PARTNERSHIPS FOR EQUITY AND INCLUSION

Assessment of gender and social stratifiers in health information management system and use of evidence in local health planning- a case study of public and private health facilities in Nepal

PILOT PROJECT REPORT

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This report was produced as part of the activities of the Partnership for Equity and Inclusion, a collaboration of international research networks aiming to support equitable practice in public service institutions. Findings aim to inform policymakers and practitioners in public services as well as advocacy groups that seek to improve public service access, outcomes and representation for socially excluded populations.

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ACRONYMS

ANC	Antenatal Care
DHIS	District Health Information Software
GESI	Gender Equity and Social Inclusion
HF	Health Facility
HFOMC	Health Facility Operation Management Committee
HMIS	Health Management Information System
HP	Health Post
IMS	Information Management System
KII	Key Informant Interview
MICS	Multi Indicator Cluster Survey
MoHP	Ministry of Health and Population
NDHS	Nepal Demographic Health Survey
NHRC	Nepal Health Research Council
PNC	Postnatal Care
PEI	Partnership for Equity and Inclusion
UHC	Urban Health Centre

EXECUTIVE SUMMARY

Introduction

The availability of disaggregated data based on gender and social stratifiers allows policy makers and decision makers to enhance health outcomes and address inequities across gender and other stratifiers. There is a growing concern and recognition that gender and social stratifiers is included in the routine IMS, however, it is less known whether, how and to what extent these IMS in public and private sector provide evidence with gender and intersectionality lens and how they inform decisions. Importance of disaggregated data is growing however, limited stratifiers available in the public and private sector information management system has restricted comprehensive and contextual gender and intersectional analysis from routine data and hindered the planning of inclusive and equitable health services. Therefore, our pilot study aimed at exploring availability of gender and other social stratifiers in the IMS of public and private health providers, assess use of such disaggregated data in health sector planning and decision making and design an evidence-informed framework that promotes gender equitable delivery of health services.

Methods

The pilot study was a cross-sectional exploratory study using mix of qualitative method and document review. Document review included review of existing IMS policies, guidelines, forms, formats, including national health policy, strategies and other documents. We interviewed a total of ten key informant interviews from health facilities, municipalities and health office of Kathmandu. We conducted this study in two municipalities of Kathmandu district of Province 3, which are Chandragiri Municipality and Kathmandu Metropolitan City. We selected two health facilities (one public and one private) in each municipality for data collection. Policy documents and qualitative data were analyzed using thematic framework analysis approach.

Results

The desk review found that the importance of gender and social stratifiers are increasingly included in health policies and national strategies, but conveying those polices and principles to the programmatic level remains daunting and challenging. Gender and intersectionality is well argued and documented in strategic approaches or principles, however, implementation its principles were mixed and insufficient as there are issues in implementation of gender-sensitive and gender-responsive legislation, policies and acts in the national system. HMIS is the main information platform to record routine health service utilization data, as public health facilities are using HMIS forms and formats for the recording of information, and both public and private are reporting through HMIS/DHIS2. Unavailability of physical resources, lack of designated and trained staff for recording and reporting of HMIS/DHIS2 and no provision of regular training/refresher training on DHIS2 were major challenges for proper functioning of HMIS. Although few social stratifiers are available in current recording forms such as age, sex, ethnicity and address, however, when aggregated into summary tools of DHIS2, the male and female disaggregation was only reported and other stratifies tends to be lost as programs did not require disaggregated summary reporting. These social stratifiers at health facility level allow some forms of analysis to inform local planning, which however is largely not being used

in health facility level planning. Annual planning at health facilities currently involve use of data, mainly aggregated using trends of total program-wise data over few years. Planning process at municipality is often guided by province and federal budget and guidance and thus local wards/health facilities plans are often not fully incorporated. Moreover, participatory process of planning engaging different sectors, community groups and stakeholders was less functional in the local planning process in both municipalities. The study also proposed a framework that strengthens the generation and use of evidence disaggregated by gender and social stratifiers in planning and decision making.

Conclusion

HMIS is the main source of routine health service utilization data for various programs and health sector planning largely depends on this data, hence quality of data and the conducive environment to generate these data should be a priority for all tiers of government. Disaggregated targets by gender and social stratifiers should be developed to encourage reporting on health indicators by gender, age and other key stratifiers. Further to this, awareness and realization of the importance of evidence with gender and intersectionality lens has to be created at all levels. This will ultimately help to develop need-based and evidence-based plans and in long-term, increase access of poor and marginalized populations to equitable health services.

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1. INTRODUCTION

Nepal is in its early stage of federalization where the new state architecture has three tiers of government – federal government, seven provincial governments and 753 local governments, and the power and responsibilities are devolved to local governments (Lecours, 2014; Kharel, 2019; Adhikari, 2020). In the new federal structure in Nepal, health is one of the most decentralized sectors where delivery of basic health services falls under the exclusive functions of local government (Ghimire, 2019; Thapa *et al.*, 2019). The health sector demands correct, complete and disaggregated data to measure its performance, recognize disparities between social groups and geographic locations, and implement planed interventions (MoHP, 2014). Health Management Information System (HMIS) is the main information platform implemented throughout the country in public sector to record health service utilization data. HMIS also record health service utilization from private providers (MoHP, 2014, 2015, 2016, 2017), however private providers use their own information management systems (IMS) and reporting to HMIS is only partially happening (MoHP, 2015, 2017). Evidence suggests that more than 50% of health care is sought primarily through private facilities including poor and excluded groups, with considerable shopping practices between public and private providers (NDHS, 2016). As the private sector occupies growing proportion of health services delivery, health data from private facilities needs to be reported timely and mainstreamed into the national information system.

A IMS must be able to produce, analyze, and disseminate reliable and timely information for decision making within the social context (Nolen *et al.*, 2005; Stansfield *et al.*, 2006; Percival *et al.*, 2014). For improving health information system and generating disaggregated information, Health Sector Information System (HSIS) Strategy 2007 introduced disaggregation of data by caste and ethnicity while the disaggregation by occupation and economic status/class was still missing (MoHP, 2007; MoHP and NHSSP, 2011). However, data from HMIS shows that the country lacks comprehensive, integrated IMS for addressing the increasing burden of disease (Dhungana *et al.*, 2019). The absence of comprehensive and integrated information in the health system is linked with significant equity gaps in health service utilization. Substantial population living across the country face financial, socio-cultural, geographical and institutional challenges while accessing quality health care services (MoHP, 2013). In addition, absence of data for health planning regarding marginalized and disadvantaged groups such as urban poor, and on neglected health issues such as mental health problems and Non-Communicable Diseases (NCDs) (Dhungana *et al.*, 2019; Mirzoev *et al.*, 2019) are other common challenges in HMIS of Nepal resulting from lack of data disaggregation.

In Nepal, the concepts of gender and social inclusion have progressed enormously on paper, mandating the civil society and economic participation and health service utilization of women. Although, gender and social inclusion polices are well adapted in the country, implementation has been more mixed (Bishwokarma, 2012; Crivelli and Salari, 2014; Lecours, 2014). Problems continue to persist with the implementation of gender-sensitive and gender-responsive legislation, policies and acts, including intersectional recognition of the number of factors that affect women based on ethnicity, caste, religion, language, indigeneity, marital status, geographical location, economic ability, and access to health and education (Bishwokarma, 2012; Crivelli and Salari, 2014). Research has demonstrated that gender inequality is associated with negative health outcomes, such as increased risk of HIV,

maternal mortality, child stunting and wasting, and poor nutrition (UNICEF and LSTM, 2011; Sawyer, 2012; USAID, 2015; UNFE, 2019; United Nations, 2019). Gender norms can have an impact on women's and men's health through improved access to and use of health services, financial resources, and decision making (USAID, 2015; United Nations, 2019). Studies that focused on gender and age revealed that, when such stratifiers are not acknowledged and addressed in health information systems, norms and inequalities that influence health and health-seeking behaviors remain invisible (Mandal, Cannon and Nondi, 2016; Brittany S Iskarpatyoti and Cannon, 2017). The availability of such data allows program managers and decision makers to examine service delivery, treatment, and health outcome data intersectional gender lens, so that they can detect differences between the sexes, age groups, and other social stratifiers (Nolen *et al.*, 2005; Mandal, Cannon and Nondi, 2016; Brittany S Iskarpatyoti and Cannon, 2017). Having data to better track and understand gender and intersectionality would ensure that health systems do not perpetuate inequalities, but instead foster greater equality. Despite the importance of examining gender and age, sex and other disaggregation are not always included or maintained in routine data collection practices and national databases, such as the DHIS2 (District Health Information Software) and IMS of private health facilities (Nolen *et al.*, 2005; MoHP, 2016). Evidence showed that neither public nor private IMS have been systematically assessed against gender and equity framework thus gap in knowledge exists.

