PLOS Global Public Health

Opportunities to sustain a multi-country quality of care network: lessons on the actions of four countries Bangladesh, Ethiopia, Malawi, and Uganda

--Manuscript Draft--

Manuscript Number:	PGPH-D-22-01888R1
Article Type:	Research Article
Full Title:	Opportunities to sustain a multi-country quality of care network: lessons on the actions of four countries Bangladesh, Ethiopia, Malawi, and Uganda
Short Title:	Opportunities to sustain a multi-country quality of care network
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Keywords:	government ownership; institutionalization; community engagement; adoption; financial sustainability; quality of care; Network; Maternal and newborn health; Bangladesh; Ethiopia; Malawi; Uganda
Abstract:	The Quality of Care Network (QCN) is a global initiative that was established in 2017 under the leadership of WHO in 11 low-and- middle income countries to improve maternal, newborn, and child health. The vision was that the Quality of Care Network would be embedded within member countries and continued beyond the initial implementation period: that the Network would be sustained. This paper investigated the experience of actions taken to sustain QCN in four Network countries (Bangladesh, Ethiopia, Malawi, and Uganda) and reports on lessons learned. Multiple iterative rounds of data collection were conducted through qualitative interviews with global and national stakeholders, and non-participatory observation of health facilities and meetings. A total of 241 interviews, 42 facility and four meeting observations were carried out. We conducted a thematic analysis of all data using a framework approach that defined six critical actions that can be taken to promote sustainability. The analysis revealed that these critical actions were present with varying degrees in each of the four countries. Although vulnerabilities were observed, there was good evidence to support that actions were taken to institutionalize the innovation within the health

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	system, to motivate micro-level actors, plan opportunities for reflection and adaptation from the outset, and to support strong government ownership. Two actions were largely absent and weakened confidence in future sustainability: managing financial uncertainties and fostering community ownership. Evidence from four countries suggested that the QCN model would not be sustained in its original format, largely because of financial vulnerability and insufficient time to embed the innovation at the sub-national level. But especially the efforts made to institutionalize the innovation in existing systems meant that some characteristics of QCN may be carried forward within broader government quality improvement initiatives.
Additional Information:	
Question	Response
Financial Disclosure Enter a financial disclosure statement that describes the sources of funding for the work included in this submission and the role the funder(s) played. This includes grants and any commercial funding of the work or authors. This statement will be typeset if the manuscript is accepted for publication. *Please review the submission guidelines and the instructions link below for detailed requirements and guidance.*	This work was funded by the Medical Research Council (MRC) Health Systems Research Initiative 5th call via grant MR/S013466/1 to TC at UCL Institute for Global Health, United Kingdom, YS and JS at Johns Hopkins University, United States of America, KA and AK at Diabetic Association of Bangladesh Perinatal Care Project, Bangladesh, CM at Parent and Child Health Initiative, Malawi, GS at Makerere University School of Public Health, Uganda, and ME at University of Oxford, United Kingdom; and by the Bill & Melinda Gates foundation via grant INV-007644 to TM at LSHTM, United Kingdom. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.
Competing Interests On behalf of all authors, disclose any competing interests that could be perceived to bias this work. This statement will be typeset if the manuscript is accepted for publication. *Please review the instructions link below and PLOS Global Public Health's competing interests policy to determine what information must be disclosed at submission.*	The authors have declared that no competing interests exist.
Data Availability	All data is derived from qualitative interviews, most with stakeholders where only one individual holds a position, either within federal or state government, facilities, or NGOs. Every care has been taken to ensure anonymity of the data in the submitted

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2 **four countries Bangladesh, Ethiopia, Malawi, and Uganda**

3

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23

24 **Abstract**

25 The Quality of Care Network (QCN) is a global initiative that was established in 2017 under
26 the leadership of WHO in 11 low-and- middle income countries to improve maternal,
27 newborn, and child health. The vision was that the Quality of Care Network would be
28 embedded within member countries and continued beyond the initial implementation
29 period: that the Network would be sustained. This paper investigated the experience of
30 actions taken to sustain QCN in four Network countries (Bangladesh, Ethiopia, Malawi, and
31 Uganda) and reports on lessons learned. Multiple iterative rounds of data collection were
32 conducted through qualitative interviews with global and national stakeholders, and non-
33 participatory observation of health facilities and meetings. A total of 241 interviews, 42
34 facility and four meeting observations were carried out. We conducted a thematic analysis
35 of all data using a framework approach that defined six critical actions that can be taken to
36 promote sustainability. The analysis revealed that these critical actions were present with
37 varying degrees in each of the four countries. Although vulnerabilities were observed, there
38 was good evidence to support that actions were taken to institutionalize the innovation
39 within the health system, to motivate micro-level actors, plan opportunities for reflection
40 and adaptation from the outset, and to support strong government ownership. Two actions
41 were largely absent and weakened confidence in future sustainability: managing financial
42 uncertainties and fostering community ownership.

