Routine Health Information System in the Health Facilities in Yaoundé-Cameroon: Assessing the Gaps for Strengthening

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Abstract

Background
Management of health data and its use for informed decision making is a challenging health sector aspect in developing countries. Monitoring and evaluation of health interventions for meeting health-related Sustainable Development Goals (SDGs), and Cameroon Health Sector Strategy (HSS) targets is facilitated through evidence-based decision-making and public health action. Thus, a Routine Health Information System (RHIS) producing quality data is imperative. The objective of this study was to assess the RHIS in the health facilities (HFs) in Yaoundé in order to identify gaps and weaknesses and to propose measures for strengthening.

Methods
A health facility-based cross-sectional descriptive study was carried out in the six health districts (HDs) of Yaoundé; followed by a qualitative aspect consisting of in-depth interviews of key informants at the Regional Health Office. HFs were selected using a stratified sampling method with probability proportional to the size of each HD. Data were collected (one respondent per HF) using the World Health Organization (WHO) and MEASURE Evaluation RHIS rapid assessment tool. Data were entered into Microsoft Excel 2013 and analyzed with IBM-SPSS version 20.

Results
A total of 111 HFs were selected for the study. Respondents aged 24-60 years with an average of 38.3±9.3 years; 58 (52.3%) male and 53(47.7%) female. Heads of HFs and persons in charge of statistics/data management were most represented with 45.0% and 21.6% respectively. All the twelve subdomains of the RHIS were adequately functioning at between 7% and 30%. These included Human Resources (7%), Data Analysis (10%), Information and Communication Technology (11%), Standards and System Design (15%), Policies and Planning (15%), Information Dissemination (16%), Data Demand and Use (16%), Management (18%), Data Needs (18%), Data Quality Assurance (20%), Collection and Management of Individual Client Data (26%), Collection, Management, and Reporting of Aggregated Facility Data (30%).

Conclusions
The level of functioning of subdomains of the RHIS in Yaoundé was low; thus, immediate and district-specific strengthening actions should be implemented if health-related SDGs and HSS targets are to be met. A nationwide assessment should be carried out in order to understand the determinants of these poor performances and to strengthen the RHIS.

Background
Quality health care delivery is a product of informed decision making which in turn is based on proper health information management (1). The management of health data and its use for informed decision making remains one of the most challenging health sector aspects in developing countries (2,3). Many health information management sub-systems that function in a non-integrated and unstandardized manner characterise the Routine Health Information System (RHIS). These sub-systems use physical tools (registers, data collection forms etc.), and in most cases, there are no delegated persons in charge of statistics to ensure proper data management.
Data is managed by clinical staff in addition to their daily tasks, thereby becoming overworked (4). This results in the poor capture of health data at every level of the pyramid, lack of analysis of the collected information at the given level before forwarding, lack of sufficient feedback mechanism and lack of public and private sectors collaboration in terms of information sharing (5). Bottle-necks resulting from these include poor completeness and timeliness in information reporting, poor archiving, in-coherences in both indicator denominators and numerators in the different data bases, and non-use of information for decision making at the given level (1).

Though there is no outlined health-related Sustainable Development Goals (SDGs) target for HIS, Universal Health Coverage (UHC) target is emphasised encompassing access to quality healthcare, essential drugs and vaccines (6). The importance of an efficient and harmonised system cannot therefore be overlooked if health-related SDGs are to be met (7).

MEASURE Evaluation post strengthening assessments of the RHIS in some countries in Africa have obtained significantly promising results trending towards proper data care. The putting into place of an enabling environment, permitting better management by stakeholders improved on data quality (accuracy, completeness and timeliness) and data use in Mali (8). In 2012 and 2018, performance assessment of RHIS were also carried out using PRISM in Ivory Coast (9). Though there still existed gaps especially with respect to data quality, data use and verification methods at the health facility (HF) level; it was also noted that reporting was greatly improved (9).

These improvements in completeness and timeliness of reporting were very visible in Uganda, after one year of strengthening, and the need for further enhancing of the system was also highlighted in order to improve its performance (10).

In order to meet the health-related SDGs, Cameroon is scaling up towards ensuring UHC for all (3,11). In this light, the country identified and defined its 100 basic health indicators following the World Health Organisation (WHO) guidelines (Ministry of Public Health – World Health Organization, 2018). The MOPH has standardised the RHIS through the putting into place the second version of District Health Information System (DHIS 2) to manage aggregated HF data (3). DHIS 2 is resolving problems encountered with the physical tools by ensuring routine health information (RHI) availability to every stakeholder. Individual client data management is so far not yet managed by DHIS 2; a persisting problem of the system (12).