Generating disaggregated data is emerging but limited stratifiers available in HMIS has restricted comprehensive and contextual gender and intersectional analysis from routine data and hindered the planning of inclusive and equitable health services. Facility-based data are an example of routine data and the census and household surveys generate non-routine data. While non- routine sources, such as the Demographic and Health Survey (DHS), collect data in every five years that are disaggregated by sex, age, geography etc., it is important for routine health information systems to integrate gender through sex disaggregation and gender-sensitive indicators (Nolen *et al.*, 2005; Mandal, Cannon and Nondi, 2016; Brittany S Iskarpatyoti and Cannon, 2017). This would allow for continuous monitoring and timely course corrections. While use of gender-related data is increasing globally, gaps remain in fully understanding the factors that can facilitate or discourage data disaggregation and use.

There is a growing concern and recognition that gender and intersectionality is included in the routine IMS, however, it is less known whether, how and to what extent these IMS in public and private sector provide evidence focusing gender and intersectionality lens and how they inform decisions, presenting challenges towards strengthening health system that is more responsive and leaves no-one behind in federalized context. Therefore, our pilot study aimed at exploring availability of gender and social stratifiers the IMS of public and private health providers with and to assess use of such disaggregated data in health sector planning and decision making at local level. The evidence generated from this pilot project will help identify barriers and measures to overcome those barriers to improve access to basic health services by the marginalized and disadvantaged groups. This study also aimed to develop a framework incorporating gender and intersectionality in routine health information system through the engagement of local government, Health Facility Operation Management Committee (HFOMC) and community people including representatives from the disadvantaged groups who utilize services from the health facilities, to gather their feedback on the framework. This report documents the process and findings of our exploration in Nepal.

1.1. Objectives of the study

The general Objective of this pilot study was:

- To assess availability and use of gender and social stratifiers in public and private sector IMS and design an evidence-informed framework that promotes access to equitable health services for marginalized and disadvantaged populations.

Specifically, the study aimed to achieve following three objectives:

- To determine availability and extent of gender and social stratifiers (age, ethnicity, occupation, geography, economic status, marital status etc) incorporated in the existing IMS in public and private health facilities at municipal level
- To determine the gaps in use of disaggregated data from IMS to inform gender and equity dimensions in local health planning
- To develop a framework that inform IMS to generate disaggregated data that support generation and use of evidence in equitable health service planning

2. METHODOLOGY

This section describes about the design and approaches of our study, study sites and population and the overall process of data collection, management and analysis including ethical considerations of the pilot study.

2.1. Study design

This was a cross-sectional exploratory study which included mix of qualitative method and document review. These methods assessed the principles, approaches and details of IMS, roles of different level of government within Ministry of Health and Population involved in implementing and managing IMS and explored the implementation situation in reality versus what is in the plan and guidelines. Our overall study was informed by WHO's framework on gender and intersectional dimensions (WHO, 2020).

2.2. Study Site and Population

We conducted this study in two municipalities of Kathmandu district of Province 3 (Bagmati Province) in Nepal – Chandragiri Municipality and Kathmandu Metropolitan City, both represented as municipalities hereafter to ensure the anonymity. We selected these municipalities purposively to facilitate data collection in the COVID-19 context, where travel was not recommended and these municipalities are situated in Kathmandu. Also, HERD International with its established relationships with these municipalities from our past projects allowed effective communication and execution of field work. We selected two health facilities (one public and one private) in each municipality. Of the two public health facilities, one was health post and the other was urban health centre. Both private health facilities were hospitals. We interviewed key informants at health section of local municipality offices and at health office (then district public health office). Our study participants were facility in-charge, service providers and HMIS focal persons from public and private health facilities, health coordinators and HMIS informants from municipalities. These informants were chosen purposively depending on their roles in implementation and management of HMIS at different levels.

2.3. Sample Size

We interviewed a total of ten key informant interviews from health facilities, municipalities and health office of Kathmandu. The details of these informants are presented in table below:

Level		Designation	Number of key-informants
Health Facility	Public	In charge, Senior Auxiliary Health Worker(Sr.AHW), AHW, Health Assistant (HA)	4
	Private	Medical Recorder, Accountant, Receptionist (IMS recorder)	3
Local Level		Senior Auxiliary Nurse Midwife (Sr. ANM), Health coordinator	2
District Level		District HMIS Focal person	1

2.4. Tools and techniques for data collection

In this study, we used two methods for the data collection. The first one was review of IMS policies, forms and format, including gender and equity related policies, plans and documents. Secondly, we conducted semi-structured interviews with key informants at federal and local levels. We used separate topic guides for the informants at health facility, municipality and federal level.

2.4.1 Document Review

We conducted a desk review of key documents on health management information system and gender and intersectionality guidelines of Nepal. We reviewed a number of government documents including national level policies, guidelines, and strategies guiding the health systems and health management information system of Nepal and documents related to gender and equity. Our study team collected relevant documents from Government of Nepal's different websites, other online sources, and shared by in-country stakeholders and partners through existing relationships.

The document review process was implemented in various stages:

Step 1: Compilation of national policies and documents, HMIS strategies, guidelines and forms, and gender and intersectionality related documents.
Step 2: Development of a data extraction framework in excel spreadsheet to extract information on availability on gender and equity dimensions in the policy documents
Step 3: Extraction of relevant information from the documents in the framework
Step 4: Summary of the extracted information from different policy documents

2.4.2 Key Informant Interviews

We developed topic guides for data collection, which were used flexibly and adaptively depending on participants and the context, to acquire breadth and depth of information. The topic guides were developed considering the objectives of this study and WHO's framework. Researchers from HERD International conducted face-to-face interviews with key-informants at the federal level, and local level following public health standards to prevent COVID-19 infection (physical distancing, use of face masks, handwashing and use of hand sanitizer).

They key-informant interviews helped to understand the implementation situation of IMS and gender and equity policy, strategies, recording and reporting system etc and factors affecting generation and use of disaggregated data in local level planning.

2.5. Development of framework

Based on the data from desk review and findings from KIIs, we developed a framework that incorporate intersectional gender lens in IMS, which will inform planning and decision making process at national and sub-national levels. Because of the second wave of COVID-19 in Nepal, we could not hold the planned consultation workshop with government and other concerned stakeholders to co-develop the framework. We planned this originally to validate concept and content of the framework and thus get ownership of the government to promote its use in their annual and longer term plans at different levels.

2.6. Data Management

The qualitative data collected was first transcribed in Nepali language. The initial transcripts were reviewed by core team members, and feedback was provided to each interviewer. After the completion of data collection and transcription, the audio-recordings were transferred to the data server for safe storage. The audio-recordings were translated from Nepali to English language by experienced translators following HERD International's standard translation guideline. The translated documents were assessed and cross-checked with original Nepali transcripts and audio-recordings for accuracy and quality. After the translation, all the data were anonymized by the project team members, using a specific alphanumerical code for each key informant and deleting any mentions to the name/position of the interviewee that could lead to their identification.

2.7. Data analysis

Policy documents and qualitative data was analyzed using thematic framework analysis approach. The information was read and re-read and a coding framework was developed following the emerging themes, issues, objectives and guided by PEI evidence synthesis briefing note.

Two independent coders with similar experiences within the research team read few randomly selected electronic transcripts to get a preliminary understanding of the data. Emerging themes that were common and recurring in the data were identified. A preliminary codebook was initially developed based on the topic guides used for data collection. Each coder then read the KIIs selected randomly. The coders then generated and enhanced the primary set of codebook for KIIs. The primary set of codebook was discussed to ensure same level of inter-coder reliability and to analyze consistency and completeness, before developing a final codebook. The data was coded using a qualitative software Nvivo following the framework of final codebook and progressed iteratively with regular discussion between research team. Then the study report was developed following triangulation of information from policy review and KIIs.