43 Evidence from four countries suggested that the QCN model would not be sustained in its
44 original format, largely because of financial vulnerability and insufficient time to embed the
45 innovation at the sub-national level. But especially the efforts made to institutionalize the

innovation in existing systems meant that some characteristics of QCN may be carried forward within broader government quality improvement initiatives.

Key Words: government ownership, institutionalization, community engagement, adoption, financial sustainability, quality of care, Network, maternal and newborn health, Bangladesh, Ethiopia, Malawi, Uganda

52 **Introduction**

53 The Quality of Care Network (QCN) is a global initiative that was established in 2017,
54 motivated by the slow progress of countries in reducing maternal and newborn mortality,
55 especially from preventable causes[1]. Evidence on the lack of equitable access to high
56 quality health services for mothers, newborn and children [2] prompted the publication of
57 standards and guidelines that promote high quality care [3,4]. Support for country-driven
58 action plans for sustainable, high-quality care was recognised as a gap. Under the leadership
59 of the World Health Organization (WHO), QCN was established to address that gap, with
60 eleven participating Network countries namely Bangladesh, Côte d'Ivoire, Ethiopia, Ghana,
61 India, Kenya, Malawi, Nigeria, Sierra Leone, Uganda, and the United Republic of Tanzania. In
62 addition to these country governments and the WHO, QCN also encompassed
63 implementing, technical and donor partner organisations. Together these countries and
64 partners created a platform for learning to understand how to implement and sustain
65 quality of care initiatives at national and sub-national levels [1]. This paper concludes the
66 collection of papers to examine the performance of QCN, focusing on four Network
67 countries: Bangladesh, Ethiopia, Malawi, and Uganda (Supplement 1). Here, we focused on
68 the sustainability of the Network after five years of development and implementation.
69 Despite its importance, the concept of sustainability is not yet well defined and there is
70 inadequate effort to measure sustainability of innovations [5–7]. In this paper we take
71 sustainability of health programs to mean the continuity of a program after the
72 implementation phase [5]. It is important that this continuity be planned alongside program
73 implementation in order for communities to reap the long term benefit of interventions
74 [8,5,9]. Without planning for sustainability, externally funded innovations that do not have

75 strong government ownership are likely to lose momentum and cease to function when the
76 funding agency withdraws or stops its support [9–11].

77 In an attempt to understand and potentially pre-empt this, studies have tried to identify the
78 factors affecting sustainability and scaleup [5,7,10–14]. Building from these,
79 Wickremasinghe and colleagues refined and summarized six actions that a donor funded
80 innovation can implement to promote sustainability. These actions are (1) planning
81 opportunities for reflection and adaptation from the outset (to ensure that innovations are
82 fit for purpose through continuous engagement with government, and relevant
83 stakeholders); (2) supporting strong government ownership with a plan for a phased
84 transition of responsibilities as external partners withdraw (to ensure government support
85 for and commitment to current and future implementation success); (3) motivating micro-
86 level actors (to ensure that the needs and gaps of local level actors are understood such that
87 they are enabled to engage and implement the innovation. In this paper, micro-level actors
88 are health care workers and the supporting team at the lower level of the health system);
89 (4) institutionalizing the innovation within the health system (to ensure that implementation
90 is embedded within existing systems to enhance ownership, efficiency and reduce
91 duplication); (5) managing financial uncertainties (to ensure financial commitment from
92 governments such that innovation costs are included in the government budget plan); and
93 (6) fostering community ownership (to ensure that community groups, for example clients
94 of the health service or community groups, have the opportunity to catalyse the continuity
95 of the innovation through advocacy and ensure accountability in the implementation of the
96 innovation [10].

97 Here we report on the presence or absence of these actions in the context of QCN
98 implementation, reflecting on how the potential for Network sustainability in four countries
99 was affected.