Efforts are being made to ensure a properly functioning RHIS for the generation of quality RHI by the year 2027 (13). The objective of the Health Sector Strategy (HSS) for the health information system (HIS) states: “By 2027, ensure the development of health research and the availability of quality health information system for evidence-based decision-making at all levels of the health pyramid” (13). This objective is first priority for implementation, with a monthly activity reports (MAR) completeness of 80% expected to be met by 2027. Also, a performance of the information system target of 95% has been set to be attained at all levels of the pyramid in the domain of governance. HSS aims at attaining 90% of health facilities having a well organised system of data management (13).

It is not only important to ensure the availability of RHI but also its performance through quality health information generation (1). Evaluating the performance of the RHIS will ensure that gaps and weaknesses are identified and recommendations made to strengthen the system (3). Progress and performance tracking of health interventions for meeting health-related SDGs, and HSS targets will be facilitated through an efficient RHIS
and use of information for evidence-based decision-making and public health action (14,15). The objective of this study was to assess the RHIS in the HFs in Yaoundé in order to identify gaps and weaknesses and to make proposals for strengthening.

**Methods**

Study design and setting:

We conducted a facility-based cross-sectional mixed descriptive study for a period of 5 months extending from 01st May 2019 to 30th September 2019 in the city of Yaoundé, the regional headquarters of the Center Region, the capital of Cameroon. Yaoundé is made up of 6 health districts (HDs): Biyem-assi, Cité Verte, Djoungolo, Efoulan, Nkolbisson and Nkolndongo. These districts are made up of 55 health areas harbouring 799 HFs (public and private).

**Study Variables**

Study variables included Socio-professional characteristics of respondents, HF-related characteristics and HF and Community Information System Standards. Socio-professional characteristics were age, sex, professional qualification, years of experience, and function. Health facility-related characteristics included status of the HF (Public, private). Health Facility and Community Information System Standards, defined and grouped into domains and subdomains by WHO and MEASURE Evaluation were:

1. Management and Governance (Policies and Planning, Management, Human Resources)
2. Data and Decision Support Needs (Data Needs, Data Standards)
3. Data Collection and Processing (Data Collection and Management of Individual Client Data; Collection, Management and Reporting of Aggregated Facility Data; Data quality assurance; Information and Communication Technology (ICT))
4. Data Analysis, Dissemination, and Use (Analysis, Dissemination, Data Demand and Use)

**Sample size and sampling**

To obtain the minimum sample size (n) of 106 HFs to be visited, we used the formula:

\[
    n = \frac{Z^2 \times P(1-P)}{d^2}
\]

(16), where \( Z \) = quantile of the normal distribution at 5% level=1.96, \( P \) is the proportion of adequately functioning HFs= 10% (17), \( d \) is the precision= 0.06 (16), and 10% non-response rate. We then proceed to select the HFs through a stratified sampling using probability proportional to size of HFs in each HD. Stratified variables were HD and HF status (Private, Public).

We included into our study functional public and private HFs of the operational level who gave their consent for participation. One respondent per selected HF was interviewed. These were either the heads of the facility,
persons in charge of statistics/data management, or any other responsible staff that was better indicated to provide the needed responses.

Data collection

Interviewers were recruited and trained to understand the objectives and the methodology of the study. Data were collected using the WHO/MEASURE Evaluation pre-established Rapid Assessment questionnaire (MEASURE Evaluation, 2018) that was slightly modified to include the socio-professional characteristics of respondents and HF characteristics. Each question on the questionnaire was scored as either 0 (no answer/not applicable); 1 (not present, needs to be developed); 2 (needs a lot of strengthening); 3 (needs some strengthening); or 4 (already present, no action needed).

Statistical data analysis

Data was entered into Microsoft Excel 2013, cleaned and then exported for analyses using IBM-SPSS version 25. Quantitative variables following a normal distribution were presented as mean ± standard deviation; and presented as median (interquartile range) otherwise. Frequencies and percentages (%) were used to describe qualitative variables.