2.8. Ethical Considerations

The study was conducted in compliance with all human rights and ethical standards required by health researchers. We obtained the ethical approval from Nepal Health Research Council (NHRC). The data collection process followed standard ethical approval prior to the interviews. Data collection process followed a standard ethical norm i.e. informing the study participants about the study, taking informed consent from the participants before starting the interview, ensuring that the participation was voluntary and without forceful coercion and ensuring anonymity of the participants. The information sheet included description of the study and why the participants were selected, the objective and the process of interview, potential risks and benefits, voluntary nature of participation, confidentiality of the data, and contact information of the research team. An informed consent form was used to obtain a written consent from the participants. We also obtained written consent of participants to audio record all the interviews for the ease of data analysis. Interview was conducted in a private place at the health facilities and safe place agreed by the study participants. Furthermore, considering the COVID-19 situation, adequate measures were followed i.e. use of mask, social distancing, and sanitization of the research accessories and adherence to government protocols regarding travel restrictions, safety protocols, and other precautions.

All the recordings and data from interviews was stored in a password-protected computer. Each interview was anonymised and was assigned with an identification number, and only senior members of the research team had access to these data. During the analysis and presentation of the study findings, no names or address of the study participants is mentioned, and the quotes (verbatim) where used, are anonymized. We ensured that participants did not have any risk participating in the study as no personal information was collected and that anonymity and confidentiality of the participants was maintained.

2.9. Limitation of the study

This study was limited to a small number of participants and their experiences, particularly from four health facilities in two municipalities and thus the findings regarding perception of the informants on importance and use of routinely generated data including factors affecting use of evidence at local levels might not be representative of other municipalities. Despite the fact, we also would like to reiterate that the findings from document review represent the national context of gender and equity dimensions in IMS, and the contextual findings from KIIs are relevant to help policy makers and managers identify and address challenges, as there is evidence that suggest gaps in use of data in local planning process.

Moreover, the planned consultation with stakeholders for the development of framework could not be done because of COVID-19 context and the shifted priority of government in COVID-19 response. Therefore, the research team themselves develop the framework presented in this report, and will share with stakeholders individually to get their feedback, which will then be handed over to them in future.

3. FINDINGS

3.1. Findings from review of documents and IMS of public and private health facilities

We conducted review of national policies, strategies, guidelines, forms and other documents related to health system, particularly health information system, gender and equity, to understand the policy perspectives of these documents. The review explored current levels of disaggregation in terms of gender and social stratifiers and importance of gender and intersectionality in national documents and policies. Besides the policy, guidelines, and strategies, we also reviewed large scale household survey reports of Nepal. We reviewed a total of 15 national and local policy documents in addition to national periodic survey reports listed below:

1. National policy documents
    - National Health Policy, 2076 (2019)
    - Nepal Health Sector Strategy (2015-2020)
    - Fifteenth Plan (2016/17)
    - National Strategy for Reaching the Unreached, 2016-2030
    - Disability management (prevention, treatment, and rehabilitation) policy, strategy, and ten-year action plan 2018
    - The sustainable development goals, 2030
    - Annual Reports of Department of Health Services, Government of Nepal
    - Gender Equality and Social Inclusion (GESI) Strategy of the Health Sector, 2018

Similarly, following HMIS related forms and formats, guidelines and manuals were reviewed.

2. National Documents and Guidelines on Health Management Information System
    - Manual HMIS Data Analysis and Use, 2070 (2014)
    - Health Management Information System Guidelines, 2075 (2017)
    - DHIS2 Software Operational Guideline Nepal

3. Municipality and health facility level documents
    - Annual workplan 2077/78 of municipalities
    - Annual workplan 2077/78 of health facility
    - HMIS recording registers and reporting forms of health facility

4. Other recent national level periodic surveys
    - Nepal Demographic and Health Survey, 2016 (NDHS, 2016)
    - Multiple Indicator Cluster Survey,
    - STEPS survey
    - Nepal Health Facility Survey
    - National Household Survey

3.1.1 Disaggregated data in national policies, strategies and plans

There are reflections on importance of disaggregated data in national policies, strategies and plans. However, very few policies specifically mentioned about inclusion of gender and social stratifiers in Information Management System (IMS). The National Health Policy (2076), which is the current guiding document for overall health systems, includes information about strengthening HMIS and its quality, although the policy has not specifically mentioned about the need for integration of gender and intersectionality in HMIS (MoHP, 2019).

Health Sector Information System Strategy (HSISS) is a national strategy that guides information system in Nepal. It highlights the modality of implementation, analysis and dissemination of disaggregated information from HMIS by health facilities. The document also highlights that the identified attributes such as gender, poverty, ecology, social and geographical area, and administrative hierarchy should be included in the disaggregation (MoHP, 2007). The policy and strategy documents related to HMIS includes the integration and expansion of information systems in health sector for ensuring use of evidence for decision making and equitable service delivery (MoHP, 2007, 2019; MoHP and NHSSP, 2017). The HMIS guidelines also mention that skills are required for analyzing, presenting and interpreting the information for better decision-making process. We also reviewed the DHIS2 guideline but it does not contain any specific information about the datasets and details on the gender and intersectionality (MoHP, 2017). Gender Equality and Social inclusion (GESI) Strategy focuses to strengthen the information system from GESI perspective and envisions to incorporate the information of GESI programmes and indicators into HMIS at local and provincial levels and monitor the disaggregated health outcomes, which is lacking currently (MOHP, 2018).

In addition to national policy documents, we also reviewed annual workplan of municipalities to explore any plans focusing on gender and IMS related indicators. We reviewed the 2077/78 fiscal year planning document of both municipalities. There were no plans on HMIS or DHIS2 related training and capacity strengthening, although, there were some activities related to GESI and disability in the local plans.

Besides the health policy, guidelines, and strategies, we also reviewed large scale household survey and health facility based survey reports of Nepal. The Nepal Demographic and Health Survey (NDHS), Multi Indicator Cluster Survey (MICS), Nepal Household Survey, Nepal Health Facility Survey (NHFS), STEPS survey etc are surveys that are conducted at an interval of 3-5 years. The household based surveys collect data that are disaggregated by various social stratifiers in every five years, for example NDHS present findings with the disaggregation by age, gender, education, wealth quintile and ecological zone and MICS also present disaggregated results by age, education, wealth, and location. Therefore, when national evidence based on such disaggregation is required, there is a large reliance on these surveys' data (MOHP, 2018) as routine health systems data do not capture such social markers. However, these sources of data still do not provide sufficient level of disaggregation. For instance, none of these surveys can offer information on the status of urban poor in terms of various household and health services related indicators (Mirzoev *et al.*, 2019).

3.1.2 Gender and equity dimensions in national policies, plans and programmes

We reviewed GESI related national policies and plans. Most of the plan and policy documents emphasized on access to health services focusing on gender, vulnerable populations and disabled persons. The National Health Policy, 2076 guiding principle is to ensure health services provisioned by the state are accessible to poor, marginalized, and vulnerable communities; based on equality and social justice (MoHP, 2019). Similarly, Nepal Health Sector Strategy (2015-2020) strives to improve the health status of all people through an accountable and equitable health service delivery system and the progressive achievement of universal health coverage. The National Strategy for Reaching the Unreached focuses on targeted interventions to address supply and demand side barriers to reaching the specific unreached populations and seeks to complement the GESI strategy and draw on the GESI institutional structure established by MoHP (MoHP and NHSSP, 2017).

The Fifteenth Plan (2016/17) includes a vision of GESI mainstreaming and empowerment by creating a decent, safe, and civilized society and ensuring equal participation in social and economic opportunities within the planned period (NPC, 2019). The Disability management (prevention, treatment, and rehabilitation) policy, strategy, and ten-year action plan includes the objective of increasing access to preventive, promotional, curative (basic and specialized) and rehabilitative health services for people with disability. The sustainable development goals of 2030 comprise a healthy life for all, the elimination of all forms of poverty, empowerment of women and children, and leaving no one behind. Besides this, a number of GESI targeted interventions have been tested and are being taken to scale in the country. This includes a system of social audit for ensuring social accountability towards GESI at the primary health care level, the functioning of Social Service Units at referral hospitals to facilitate subsidies to vulnerable and targeted populations, and the establishment of hospital based One Stop Crisis Management Centers to provide coordinated services to survivors of gender-based violence (MOHP, 2018).

