Effective Implementation Strategies for Community Health Information System in Urban Settings of Ethiopia

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Abstract

Background: The Urban Community Health Information System (UCHIS) in Ethiopia aims to collect, document, and exchange data at the community level to enable health system managers and health workers to make evidence-based decisions and improve health outcomes. The system, which was recently launched, faces several challenges that hinder the full integration of the new information system into the national health system. Thus, this study aimed to produce a compile refined implementation strategies that could guide effective service delivery, adoption, and sustainability of UCHIS in Ethiopia and evaluate the feasibility and significant of these strategies.

Methods: This study employed a qualitative research design utilizing key informant interviews and iterative consultation workshops conducted in eight major cities of Ethiopia from March 22 to May 2022. First, we conducted qualitative interviews with 28 experts, including implementers, policymakers, academicians, and implementation researchers. We then invited these experts to participate in iterative consultative workshops to refine the list of strategies and rate them based on their importance and feasibility using a four-level Likert scale.

Results: The qualitative analysis identified six major themes related to the challenges and opportunities for the adoption of UCHIS: (1) the existing approach and workflow of UCHIS; (2) readiness for implementation; (3) human resources; (4) mentorship and supportive supervision; (5) community sensitization and advocacy toward UCHIS, and (6) challenges to the implementation of UCHIS. We developed 63 strategies under eight domains that could improve the implementation, adoption, and sustainability of UCHIS in Ethiopia. Of the 63 strategies, 47 were rated as highly important and highly feasible, while 19 were rated as highly important but less feasible.

Conclusion: This study provides a valuable resource for prioritizing implementation strategies for the effective adoption of UCHIS in Ethiopia. The findings of this study should be used to guide the development and implementation of a national plan for the adoption of UCHIS. Prioritized strategies should be tested and compared in terms of improving the adoption of UCHIS in Ethiopia and other low- and middle-income countries. [*Ethiop. J. Health Dev.* 2024; 38(SI-2)]

Keywords: community health information system, implementation strategies, feasibility and importance of implementation strategies, evidence-based guidance, urban CHIS, Ethiopia.

Background

The Ethiopian Urban Health Extension Program (UHEP) aims to address the unique, ever-increasing health needs of the urban population while promoting health equity. The program is designed to generate demand for essential health services by providing the of health information at the household level and improving access to health services through referrals to health facilities (1). UHEP enables health management and service providers to document, analyse, and use data to improve coverage, continuity, and quality of care (2).

Urban community health information system (UCHIS) is at the early stage of implementation and is currently being operational in only in 16 towns of Ethiopia: (Addis Ababa, Bahirdar, Dessie, Wukuro, Mekelle, Semera, Bishoftu, Adama, Legetafo, Hawassa, Arbaminch, Gambela, Assosa, Dire-Dawa, Harar, and Jigjiga). A pilot test for UCHIS was conducted in 2020 (3). The program is currently hindered by the lack of a standardized community-based health information system for recording, monitoring, and reporting urban community health services, as well as ensuring the quality of health information and the performance of urban health extension professionals (UHE-ps) (1, 4). Thus, of the 260 implementation sites, in 2020, 180 (69%) had begun providing any type of service and reporting through UCHIS, only 188 (72%) completed baseline data collection and categorization, and 44

(17%) had not yet initiated UCHIS implementations (4).

The UHEP operates under the direct supervision of the health centres and is staffed with UHE-Ps who is trained nurse's health officers. UHE-Ps is the most accessible health workers for the general population, providing promotional, preventive, and referral services to the health facilities. The UHEP is expected to deliver 16 health extension packages across four major program areas: (hygiene and environmental sanitation, disease prevention and control, family health services and accident prevention, control and first aid, and referral services (4).

