level metrics are often unreliable in the DRC.
Adolescent Health	6.1: Adolescent birth date	Population-level indicator with impractical denominator
	6.2: Sexual violence against children	Information not actionable, population-level indicator with impractical denominator
	6.3: Adolescent mortality rate	Population-level indicator with impractical denominator
	6.6: Suicide rate, disaggregated	Population-level indicator with impractical denominator Low burden of disease
Sexual and gender-based violence	7.2: Percentage of health facilities with clinical management of rape services	Service mapping exercise
	7.5: Number of rape survivors requesting abortion	Though it is technically legal to receive an abortion due to rape according to the Maputo Protocol, this exception has yet to be written into national law. As such, this indicator is not collected.
	7.6: Number of rape survivors receiving induced abortion care or referral	Though it is technically legal to receive an abortion due to rape according to the Maputo Protocol, this exception has yet to be written into national law. Though care will be provided to clients presenting with abortion, due to its rarity and potential repercussions, this indicator is not collected.
	7.7: Availability of intimate partner violence front line support (LIVES)	Service not routinely provided

Indicator number and name	Rationale for exclusion
HIV	No indicator indicated for exclusions in this section
Prevention of mother-to-child transmission	No indicator indicated for exclusions in this section
Sexually transmitted infections (STIs) and reproductive tract infections (RTIs)	No indicator indicated for exclusions in this section

Table 4

List of indicators that were recommended to be added to the core list of indicators

Indicator			Percentage of org. collecting this indicator (%)			Resources and training needed for routine collection
<i>Kasaï</i>	<i>Kasaï Central</i>	<i>Kasaï Oriental</i>				
Contraception	1.1: Number of clients initiating contraception	<i># of clients accepting a new modern contraceptive method, by method</i> Should be couple with indicators covering use, discontinuation and trained staff on provision of modern contraceptive methods	100%	56%	89%	Training for all primary care providers on the different modalities of contraception
	1.2: Number of clients receiving emergency contraception	Should be coupled with an indicator tracking the number of resources available in clinic and indicator on number trained staff on provision of modern contraceptive methods	100%	44%	78%	Training on the new IAFM guidelines Train primary care providers on the different contraceptive modalities that can be used for EC
	1.3: Percentage of clients adopting modern contraceptive method after delivery	N/A	100%	56%	89%	N/A
Abortion	2.4: Number of clients presenting for post-abortion care	N/A	88%	0%	89%	Training on the new IAFM guidelines DHIS2 create anonymity for this indicator(code) Service mapping of abortion providers who provide abortion services to the fullest extent of the law
	2.5: Number of clients receiving post-abortion care	N/A	100%	22%	78%	Training on the new IAFM guidelines DHIS2 create anonymity for this indicator(code) Service mapping of abortion providers who provide abortion services to the fullest extent of the law
Maternal Health	3.1: Number of maternal deaths	<i># of maternal deaths in the facility, by cause of death</i> Should be disaggregated by cause and coupled with indicators that capture maternal death in the community	100%	44%	78%	Increased transparency in auditing practices surrounding maternal death Resources will need to be developed and implemented at the community level to capture the indicators for the maternal deaths in the community
	3.2: Number of maternal deaths, disaggregated	<i># of maternal deaths¹, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i>	38%	44%	44%	Training for data collectors on the different causes of maternal death and how to encode for each Develop detailed manuals for frontline workers and data collectors Training and capacity building for community health workers Increased transparency in auditing practices surrounding maternal deaths.
	3.3: Percentage of maternal death reviews	<i># of maternal deaths in the facility that were audited and reviewed</i> French wording should be changed to "revue" as this is how it is reported in DHIS2.	75%	11%	89%	Training and capacity building for staff to review on maternal death cases Training and capacity building for community health workers Increased transparency in auditing practices surrounding maternal deaths