Qualitative method

We conducted in-depth interviews with eleven key informants at the regional health office. The qualitative aspect aimed at capturing their propositions concerning RHIS at regional level such as policies and planning, management, human resources, data needs, standards and system design. All interviews were conducted in a private location and audio-recorded with permission from the interviewee, and transcribed.

Ethical Considerations

The study received ethical approval 0552-/CRERSHC/2018 from the Regional Ethical Committee for Research and Human Health” (Center Region) and the authorization 0549-/AP/MINSANTE/SG/DRSPC from Regional Delegate of Public Health of the Centre Region.

Recruitment of participants was conducted only after describing the study procedures and obtaining informed consent. During the process of obtaining informed consent, participants were clearly informed that participation is voluntary and that non-participation would have no negative consequences.

Results

Socio-professional characteristics of the participants

Respondents’ age range was 24 to 60 years with an average of 38.3 ± 9.3 years; 58 (52.3%) male and 53(47.7%) female. Their median years of experience was 8(4–16) years. Nurses and nurse assistants made up 59.5%, while medical doctors were 10.8% (Table 1). With respect to post of responsibility of the participants, heads of HFs represented 45.0%, statistician/data managers (21.6%), Ward Charge (18.0%), and General supervisor (15.4%).
### Table 1
Socio-professional characteristics of respondents.

| Variable                     | Count | Percentage (%) |
|------------------------------|-------|----------------|
| Age (years)                  |       |                |
| < 30                         | 25    | 22.5           |
| 31–40                        | 46    | 41.5           |
| 41–50                        | 27    | 24.3           |
| > 50                         | 13    | 11.7           |
| Sex                          |       |                |
| Female                       | 53    | 47.7           |
| Male                         | 58    | 52.3           |
| Professional Qualification   |       |                |
| Medical Doctor               | 12    | 10.8           |
| Nurse and Nurse assistant    | 66    | 59.5           |
| Midwife and assistant        | 7     | 6.3            |
| Lab technician               | 9     | 8.1            |
| Health administrator         | 4     | 3.6            |
| Specialised nurse            | 6     | 5.4            |
| Others                       | 7     | 6.3            |
| Function                     |       |                |
| Head of HF                   | 50    | 45.0           |
| General Supervisor           | 17    | 15.4           |
| Ward Charge                  | 20    | 18.0           |
| Statistician/Data manager    | 24    | 21.6           |

Characteristics of health facilities

There were 16 (14.4%) public and 95 (85.6%) private HFs. These HFs were distributed per district as follows (Table 2): Biyem-Assi (21, 18.9%), Cité-Verte (6, 5.4%), Djoungolo (20, 18.0%), Efoulan (18, 16.2), Nkolbisson (9, 8.1%), and Nkolndongo (9, 8.1%).
Health facility and community information system standards

Overall, the four domains of the RHIS were adequately functioning at between 15% and 22% (Fig. 1). Domains needing strengthening actions were: Data Collection and Processing (51%), Data Analysis, Dissemination and Use (48%), Data Decision and Support Needs (43%), and Management and Governance (41%).

All the twelve subdomains of the RHIS were adequately functioning at between 7% and 30% (Fig. 2). These included Human Resources (7%), Data Analysis (10%), Information and Communication Technology (11%), Standards and System Design (15%), Policies and Planning (15%), Information Dissemination (16%), Data Demand and Use (16%), Management (18%), Data Needs (18%), Data Quality Assurance (20%), Collection and Management of Individual Client Data (26%), Collection, Management, and Reporting of Aggregated Facility Data (30%).

Subdomains most needing some or a lot of strengthening actions were: Collection, Management and Reporting of Aggregated Facility Data (59%), Data Demand and Use (57%), Collection and Management of Individual Client Data (54%), and Data Quality Assurance (50%).

The level of strengthening actions needed per domain differed in the six districts (Fig. 4). E.g., Cite Verte and Biyem-Assi mostly needed strengthen for the domains of a) Data Analysis, Dissemination, and Use (56% and 53%); and b) Data Collection and Processing (54% and 59%). With respect to the domain Data and Decision Support Needs, Biyem-assi (55%) and Nkolbisson (47%) needed to be strengthened. Lastly, Management and Governance needed the most strengthening measures in the districts of Cite-Verte and Efoulan at 67% and 62% respectively.