100 **Method**

101 This analysis was part of the multi-country evaluation of QCN, the methods of which are
102 reported in our common methods supplement for our QCN Evaluation collection of papers
103 (Supplement 2). Key aspects of the methods in relation to this paper are summarized here.

104 **Study setting:**

105 The study was conducted in four QCN countries, namely Bangladesh, Ethiopia, Malawi, and
106 Uganda; the study was started in 2018 except in Ethiopia that joined the study in 2019. An
107 overview of key country characteristics is provided in Table 1.

108 *Bangladesh:* Maternal, newborn and child health (MNCH) is a priority agenda for Bangladesh
109 with a population of more than 165 million [15]. According to the national health,
110 population, and nutrition sector plan for the year 2017-2022, the government of Bangladesh
111 has striven to improve the health of mothers and newborns through making home delivery
112 safe, improving access to and utilization of emergency obstetric services, and improving
113 access to newborn and child health care at the lower level of the health system [16]. Since
114 2017, the government of Bangladesh with implementing partners launched the QCN; it
115 currently has 28 learning districts out of 62 districts, where Quality Improvement (QI)
116 activities have been implemented (Table 1).

117 *Ethiopia:* The second most-populous country in Africa, Ethiopia achieved its Millennium
118 Development Goals (MDGs) for maternal and child health [17]. There have been a number

119 of government-led initiatives that explicitly address quality improvement and most recently,
120 the Ministry of Health (MOH) adopted the national maternal and newborn quality of care
121 roadmap for the year 2017-2020 [18]. This roadmap closely aligns with QCN activities which
122 have been implemented in 14 learning districts out of 770 districts [19].

123 *Malawi:* Malawi is less populous compared to the other case study countries [20] (Table 1).
124 Following its success in achieving its MDG target for child health, the MOH in Malawi
125 engaged in initiatives that aimed to improve the health of mothers and newborns. The
126 country established the Quality Management Directorate (QMD) within the MOH to
127 improve service quality, addressed quality of service in its Health Sector Strategic Plan
128 (HSSP-II) and developed its National Quality Policy and Strategy [21]. The MOH along with its
129 partners have been implementing QI interventions in six learning districts out of 28 total
130 districts in the country.

131 *Uganda:* Uganda with a population size of more than 47 million[22] is also striving to
132 improve quality of health service provision to improve the health of mothers and newborns.
133 Uganda's adoption of various components of quality in healthcare dates back to 1994 [23]
134 initially driven by quality management interventions in HIV/AIDS, TB and malaria. In the
135 recent past, the national standards, guidelines, and policies on maternal and newborn
136 health (MNH) quality of care (QoC) as well as the health sector QI framework and health
137 sector strategic plan 2015/16–2019/20 have been developed. The MOH has begun to
138 implement QI interventions in six learning districts out of 111 total districts in the country
139 [24].

140

141 **Table 1: Demographic and mortality characteristics for the four case study countries**

Characteristics	Bangladesh	Ethiopia	Malawi	Uganda
Total population size (million)[1]	166.3	117.9	19.6	47.1
Total number of districts	64	832	28	136
Maternal Mortality Ratio per 100,000[2]	173	401	349	336
Under 5 Mortality Rate per1000[3]	29.3	59	59.1	58.4
Neonatal Mortality rate per 1000[4]	17	33	19	19
Date launched QCN	2017	2017	2017	2017
Number of QCN learning districts	28	14	6	6
Number of QCN learning facilities	298	48	25	18

142 [1] Population size from World Bank 2021 https://data.worldbank.org/indicator[17,20,22,15]

143 [2] Bangladesh, Ethiopia, and Malawi MMR estimates from World Bank 2017[25,26]; Uganda
144 from UDHS2016[27]

145 [3] Under 5 MR Bangladesh, Malawi and Uganda(global age -sex-specific fertility and
146 mortality rate 2019) [28]; Ethiopia (Mini-DHS 2019)[29]

147 [4]NMR Ethiopia (Mini-DHS 2019), UNICEF DATA (2020) Bangladesh, Malawi and Uganda
148 [25,26,29,30]

149

150 **Design:**

151 To explore the actions taken by the QCN actors that affect the potential for sustainability, a
152 thematic analysis [31] of qualitative interview data and observations from the participating
153 four countries and from interviews with global-level actors was conducted.