Although many implementation strategies are generic and are applicable across contexts, it is essential to identify specific strategies that can support effective service delivery, adoption, and sustainability to bridge the gap between evidence-based practices (EBP) and routine services. Implementation researchers have systematically published taxonomies of implementation strategies (5, 6). However, there is no evidence-based recommendation to guide the effective implementation of UCHIS in Ethiopia.

This study aimed to compile refined implementation strategies that could guide effective service delivery, adoption, and sustainability of UCHIS in Ethiopia, as well as evaluate the feasibility and significance of these strategies. Through this study, we seek to provide

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valuable insights for policymakers, and practice insights for policymakers, implementers, and implementation science researchers.

Methods

The study employed a qualitative research design that included key informant interviews and iterative consultative workshops to develop and evaluate evidence-based strategies for the effective implementation of UCHIS in the country.

This study was conducted in eight major urban centers in Ethiopia from March 22 to May 2022. These cities include Addis Ababa, Adama, Bahir-Dar, Arba-Minch, Hawassa, Dire-Dawa, Harar, and Jimma.. The cities were selected purposefully based on their urban characteristic s and experience in implementing UCHIS. A technical working group (TWG), comprising of researchers, implementers, and policymakers from Ethiopia's Data Use Partnership (DUP) and MOH, was established to conduct this research.

Qualitative section

The study team developed a semi-structured data collection tool to assess information, including current UCHIS implementation approaches, challenges, and recommendations. A purposive sampling technique was employed to select 28 study participants. Individuals knowledgeable and experienced in the program were purposefully chosen for the interviews. None of the selected participants refused to participate in the interview. The key informant in-depth interview section of this study was conducted through face-to-face interviews with participants from MoH, RHBs, zonal health departments, district health offices, health extension program coordinators, and partner organizations.

Data was collected by researchers from MOH and the data use partnership (DUP) who had prior experience in qualitative data collection and analysis. The Data were audio recorded after obtaining informed consent from each participant and was transcribed into English. After reach in a consensus with the research team, the data was coded as it emerged, and then codes were categorized and analysed thematically.

Strategy identification and rating

In addition to the research TWG, a panel of diverse experts, including implementers and researchers from MOH, RHBs, partner organizations, and local universities, was identified using purposive sampling. These experts participated in two consecutive workshops to identify, map, and rate strategies as described in detail below.

Workshop one (three days): The TWG members identified challenges and recommended strategies from the document review and qualitative interviews. The team also included lessons from practical experiences to produce a draft compilation of challenges and strategies.

Workshop two (three days): A total of 35 experts from diverse stakeholder, including those who participated in the qualitative interviews, were invited to review and rate the compiled challenges and strategies. These experts were divided into five groups, each with two TWG members, each group to conduct the rating exercise. Strategies were rated based on their importance and feasibility on a four-level Likert scale, i.e., highly important, highly feasible, highly important, less feasible, highly feasible less important, and less feasible highly important. Ratings that showed discrepancies among the five groups were presented to the panel for consensus rating.

Results

Qualitative findings

A total of 28 individuals participated in the study, representing the MoH, regional health bureaus, district health offices, PHCU directors, and HEP coordinators. The study identified six major themes, including the existing approach and workflow of UCHIS, readiness for implementation, human resources, mentorship and supportive supervision, community sensitization and advocacy toward UCHIS, and challenges to the implementation of UCHIS.

Existing approach and workflow for UCHIS

Participants agreed that lack of a formal structure for (HEW) coordinators at the facility level made it difficult to monitor UCHIS activities and UHEp's performance. The informal assignment of HEW coordinators is also placed an additional burden on the UHEps without any formal recognition.

> *"They [UHE-Ps] are working as a team, but there is no formal structure for the HEW coordinator. Unless a HEP coordinator is assigned under a formal structure, it is difficult to give clear roles and responsibilities, measure their performance, and ensure accountability" (Dire-Dawa RHB, PPMED director).*

The availability of color-coded labelling of kebeles and the categorization of household data based on health risk and economic status was mentioned as the best practice for delivering health services.

