Informal Scoping Paper: Opportunities to incorporate integrated community case management monitoring indicators into national-level health information system reporting structures using DHIS 2 in 14 countries

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Introduction

Routine monitoring of health programs is important to track progress and identify issues in implementation. Most all countries rely on national, routine health management information management systems (HMIS) to monitor the delivery and utilization of services at health facilities. Fewer countries have incorporated data collected at the community level into their HMIS reporting structures at all levels of the health system, even though community-based initiatives provide a number of services, such as treatment of sick children, to the population. Data about services provided at the community level is important to track at all levels so that district, regional and national level health authorities can monitor and better manage community-based programming.

The District Health Information Software Version Two (DHIS 2) is the flexible, web-based open-source, electronic information system currently used as the primary HMIS platform in 47 countries globally. DHIS 2 is typically used for data management and analysis, health program monitoring and evaluation, facility registry and service availability mapping, logistics management and mobile tracking of services delivered.[1] Many countries are in the process of adopting DHIS 2, which presents an opportunity to incorporate community-level information collection into HMIS reporting structures to strengthen routine monitoring of national integrated community case management (iCCM) implementation at higher levels of the health system.

The Monitoring and Evaluation (M&E) Subgroup of the global CCM Task Force (TF) undertook a rapid, informal review in order to identify opportunities to integrate iCCM indicators from the community level into national HMIS using the DHIS 2 platform in 14 countries. In order to inform the development of strategies to strengthen routine monitoring of iCCM, we have identified: 1) key organizations providing financial and technical support for iCCM; 2) status of iCCM monitoring and evaluation (M&E) plans in countries; 3) levels of incorporation of iCCM indicators in routine monitoring systems; 4) phases of DHIS 2 implementation in each country; and 5) potential uses of DHIS 2 to create dashboards and other data visualizations. We also provide recommendations for types of potential support to countries at different phases in incorporation of iCCM into routine systems and DHIS 2 roll-out and suggest next steps to realize this support.

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[1] https://www.dhis2.org/deployments

Methods

Country Selection: We purposively selected countries based on: 1) status of iCCM implementation; 2) recipient status of integrated funding for iCCM from the Global Fund (GF); and 3) presence of key CCM TF member organizations—e.g. UNICEF, Save the Children, MCSP/USAID, WHO/RAcE Project countries—implementing iCCM (Table 1). Countries selected based on these criteria are more likely to have opportunities to adopt or adapt iCCM information into their national HMIS/DHIS 2 roll-out. Criteria (Table 1) for country selection were determined through the UNICEF CCM survey 2013,[2] CCM TF member organization reports and the GF concept note situational analysis reported by the CCM Task Force Financing Task Team dashboard.

Table 1: UNICEF/GF MOU and scale of iCCM implementation in 14 countries selected for the review

Country	GF/UNICEF MOU for funding (yes/no)	Phase of iCCM national roll out[a] (Pilot, Expansion, Advanced)
DRC	Yes	Expansion[b]
Ethiopia	Yes	Expansion
Ghana	Yes	Expansion
Kenya	Yes	Pilot[c]
Malawi	Yes	Advanced
Mali	Yes	Expansion[d]
Mozambique	No	Advanced
Niger	Yes	Advanced
Nigeria	Yes	Pilot[e]
Rwanda	No	Advanced
Sierra Leone	No	Advanced
South Sudan	Yes	Expansion
Uganda	Yes	Expansion
Zambia	Yes	Expansion
Notes:		
a – Definitions of phase: <u>Advanced</u>: iCCM implemented in in >50% of target districts; <u>Expansion:</u> iCCM introduced and in scale-up phase, but not reached >50% of target areas; <u>Pilot:</u> iCCM introduced in pilots; policy and plans for expansion not clear Information based on: UNICEF CCM survey 2013; CCM TF member organization reports and the Global Fund concept note situational analysis reported by the CCM Task Force Financing Task Team dashboard b - iCCM implemented in 295 out of 516 health zones c – iCCM Pilots in 13 of 47 counties, no saturation of target sub-counties d – iCCM implementation in five the southern regions where >75% of the population resides e – iCCM implementation in several states: 2 Global Fund, 2 UNICEF/EU/GAC & 2 WHO/RAcE supported		

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[2] Rasanathan, K., Muñiz, M., Bakshi, S., Kumar, M., Solano, A., Kariuki, W., & Diaz, T. (2014). Community case management of childhood illness in sub-Saharan Africa–findings from a cross-sectional survey on policy and implementation. *J Glob Health*, *4*(2), 020401.

Compilation of information: Information was collected informally via emails and phone calls with headquarters and country staff at the CCM Task Force key partner agencies, such as Save the Children and UNICEF. Informants were asked about the roll-out of iCCM, external funding, technical and implementing partners, M&E systems for iCCM, and the roll-out of DHIS 2. In addition, relevant data were abstracted from the *UNICEF, Community Case Management Survey in Sub-Saharan Africa 2013 (CCMS 2013)[3]*, and the DHIS 2 website.

Status of routine monitoring for iCCM

Support for iCCM

Table 2 presents the major external funding sources for iCCM implementation. According to respondents most countries have multiple sources of external support. The MOH is the key implementing partner in all countries and other implementing partners across the 14 countries include international and national NGOs and in some countries, academic and private partners (table 2).