154 **Data Collection:**

155 For the purpose of this analysis, two data sources were accessed across the four countries
156 (Table 2), and described below.

157 *Semi-structured interviews*

158 First, semi-structured qualitative interviews with national (n=122) and sub-national (107)
159 level Network members and key stakeholders were conducted. Several iterative rounds of
160 interviews were conducted in each country, typically at least six months apart, to capture (a)

161 changes in how the Network was operating, (ii) views pertaining to Network activities at the
162 time of interview, and (iii) follow-up on emerging findings from the previous round. The
163 participants were recruited purposively by identifying MOH and partner organizations
164 involved in QCN who could provide rich information about the Network (Table 2).

165 **Table 2: Qualitative interviews and health facility observations completed, by time, in**
166 **each country.**

Case-study Country	Data collection dates	National interviewee (n)	Sub-national Interviewee (n)	Facility Observation (n)
Bangladesh	1 (Oct 2019 – Mar 2020)	13	7	3
	2 (Oct 2020 – Jan 2021)	14	11	0
	3 (May 2021 – Sep 2021)	10	12	4
	4 (Jan 2022 – Mar 2022)	8	0	0
Ethiopia	1 (Jan 2021– Mar 2021)	8	11	4
	2 (Nov 2021 – Dec 2021)	10	11	3
Malawi	1 (Oct 2019 – Mar 2020)	7	12	4
	2 (Nov 2020 – Jan 2021)	10	7	4
	3 (Aug 2021 – Nov 2021)	9	7	4
	4 (Mar 2022)	2	3	0
Uganda	1 (Nov 2020 – Mar 2021)	7	13	4
	2 (Jun 2021 – Sep 2021)	12	8	4
	3 (Feb 2022 – Mar 2022)	10	5	4

167

168 Concurrently, semi-structured interviews were also conducted with QCN global actors (n=7
169 in Mar-2021 and n=14 during Nov-2021–Feb-2022). The number of interviews at each
170 setting was based on having suffiecent information saturation to answer our research
171 questions. These interviews explored views on attributes of QCN and its operational
172 strategy and performance that might affect the sustainability of QCN, among other things
173 (Supplement 2).

174 *Non-participant observations*

175 Second, non-participant observations were conducted. In QCN health facilities, these were
176 conducted via visits to two well and two least performing QCN health facilities in each case
177 study country in two to three iterative rounds (Table 2). Well and least performing QCN
178 health facilities were purposively selected through discussion with key stakeholders and
179 review of facility-level maternal and newborn health outcome and other quality of care data
180 (e.g., those used in national schemes). During these facility observations, structured
181 templates were used to capture key processes relevant to the focus of the Network in each
182 country, as well as unstructured notes. In addition, non-participant observations of key
183 national-level and district level meetings were conducted during which processes and
184 priority discussion topics were captured through unstructured notes. These meetings were
185 usually organized by national level actors such as MOH and the schedule and purpose of the
186 meeting was communicated by the host or during partner interviews. Finally, one global
187 level QCN meeting was observed during the study period.

188 **Analysis:**

189 We performed a thematic analysis of the qualitative interviews and observations. A
190 framework approach[32] was used to analyse the data based on a priori themes around six
191 critical actions summarised by Wickremasinghe and others to define the actions that actors
192 at different levels can take to help sustain innovations (table 3). We developed a matrix
193 based on the themes, and codes that fall under each theme were assigned (supplement 3).
194 All the co-authors reviewed and approved the matrix. Then the data was charted into the
195 matrix for each country including the quotes that represent the summary data. We analysed
196 and interpretated the data for each country first and after receiving feedback from each
197 country data lead, the results were further analysed and interpreted, identifying similarities

198 and differences across countries and results were presented using the six sustainability

199 actions. We defined community as patients, clients of the health service, families or

200 members of local community who have stake in the health service provision.