The strengthening measures proposed by key informants at the regional health office were summarised and presented in the Tables 2–5.
Table 3
Proposed strengthening actions for Management and Governance.

| Subdomains            | Proposed strengthening measures                                                                                                                                                                                                 |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Policies and Planning | 1. Review the legislation and regulation.  
2. Define clearly the roles and responsibilities of stakeholders at all pyramidal levels and disseminate to all HFs, especially private HFs during their creation.  
3. Develop and disseminate a procedure manual and appropriate data management guidelines.  
4. Ensure coordination between stakeholders at the district level.  
5. Include stakeholders in the data validation process.                                                                                                        |
| Management            | 1. Harmonize the various Standard Operating Procedures (SOP) between stakeholders.  
2. Train and post the personal in charge of monitoring and evaluation (M&E).  
3. Introduce performance-based financing (PBF) in M&E activities.  
4. Produce and disseminate supervision guidelines to all stakeholders.  
5. Enforce the implementation of the already existing supervision action plans.  
6. Update the Master facility list (MFL) to include service domains and unique identifier codes for all HFs.  
7. Consider regular trimestral update by the districts and a general census every 5 years to update the MFL.                                                   |
| Human resources       | 1. Define clearly in the procedure manual the various positions and the competencies of staff required at every level.  
2. Identify the various required staffs and then post according to their competencies.  
3. Develop and validate a costed work force training plan for pre- and in-service training.  
4. Standardise the training curriculum and modules among training institutions in the health sector.  
5. Harmonise staff training databases between the Regional authorities and partners.  
6. Use staff management software to manage pre- and in-service training of staff.                                                                          |
| Subdomains | Proposed strengthening measures |
|------------|--------------------------------|
| Data needs | 1. Develop a regional data dictionary aligning with international standards. |
|           | 1. Standardise data on mortality to be collected by all HFs. |
|           | 1. Introduce the use of the international certificate of cause of death by all facilities to collect data on causes of death. |
|           | 1. Train health professionals on the use of the international certificate of cause of death. |
|           | 1. Introduce coding of cause of death (DHIS 2 start-up mortality list) into DHIS 2, and train staff on the coding of cause of death. |
|           | 1. Introduce the use of Verbal Autopsy (VA) to investigate community deaths of unknown causes. |
|           | 1. Train targeted HF and community staff to conduct VA. |
|           | 1. Put in place review committees to analyse the cases of deaths of unknown causes. |
|           | 1. Sign contracts with community workers and compensate them accordingly. |
|           | 1. Enforce the sensitisation of stakeholders on the surveillance of epidemic prone diseases. |
|           | 1. Equip the national laboratory to confirm the diagnosis of detected cases at the regional level. |
| Data standards | 1. Widely disseminate community-based information guideline to all HFs and community agents. |
|           | 1. Intensify efforts to harmonise indicators between partners |
|           | 1. Integrate all national classifications and data collection forms into DHIS 2. |
|           | 1. Ensure participation of all stakeholders (end users inclusive) in the evaluation and update of the HF and community HIS. |
|           | 1. Enforce regular monthly meetings between stakeholders to discuss ways to render routine data more relevant |
Table 5
Proposed strengthening measures for the domain Data Collection and Processing.

| Subdomains | Proposed strengthening measures |
|------------|--------------------------------|
| **Collection and Management of Individual Client Data** | 1. Gradually and steadily introduce patient electronic files into DHIS 2 to standardise the collection of individual client data across all implementing partners.  
2. Train district staffs in the use of DHIS 2, and ensure that the district staff trains their respective staff.  
3. Put suitable video training tutorials at the disposal of HFs.  
4. Produce and disseminate data management guidelines according to DHIS 2 indicators. |
| **Collection, Management and Reporting of Aggregated Facility Data** | 1. Harmonise data compilation among implementing partners.  
2. Ensure regular follow-up of reporting of activities to improve on completeness and timeliness  
3. Train staff on the techniques of physical and electronic records archiving.  
4. Develop a plan to update, produce and distribute data management tools (registers, compilation forms and DHIS 2).  
5. Collect data from personal computers of staffs and store them according to national data storage policies. |
| **Data quality assurance** | 1. Develop and disseminate a standardised data quality assurance plan to all actors.  
2. Enforce the implementation of data quality norms, especially at the HF level;  
3. Ensure that findings from data quality assessments are published.  
4. Hold regular data quality validation and review meetings with all stakeholders before forwarding the data.  
5. Introduce data quality checks into DHIS2 at all levels. |
| **Information and communication Technology** | 1. Update ICT framework and define needs of HFs at all the levels.  
2. Improve on the stability and simplicity of the android version of DHIS 2 for remote areas.  
3. Ensure better internet and electricity coverage to remote areas to facilitate aggregated facility data reporting. |
Table 6
Proposed strengthening actions for Data Analysis, Dissemination and Use.