3.1.3 Data generation and reporting pathway through HMIS and DHIS2

HMIS is used for recording and reporting of routine health services data from public and private health facilities at all three tiers of government (local, provincial and federal). There are 9 categories of different HMIS registers and tools according to the programs. They are Common tools, Infant and Child Health forms, Family Health, Community Services, Malaria, Leprosy and Kalazar forms, Tuberculosis, HIV/AIDS and STI, Registers for Hospital and Monthly Reporting Forms which are further divided into sub-groups (MoHP, 2017). The reporting forms are used by female community health volunteers, immunization and outreach clinics at community level and by public and private health facilities and hospitals to report service delivery information to higher level. The public health facilities use HMIS 9.3 and the private health facilities use HMIS 9.5 for reporting the monthly aggregated data and online District Health Information Software (DHIS2) platform to enter and report disaggregated data. DHIS2 is used in aggregated statistical data collection and also can be used for data validation, analysis, management and presentation.

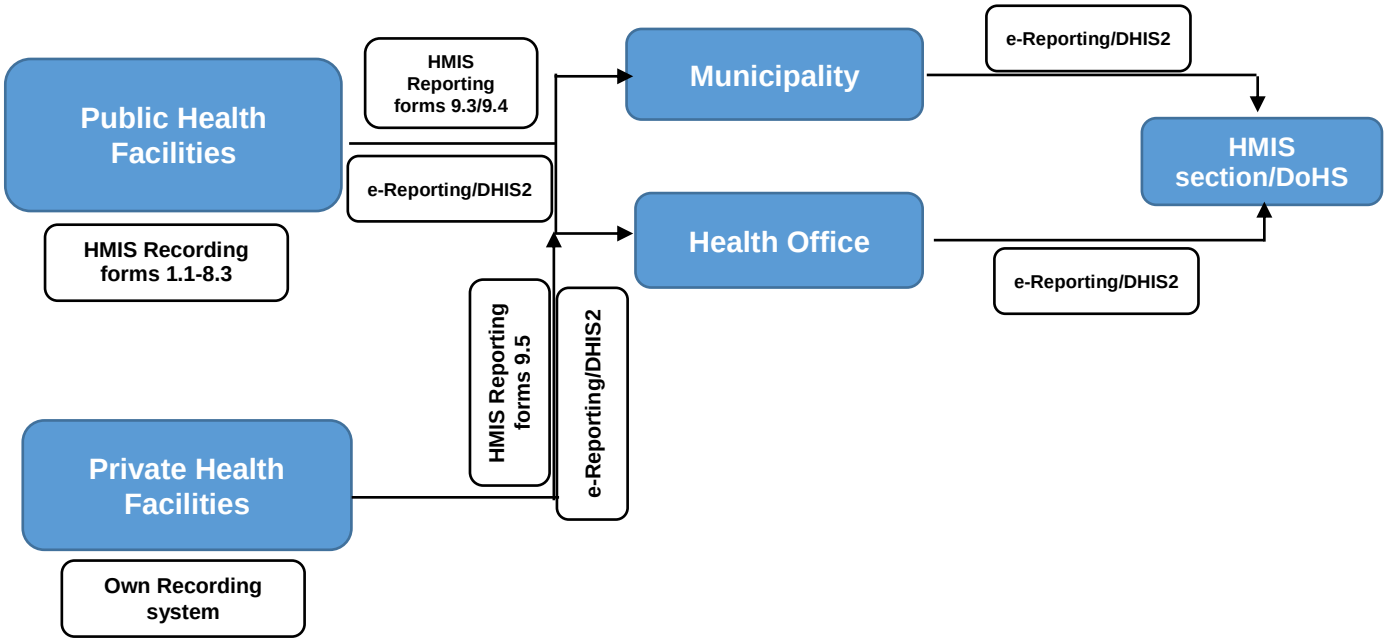

Figure 1: Recording and reporting pathway at different levels

3.1.4 Gaps in data generation, use and dissemination

The HMIS registers collects the disaggregated data through different programs registers. All programs' registers have provision to records basic four stratifiers - age, sex, ethnicity, address and contact number of the service recipients. However, from a close review, the sex has been classified only as male and female, giving no space for other transgender population. Only few programmes like HIV/AIDS and STI have category for the third gender service recipients. There are inconsistencies in the collection of gender and social stratifiers in various programmes or services, as highlighted in table 1 below. While there is programme like Family Health that collects additional information about occupation and education, this is largely lacking in other programmes. The table 1 shows different stratifiers in addition to basic four social markers (age, gender, ethnicity and address) collected by routine HMIS programs.

Table 1: Detail of social stratifiers collected by different programs and their respective register

HMIS	Name of Program/Register	Social Stratifiers (in addition to age, gender, ethnicity and address)
Recording registers		
1.3	Out-patient Register	Gender Violence Victim, Patient for free service
2.6	IMAM Register Hospital	Total No. of Family members in child's home
3.1	Face Sheet (Family Planning Service Card)	Education level, Occupation
3.7	Safe Abortion Service Register	Education of female

HMIS	Name of Program/Register	Social Stratifiers (in addition to age, gender, ethnicity and address)
5.4	Leprosy Examination Treatment Card	Current occupation, disability grade
7	HIV/AIDS and STI	Age Gender(F/M/TG), Marital Status, Risk group: (1 = FSWs 2=PWID, 3=MSM/TG; 4 = Blood or Organ Recipient, 5=Clients of FSWs; 6 = Migrants; 7 = Spouse/Partner of Migrants; 8= Others.
Reporting form: HMIS 9.3		
	HIV/AIDS	Only gender-wise reporting in other programs except HIV/AIDS which includes - Gender, age, risk-groups

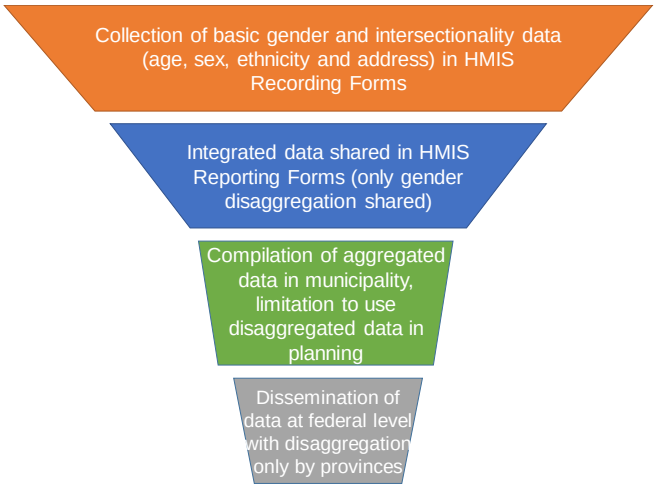

Figure 1: Gap in data generation, reporting and use

The existing recording formats do not help to understand who are disadvantaged and marginalized people in the community. Some of the programs' HMIS forms as shown in table 1 collect extra information in recording form. However, when the health facility reports monthly data through the standard reporting format of HMIS, the information is narrowed down. Not all the information collected at the facility level are reported to higher authority, except for few programs like HIV/AIDS, TB, Family Planning etc. Only gender disaggregation (male and female) is reported in general for other programs. This indicates a gap in data availability at generation and reporting stages. Where our recording format already have lesser forms of disaggregated data, the reporting format has further narrowed down the availability of disaggregation at municipality and higher level. This limits the ability of municipality for evidence based planning of health services. Similarly, when the report is compiled and reported to central level, information is further tapered. The information disseminated at the national level by government through annual reports based on HMIS findings has only disaggregation by provinces (as geographic location). Only the Tuberculosis cases and HIV cases were disaggregated by age and Nutrition program data by sex. This clearly shows that the data available to public at national level do not have diasggregation based on gender and social stratifiers, and that the health information system do not allow to understand disease and service utilization patterns by different groups of population to make tailored decisions.

The situation was found similar in IMS of both private health facilities, where they only record age, gender, address and contact number of service users. The private health facilities did not record any extra social variables than those available in the HMIS reporting forms. There was

also unavailability of basic information such as patients age and sex in the recording register of one private health facility, which has unmanaged recording system.

3.2. Findings from qualitative research

We conducted Key Informant Interviews (KIIs) to explore the use of gender and intersectional analysis in the health planning process of the local municipalities and further explore the factors contributing to the gaps in use of evidence. We have highlighted the findings related to the recording and reporting formats, availability of different stratifiers in routine data recording and reporting process, use of disaggregated data in planning, the planning process and the proposed framework for integration of disaggregated data in routine data generation process.