Indicator			Percentage of org. collecting this indicator (%)			Resources and training needed for routine collection
	3.4: Number of clients receiving antenatal care	N/A	100%	44%	67%	Accessibility to commodities and supplies
	3.5: Number of deliveries	<i># of clients delivering in facility, including both live and stillbirths</i> Should be coupled with indicators to capture births occurring in the community	100%	44%	89%	Frontline workers will need training on reporting on stillbirths Leveraging systems to capture stillbirths for community births (UNICEF) Training and capacity building for community health workers
	3.6: Number of deliveries, disaggregated	<i># of clients delivering in facility, including both live and stillbirths, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i>	63%	22%	78%	Frontline workers will need training on reporting on stillbirths Leveraging systems to capture stillbirths for community births (UNICEF) Training and capacity building for community health workers
	3.7: Number of clients receiving post-natal care	N/A	88%	22%	78%	N/A
	3.8: Number of caesarean section deliveries	Coupled with an indicator on the number of referrals for cesarians	88%	11%	67%	Might not be useful outside of hospital setting.
	3.13: Number of antenatal care clients with tetanus vaccination	N/A	100%	33%	89%	N/A
	3.14: Number of antenatal care clients receiving preventive therapy for malaria	N/A	88%	44%	89%	N/A
	3.15: Number of antenatal care clients receiving syphilis screening	N/A	50%	22%	33%	N/A
	3.16: Number of antenatal care clients receiving urinary tract infection screening or treatment	N/A	88%	33%	67%	N/A
	3.17: Number of clients with identified maternal morbidities during post-natal care	N/A	75%	33%	78%	N/A
Newborn Health	4.1: Number of neonatal deaths	<i># of neonatal deaths (0-28) at the facility level</i> Should be coupled with an indicator tracking neonatal death within the community	75%	44%	67%	Increased transparency in auditing practices surrounding neonatal death audits. Training and capacity building for community health workers
	4.2: Number of stillbirths	N/A	75%	44%	67%	N/A
	4.3: Number of babies born low birth weight	Should be coupled with an indicator tracking malnutrition among pregnant women.	75%	44%	78%	N/A
	4.4: Number of small and sick newborns receiving care	N/A	50%	22%	78%	N/A
	4.5: Number of newborns receiving post-natal care	<i># of newborns receiving post-natal care within 7-10 days</i>	63%	22%	67%	N/A

Indicator			Percentage of org. collecting this indicator (%)			Resources and training needed for routine collection
	4.8: Number of neonatal deaths, disaggregated	N/A	63%	11%	67%	When reviewing data and making recommendations for health programs, consider the disaggregated indicator. Leverage systems that capture newborn death and review these cases for cause of death Training and capacity building for of primary care providers
	4.9: Percentage of perinatal death reviews	French wording should be changed to "revue" as this is how it is reported in DHIS2.	25%	22%	67%	In urban settings, national systems would need to be established to capture newborn death and review these cases for cause of death Training and capacity building of primary care providers Will need to be added to the DHIS2
	4.10: Number of newborns receiving Hepatitis B	N/A	0%	0%	22%	Will need to be added to the DHIS2 Extensive training and capacity building will need to be implementing for scale-up at the national level
	4.11: Number of newborns initiating breastfeeding early		75%	33%	56%	N/A
	4.12: Number of infants weighed at birth	<i># of newborns weighed at delivery</i>	75%	11%	56%	N/A
	4.13: Number of babies registered	Distinguish between registration at the facility level and at the state level.	63%	22%	67%	Civil registries to be integrated into hospitals and clinics Significant training and resources will need be implemented
	4.14: Number of newborns receiving treatment for possible severe bacterial infection (PSBI)	N/A	63%	0%	56%	N/A
	4.15: Number of newborns admitted	N/A	25%	11%	44%	N/A
	4.16: Number of newborns with morbidities identified during post-natal care	N/A	38%	0%	44%	Resources for primary care providers on the definitions for morbidity type Will need to be added to the DHIS2 Extensive training and capacity building of primary care providers
Child Health	5.1: Number of deaths of children under 5	N/A	88%	0%	44%	Training and outreach programs will need to be implemented at the health facility and community level Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection

Indicator			Percentage of org. collecting this indicator (%)			Resources and training needed for routine collection
	5.4: Coverage of diarrhea treatment	N/A	50%	14%	44%	Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection.
	5.6: Percentage of children under 5 who are registered	The denominator of this indicator is not feasible since population level metrics are often unreliable in the DRC.	25%	0%	56%	Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection. Significant resources and training will need to occur for this to be captured
	5.7: Number of children presenting with fever tested for malaria in endemic settings	<i># of children under 5 who have been administered outpatient malaria tests, by age</i>	50%	14%	56%	Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection.
	5.8: Number of confirmed cases of malaria in endemic settings	N/A	50%	14%	56%	Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection.
	5.9: Percentage of confirmed malaria cases treated	N/A	50%	14%	56%	Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection.
	5.10: Coverage of DPT3	N/A	50%	14%	56%	Child health indicators to be integrated into routine service delivery as a specific area of its own, including for data collection.
Adolescent Health	6.4: Percentage of adolescents living with HIV who are currently receiving antiretroviral therapy, disaggregated	<i># of adolescents living with HIV who are currently receiving antiretroviral therapy, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i> Removal of the denominator	38%	38%	22%	Significant training and capacity development for frontline staff on adolescent health indicator reporting Will need to be added to the DHIS2
	6.5: Immunization coverage rate	<i># of adolescents receiving the nationally mandated immunization, disaggregated by age (less than 15 years; between 15-19 and equal or greater than 19 years)</i> Removal of the denominator	50%	38%	44%	Significant training and capacity development for frontline staff on adolescent health indicator reporting Will need to be added to the DHIS2
SGBV	7.1: Number of rape survivors	N/A	88%	50%	78%	An anonymous code should be assigned to each survivor to avoid duplication of data.
	7.3: Percentage of rape survivors receiving HIV post-exposure prophylaxis	Should be coupled with indicators capturing referrals and availability of supplies	63%	29%	67%	Significant training for the entire health care team Training on the new IAFM Inclusion of community leaders Inclusion of judicial system Training and outreach for community leaders Changes in the DHIS2 will need to be made to avoid duplicity in the data reporting Training in clinical management of HIV Increased availability/supply of PEP kits Coordination with the Justice System

Indicator			Percentage of org. collecting this indicator (%)			Resources and training needed for routine collection
	7.4: Percentage of rape survivors receiving emergency contraception	Should be coupled with indicators capturing referrals and availability of supplies	88%	38%	67%	Significant training for the entire health care team Training on the new IAFM Training and outreach for community leaders Inclusion of judicial system Changes in the DHIS2 will need to be made to avoid duplicity in the data reporting Coordination with the Justice System
HIV	8.1: Antiretroviral therapy coverage among people living with HIV, disaggregated	N/A	38%	38%	56%	Training in clinical management of HIV
	8.2: Percentage of exposed individuals receiving post-exposure prophylaxis	N/A	38%	38%	56%	Training in clinical management of HIV
	8.3: Percentage of donated blood units screened for HIV in quality assured manner	N/A	38%	13%	56%	Training in clinical management of HIV Might not be useful outside of hospital setting
Prevention of mother-to-child transmission	9.1: Percentage of antenatal care clients receiving syphilis screening and treatment	N/A	50%	25%	44%	Scale-up of these programs at the national level Training and capacity building of staff for service delivery and data capturing
	9.2: Percentage of antenatal care clients offered testing for HIV	<i># of first-time antenatal care clients who received pre-testing counselling for HIV</i>	50%	25%	56%	Training in clinical management of HIV
	9.3: Percentage of HIV-positive pregnant people receiving antiretroviral therapy	N/A	63%	25%	44%	Training in clinical management of HIV
	9.4: Percentage of all deliveries to HIV-positive mothers receiving antiretrovirals	<i># of HIV-positive mothers who receive ART according to national protocol</i> Should be coupled with an indicator for the infant also receiving ART	50%	25%	44%	Training in clinical management of HIV
STI & RTI	10.1: Percentage of STI/RTI cases managed	<i># of patients with STI/RTI accessing services who are diagnosed symptomatically, and counselled according to protocol</i> Distinguish between the number of cases and the number of cases "managed". STI and RTI cases need to be formulated as separate indicators.	75%	15%	78%	Training on how to identify and report on STI/RTIs Training on the clinical management of STI/RTI cases

Figures

Figure 1

Data collection for Phase II

Acronyms: Non-governmental organization (NGO); Community based organization (CBO)

Figure 2

Challenges and solutions for timely, reliable, quality SRMNCAL indicator reporting at the facility, programmatic, and national and global levels in the DRC, reported by the study participants

*Backed up by the literature, our findings confirm that the matrix used for funding allocation to the health zones is incompatible with the needs.