| Subdomains                  | Proposed strengthening measures                                                                 |
|-----------------------------|-------------------------------------------------------------------------------------------------|
| Analysis                    | 1. Collaborate with local research and academic institutions to conduct analytical reviews of HF and community-based data.  
                               | 2. Standardise and diffuse SOPs on data analysis, dissemination and use.                          |
| Dissemination               | 1. Produce summaries of key finding (bulletins) every 3 to 6 months and distribute through mass media to all stakeholders.  
                               | 2. Make use of dashboards and summary charts to convey information to target populations accordingly. |
| Data demand and Use         | 1. Sensitise and train clinical staff, facility managers and local level decision-makers on the use of information for monitoring their activities.  
                               | 2. Ensure that HF and community-based information is used in health sector planning.  
                               | 3. Render managers of RHI autonomous in defining their interventions and data needs and implement them. |

Discussion

The objective of this study was to assess the RHIS in the HFs in Yaoundé in order to identify gaps and weaknesses and to propose solutions for strengthening. This was fulfilled by assessing the RHIS domains and subdomains through a health facility-based cross-sectional mixed descriptive study in the six HDs of the city of Yaoundé.

It has been evidenced that the HF should be paid more attention if the RHIS is to be strengthened successfully, since the HF is the point of data generation and entry into the information system (9). However, national, regional and district levels decision makers, administrative and coordination bodies cannot be neglected in the strengthening process. In light with this, we hoped to set the bases for programmatic RHIS strengthening interventions and for further extensive RHIS evaluations with emphasis at the HF level.

The 2016 to 2027 HSS outlines problems in the RHIS, some of which are: poor development of research in health, poor management of health information, non-informed decision, and insufficient dissemination of health information and research findings to all health pyramidal levels (13). As such, the HSS objective for 2027 aimed at improving availability of quality information for decision making through: (i) the creation of a database accessible to all stakeholders, and (ii) the computerization of the National Health Information System. Data quality can be improved by assigning staff according to their competencies and posts (18). Most of the respondents in this study were clinical staff who occupied additional post as data managers and only 24 (21.6%) of them were statisticians. Staff trained specifically for this role are limited, and this could explain some of the bottle necks in data management. This points out the need to train and deploy statisticians at the health facility level to carry out this task (4).

From the overall results of the four domains, Data Collection and Processing scored highest for adequate functionality. However, there some participants ignored the RHIS standards at the health facility level. A lot of communication and training is necessitated at this level, considering the fact that the HFs and the communities are the initiation points for data management. Data Collection and Processing (51%) and Data Analysis,
Dissemination and Use (48%) were mostly recommended for strengthening. On the other hand, Data Collection and Processing was the most cited domain for adequate functionality (22%). This could be explained due to the fact that actors are getting more and more familiar with this domain, especially after the introduction of DHIS 2 (3). Efforts to harmonise tools and procedures for collection and forwarding may also account for these results (19).

The sub-domains of Collection and Management of Individual Client Data, and Collection and Management of Aggregated Facility Data showed encouraging results. They scored at least 25% for adequate functionality, 65% and 50% respectively for needing strengthening, and less than 12% each for needing to be developed. The proportion of the ignorant for these two sub-domains is also very low (less than 6% each). On the other hand, in the same domain, Information and Communication Technology only has 11% and 42%, of adequate functionality and needing strengthening respectively. The importance of ICT cannot be over stressed here, considering that computerizing the national health information system is an HSS strategic objective. ICT framework and competence are still a major set-back to the proper functioning of the RHIS. Only 9% of responses acknowledged the presence of an overall framework and plan that includes equipment, acquisition and its use at all levels of the RHIS as well as internet coverage. So far, ICT (eHealth, mHealth) is mostly used only in active surveillance data collection and forwarding. However, these ICT methods could also be developed and integrated into the RHIS for client and aggregated data collection in remote areas. Although ICT is gradually being implemented across the national territory, ICT methods alone cannot improve much on the quality and availability of data for decision making (20). Other strategies should be employed in combination with social media to ensure strengthening.