201 Table 3: Six critical actions to help sustain innovations [10]

#	Critical action	Rationale
1	Planning opportunities for reflection and adaptation from the outset	Building in the expectation that there will be a need to continuously learn, reflect and adapt processes can help innovations be fit for purpose in the real world
2	Strong government ownership	Enabling government leadership in planning, inception and implementation strengthens the potential for commitment to, and responsibility for, innovations in the longer term
3	Motivating micro-level actors	Consideration of the needs and preferences of local-level implementers is essential for most innovations
4	Institutionalizing the innovation within the health system	Integration of processes (eg supervision, supply chain, data) within existing systems promotes ownership, reduces duplication, improves efficiency
5	Managing financial uncertainties	Seeking sustained financial commitment from government, e.g. adding innovation costs to strategic plans and budgets, works alongside institutionalization and can help to minimise the impact of system shocks, e.g. a change in government.
6	Fostering community ownership	Community groups can be important advocates for the continuation of innovations and hold leaders to account

202

203 **Ethics**

204 All data collection was conducted after obtaining written consent, including separate

205 consent for tape recording. Patients' privacy was respected during hospital observations.

206 Our study didn't include minors as study participants. All data is confidential and

207 anonymised. Ethical approval was obtained from the Research Ethics Committee at

208 University College London (3433/003); institutional review boards in Bangladesh, BADAS
209 Ethical Review Committee (ref: BADAS-ERC/EC/19/00274), Ethiopian Public Health Institute
210 Institutional Review Board (ref: EPHI-IRB-240-2020), National Health Sciences Research
211 Committee in Malawi (ref: 19/03/2264) and Uganda Makerere University School of Public
212 Health- Higher degrees Research Ethics Committee in Uganda (ref: Protocol 869)
213

214 **Results**

215 Results are synthesized across the experience of the learning districts and health system of
216 four QCN countries. We draw on the evidence described in Table 2, in addition to the
217 interviews and observations with global level actors to identify whether each action was
218 present and how it influenced the potential for Network sustainability at the scale it had
219 been implemented at during this investigation. To give a snapshot of experience by country,
220 we also present a high-level summary of these actions by country (Table 4). Overall, the
221 evidence from Bangladesh suggested that all sustainability actions were present during QCN
222 implementation to a certain degree. Other countries experienced more limited engagement
223 across the set of actions, especially apparent around managing financial uncertainty and
224 fostering community engagement.

225 **Table 4: Status of the sustainability actions in the four QCN countries**

Sustainability actions	Bangladesh	Ethiopia	Malawi	Uganda
1. Planning opportunities for reflection and adaptation	[green]	[green]	[yellow]	[yellow]
2. Government ownership with a plan for a phased transition	[yellow]	[yellow]	[yellow]	[yellow]
3. Motivating micro-level actors	[green]	[green]	[green]	[green]
4. Institutionalizing the innovation within the health system,	[yellow]	[yellow]	[yellow]	[yellow]
5. Managing financial Uncertainties	[yellow]	[red]	[red]	[red]
6. Fostering community engagement	[yellow]	[red]	[yellow]	[red]

226 ***Green** represents the weight of evidence suggest the presence of the action on multiple
227 accounts, if not all. **Yellow** represents that evidence indicates the action to be present to
228 some degree, but with some vulnerability or weakness**. Red** represents there is no evidence
229 in the data to indicate the action exists.

230 **1. Planning opportunities for reflection and adaptation**

231 All respondent types interviewed reported that opportunities for planning, reflection and
232 adaptation were embedded in the Network approach at the global, national, and sub-
233 national levels, although some vulnerability was described in Malawi and Uganda.

234 At the global level, between countries, respondents recalled the importance of holding
235 repeat, joint international meetings with global partners, held in Malawi in 2017, Tanzania
236 in 2018, and Ethiopia in 2019. These meetings promoted the importance of country
237 engagement with the Network and encouraged learning. A respondent in Bangladesh
238 noted:

239 *"But I was in that [QCN] meeting along with the government …. the ministry agreed, and the*
240 *team participated in that Malawi workshop. …. we had highest policy level commitment to*
241 *participant in the QCN network*" (Implementing Partner- National-Bangladesh Round 1).

242 However, some respondents commented that there was limited follow-up and support from
243 the global actors to see if the learning at the global level was adopted at the national level.

244 At the national level, respondents acknowledged opportunities for reflection and adaptation
245 from the outset in the form of joint consultative meetings and joint assessments. During
246 these meetings, activities were planned, learning sites selected, and then partner
247 organisations contributions discussed and coordinated. This type of national level
248 engagement was particularly strongly reported in Ethiopia, including the MOH and partner
249 organizations organising a joint quality summit in the country.