3.2.1 Recording and reporting formats and practices

HMIS includes separate registers for recording data from different services or programmes (named and numbered uniquely) and a consolidated monthly reporting form (HMIS 9.3 for public and 9.5 for private facilities). Public health facilities are mandated to use HMIS for recording and reporting of health service delivery data in Nepal. In our study, HMIS registers were used by both public health facilities for recording and reporting of data, while the private health facilities were using their own recording forms and formats. As DHIS2 is the online platform of HMIS, it was found that public health facilities were using paper-based HMIS registers for recording and DHIS2 for reporting, although DHIS2 has provision for recording as well. In fact, one of the public health facility was using both paper-based (HMIS 9.3) and DHIS2 for reporting to municipality.

While the private health facilities have their own internal information management system, they were using their own recording forms based on areas of services they offered and their respective department eg, outpatient department, emergency wards etc. One of the private facilities was using a developed online system for recording information, while the other one is using paper-based system, which is merely a register that captures minimum details of patients with inconsistencies and incompleteness in recording patterns. Both private health facilities were however using HMIS reporting tools (HMIS 9.5 and DHIS2) to report monthly data to government authorities (Municipality Office and Health Office of Kathmandu), although it was reported by district authority that the data shared by private health facilities were often incomplete.

Reporting mechanisms in federalized context

The overall HMIS system in the federalized context remains the same as before, only authority to report has changed in the present context. Since, power has devolved to local government (municipality), hence the responsibility of collecting monthly reporting of HMIS from health facilities now falls under the mandate of the health section of municipality. One public (health post) and both private health facilities are directly reporting to municipality and Health Office by entering monthly reporting data in DHIS-2 and also submitting paper-based reporting form HMIS 9.3 and HMIS 9.5 respectively. The participants from the public health facility said that DHIS2 resembles with HMIS 9.3, therefore is easier to fill up DHIS2 reporting template. Because they are not confident using the DHIS2, they first report in HMIS 9.3 and then after sharing that with municipality they report in DHIS2.

DHIS-2 is just for reporting. I just do reporting on the basis of HMIS 9.3 tool. In DHIS-2 we fill as per the HMIS 9.3 form.

KII2_PublicHF1

The other public health facility (urban health centre), however, is not using DHIS2 because the health facility does not have internet facility. They are only reporting through HMIS 9.3 to municipality. Health Office receives a copy of compiled monthly report from municipality.

We do not have internet and telephone facilities here till date. So we have not started online DHIS-2. Based on the existing HMIS format, we provide monthly report to health division of metropolitan city. Then health division (of municipality) send it to district public health office and then to health ministry. This is the process.

KII3_PublicHF2

3.2.2 Availability of gender and social stratifiers in HMIS

Similar to the findings from review of documents, health facilities staff responded about limited availability of social stratifications in the HMIS. Health workers in the public health facilities acknowledged that the available formats do not allow to capture wider social stratifiers and the reporting format include even lesser stratifiers. Although there are some stratifications in the recording forms, they felt that those are not enough to understand the background of patients.

Age, sex, ethnicity is already there. If there is space to record about education status, occupation and monthly income, it would be better. And in the disease part, it would be better if there are extra columns to record about the patient diseases and medicines that the patient has been using.

KII3_PublicHF2

The health workers were of the view that from the available information, health facilities will not be able to identify which groups of population are left behind in terms of service access.

Categorized data are very important. We need to get health services to all the places. Moreover, the people who are financially weak and geographically difficult to reach need to be provided with health services which is why this is an important topic of discussion. How do we reach them? I feel that it would be better if we could categorize it further. We need to focus more on the geography. And then, we need to also consider the literacy and illiteracy.

KII4_Municipality1

An informant from a public health facility also expressed that there is no space for recording third gender in recording forms besides the HIV-AIDS program. However, the health facilities have not introduced any new forms to capture additional information.

Third gender is also Nepalese citizen. They are human and they also get problems. If they visit us, then we also get confused and they need to be

identified if they come to us. It does not seem good that our HMIS does not include that although the government has started giving them citizenship card. [Third gender] should be included compulsorily in HMIS.

KII3_PublicHF2

During monthly reporting, as captured by the monthly reporting form, aggregated data on overall number of patients were being sent to municipality, even though health facilities had been recording different variables as per the recording forms.

For example, the face sheet (of Family Planning programme) that remains here contains information about education, husband, family, no. of children and everything. But in reporting we just report old and new users of family planning services. There is no mention about education in reporting form.

KII3_PublicHF2

Officials from both municipalities also agreed that they do not receive all information recorded at the health facilities from the existing HMIS reporting format.

The information of patient's such as ethnicity, education, etc. are in the registers at ward and clinic level. It remains there. It doesn't come here.

KII6_Municipality2

Likewise, the private health facilities were not recording any extra social stratifiers other than those available in the HMIS reporting forms. During the observation, we found no recordings of patients age and sex in one private health facility while another had standard format for age, sex, ethnicity and address of patients.

We record name of patients, their age, sex and address. We do not ask about their socio demographic economic conditions.

KII8_PrivateHF2

3.2.3 Resources gaps affecting implementation of HMIS/DHIS2

Several resource constraints were found that were affecting effective implementation of HMIS and DHIS2 in health facilities of both municipalities. Factors ranged from soft skills like knowledge of using DHIS2 among health workers to hardware issue like unavailability of internet supply.

Unavailability of focal person and resources for HMIS

In both municipalities, there was no sanctioned position for information system management within health section. Existing staff, although limited in number, within the municipalities were performing routine data management functions, such as data entry from HMIS 9.3 to DHIS2 and reporting to province and federal level.

We do not have a position specified for this who only reads those data. However, we have assigned a focal person amongst the human resource available to us and trained them. The person has a lot of

responsibilities at the moment as we are lacking sufficient human resource here. We might not be able to handle everything.

KII4_Municipality1

Responsibility is not assigned. When I came here, there was no one who knew how to use computer. I knew how to use computer although I was ANM (Auxillary Nurse Midwife). So, I started working. We first created hard copy format for compiling and created a system and then entered into HMIS. I started reporting there since the start.

KII6_Municipality2

Similarly, in both public health facilities, there were no sanctioned position allocated for HMIS. All the health workers were individually recording the services they provided in the respective HMIS recording forms, while there was a designated recorder for recording this in the private health facilities.

For examples, nursing staff look after ANC (Antenatal Care), PNC (Post-natal Care) and Family Planning services and those nursing staff prepare the recording forms and tally sheets. We paramedics look after OPD, DOTS and prepare our recording forms and tally sheets. After that, we do checks and prepare the HMIS 9.3 (refers to the reporting sheet) which is then submitted to the municipality on the monthly meetings.

KII1_PublicHF1

Lack of designated human resources for information management was not only the issue, regular internet connection was also one of the challenges health workers were facing for effective and timely reporting through DHIS2 at the health facility level. One public health facility did not have computer and internet facilities to implement DHIS2 while the other that had been using DHIS2, was relying on the internet supply shared by adjoining ward office. Municipality had realization that health facilities were facing challenges regarding the devices and internet for using DHIS2.

We enter data in health facility but sometimes the internet problem might arise. We are using the internet from ward office. The internet is weak. I just tried to open the server times and again. It works but sometimes we get trouble.

KII2_PublicHF1

..Since we have to work electronically, there are aspects of different trainings, various devices and internet which might not be available on time that adds to the challenges.

KII4_Municipality1

Gaps in training and capacity on HMIS/DHIS2

In both public health facilities, health workers received training on HMIS during their placement which was years ago. They have not received any refresher training after that. Any changes or updates in the HMIS and DHIS2 platform were informed to health workers via email or phone communication by municipality and Health Office, Kathmandu (then District Public Health Office in the previous structure). Health facilities have assigned one health worker as the focal person for HMIS, however, these health workers have not received training for DHIS2 and are performing the roles based on the orientation received from previous co-workers and from learning-by-doing experience.

> *I do not have computer knowledge. I just have basic knowledge. We have another staff; she has little computer knowledge. She has been doing data entry [in DHIS2] without any training since she came in this health facility. Training should be provided. [I do not know] whether province government or local government, who has not been able to bring this training. The training should be given to not only one staff in a health facility but 2-3 staff should be trained.*
>
> *KII1_PublicHF1*

> *We have DHIS2 trained professionals here at our division. Still, we have a few people at the health facilities that have not received the DHIS2 training which has caused us some problems.*
>
> *KII4_Municipality1*

Because they have not received any formal training, the health workers have little knowledge and thus are less confident in using DHIS2.