Table 2: Major external funding/technical and implementing partners for iCCM in 14 countries

	Major external funding / technical partners						Major implementing partners [in addition to MOH]			
	UNICEF[a]	USAID[b]	WHO[c]	Global Affairs Canada	Global Fund	HSDP[d]	Private partners	Academic partners	Int'l NGOs	Ntn'l NGOs
DRC	X	X	X	X	X			X	X	X
Ethiopia	X	X		X	X			X	X	X
Ghana	X			X	X		X	X	X	X
Kenya	X			X	X			X	X	X
Malawi	X	X	X	X					X	
Mali[b]	X	X		X		X		X	X	
Mozambique	X	X	X	X	X	X	X		X	
Niger	X	X	X	X					X	X
Nigeria	X	X	X	X						
Rwanda	X	X	X		X			X		X
Sierra Leone	X			X	X					X
South Sudan	X			X						
Uganda	X		X	X			X	X		X
Zambia	X	X	X	X				X	X	
NOTES										
a - UNICEF provides financial and technical support and can be considered implementing partner in all 14 countries										
b - USAID is also reported as an implementing partner in Mali										
c – WHO also reported as implementing partner in all countries except Rwanda										
d – HSDP - Health Sector Development Partnership Comprising the WB, CIDA, Russia, Swiss Cooperation, French Cooperation										

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[3] *Version 2.1 of the public use dataset (accessed January 2015), provided by the KMIR Unit, Health Section.*

National Monitoring and Evaluation (M & E) plans for iCCM

We asked respondents about the status of national M&E plans for iCCM. Table 4 shows that eight countries (Ethiopia, Kenya, Ghana, Malawi, Niger, Nigeria, Uganda, and Rwanda) reported that a full M&E plan for iCCM existed at the national level. Respondents from three countries (Mozambique, Sierra Leone, and Mali) reported that a partial/incomplete M&E plan for iCCM was present in country. Respondents from the DRC, South Sudan and Zambia reported that there was currently no national M&E plan for iCCM.

Table 3: Status of National M&E plans for iCCM

Status Based on key informants reports	Definition of M&E plan status[a]	Countries with this M&E plan status
Full M&E plan	A full M&E plan covers all relevant CCM conditions and has four critical components: 1. Program goals and objectives; 2. Indicators to be measured; 3. How (tools), how often (frequency) and where (at what level) the indicator data will be collected (methodology); 4. Dissemination/use of information (how often and to what levels).	Ethiopia Niger Ghana Nigeria Kenya Rwanda Malawi Uganda
Partial/ Incomplete	An M&E plan is available, but has only some of the four critical components or does not cover all CCM conditions.	Sierra Leone Mali Mozambique Sierra Leone
Non-existent	No written M&E plan that covers CCM	DRC[b] Zambia South Sudan
Notes: a - Definition of the M&E plan status taken from the UNICEF CCM Survey in sub-Saharan Africa (2013) b – M&E plan in draft form		

iCCM Data Reported in National HMIS and DHIS 2 roll-out in 14 countries

Data on whether countries report on iCCM data at the national level through their HMIS were extracted from the UNICEF CCM Survey in sub-Saharan Africa (2013) and is presented in Table 4. Table 4 also presents the stage of DHIS 2 roll-out among the 14 countries, from data from the website (https://www.DHIS 2.org/). Out of the 14 countries included in this review, six countries have had national roll-out of DHIS 2, four countries had rolled out DHIS 2 either partially or through programs, three countries had no DHIS 2 system in place, and one country was in the pilot implementation phase. Of the countries where no DHIS 2 system was present, Ethiopia and South Sudan are reporting using a paper-based HMIS. In Mali, there are plans to adopt and roll-out DHIS 2 in 2016. In South Sudan, the Ministry of Health (MOH) has reportedly shown interest in rolling out DHIS 2, but challenges remain on who can financially support this expansion. Table 4 also presents information about the government agencies and external partners supporting the DHIS 2 roll-out in each country, where available. The Annex provides complementary information available about Integrated Management of Child Illness (IMCI) and iCCM indicators included in national HMIS and DHIS 2.

Table 4: Status of iCCM reporting in national HMIS and DHIS 2 implementation and support in 14 countries

	iCCM data reported at national level in HMIS[a]	DHIS 2 status	Description of data systems where DHIS 2 is rolled-out	Agencies supporting development of DHIS 2/ HMIS
Data source:	*UNICEF report*	*DHIS2.org*	*Key informants via email & telephone*	*Key informants via email & telephone*
DRC	Partial	Partial roll-out	In roll-out phase of DHIS 2 in the health zones that MEASURE Evaluation supports, data is being entered into DHIS 2 at the health zone level. Our understanding is that facilities will send their monthly tally sheets to the health zones (in paper form) where they are entered into the system.	MEASURE Evaluation supporting DSNIS (National Health information Directorate) in selected health zones in Katanga. SANRU in supported Global Fund zones. ASSP in DFID supported zones. IHP in USAID-supported zones
Ethiopia	Partial	Not rolled out	N/A	N/A
Ghana	Yes	Full roll-out	Monthly data are collated and reported with standardized reporting forms and submitted to the health worker supervising the C-B agent for review and approval. The reporting form is then sent to district office where it is checked by the data validation team and keyed into DHIS 2. Once entered, data is available to the region; a regional validation team further facilitates the data and signs off for use at the national level. The MOH through the GHS provided 540 tablets in 2015 for health centers to input their data into DHIS 2.	No information
Kenya	Yes	Full roll-out	The data are entered at district level but can be disaggregated by the community unit levels (linked to health facilities in the respective counties).	A division within the MOH in Kenya is tasked to maintain DHIS 2 as the national reporting tool for all government health statistics.
Malawi	Yes	Full roll-out	Data are entered at district level and can be disaggregated to the health facility level and community level. Data cannot be disaggregated to the individual community health worker (CHWs), although this may happen in the future (would greatly add to data entry burden).	UNICEF is working with CMED and U of Oslo to support DHIS 2; JHU using DHIS 2 (separate) for National Evaluation Platform (NEP). There is possible ICF support. SSDI and EPOS support DHIS 2/HMIS for dashboard development, etc. Save the Children supported training of IMCI and staff in DHIS 2 & interested to support dashboard development.
Mali	No	Not rolled out	As of March 2016, the DHIS 2 software is being set up. In 2016, the data are expected to be entered at district level and then health facilities will gradually perform their own data	Technical assistance for DHIS 2 provided by MEASURE Evauation