> *"From the beginning, the process of data collection, data storage, categorizing and archiving the data at the health center in using identifiable colours per kebeles was remarkable and provided the best experience." (ARHB, M&E officer).*

Currently, UHE-Ps is using the paper-based family folder which contains information on household profiles, economic situations, and health and health risk status, as a tool for the UCHIS program. To address the needs of highly mobile urban dwellers, tracking the whereabouts of households was practiced in Dire-Dawa. However, tracing individuals who move out of the PHCU catchment area in Dire Dawa was not available.

> *"When a family registered for the service moves to a different residence, we try to trace the residence where that family relocated. If the family moves within our catchment area,*

there will be a transfer of family folders between the health extension workers. However, if he moves out of the catchment area, no tracing is available." (Dire-Dawa Gendekore PHCU).

The study reveals that the FHT service delivery approach is currently being implemented in the assessed regions, except for the urban health posts, which are supported by HEWs only. The FHT is a multidisciplinary health team that includes nurses, health officers, medical doctors, environmental health experts, and UHE-Ps. The team provides tailored preventive, curative, and rehabilitative health services for needy population groups. It was noted that the existence of the FHT has significantly improved the comprehensiveness of service delivered to the community, increased access to hard-to-reach communities, and enhanced the level of acceptance of UHE-Ps by the community.

"The FHT is very important; first, the health center's performance has increased due to the availability of the FHT, and the community is now well aware of the available types of services in the health center, that increase patient flow. Second, the acceptance and value given to the HEWs by the community have significantly increased." (Harar, Amir Nur HEP coordinator).

Readiness for implementation
The finding of this study reveals that training of trainers and subsequent training of UHE-Ps was provided for most of the UHE-Ps at the regional level before the implementation of the UCHIS, in collaboration with MoH, RHB, and partner organizations. However, the training provided for the UHE-Ps was not adequate, and they claimed that training was not provided for the newly deployed UHE-Ps.

"The previous training was provided for five days, which is not sufficient. There is frequent staff turnover; therefore, periodic training at least once a year should be provided to refresh and update experienced individuals and will be basic training for newly deployed HEWs." (Zonal Health Office).

Peer-to-peer training for the newly deployed HEWs was also implemented to engage them in the program. It was noted that in some regions, it is through peer-to-peer training that most of the activities are performed.

"It is through the peer-to-peer training we are working. It is better than nothing; it can help individuals as a starting point, but it may not provide a comprehensive understanding the program. Since there is no solution from the higher level, we are taking peer-to-peer training as a solution." (Bahir Dar HC).

Study participants cited that before the implementation of UCHIS, agrarian CHIS was piloted in some urban centers and was changed during that period. Another participant mentioned that UCHIS was piloted before it was scaled up to other areas.

"Initially, agrarian CHIS were implemented in urban centers, but later on, it was changed to urban CHIS; following that, we provide training and cascade to the lower levels and the program is promising." (Harar PPMED director).

Human resources for the implementation of UCHIS
All study participants agreed that the deployment and number of UHE-Ps per PHCU depend on the total catchment population. However, due to the shortage and high turnover rate of UHE-Ps, the UHE-Ps to population ratio does not meet the standard.

"The major challenge is that the number of HEWs and the catchment population are not proportional, which results in poor adherence to the recommended practices. In our context, one HEW is serving 800 to 1,000 households, which creates difficulty in providing standardized service." (Zonal HEW coordinator).

The Performance Monitoring Team (PMT) was available in all interviewed sites; however, the level of functionality varies from place to place. In almost all regions, the HEW coordinator is a member of the PMT.

Almost all participants agreed that formally trained and deployed human resources for FHT are not available. All are using the existing HC staff except the HEWs.

"The fundamental issue is that the program needs specifically trained and dedicated healthcare professionals assigned to the FHT positions. The current approach relies on existing health center staff as FHT, which depends on the willingness of the PHCU heads to assign them to the FHT program." (Health Center FHT member).