Computerisation of the RHIS entails not just the creation of DHIS 2 but also ensuring an efficient internet and electricity coverage throughout the national territory, and the use of an electronic client file. So many HFs, especially private, expressed the need for a computer for data management. The android version of DHIS 2 that was expected to function for centres without a computer is not much solicited by the staff, as this version is only supported by sophisticated android phones that most of the persons in charge of statistics are unable to purchase. This has led to delays in reporting of those HFs. An existing and functional individual client electronic file remains a weakness since DHIS 2 still does not manage individual client data. However, some private HFs are already implementing electronic patient health records to facilitate client’s data management. This has greatly improved client routine data capture and recording of medical services rendered at the health facility level. Lessons can be learnt from these facilities on what has, and what has not worked so as to integrate the electronic file into DHIS 2 (12).

This study revealed that Data Demand and Use functions adequately at only a maximum of 16%, and needs strengthening at 58%. This finding is low compared to the PRISM assessment obtained in East Gojjam Zone, Northwest Ethiopia, which revealed that 45.8% of workers had good level of health information use (21). Promoting a culture of demand and use of information greatly improves on its use for informed decision making, as well as influences on donor response (22). However, this aspect is not felt by actors on the field (only 4% of adequate functionality, with 36% level of ignorance with respect to this culture.

Results per districts provided orientation to specific programmatic strengthening of the RHIS in the various districts. For example, in Biyem-Assi, Data Decision and Support Needs presented worst results (5% of adequate functionality, 55% for strengthening). In this domain, the components of surveillance mostly needed strengthening. Eighty-one percent (81%) recommended strengthening of the definitions of priority diseases under
national surveillance. A successfully strengthened RHIS will facilitate not just the surveillance of epidemic prone diseases, but also surveillance of other background health potentially dangerous health issues due to routine data availability (23). In Cité verte, worst results were registered by the domain Data Analysis, Dissemination and Use (5% for adequate functionality and 51% for strengthening). Bulletin and annual reports should be produced regularly and disseminated to HDs, as well as ensuring regular feedback on the performance of the various districts and also on the RHIS performance should be ensured to the HDs. Social media has been found to improve on health information dissemination and thus can well be exploited at the HDs to improve on data dissemination (24). Coupled with staff empowerment in data analysis and dissemination, this will improve on the use of data for decision making at the HF level (4). Disaster response preparedness is also be assured by an adequately functioning RHIS. This is due to the fact that there is available baseline information on health indicators (population at risk, human resources) that can immediately be exploited for immediate response planning (25,26)

One major limitation of the study is that the design does not permit to determine factors associated to the poor performances.

**Conclusions**

The domains and subdomains of the RHIS of the HFs in Yaoundé were functioning adequately at very low rates. While gearing up to meeting the health-related SGD’s and the HSS objectives, it is imperative that district-specific strengthening actions should be implemented. In this light, the findings of this study have been communicated to the various HDs and HFs so as to facilitate strengthening at these levels. The study design neither permitted an exploration of the factors associated to the poor performances, nor the understanding of the mechanisms of these associations. As such, a nation-wide assessment should be carried out in order to understand the determinants of these poor performances and to strengthen the national RHIS.

**List Of Abbreviations**
Declarations

Ethical approval and consent to participate

The study received ethical approval 0552-/CRERSHC/2018 from the Regional Ethical Committee for Research and Human Health” (Center Region) and the authorization 0549- /AP/MINSANTE/SG/DRSPC from Regional Delegate of Public Health of the Centre Region.

Consent for publication

Not applicable

Availability of datasets and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interest
We the authors declare no competing interest in the study

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**Authors’ contributions**

Conception: BBT, GNT, CBN, SMB. Data collection: BBT, CBN, MNN. Analysis and interpretation: BBT, GNT, SMB. Manuscript writing: BBT, GNT, MNN, SMB. Revision of the manuscript: All the authors. Approval for submission: All the authors.

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Figure 1

Level of actions needed per domain of the RHIS of HFs in the City of Yaoundé
Figure 2

Level of adequate functioning of the subdomains of the RHIS of HFs in the City of Yaoundé
Figure 3

Level of actions needed per domain and subdomain of the RHIS of HFs in the City of Yaoundé
Figure 4

Overall Health facility and community RHIS by domain of the health districts