	iCCM data reported at national level in HMIS[a]	DHIS 2 status	Description of data systems where DHIS 2 is rolled-out	Agencies supporting development of DHIS 2/ HMIS
Data source:	*UNICEF report*	*DHIS2.org*	*Key informants via email & telephone*	*Key informants via email & telephone*
			entry. The new system is designed to allow disaggregation by source of care (community vs. facility).	
Mozambique	No	Partial roll-out	Data are entered at provincial level into a database. Data from this database can be disaggregated to district and health facility levels, but not to individual *agentes polivalentes elementares* (APEs); information from the individual APE can only be obtained from tally sheet reports from the district.	UNICEF, University of Oslo and Malaria Consortium support. Save the Children has no current DHIS 2 support but interested. JHU intends to use DHIS 2 for NEP.
Niger	Yes	PILOT	No details available	
Nigeria	Yes	Partial roll-out	The DHIS 2 has been live in Nigeria since 2013. Most facilities report to local government authority M&E officers who input the monthly summary data straight into the system, depending on capacity, from each facility they oversee; then data gets sent up to the state level and then central level.	Department of Health Planning Research and Statistic FMOH
Rwanda	Yes	Full roll-out	Data are entered at the health center level.	The HMIS-DHIS 2 is fully operational in Rwanda; MSH and Oslo University were the main leads of the development of HMIS-DHIS 2 in Rwanda.
Sierra Leone	Yes	Partial roll-out	Data are entered at the district level.	IRC, MOH; unsure of others providing support
South Sudan	No	Not rolled out		
Uganda	Yes	Full roll-out	Data are entered at the health facility level through the aggregated health facility village health team (VHT) tool. However, the reporting rate for this tool has been the lowest of all tools in the system since 2012. Some districts did not produce reports over several months.	CDC/Uganda has led supporting implementation of DHIS 2. There has not been any single source of funding for DHIS 2 in Uganda and both USG and UN agencies have been playing a limited role.
Zambia	No	Full roll-out	Data entry for the DHIS 2 is done at district level. There are currently efforts to try to pilot a system where some facilities could be allowed to enter data directly into DHIS 2.	The EU has supported the development of the HMIS and is likely to continue doing so, as they have provided considerable budget to the Millennium Development Goals Initiative. Global Fund has also been supporting HMIS

	iCCM data reported at national level in HMIS[a]	DHIS 2 status	Description of data systems where DHIS 2 is rolled-out	Agencies supporting development of DHIS 2/ HMIS
Data source:	*UNICEF report*	*DHIS2.org*	*Key informants via email & telephone*	*Key informants via email & telephone*
				improvement by supporting the HMIS activities and funding of the data collection tools. UNICEF is also supporting integration of community data into DHIS 2.

a - Information extracted from UNICEF CCM Survey – Codes signify:

YES = Data on all CCM conditions is included in the national HMIS system and disaggregated by level (community/ facility)

PARTIAL = Data on at least one but not all CCM conditions is included in the national HMIS & disaggregated by level (community/ facility)
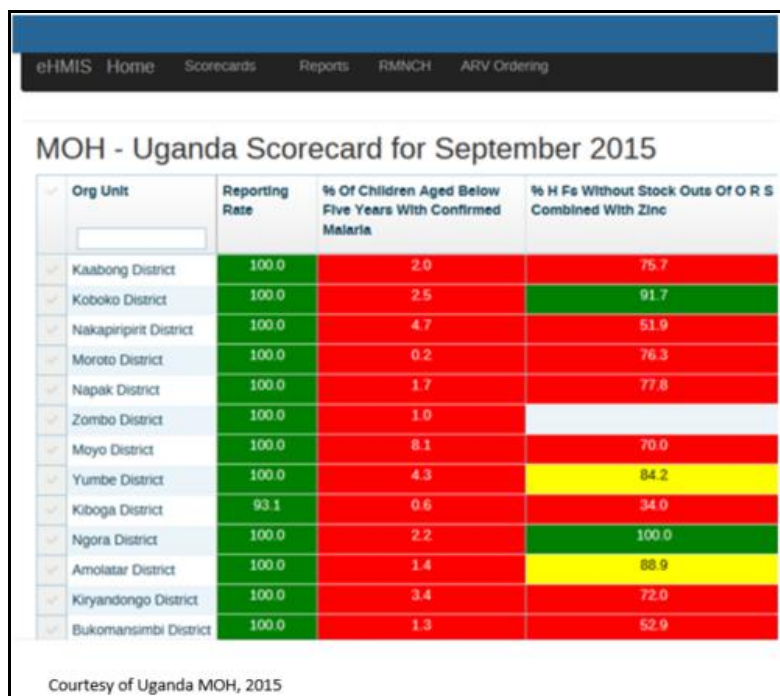
NO = No recommended CCM indicators are included in national HMIS, or are included but not disaggregated by lev

Data visualization using DHIS 2

Key informants highlighted the importance of DHIS 2 in easily creating dashboards to improve data visualization and the use of data. For example, Zambia highlighted how DHIS 2 can produce pivot tables, graphs and maps and demonstrated that one could customize data visualizations, as long as the data elements were in the system. Evidence from Zanzibar also suggests DHIS 2 dashboards in conjunction with quarterly data-use workshops at district level can lead to increased user engagement of the system, rationalization of data collection based on data requirements for dashboards, improved capacity to analyze and interpret data and improved problem-solving skills, and improved data quality and use.[4] Below we present two examples of DHIS 2 generated dashboards in Uganda and Malawi.

Example: *RMNCH scorecard in Uganda:* The Uganda MOH, with support from UNICEF, the Health Information Systems Program (HISP-Uganda) and the University of Oslo, has developed a scorecard using data from the national eHMIS (based on DHIS 2) for tracking performance of key indicators on reproductive, maternal, newborn and child health (RMNCH) at the national and subnational levels. The scorecard has been used at quarterly meetings of program managers in country to review progress and trigger corrective actions. Figure 1 shows a subset of the indicators in the RMNCH scorecard by district.