Mentorship and supportive supervision of UCHIS implementation
Regular mentorship and supportive supervision were not consistently available for all regions. Participants explained that the MoH provides annual supervision and conducts assessments. Regional participants mentioned offering integrated supportive supervision to lower levels.

"The monitoring and supportive supervision are provided in coordination with the PPMED, HEP, and other partner organizations. However, it has not as effective as expected. We provide integrated supportive supervision every six months, which is conducted by including some UCHIS indicators in the supervision checklist." (Harar HEP coordinator).

After each assessment and supportive supervision, oral feedback is provided for the health centre management team, and written feedback is also provided for RHB at the lower level. The implementation of the provided feedback was checked during the consecutive supportive supervision activities.

In Addis Ababa, a verification task force consisting twelve team members, including the medical director and finance department UCHIS staff, has been established. Similarly, verification is done in other regions through the coordination of PHCU directors. The verification task force verifies and provides service to the community through direct supervision. It was noted that phone verification is also used to confirm the provided service.

> *"The verification task force, which includes individuals from the medical director, finance, pharmacy, and other individuals making twelve members, and is established at the health center. The task force monitors the functionality and performance of the PHCU."* (Shiro Meda HEP focal).

Community sensitization and advocacy toward UCHIS

The study's findings indicate that the FHT's service fosters community ownership and increases community ownership an increases trust in the health services provided. However, some areas, such as communal public living areas, streets, and schools, require extensive advocacy and sensitization activities.

> *"The provision of family health services creates community ownership; they trust the service and recognize the efforts of the health care providers. We are mainly working on the prevention services; we take care not to divert to the full curative service."* (Amir Nur, PHCU head).

As part of stakeholder engagement activities, review meetings with mayors and communication offices, and experience -sharing with health facilities were reported.

> *"During experience-sharing with various stockholders, such as the education sector, mayors, communication offices, and others are invited to the program. During that time pictures are presented to show the activities of the HEWs and FHT that creating an impression and sense of belonging among the concerned stakeholders."* (RHB coordinator).

Challenges to the implementation of UCHIS

During the document review and qualitative interviews, challenges to the effective implementation of urban CHIS were identified. A summary of these challenges is presented in Supplementary Table 1.

The implementation of the Urban Community Health Information System (UCHIS) faces several challenges. Weak leadership engagement, insufficient human resources, and poor partner participation hinder the program's success. Specifically, the Ministry of Health's (MoH) commitment and coordination between Regional Health Bureaus (RHBs) are lacking.

> *"In the current situation, for the past two or three years, the frequent turnover of RHB heads has led leadership engagement is very poor. Especially since there is no commitment to support UCHIS and the entire UHEP, and I do not think they have a basic understanding*

of UHEP and UCHIS programs." (ARHB HEP coordinator).

Moreover, the UCHIS program in Ethiopia faces critical infrastructure challenges. There is a shortage of essential supplies, including community folders, shelves, computers, and even medical equipment. Additionally, acquiring these supplies from abroad is slow and bureaucratic, making it difficult for health workers to perform their duties and ultimately hindering the program's ability to serve the community effectively.

> *"Strong support should be provided by the MoH; material such as training supplies, community folders, printed documentation tools, shelves, and computers should be supplied. There is a shortage of both shelves and computers."*(AARHB, HEP focal).

Furthermore, the poor attitudes of the healthcare professionals in the community were identified as the bottleneck to providing the service to the entire community. When healthcare providers refuse to accept the services provided by the FHT and the UHE-Ps, it creates suspicion among the general public. The assumption that if professionals do not accept the service, it must not be beneficial, as explained by a participant from Dire Dawa:

> *"Health care providers available in the community refuse our services, particularly in the area of hygiene and sanitation. They refuse to address visible poor solid and liquid waste management practices, saying, "Don't try to teach me." If the health care professional who is part of the community does not believe in our service, how could it be possible to teach other community members?"* (Dire Dawa Goro PHCU, FGD).