250 In all countries there was also evidence that the generic quality of care standards from the
251 WHO Quality of Care framework were adapted to meet the needs of government quality

252 management directorates. A respondent capitalized on the importance of contextualizing
253 interventions at the country level as follows:

254 *"…economically we are different, the setups of the government are different. For instance,*
255 *we take Malawi, and we compare it with South Africa its [implementation] will be totally*
256 *different but the standards will be the same."* (Government-Local case 1-Malawi round 2)

257 Finally, at sub-national levels in all countries, the restriction of implementation to a small
258 number of learning health facilities, with the intention to foster learning for future scale-up,
259 automatically implied built in opportunity for reflection and adaptation. These learning sites
260 also had opportunities for reflection during the learning forums where health facilities with
261 better performance in QI work shared their experience. However, linkages between
262 reflective learning at national and sub-national levels did not always lead to adaptation in
263 practice, for example in Uganda and Malawi where QCN structures at the sub-national and
264 local level were reported to be less strong respectively.

265 *"At the district level, they have known their part in the Network but at facility level we don't*
266 *really mention the Network. We mention it during training, but they are not that conscious*
267 *about it, although they know that there are facilities within the district that are also*
268 *implementing and that they need learn and share and thus should hold meetings every*
269 *quarter to come together and learn from each other. The importance of the Network at the*
270 *district level is not so high, it is more at the national level."* (Government-National-Uganda
271 round 2)

272

273 **2. Strong government ownership with a plan for a phased transition**

274 All countries demonstrated strong ownership of the QCN, at least in terms of political and
275 normative commitments. However, none of the countries had a plan for transition when
276 QCN partners had completed their contract of implementation.

277 At the global level, there was a push for country governments to take ownership of their
278 respective QI activity. WHO provided technical support, developing guidelines and
279 frameworks such as the LALA (leadership, action, learning and accountability) framework
280 which facilitated the implementation and monitoring of the Network activity at national and
281 sub-national levels. WHO's approach of leadership was also appreciated as being non-
282 prescriptive, actively seeking buy-in and ownership from partners and country governments.

283 At the national level, the MOH of each country took ownership of the QCN initiative and
284 enlisted partner support. In Ethiopia, QCN was reported as the Ministry's flagship program,
285 creating technical committees and organizing partners' efforts. Similarly, in Bangladesh a
286 government academic institution, National Institute of Preventive and Social Medicine
287 (NIPSOM) supported MoH in the implementation of the Network, together with other
288 partners.

289 *"The Government has many initiatives especially in the context of quality of care. It's*
290 *basically a government program."* (Implementing Partner-National-Bangladesh round 1).

291 However, a vulnerability that was reported across countries was the fact that the national
292 MOH quality directorates worked in isolation; it was thought that better integration of
293 quality across directorates could further strengthen ownership of the Network.

294

295 *“I think one other problem we have in higher offices in the ministry is that programs are*
296 *working in isolation. And we know worldwide that we cannot achieve quality, or we cannot*
297 *make quality improvement if we try to work as individuals. So, the departments need to*
298 *come together and be seen of the ground together and move forward” (Health facility*
299 *worker-Local case 4-Malawi round 3)*

300 Between countries, government ownership was not uniform at the sub-national level. In
301 Malawi, the structure that was established at the national level went to the lower-level
302 health system, down to the community. In Bangladesh, the Civil Surgeons took leadership of
303 the QI activities at sub-national level. But in Ethiopia and Uganda government ownership
304 was relatively weaker at the sub national level. In Uganda, the system didn’t cascade down
305 to the lower level of the health system and in Ethiopia a lack of commitment was observed
306 from the regional health system. A respondent from Ethiopia commented:

307 *“We have no role in the Network so there cannot be conflict of interest. We do mentorship &*
308 *coaching at three hospitals. Other than that, the structure is not stretched down. At the*
309 *office level, we are not required to provide support. …… to be frank the plan is not ours; it is*
310 *MOH’s plan.”* (Government-Local-Ethiopia Round 1)

311 Although the MOH of the respective countries took ownership of the Network, and activities
312 took place within existing structures, a particular vulnerability was that implementation was
313 usually facilitated by the implementing partners through individual projects.