Figure 1. Screenshot of MOH scorecard for child health indicators in Uganda

MOH - Uganda Scorecard for September 2015

Org Unit	Reporting Rate	% Of Children Aged Below Five Years With Confirmed Malaria	% H Fs Without Stock Outs Of O R S Combined With Zinc
Kaabong District	100.0	2.0	75.7
Koboko District	100.0	2.5	91.7
Nakapiripirit District	100.0	4.7	51.9
Moroto District	100.0	0.2	76.3
Napak District	100.0	1.7	77.8
Zombo District	100.0	1.0	
Moyo District	100.0	8.1	70.0
Yumbe District	100.0	4.3	84.2
Kiboga District	93.1	0.6	34.0
Ngora District	100.0	2.2	100.0
Amolatar District	100.0	1.4	88.9
Kiryandongo District	100.0	3.4	72.0
Bukomansimbi District	100.0	1.3	52.9

Courtesy of Uganda MOH, 2015

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[4] Braa, Jørn, Arthur Heywood, and Sundeep Sahay. "Improving quality and use of data through data-use workshops: Zanzibar, United Republic of Tanzania." *Bulletin of the World Health Organization* 90.5 (2012): 379-384.

Example: Prototyping a bottleneck analysis dashboard in Malawi and Uganda: The MOHs in Malawi and Uganda—with support from UNICEF, HISP Malawi, HISP Uganda and the University of Oslo—are currently (as of March 2016) prototyping a bottleneck analysis dashboard that uses the DHIS 2 platform and routine data. Based on a simplified adaptation of the Tanahashi model,[5] the bottleneck analysis dashboard is intended to visualize the steps along the pathway of a given intervention. The aim is to enable district managers to identify and document bottlenecks in the pathway of the intervention, root causes of the bottlenecks, and feasible corrective actions to implement. Figure 2 below illustrates a generic mockup of the bottleneck analysis dashboard for a district in Malawi. In addition, Uganda plans to also develop an "Action Tracker" dashboard that will visualize progress on implementation of the corrective actions identified in the bottleneck analysis. The Action Tracker dashboard will work like an IT service ticket system: it will display the corrective actions that are open/in-progress, open/due soon, open/over-due, and closed/completed. Through the RMNCH scorecard, bottleneck analysis dashboard and Action Tracker, the DHIS 2 platform in Uganda may facilitate learning, action and accountability.

Figure 2. Example of Bottleneck Analysis Dashboard from a district in Malawi

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[5] Tanahashi T. Health services coverage and its evaluation. Bulletin of the World Health Organisation 1978; 56:295–303.

Other electronic platforms and mHealth initiatives pertinent to iCCM

The CCM Task Force M&E Subgroup informally inquired about other electronic platforms or mHealth initiatives pertinent to iCCM in each country. A few countries have attempted to use mHealth strategies for iCCM—for clinical management and data collection and reporting related to supplies, referrals and services delivered. As seen across many mHealth initiatives for community health workers, the efforts are often in limited geographical areas,[6] frequently partner-driven and usually not well-coordinated. Table 5 presents the identified mHealth initiatives relevant to iCCM by country.

Table 5. Identified mHealth initiatives pertinent to iCCM

Country	Other electronic platforms / mHealth initiatives
Malawi	A small number of health service assistants are using smart phones with the CommCare app; service data are transmitted back to servers maintained by D-tree, but they are not integrated with DHIS 2 and presently only available to D-tree staff. A C-stock electronic data application for supply chain management is widespread. Plans are underway with UNICEF to integrate C-stock data into DHIS 2.
Mozambique	Malaria Consortium is supporting APEs to use a mobile app for service delivery that generates data that could be integrated within DHIS 2. The integration of iCCM within DHIS 2 in the country has a long way to go.
Rwanda	The MOH's vision is to strengthen the existing system. Rwanda has developed and scaled up a system called Rapid SMS that is designed to track referral and counter referrals between CHWs and health centers, but is being expanded and could include iCCM reporting. The Rapid SMS is not yet linked to DHIS 2.
South Sudan	MHealth has been piloted in the country by different partners implementing health system strengthening projects. Save the Children used mHealth applications for iCCM data collection in the past, but is not currently doing so.
Uganda	In Uganda, a number of attempts have been made to deploy mobile reporting for VHTs. Challenges have included the usability of the platforms due to low literacy levels among CHWs, phone connectivity, and poor infrastructure, i.e. power shortages. UNICEF/Uganda was using SMS-based reporting in one district but reporting has also been low. DHIS 2 SMS-based reporting has also been deployed in four districts in Uganda but only on two maternal and perinatal indicators. The MOH of Uganda has been piloting an Android app, but requires further funding to fully implement it.
Zambia	No mHealth system captures information related to IMCI or iCCM. There are efforts and initiatives by some partners to capture a number of child health indicators. For instance there is "Programme Mwana," supported by UNICEF, which helps in the management of HIV-exposed infants. Also, partners like Better Immunization Data are trying to pilot the electronic capture of immunization data.

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[6] Källander, K., Tibenderana, J. K., Akpogheneta, O. J., Strachan, D. L., Hill, Z., ten Asbroek, A. H., ... & Meek, S. R. (2013). Mobile health (mHealth) approaches and lessons for increased performance and retention of community health workers in low-and middle-income countries: a review. *Journal of medical Internet research*, *15*(1), e17.