Strategy mapping and rating exercise

Two consecutive workshops were conducted to refine and rate strategies that could potentially optimize the implementation of UCHIS in Ethiopia. During the first workshop, the TWG members conducted a deliberative discussion based on the findings of qualitative interviews and a review of the literature and identified 63 strategies under 8 domains. Three additional strategies were included during the second consultation workshop among 35 diverse experts. The rating was conducted for the identified 66 strategies. The team of experts was divided into five groups for the rating exercise. The team identified 47 highly important and highly feasible strategies and 19 highly important and less feasible strategies. A summary of these strategies is presented in Supplementary Table 2.

The strategies focus on strengthening leadership and collaboration across government departments. The study recommends the Ministry of Health's Health Extension Program lead UCHIS nationally for data-driven decision-making. Additionally, unwavering leadership commitment, adequate budgets, and the involvement of healthcare providers are seen as crucial for successful implementation. To improve data

management, this research suggests transitioning to electronic CHIS (eCHIS) while acknowledging the need to address UHE-P computer literacy and maintain the paper system as a backup. Standardized monitoring and reporting are also emphasized for effective program assessment. The report further acknowledges challenge related and proposes solutions like motivation packages and strategic staff replacement. Finally, our research highlights the importance of integrating UCHIS with the Family Health Program and engaging communities through awareness campaigns and program advocacy.

Discussion
This study assessed the current approaches, challenges, and recommendations for UCHIS in Ethiopia and suggested strategies to improve its implementation. The research suggested that a standardized approach to health service delivery, prioritization based on health risk and economic status, can enhance the effectiveness of health services. By prioritizing household according to risk and need, health workers can target their efforts toward the most vulnerable and in need of support. Consistent findings from the pilot study conducted in Ethiopia suggest that such an approach can significantly improve the effectiveness and impact of health services in Ethiopia. This could result in improved health outcomes and reduced health inequities, particularly for those most vulnerable and needing support (3).

Our study finding indicates that the shortage of UHE-Ps and high staff turnover significantly affected the blanket coverage of UCHIS. The standard UHEP to population ratio is not achieved. Previous studies conducted in Ethiopia support the findings of our study (8,9). High staff turnover can have severe implications for the delivery of healthcare services, which should be addressed through policies and programs aimed at improving the recruitment and retention of UHE-Ps.

Our study reveals that the lack of motivational packages, limited educational opportunities, and restricted professional growth are the primary drivers of staff turnover and demotivation among UHE; on the contrary, being accepted by the community and satisfied by helping the poor was motivating UHE-PS. A similar finding conducted in Ethiopia indicates s a lack of training opportunities and the absence of a clear career structure are among the reasons mentioned for dissatisfaction by UHE-Ps (10). Studies signify that incentivizing HEWs positively impacted staff retention and performance; on top of that, acceptance and validation by the community were important motivating factors (11-14).

The results of our study indicate that competing priorities hinder the full engagement of HEWs and FHT in the implementation of UCHIS. Specifically, the availability of vaccination campaigns, community-based health insurance implementation programs, and COVID-19 response activities were identified as the most significant factors affecting their engagement. These findings align with a previous study conducted in Addis Ababa, which also reported that competing

programs and expectations from the District Health Office adversely impacted the implementation of planned activities (15).

Our findings indicate that most UHE-Ps received adequate training. However, our study also revealed that newly deployed UHE-Ps did not receive any training, highlighting a crucial gap in the training and capacity development of UHE-PS. This finding is consistent with a study conducted in Ethiopia, which showed that a significant proportion of UHE-Ps did not receive regular refresher and on-the-job training (16). Consistent regular training and development opportunities for UHE-Ps can positively affect their performance and the quality of care they provide. Therefore, developing and implementing sustainable regular and refresher training opportunities for all UHE-Ps, including newly deployed staff is essential to addressing this issue.