> *I have talked to municipality about need of training. What I know about DHIS2 tool is just 10%. I just know about data entering process. We can generate all the pie charts form DHIS2. I do not know how to use [DHIS2 for generating such charts]. We are even using our general knowledge while using DHIS2 but do not have detail knowledge on it. We feel that something might get wrong while using new things. Hence, we are only doing data entry function.*
>
> *KII2_PublicHF1*

Despite the fact and realization that health facilities staff do not have sufficient capacity in using DHIS2 and not all of them were trained on using it, municipality however, did not have any written plans for training of health workers on HMIS/DHIS2. A municipality's staff sharing the realisation of the need of refresher training for health workers, verbally mentioned during the interview about municipality's plan to conduct on-site or refresher training on both HMIS and DHIS2 to at least two health workers from each health facility, which however could not be traced by research team while reviewing their planning documents. Participant from the health office mentioned that they provide trainings to health workers but only based on the demand and plan of the local municipality.

The training for this HMIS and DHIS2 was received long time ago. Some of our colleagues who have implemented it after their training have seen improvements. But the ones who have not had chance to implement it are on the verge of forgetting it. That is why we have a plan to conduct a refresher course on HMIS and DHIS2 for them.

KII4_Municipality1

Both municipalities staff had reportedly received training on HMIS and DHIS2 and they have been receiving support from provincial and federal governments for their capacity enhancement. However, they seemingly not have enough skills to use the data and perform analysis.

3.2.4 Practice of data analysis and use

At the health facility level, health facility in-charge (who is the head of health facility with clinical and managerial roles) was playing roles in analysis and use of data in health facility planning process. It was reported that not all health workers who use HMIS forms for recording and reporting have capacity to analyse and use local data. Practice of data analysis using DHIS2 was not being done at both public and private health facilities. Review meetings at frequent intervals (quarterly, biannually and annually), in addition to other program specific meetings are held in the municipalities to monitor and reflect on the progress, and these are the platforms where health facilities shared their data. While presenting data in different platforms, priority was given to the trends of the number of cases for different programmes over the period of three to five years in each health facility with no focus on gender and intersectional analysis that is possible with the available data.

We make pie-charts, bar graphs while presenting data. We evaluate by showing them the trends of three years. For example, let's talk about CB-IMCI topic. We show the number of registered cases and disease of three years. We present whether pneumonia, ARI or diarrheal cases have decreased or not after we have conducted awareness programs…We show it as a number rather than percentage because the percentage is at lower value while presenting data of the municipality. When we say it in number then they praise us by saying that we have seen 6000 cases this year compared to 3000 cases previous year although increase in number of patients is not a good thing.

KII9_PublicHF1

Moreover, the urban health centre was not analyzing and presenting the data from their health facility at any platforms and meetings. They were only reporting monthly data to municipality.

Both municipalities were reportedly using DHIS2 online platform for the analysis of data. The municipality staff had received the DHIS2 training from province and district level. According to one municipality, data received from public health facilities were used to observe the progress and health situation of their municipality. The online platform had made it easier for the municipality team to perform data analysis and to identify the health problems and determine the way of improving the service delivery.

In the annual review, we need to make such reports and submit it to the authorities. We need to analyze all the reports from all health facilities. In the

annual review, we discuss the levels of indicators that each of them have achieved. We discuss with them monthly as well as semiannually and then make our plans accordingly.

KII4_Municipality1

According to a participant from Health Office, the disaggregated data need to be used in the planning process and that communities should be engaged while making plans.

… For example, we can't know which caste received safe motherhood program and which caste received less. It is mentioned in the recording. Those who are at higher level should consider the need of the specific area/ geographical location and involve manpower who works directly in the field while planning and making policies. Only statistics is not enough… That is why; I think we need to ask at grass root level.

KII7_Health Office

3.2.5 Planning process – if evidence based and participatory

Planning in the municipality is conducted to develop annual workplan as well as longer-term plan (5-year plan); and other planning process takes place at province and federal level. Ideally, the annual planning process at municipality takes place in seven steps with defined dates for the development of annual work plan and budget, as defined in the constitution (Justice and Rights Institute (JURI Nepal) 2020). Municipalities allocate their budget for planning of all sectors including health with the engagement of wards and community. At the first stage, municipalities receive budget ceiling from federal and provincial government. Secondly, municipalities identify total budget in addition to other internal budget of the municipalities. The third important step is selection of plans and programs from community level in each ward, which encourage participation according to gender, ethnicity, disability, elderly, sexually disadvantaged and other marginalized and disadvantaged groups. The plans and programmes raised by communities will then be prioritized at ward level and submitted to municipality. Planning from health facilities jointly developed by HFOMC are incorporated in the ward level plans. Then the municipalities prepare consolidated plan based on the plans received from each ward and from different sections within the municipalities, which is then presented to the municipal assembly where the plans eventually get approved (JURI Nepal, 2020).

Following the rules, the local level must complete 7 stages of annual planning process. We need to learn the health problems that are there at the ward level and identify the health problems at the community level. Then, we consider the same issues at the ward level where it is approved by the ward committee. After that, it comes to the municipality. It is approved by the executive committee at the municipality where the health department is also involved in it. And if there is anything that needs to be added or removed then it is forwarded by the health department to the executive committee which is passed in their meeting.

KII4_Municipality1

There were mixed responses from the health facilities staff and municipalities staff about the use of evidence in planning process. While the health section of one municipality claimed that they prepare health sector plan considering reported data and plans received from wards and in consultation with health facilities' in-charges, however the health worker expressed contrasting experience. They reported that plans prepared at the health facilities were not prioritized and included in municipal level plans.

> *There is no use of plans formulated locally utilizing all the available health data because that plan will remain only in the paper as municipality do not value any of the plans prepared through local health units. While conducting elderly program, we made visits to every households and collected information about the proportion of disabled, blind, mentally ill, patient at need of critical care such as oxygen therapy, tumor cases, carcinoma and generated disaggregated data however that data seemed to be of no use in the municipal level as no any budget has been allocated for the program related to disabled or critically ill.*
>
> *KII9_PublicHF1*

One of the public health facility's staff mentioned that municipality plans several programs targeted to poor and disadvantaged groups in the community, however do not follow a proper process to reach out to such groups. The health sector planning in both health facilities was led by health facilities' in-charge, although the plan was approved by HFOMC. The health facility level plans, although were informed by data utilization trends of few years, however were not analyzed with gender and intersectional lens.

One of the crucial steps in this planning process is the engagement of communities for identifying the real problems and needs, which seemingly was less happening at both municipalities. The seven steps planning process promotes participatory approaches to develop locally tailored plans and programs (Justice and Rights Institute 2020). However, this participatory process was hardly functioning in the local planning process. The health sector planning in both health facilities was led by health facilities' in-charge that later was approved by HFOMC. The health facility level plans, although were informed by programmatic total service utilization trends of past few years, however were not analyzed with gender and intersectional lens, which is possible to some extent from the available data.

One municipality's health unit reportedly organize meeting at municipal level for planning where they only invite ward-chairpersons. The health workers from the urban health centre expressed that their health facility was never invited and engaged in neither municipality nor ward level planning.

> *We do not have meetings in wards for health. But sometimes we organize monthly meetings for FCHVs. There are no special meetings for health conducted at ward level. HFOMC has not been formed.*
>
> *KII3_PublicHF2*

Likewise, participation of private health facilities in municipality planning process is also missing.

We have not yet invited private health facilities to such (review and planning) meetings. But we had also provided them the same trainings (for DHIS2) initially.

KII4_Municipality1

M: Do the ward or municipality have been using data from hospital in planning process or anywhere?
P: No. I do not know that they have used the data till now.
M: Do the hospital representative visit the ward level meetings?
P: No.
M: What about DPHO meetings?
P: Not in there as well.

KII8_privateHF2

Both municipalities health staff iterated that health has always received less priority over other development agenda at the municipal level planning and budget allocation. The health section apparently conducted series of meetings with the health workers and ward chairs for identifying the issues and needs, however, they had been facing challenges in getting approval of those plans in the municipal assembly.

There are problems and challenges because we do not have sufficient resources... financial resources. At the municipal level, we are suggested to run them under the available financial resources that we have. Sometimes the local level representatives have also stated that it is not a big issue (for health) since the government provides the medicines for free which we are asked to distribute. We face a challenge to explain in detail about the requirements because it is not in their priority till now.

KII4_Municipality1

Both municipalities, on the other hand shared that they were not included in provincial level planning. The municipalities presented their findings at the annual review meetings at provincial and federal level, however, they were not involved in the planning and program selection process later.