Discussion & Recommendations

Summary

As seen in Table 4 above, many countries are moving forward to incorporate data collected at the community level, such as iCCM data, into their national routine health information systems reporting structures to higher levels. At the same time, most all countries have implemented or are in the process of rolling out DHIS 2 as their HMIS electronic platform at the national level. There was general agreement among respondents from countries where DHIS 2 has been fully rolled out that the software provided an opportunity to integrate data into one system. In Uganda, where DHIS 2 appears to be successfully mainstreamed, respondents cited facilitating factors such as an easy-to-use mHealth tool for reporting, appreciation of DHIS 2 as a central repository of health data, high reporting rates using DHIS 2, availability of experts on DHIS 2 to support implementation, and training on the evolving nature of DHIS 2 modules including use of community data platforms offline. Countries that are more advanced in their transition to DHIS 2—such as Uganda and Malawi—are now using the strong DHIS 2 platform for data visualization.

Recommendations

This is an opportune moment to: 1) advocate for inclusion of iCCM and other community health information into national HMIS reporting structures that use DHIS 2; 2) provide targeted technical assistance to ensure successful integration of iCCM information into national HMIS reporting systems, using the DHIS 2 platform; and 3) facilitate learning across countries at different stages of incorporating iCCM indicators into national HMIS systems, often supported by DHIS 2. The priority advocacy agenda, necessary support and technical assistance will vary by country, depending on the status of iCCM data collection and DHIS 2 roll-out. Based on the information compiled in this document, Table 6 presents the types of support of likely highest priority in each of the 14 countries. Overall, we recommend the following types of support for countries at different stages in iCCM data collection and DHIS 2 roll-out:

Identification, agreement and/or review of key data elements to track iCCM*:* In countries that have not integrated iCCM indicators or only have partial integration into their national HMIS reporting systems, the identification of the key data elements and indicators from the community level to collect, report to higher levels and track is a first step. For example, in Zambia, it was noted that key players would need to engage and agree what type of iCCM data is needed from and at the different levels and then resources would be needed to make any changes to data-collection tools feeding into the DHIS 2 platform, as well as resources to orient CHWs and health staff to any new forms. Even in countries which are more advanced in incorporation of iCCM information into the DHIS 2 platform, there is a need to review how community and facility data are aligned and/or integrated. For example, in Malawi the facility and community levels use different classifications for sick child conditions, making integration of the data from both levels into one system more complex.

Integration and streamlining of information systems: In countries where other electronic information systems are used to collect iCCM data (such as mHealth initiatives), the integration or interoperability of

these initiatives with the DHIS 2 platform could avoid double reporting and additional reporting burden on the CHWs and facilities. A respondent from Ghana noted that parallel reporting resulted in the duplication of data in reports and that frequent changes in data and information needs by partners and other stakeholders required changes in reporting formats. In some contexts, other electronic information systems may be more appropriate for collecting iCCM data at the community level, such as CommCare in Mozambique. However, consideration should be given to ensuring that the iCCM platform is interoperable with the broader HMIS on the DHIS 2 platform to ensure that iCCM data can be used within the larger context of monitoring health system performance.

Improving data quality, including accurate & complete reporting: In all countries, ensuring data collected at the community level is of high quality and complete is a challenge. Ensuring data quality and completeness is a high priority in countries that have already incorporated iCCM into their national HMIS reporting structures. For example, Kenya is starting to collect iCCM data through DHIS 2 in all counties, but very few health facilities are reporting on the conditions through the community units. Therefore, this could be an opportunity to provide technical assistance to ensure the accuracy and quality of community-level data and improved reporting. In Rwanda, assistance is needed to support and strengthen the existing system and ensure that data elements collected respond to national and international guidelines like sex disaggregation.

Support to overcome operational, logistical and infrastructure challenges: As noted by respondents, various operational, logistical and infrastructure challenges exist to fully operationalizing DHIS 2, especially to include reporting from the community level. In Ghana, reported challenges to DHIS 2 use included poor internet connectivity, inadequate training for officers on use of DHIS 2 applications, and absence of standard operating procedures that clearly define all data elements and indicators. In Uganda, a respondent suggested that the iCCM data collection and reporting tools in paper form needed to be made available to ensure timely reporting and that a sustainable mHealth solution should be developed to submit iCCM data to the DHIS 2 platform.

- **Developing and supporting data visualization approaches, including identification of key/tracer indicators for dashboards and promotion of data use:** As countries progress with including iCCM data in their national DHIS 2 platforms, there are significant opportunities to use the DHIS 2 platform for data visualization to facilitate and foster data use at all levels. Data visualization and use can also foster improvements in data quality—i.e. when people are examining and using the data, there is more incentive to have accurate and complete data. Currently In Malawi, there is potential for collaboration between UNICEF, Save the Children, and the University of Oslo to develop dashboards and build country capacity to track and use iCCM information. In Rwanda, there are opportunities to partner with University of Oslo to help develop applications and/or dashboards for district managers and/or facility-based staff to monitor key iCCM information.

Table 6: Potential areas for priority technical and financial support to incorporate iCCM into national HMIS and DHIS 2 platforms in 14 countries

Country	Potential priority types of technical and financial support	iCCM data reported at national level in HMIS –a	DHIS 2 status -b
DRC	• Agreement on key iCCM data elements for national HMIS • Incorporation of community level data into DHIS 2	Partial	Partial roll-out
Ethiopia	• Agreement on key iCCM data elements for national HMIS	Partial	Not rolled out
Ghana	• Integration/interoperability of parallel reporting systems into DHIS 2 platform • Logistic & technical support to improve data quality	Yes	Full roll-out
Kenya	• Support to improve data quality and completeness of reporting	Yes	Full roll-out
Malawi	• Integration of mHealth initiatives on DHIS 2 platform • Alignment of facility- and community-level information • Develop and support data visualization approaches	Yes	Full roll-out
Mali	• Agreement on key iCCM data elements for national HMIS on DHIS 2 platform • Support to improve data quality and completeness of reporting from CHWs through facilities	No	Not rolled out
Mozambique	• Integration of iCCM indicators into national HMIS and DHIS 2 (through either migration into DHIS 2 or interoperability) • Support to improve data quality and completeness of reporting	No	Partial roll-out
Niger	• Support to ensure iCCM data included in HMIS also included in DHIS 2 roll-out • Support to improve data quality and completeness of reporting	Yes	PILOT
Nigeria	• Support to improve data quality and completeness of reporting • Develop and support data visualization approaches	Yes	Partial roll-out
Rwanda	• Integration / interoperability of Rapid SMS to track referrals into DHIS 2 platform • Develop and support data visualization approaches • Support to improve data quality and completeness of reporting, including disaggregation	Yes	Full roll-out
Sierra Leone	• Develop and support data visualization approaches • Logistic, infrastructure & technical support to improve data quality and completeness	Yes	Partial roll-out
South Sudan	• Agreement on key iCCM data elements for national HMIS	No	Not rolled out