The implementation of the UCHIS was identified as a tool to monitor the performance of UHE-Ps and the FHT. However, the shortage of community folders was a critical challenge for the successful implementation of the system, indicating that the government should address the gap to ensure sustainable and quality service delivery (16). Additionally, a shortage of computers, shelves, and workspace has been identified as a critical hindrance factor in the successful implementation of UCHIS in the country. A similar challenge was reported in a case study conducted in Addis Ababa (17).

The Family Health Team (FHT) was found to be implemented in the assessed areas. Despite the implementation of the program, the lack of formally trained family health professional, task overload at the health center level, poor commitment and willingness of professionals, and inadequate e supportive supervision and support from administrators hinder the program's performance. A consistent finding was reported in a study conducted in Ethiopia (17).

The finding shows that integrating the UCHIS with the FHT provides the opportunity to facilitate the delivery of outreach services based on the prioritization protocol. However, the integration faces challenges such as poor leadership prioritizing clinic services, work burden, and willingness of health center professionals in some regions. A case study in Addis Ababa aligned with our findings (17).

Digitizing the system was recommended as an optimization strategy. Our study supports the finding that the availability of power and network infrastructure, digitally skilled UHE-Ps, and the availability of 1,100 tablets in Addis Ababa are good opportunities to implement digital UCHIS. Besides, scientific evidence suggests that implementing electronic health management information systems can improve quality and performance and easily track the whereabouts of the mobile community through unique identity cards (18 - 21).

Through this research, academics, implementation researchers, implementers, experts in the health system and policymakers collaborated to assess the current situations and gaps the health system is facing regarding UCHIS and to generate implementation strategies to improve its adoption in the country. This collaboration enabled the research team to reflect on the existing reality of implementing UCHIS in the health system while developing strategies.

Strategies rated as low importance and/or low feasibility may still be useful and effective in some implementation scenarios and shouldn't be dismissed, even though this study concentrated on perceptions of importance and feasibility. It's also possible that participants rated the strategies higher in importance because they perceived them to be more feasible additionally, since all of the strategies in a single session, fatigue may have influenced the later. Ratings Furthermore, although this research identified highly important and feasible strategies, the strategies are many in number, and further prioritization of these strategies is required. These strategies should also be tested and compared in terms of improving the adoption of UCHIS in Ethiopia as well as other low- and middle-income countries.

Conclusion
This study examined the current approaches and challenges of implementing UCHIS through a collaborative team of researchers, implementers, and policymakers. The study identified and rated 63 strategies under 8 domains to improve the implementation, adoption, and sustainability of UCHIS in Ethiopia. Of the 63 strategies, 47 of them were rated highly important and highly feasible, while 19 of were considered highly important but less feasible. The strategies emphasized the crucial importance of strong leadership, funding, and healthcare provider involvement, as well as transitioning to electronic data management (eCHIS) with training, paper backups, and standardized reporting for improved program tracking. These findings may assist implementation researchers and practitioners in prioritizing the selection of strategies to advance UCHIS in Ethiopia and other low- and middle-income countries.

Supplementary Table 1: Summary of challenges against effective implementation of UCHIS in Ethiopia, October 2022

Supplementary Table 2: Rating of urban CHIS strategies based on importance and feasibility

List of Abbreviations and acronyms
AAHB: Addis Ababa Health Bureau
CBHI: Community-Based Health Insurance
FHT: Family Health Team
HEW: Health Extension Worker
HIS: Health Information System
MOH: Ministry of Health
PHCU: Primary Health Care Unit
PPMED: Plan Policy Monitoring and Evaluation Department
RHB: Regional Health Bureau

UCHIS: Urban Community Health Information System
UHEPs: Urban Health Extension Professionals
WHO: World Health Organization.

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