I don't have idea whether what type of disaggregated data are used while making policies at district and provincial level. They do the analysis themselves and prepare budget. Only presentation was done at the review meetings of province. Findings of reports were discussed. Province and district make planning based on that reports. We are not involved in making planning and policies.

KII6_Municipality2

4. GENDER AND INTERSECTIONALITY FRAMEWORK FOR IMS

One of the main objectives of this pilot study was to co-develop a framework with defined social stratifiers to be recorded and reported in routine health information system keeping gender and intersectional lens intact, in collaboration with government officials at federal and local level. Engagement of government will help create their ownership on the framework and its possible use in future health service planning. However, this co-development process could not be conducted as planned due to the present context of COVID-19 in Nepal, where the second wave is in surging stage. Therefore, the research team developed a framework based on the findings from documents review and key-informant interviews and also incorporating practices and lessons learnt in other countries' contexts. This framework was then circulated to concerned government officials and other stakeholders to receive their feedback which will be followed by a discussion and dissemination event to handover study findings including the framework to the government.

In the proposed framework we have presented several dimensions that are required for an information management system to function smoothly and efficiently. These are explained under following headings:

Interconnection between HMIS and other MIS and periodic surveys

At the very first stage, the health sector can take advantage by creating interlinkages with different existing MIS systems within and across health sector. HMIS can to be interlinked with other existing information system in health sector (like the Human Resource Information System/HuRIS, Health Infrastructure Information System/HIIS etc) and information system of other sectors such as Education Management Information System (EMIS) etc that would provide opportunities to understand needs of different sectors based on gender and equity perspectives and align plans and programs for greater achievement to reach target groups. Furthermore, an information system alone will not be able to capture all population based data. Other data sources like periodic surveys like NDHS, NHFS, MICS etc, both population based and facility based surveys, are important and complement data gap in the country. Therefore, it requires a careful planning and discussion at national context ahead of data collection on how this complementarity in data from routine sources and periodic surveys can be best achieved. Further, the HMIS is largely missing health service utilization data from private providers that have larger share of health service delivery in the country. Environment should be created to maximize complete reporting of health service utilization data from private sector to provide a complete picture of national data.

Gender and social stratifiers in recording and reporting

As revealed from the review of HMIS forms and formats, there are very few social stratifiers collected through current HMIS recording system for majority of the programs. These stratifiers are narrowed down in the reporting process as current reporting largely includes aggregated-figures with gender disaggregation only. Therefore, at the first stage we promote generation of wider social stratifiers informed by WHO as basic social markers (WHO, 2020), as shown in table 2 below, that enable gender and intersectional analysis at health facilities as well as municipality for evidence-informed planning. We have proposed gender and other determinants of social stratification such as age, ethnicity, education, occupation, disability status, migration status etc that can be collected from routine health information system. Likewise, the next crucial stage is to extend the reporting system to include wider social stratifiers that will help municipality, province and federal authorities to understand the local data. The revised reporting system can include integrated data according to various social stratifiers (not all that will be recorded) for all programs. Routine availability of such data will

help to generate indicators with gender and intersectionality lens that would allow to assess, for instance, population of which gender and social stratifications (by education and occupation status) are seeking health services and which groups are left behind. When such information is available at the health facility/ward level, tailored plans and programmes can be developed to identify and reach disadvantaged and unreached groups of populations. As also highlighted by the study, there are several factors that affect quality data generation and reporting process that require immediate attention from managers and policy makers. These stressors are unavailability of functional computers and internet supply, unavailability of designated and trained human resources for HMIS data recording and reporting, lack of routine training or refresher training on HMIS/DHIS2 and lack of technical support and guidance by municipality staff thus resulting in insufficient capacity and confidence among health workers to use HMIS/DHIS2, ultimately raising question on their data quality.

Table 2: Currently available versus proposed gender and social stratifiers in HMIS recording and reporting forms at entry level

Recording		**Reporting**	
Current	**Proposed**	**Current**	**Proposed**
Age Sex/Gender (Male and female only, no space for other sexual orientation) Ethnicity Address Contact number	Age Sex/Gender with sexual orientation, Race/ethnicity, Religion, Education, Employment/occupation Marital Status, Disability status, Address, Migration status, Income/social class	Total aggregated Male and Female disaggregation in some programs	Age group Sex/gender with sexual orientation, Race/ethnicity, Religion, Education categories Disability status, Region of Residence, (Urban/Rural) Migration status

Data use and planning

Annual planning at health facilities currently involve use of data, mainly aggregated data to show total program-wise trends over few years. Although current data allow some forms of analysis at health facilities, however this was not being practiced and should be promoted through awareness on importance of disaggregated analysis and capacity strengthening to perform such analysis. When additional stratifiers are added in recording and reporting forms, a detailed gender and intersectionality based analysis can be performed. It is very important to inform this process by real community health needs following participatory community engagement. Then a need-based and evidence-based plans can be developed from the health facility level.

Planning process at municipality, which is often guided by province and federal budget and guidance and by local wards/health facilities plans should be strengthened to make it more evidence-based. Health facilities have to be supported to generate quality data and conduct gender and intersectional analysis to develop realistic plans. Then the municipality can prioritize and consider these local plans, in addition to other municipal priorities and needs.

Figure 1: Framework to incorporate gender and social stratifiers in IMS for evidence based planning and equitable delivery of health services

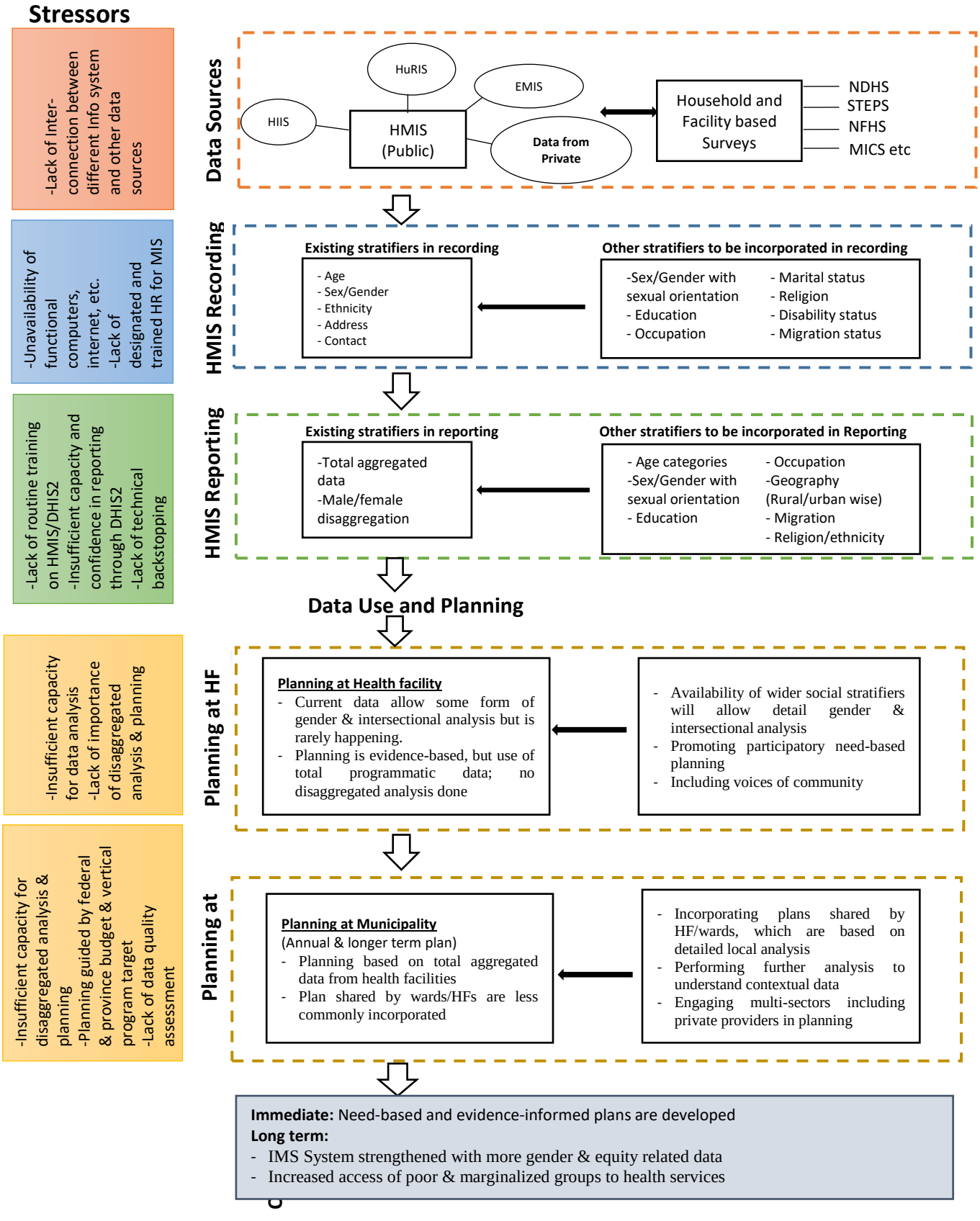

Figure 2. Framework to incorporate gender and intersectional stratifiers in HMIS for evidence based planning and equitable delivery of health services