Country	Potential priority types of technical and financial support	iCCM data reported at national level in HMIS –a	DHIS 2 status -b
Uganda	• Support to improve data quality and completeness of reporting, including operational support • Develop and support data visualization approaches	Yes	Full roll-out
Zambia	• Agreement on key iCCM data elements for national HMIS	No	Full roll-out
a - Information extracted from UNICEF CCM Survey – Codes signify: **YES** = Data on all CCM conditions is included in the national HMIS system and disaggregated by level (community/ facility) **PARTIAL** = Data on at least one but not all CCM conditions is included in the national HMIS & disaggregated by level (community/ facility) **NO** = No recommended CCM indicators are included in national HMIS, or are included but not disaggregated by level b- information from DHIS2.org			

Next steps

The information presented in this scoping paper highlights opportunities to coordinate efforts in encouraging countries to incorporate iCCM indicators into national HMIS reporting structures as they progress in using the DHIS 2 platform for their national HMIS. Next steps in moving forward include:

- Share this document with CCM TF members (publish on CCMCentral.com), and more broadly as appropriate, and emphasize the need to support country level engagement to strengthen routine M&E of iCCM.
- Use the information presented in this scoping paper to inform the design of the broader review of iCCM and child health indicators in national HMIS systems being conducted by MCSP.
- Compare technical assistance requests from countries using the GF mechanism to support iCCM (that met in Nairobi in February 2016 to discuss M&E of iCCM) to the opportunities identified in this review document. Countries can be targeted accordingly for technical and financial support, for example using the UNICEF/GF iCCM funding integration as an opportunity.
- Identify two to three countries for coordinated technical assistance, learning and documentation as part of the M&E Subgroup of the iCCM Task Force.
- Support countries at different stages of incorporating iCCM into national HMIS/DHIS 2 platforms to share experiences and learning through a regional workshop and/or other venues where national IMCI/iCCM/community-based health programming implementers, M&E and HMIS/DHIS 2 technical staff can convene.
- Develop guidance on iCCM dashboards for DHIS 2 based on the 12 priority routine iCCM indicators.
- Track and update the key information presented in this document (primarily Table 4—related to iCCM in national routine monitoring systems and incorporation of iCCM into DHIS 2) on an annual basis to share with the CCM Task Force members to encourage coordinated action.

ANNEX: Status of iCCM indicators integrated into DHIS 2/HMIS reporting in 14 countries

Table A1: Summary of the status of iCCM indicators integrated into DHIS 2/HMIS reporting among 14 countries

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
DRC	Not currently included in DHIS 2	Not included in HMIS	
Ethiopia	No DHIS 2 system. Currently L10K project is using DHIS 2 for iCCM.	• From **Ethiopia HMIS IPD and OPD Disease Report (IMCI):** morbidity and mortality related to malaria cases at public, private not-for-profit and private for-profit facilities disaggregated by age and sex; morbidity and mortality related to non-bloody diarrhea, diarrhea with dehydration and bloody diarrhea at three types of facilities disaggregated by age and sex; morbidity and mortality related to pneumonia at three types of facilities disaggregated by age and sex. • Moderate and severe acute malnutrition at three types of facilities disaggregated by age and sex • From **health facility registers (OPD/IMNCI/iCCM, IPD), disease information tally (for health posts [HP])** • Proportion of children treated for pneumonia at health facility and community (HP) • From **service delivery tally for (HP), Immunization and Growth Monitoring registers** • Percentage of underweight (weight-for-age less than -2 standard deviations of the WHO Child Growth Standards median) among children aged 0-5 years. • From service delivery tally for (HP)/ICCM/IMNCI	

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
		Registers • Proportion of children 6-59 months with severe acute malnutrition • From IPD (source) • Proportion of children 6-59 months with severe acute malnutrition that exit, defaulted, died, transferred or recovered (indicator) • From Family folder. Outpatient/ inpatient registers (source) • Malaria cases per 1,000 population disaggregated by age and sex (indicator)	
Kenya	The following list of indicators have been added in the revised community health extension worker (CHEW) summary form and data is being collected: • Number of fever cases managed • Number of fever cases <7days RDT done • Number of fever cases <7days RDT positive • Number of U5 malaria cases (RDT positive) treated with ACT • Number of cases of diarrhea identified in children 0-59 months • Number of children 12-59 months with diarrhea treated with zinc and ORS • Number of children 0-59 months age presenting with fast breathing • Number of children 0-59 months age presenting with fast breathing treated with Amoxicillin • Number of 0-59 months participating in growth monitoring	Relevant iCCM indicators have been added as part of the national reporting tools. Data is collected and reported in the national DHIS 2.	
Ghana	Roll-out of iCCM has been challenging. In some regions, the CHPS is considered a sufficient strategy to achieve full of child health services. There has been limited success by partners to roll-out iCCM.		
Malawi	• iCCM data elements included in DHIS 2 (Form1-B); disaggregation to health facility level, moving to	• Same as DHIS 2: issues with ability to integrate with facility level data on treatments for iCCM	