The research team understands that revising HMIS is a huge step for the government as this requires amending the entire HMIS recording and reporting forms and formats. However, we recommend that when the time for routine amendment of HMIS and DHIS2 is planned, respective team and sections can follow this framework to guide the revision process. We are aware and assert that amending the recording and reporting system alone will not help to generate quality data that can be used for performing gender and intersectional analysis. There are several other factors/stressors (as shown in the framework) that affect functioning of whole system ranging from capacity to use HMIS and DHIS2 to availability of resources and strong leadership and dedicated commitments particularly from municipality. Local leaders and health managers should ensure training and capacity strengthening activities is routinely held within their municipality to fill any capacity gaps. Capacity strengthening not only in using HMIS and DHIS2, but also in understanding data with gender and intersectionality lens and performing routine analysis from the data is equally important. This could also be included in training curriculum and manuals related to information system. HMIS is the only source of getting routine health data, and health sector planning largely depends on this data, hence quality of data and the conducive environment to generate these data should be a priority for all tiers of government. Further to this, awareness and realization of the importance of gender and intersectionality in the information system has to be created at all levels. This will ultimately help to achieve immediate outcome of developing need-based and evidence-based plans and longer terms impact in terms of increasing access of poor and marginalized populations to equitable health services, ultimately reaching the unreached.

5. DISCUSSION AND RECOMMENDATIONS

This pilot study aimed to explore the extent of the availability and use of gender and other social stratifiers in information management system in Nepal. The study also explored underlying factors that affected generation and use of data to inform gender and intersectionality dimensions in local health planning. Informed through the evidence generated from documents review and interviews with key informants, we have proposed a framework to generate disaggregated data based on gender and social stratifiers that support use of locally generated evidence in developing tailored and equitable health plans and programs focusing on marginalized and disadvantaged populations.

The document review found that the concept of gender and equity is increasingly included in national policies and strategies. Gender and equity is well discussed and prioritized in national health policy and strategies including separate GESI strategy, however challenges remain to bring those goals and principles to implementation level with clearly defined operational guidelines and roles (Nolen *et al.*, 2005). Most of the national policy documents highlighted the importance for routine health information systems to integrate gender disaggregation and gender-sensitive indicators, which however is missing in the HMIS.

HMIS is the main information platform to record routine health service utilization data in the public health facilities while private health facilities are using HMIS and DHIS2 only for reporting the service utilization data (MoHP, 2014, 2015, 2017). It was observed that, existing recording forms for the majority of programs only generate limited gender and social stratifiers such as age, ethnicity, address and contact number of the service users, although there are few programs like HIV/AIDS, family health etc that record additional information of the users. The sex/gender category in the HMIS includes male and female disaggregation only for all other programs except HIV/AIDS and STIs, allowing no space for sexual minority groups (MoHP, 2014, 2017). This clearly indicates that there are inconsistencies in the recording forms within different programs and that if detailed information can be generated for one program (like HIV/AIDS) then it can be provisioned in the registers of other programs too.

Moreover, for monthly reporting of data from health facilities, the data has to be aggregated into summary tools for DHIS entry or HMIS 9.3 (for public) and 9.5 (for private). The service users are often aggregated into total number of male and female, and other stratifiers tend to be lost in HMIS reporting (MoHP, 2014). Hence, when the municipality receives data from all health facilities, they do not have a clear picture of beneficiaries, except for a few programs which involve some disaggregated reporting. The quality of data from public health facilities and incomplete reporting from private providers further restrict proper planning. Since, health workers are less confident in using DHIS2 and because they had not received training and technical support from municipality or other authority, there is a high chance that the quality of data is being compromised, hence should be considered. Moreover, in order to achieve maximum reporting from private health facilities, both supportive and regulatory mechanisms have to be employed. A supportive environment involves informing, orienting, following up and promoting the participation of private sector providers in review meetings and planning processes while through regulatory mechanism mandatory reporting should be introduced in HMIS that can be linked with the license renewal process of the private organizations.

The routine data at health facilities are not analysed according to gender and intersectionality lens, although current data allow some form of such analysis. These data when shared at different platforms like monthly, quarterly and annual review meetings, only total figures are presented that provide no sense of age, sex and social groups of people who are getting health services. And thus, nationally disseminated data in the annual reports completely lack any form of disaggregation other than provincial categorization of data (DoHS, 2019). While key informants were aware and agreed about the value of disaggregating data by gender and other social stratifiers, they reported differences in how often disaggregation is used in practice. We found similar context in other countries in eastern and southern Africa, indicating that although attention to gender and intersectionality is increasing in health information system, sex- and age disaggregated data are not always available or used (Mandal, Cannon and Nondi, 2016; Brittany S Iskarpatyoti and Cannon, 2017; Brittany S. Iskarpatyoti and Cannon, 2017). It is clearly understandable that HMIS alone cannot generate and fulfil all information needs and thus data from other sources like periodic surveys should be acknowledged and careful planning is needed so that different sources complement with each other.

Further, utilization and analysis of disaggregated data at health facilities and municipalities was very low. Health workers in the study concurred that many times data were not used and plans and programs seem to be developed in a more or less predicted manner. This is an important consideration, because if the importance of disaggregated data is not felt to be other than for reporting purposes, the data are less likely to be used for planning and decision making. In addition, if health workers do not see value in recording the disaggregation, the data may be less likely to be of high quality, which was highlighted in studies conducted in African countries (Mutale *et al.*, 2013; Muhindo and Joloba, 2016). Our findings in congruence with other studies also have shown that health planning at local levels are more guided by vertical programmes and federal and provincial budget guidance (Sharma et al, 2018; Mirzoev *et al.*, 2019; Thapa *et al.*, 2019). The planning process which should in principle be participatory and evidence based was often compromised in both municipalities. On the one hand, the health plans developed at ward level were not participatory and tailored targeting disadvantaged and marginalised groups, and on the other hand plans shared by wards were not fully incorporated at municipality level planning and budget allocation again reducing the possibility of equitable service planning. Strategic evidence based planning was less operationalised and focus and efforts were diverted to meeting annual targets for different programs set for health facilities and municipalities.

Likewise, this study also explored several gaps in HMIS implementation and use of evidence at health facilities and municipalities. There was no designated focal person assigned for recording and reporting of HMIS in the public health facilities as well as municipalities. Existing staff in both health facilities who had capacity to use computer was internally assigned for HMIS/DHIS2 reporting functions and these staff were not trained on DHIS2 and were trained on HMIS years ago with no refresher training then after. This not only flags the issue of confidence among the health workers to use recording and reporting forms, but also questions the quality of data being recorded and reported from such health facilities. On top of that health facilities were also facing other troubles because of lack of regular internet supply and functional computers for online reporting. The municipalities although aware of these facts, did not have plan for training of health workers on HMIS/DHIS2 and arranging internet and devices.

Based on these findings the research team has developed a framework that will broaden the scope of availability of disaggregated data at municipality, province and federal levels. This requires amending the HMIS recording and reporting system and ensuring supporting environment for its implementation. As also discussed in the framework section, strong leadership and commitment is required at all tiers to promote effective functioning of HMIS with generation of quality data. There is a huge requirement particularly from the municipality to assess and ensure quality of data recorded from health facilities. After considering all these stressors and barriers, the framework can be effectively used to generate quality data with inclusion of varied gender and social stratifiers. The study findings including framework was shared to stakeholders at local and federal level and their feedback has been well incorporated in this report. Based on the discussion between the stakeholders and research team, as a next stage of this pilot study, implementation research can be undertaken applying the framework in sample of health facilities and municipalities, particularly in areas of HMIS that are currently neglected, such as mental health and NCDs. Implementation of the framework will require strong coordination, co-design and engagement with diverse population groups and concerned stakeholders at all tiers of government.

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