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	HSA level in some districts, but no indicators established within DHIS 2, although set of implementation strength indicators for iCCM agreed nationally; data entry completeness improving. • No information on HSA level. Customizing indicators (Task Force); summary reports	conditions (not same classification) • The Village Clinic Monthly Report Form for Under-Fives Disaggregated by Sex and Age (up to 59 months) • Malaria cases-RDT positive; RDT negative, diarrhea, fast breathing-- Number of new confirmed; Number of cases referred with danger signs; Number of referrals made because of drug stock-outs; Number of deaths within 7 days of receiving treatment at village clinic • Number of new cases for malnutrition and number of referrals made with danger signs • Stock status of key medicines include LA 6X1 6X1, RDT, ORS, zinc, Amoxicillin[7]	
Niger	Not aware of functional DHIS 2 in country. iCCM data not included.	CCM indicators have been added to the HMIS. They are finalizing the system and it should be fully functional at the end of the year.	
Nigeria	The iCCM data collected in the community is summarized in the community monthly summary form by the supervising CHEW and taken to the health facility. If the M&E officer has skill, they can input this summarized data into the web-based DHIS 2 platform. If not, it is taken to the local government area (LGA) where the LGA M&E officer will enter the data into the DHIS 2 platform. • 0-28 days who received Chlorhexidine for cord care • 0-28 days seen with fever • 0- 28 days seen with fever referred for further	• IMCI/iCCM data are already integrated into HMIS/DHIS 2. A hand-filled copy of the summary form is left at the LGA for validation. The IMCI data from the health facility is either entered directly or sent to the LGA similar to community data. From LGA it goes to the national level through the state. • The current tools used to monitor iCCM are used for the GF-supported integrated financing for iCCM.	

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[7] More information expected as part of MCSP HMIS review

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	management • 0-28 days seen with diarrhea • 0-28 days seen with diarrhea referred for further management • 0-28 days seen with rapid breathing • 0-28 days seen with rapid breathing referred for further management **Malaria** • Number seen with fever • Fever cases referred for further treatment • Fever cases presumptively treated in the community with ACTs • Fever cases tested with RDT • Fever cases tested RDT positive • Confirmed uncomplicated malaria cases (RDT positives) treated with ACT • Confirmed uncomplicated U5 malaria cases referred to facility for lack of improvement after treatment with ACT • Severe malaria cases referred to facility for further management **Pneumonia** • U5 pneumonia cases seen • U5 pneumonia cases given oral Amoxicillin • U5 pneumonia cases referred for further treatment **Diarrhea** • U5 diarrhea cases seen • U5 diarrhea cases given low osmolarity ORS • U5 diarrhea cases given zinc tablet • U5 diarrhea cases referred for further treatment **Nutrition** • Children with growth monitoring charts		

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	• 6-59 months whose mid upper arm -circumference (MUAC) was measured • 6-59 months with red MUAC • 6-59 months with red MUAC referred to -Outpatient Therapeutic Program (OTP) site • 6-59 months given Vitamin A supplement • U5 cases treated with ADR outcome		
South Sudan[8]	No DHIS 2.	iCCM primary data source is the community-based distributor. Data flow goes from PSI as the GF Principal Recipient, who then reports to the donor and gives a copy of the data file to the MOH.	
Uganda	The iCCM tool referred to as the HMIS 097 VHT Quarterly Report is also customized in the Uganda national DHIS 2 (eHMIS) to allow data entry of an aggregated health facility VHT report into DHIS 2. Indicators collected on iCCM: • total number of sick children aged 2 months to 5 years seen/attended to by the VHT; • total number of sick children 2 months to 5 years with diarrhea; • total number of sick children 2 months to 5 years with malaria; • total number of sick children 2 months to 5 years with fast breathing/pneumonia; • total number of children under 5 years with red MUAC; • total number of children under 5 years referred to the health unit; • total number of villages with stock out of the first-	The iCCM reporting tool was one of the reporting tools that was not revised during the last HMIS revision.	

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[8] Unable to obtain the iCCM register

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	line antimalarials; • total number of villages with stock-out of Amoxicillin; • total number of villages with stock-out of ORS		
Zambia	IMCI and iCCM data collection is not fully integrated into the DHIS 2; however, in 2016 UNICEF will be working on integrating CHW data into DHIS 2 in Zambia.	• Data for IMCI key proxy indicator diseases included in routine HMIS including case fatality rates and incidence rates for pneumonia, diarrhea and malaria. • Data related to human resource attending to sick children being trained in IMCI is not there in DHIS 2. Utilization of some key IMCI medicines is also not included. • **OPD/IPD (health center disease aggregation form):** U5 confirmed cases, treatment and deaths related to malaria, cases of diarrhea, pneumonia, and malnutrition; child health • **Health Service Delivery Aggregation Form**: U5 clinic attendance, GMP and nutrition, immunization, medicines and supplies management • **CH activity sheet**: growth monitoring nutrition and immunization • **IPD discharge and OPD first attendance tally sheets**: malaria, pneumonia, diarrhea for children under 5 years • iCCM study being conducted by ZCAHRD in Eastern province in two districts; piloting community DHIS 2 through CHWs and Health center supervisors using mobile phones that will soon be shared with the MOH M&E Unit for possible adoption as they are in the process of developing community HMIS. • **Community-based agents aggregation form**:	

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
		malaria, pneumonia, malnutrition, TB, skin infection diagnosis by CHW and referrals; growth monitoring; logistics information. • **Mentorship Tool for CHW:** assesses rapport development, problem identification of child, RDT performance, classification, decision making, community-/home-based care, pre-referral treatment. • **Supervision Checklist for C-IMCI:** case management (observation)—diagnosis and referrals of children for fever, cough, diarrhea, malnutrition, convulsions, unconsciousness; caregiver satisfaction, availability of drugs and supplies, water and sanitation at outreach post. • **CHW aggregation form:** number of diagnoses and referrals, GMP, logistics. • **Community register:** aggregate diagnosis and treatment of iCCM diseases. • **Sick child recording form (CHWs):** assessment, diagnosis for cough, diarrhea, fever, difficulties feeding, chest indrawing, malnutrition; treatment-RDT test+ antimalarials, provision of Amoxicillin, ORS/zinc; referrals and follow up	
Mali	• The development of the DHIS 2 software is still underway, as of March 2016. • The entire HMIS template is being transferred to the application, including data from facility level and community level as described in the next column on right.	• The current National HMIS starts from the health facility level and data are submitted quarterly. Each health facility is expected to report all cases from its catchment area, including those seen by CHWs. An evaluation conducted in 2014 reported that very few	

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	• Technical assistance is provided by MEASURE Evaluation.	health facilities report data from CHWs in their HMIS reports[4] • All data are disaggregated by age 0-11 months vs. 1-4 years (12-59 months) **Data collected at facility level:** • # cases seen, disaggregated by 1st visit and follow-up visits, [age 0-5 years combined] • # diarrhea [non-cholera] cases, • # measles cases, • # lower ARI cases (pneumonia cases from iCCM are combined with facility) • # higher ARI cases (cases of cough/cold from iCCM are combined with facility) • # cough >15 days • # simple malaria cases • # severe malaria cases • # severe malnutrition cases • # simple gingivitis cases • # acute necrotizing ulcerative gingivitis cases **Data collected at community level BUT aggregated with facility level:** • # cases seen, disaggregated by first visit and follow-up visits • # cases referred, disaggregated by newborn and others • # cases of fever, and RDTs performed, disaggregated by negative and positive results	

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[4] Evaluation des Niveaux CSREF, CSCOM et Communautaire du SLIS du Mali à l'Aide de l'Outil PRISM accessible at http://www.cpc.unc.edu/measure/resources/publications/tr-14-105-fr

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
		# pneumonia cases # cases of cough/cold # malaria cases confirmed by RDT # diarrhea cases # children screened for malnutrition # moderate acute malnutrition cases detected, # discharged, abandoned treatment, non-responding to treatment # severe acute malnutrition cases without complication detected, # discharged, abandoned treatment, non-responding to treatment	
Mozambique	Unclear; iCCM data elements/ or indicators are/may not yet be included in DHIS 2 (only one indicator is currently included—malaria diagnostics and treated cases). The next version of the APE mobile platform (CommCare) has been finalized. New M&E forms have just been designed to automatically input iCCM data elements into the DHIS 2.	- iCCM indicators not integrated into HMIS; all data from iCCM client encounters, MOH has fed back revising registers and reporting forms and plans to an excel-based platform at the district. However, since this platform is not very user-friendly this data has not been integrated roll-out shortly; unclear if plans to integrate into the HMIS/DHIS 2. - Currently partners are collecting and sharing information on iCCM.	Data from the client encounters is entered by APEs into a mobile platform (CommCare). In Inhambane province, this data is fed back to the district into an excel database. However, since this database is not user-friendly, this data has not been utilized.
Rwanda	All iCCM indicators are reported through SISCOM which is now integrated into HMIS/HIS-DHIS 2. However the current SISCOM doesn't capture sex disaggregation; case management information is also captured. No information on stock status exists yet. Source: **SISCOM** # of episodes of diarrhea treated per child per year in the community % of total cases presenting with diarrhea % of moderately malnourished (MUAC yellow) children who are identified	All key iCCM indicators are reported in HMIS through SISCOM	

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	• % of moderately malnourished (MUAC yellow) children who are referred • % of moderately malnourished (W/A yellow) children who are identified • % of moderately malnourished (W/A yellow) children who are referred • % of severely malnourished (MUAC red) children who are identified • % of severely malnourished (MUAC red) children who are referred • % of severely malnourished (W/A red) children who are identified • % of severely malnourished (W/A red) children who are referred • % of fever cases seen tested with RDTs • % RDT positive cases treated with any Primo • # of months supply remaining (per drug) • % of RDTs found positive • % RDTs found invalid • % RDTs found negative		
Sierra Leone	• COMET is the name of IRC's DHIS 2 platform which is being rolled out in the country over the next several years. • All iCCM elements are included in the COMET system. IRC has started entering the data they have so far up until December 2015. At the moment, they are still using both COMET and the original excel and are still determining a cut-off point when we stop entering both systems. • M&E district teams (M&E managers) are working on the formulas for the iCCM indicators which will be submitted to a help desk for inclusion in COMET. M&E managers are learning to analyze and prepare		

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	reports using the data in COMET. • All three IRC ICCM districts are now using COMET to do their monthly reports (Kono, Kenema and Tonkolili). In Kambia, they are working through a national NGO partner. • IRC is currently using the COMET system to analyze monthly report for donors report (e.g. tables 4 and 5) to UNICEF. These look at service utilization and human resources for health. • Some managers are starting to produce dashboards on key indicators (e.g. drug stock outs, conditions treated) and share info with the team. • There are various literacy levels of CHWs in Sierra Leone which makes use of mHealth applications unrealistic. • Benefits • Integrating iCCM with the DHIS 2 will reduce workload of the M&E and health team—less time on data collection and submission of (hard copy) reports will mean more time in the field conducting quality technical supportive supervision, a balance that can be challenging. • Can support DHMT and MOHs to have this information at their fingertips for their own use, building capacity of government structures in data management and analysis to help improve program quality. • The biggest opportunity also is that partners and MOHs can get information from the DHIS 2 for their own use. • Challenges: Need for phones, updating the systems, further training and refresher training for health team, much stronger internet bandwidth		

Country	iCCM indicators/information in DHIS 2	Summary of IMCI/iCCM indicators/information in HMIS *(Note: on-going HMIS review of all forms & reporting flows will provide more detailed information)*	iCCM information collected separately outside of HMIS
	(big problem), better computers for M&E staff. • Next steps: Nationwide, we believe all iCCM partners will be instructed by MOHs to use DHIS 2 so MOHs can readily access all the partner implementation data at once, rather than relying on partner-led updates and data.		