314 *“… regionalized support like UNICEF is already in certain districts, so they have been*
315 *supporting that work in their districts. That’s how it’s been working and then Government*
316 *sort of takes the middle piece where if there is capacity building, they support that, although*

other partners have also done their part in capacity building and trainings within their budgets." (Government-National-Uganda round 2)

While the strong ownership and coordination at national level was positive, the more fragmented ownership sub-nationally, and the approach of partners implementing activities on a project basis, limited the opportunity for a phased transition of responsibilities in all countries. Some partners did not have a vision for long term engagement, beyond their current funding, and sub-national leaders did not feel confident that they would have the resources to implement without partner support.

"…you know some other partners just come and then disappear. So sometime other partners are inactive, and some partners will come and say, I think our funding has finished. And when their funding has finished they just disappear, and they even don't say anything and this has been a problem" (Government-Local case 2-Malawi round 2)

3. Motivating micro-level actors

All four countries employed various mechanisms to motivate the healthcare workers and those supporting the work of health facilities at a grass root level in relation to the QCN work. An incentive mechanism in the form of small funding or grants for health facilities was reported in Bangladesh, Ethiopia, and Uganda as part of the QCN intervention. This incentive approach was appreciated by the respondents because it created an enabling environment for the health workers to be innovative in identifying, prioritizing, and solving problems within their health facility. The incentive was also given to their health facility as a form of reward for the best performer in quality service provision.

338 *" They [facility workers] come [to a fair] and participate in a competition. Whose*

339 *performance is the best according to the report? An award is given according to the [facility]*

340 *performance. It is given facility wise and inter-district wise."* (Government-Local case 1-

341 Bangladesh round 1)

342 In addition, several respondents confirmed that the knowledge and skills gained through the

343 extensive training linked to the Network activities further fostered motivation.

344 *"Without having knowledge, there is no motivation to do the work. Now when they realized*

345 *that they could do better, now they do the work with more enthusiasm and do the work with*

346 *more quality."* (Government-Local case 1-Bangladesh round 1).

347 *"The activities[training] are nice because it fills the skill gaps. As you know even though most*

348 *of our workers have theoretical knowledge they lack skills. ….In the process of filling the skill*

349 *gaps indicators are presented, detail technical works are also included. Because of this, I am*

350 *interested in the activities. These are technical duties that help professionals to follow every*

351 *step to provide health services."* (Government-Local-Ethiopia round 1)

352 Nonetheless, despite the positive comments on QCN actions to motivate micro-level actors,

353 two areas of concern were broadly noted. First that while such incentives were observed to

354 positively motivate micro-level actors during this phase of QCN, the use of financial

355 incentives for individuals might not be sustainable in the longer term or if QCN activities

356 were scaled up beyond the current learning areas. And second, if deficiencies in health

357 facility structural quality persisted into the future, or if career progression for health

358 workers was limited, then the QCN actions to motivate the workforce would be weakened.

"…there are a lot of demotivators yah? Maybe career paths. Frustrations also come with small issues like infrastructure in which the staff are working in." (Government-National-Malari round 2)

4. Institutionalizing the innovation within the health system

Implementers in all four countries were keen to work within the existing health system, to avoid creating parallel systems, and to enable the physical environment for QI through investment in existing infrastructure, job aids and guidelines. In each country, Network activities were located within a designated government unit or department that was responsible for health care quality. For example, in Ethiopia, QCN had a designated person at each level of the health system, and activities were coordinated as part of the national plan, with some variation at sub-national levels. In Malawian hospitals, Network activities were integrated in Quality Management Units, working through pre-existing Quality Improvement Support Teams. However, the institutionalization of QI in Malawi was not perceived to be adequate and respondents suggested to have QI as part of the tertiary level education, so that health workers would have adequate knowledge and understanding of QI when they joined the workforce.

"My best bet would be to have as many officers, as many frontline workers playing in quality …We should be really thinking about… if graduates are coming straight from college, they should already know that quality is built in every clinical program and that it's not something that is separate, but it is part of that clinical training. So, the training in MNH, then QI is part of it because quality is eventually what we need… that's how we serve a customer." (Implementing partner-National-Malawi round 3)

381 Learning forums and training were thought to play an important role in institutionalizing QI
382 in the health system. The learning forums allowed transfer of knowledge and skill within
383 and across health facilities and these were shared by health workers and managers with
384 their colleagues and remained in the health system. As was the advocacy work that partners
385 carried out to raise awareness about the initiative. An example was reported from Ethiopia
386 of a region that had started to prepare a quality improvement bulletin to give more voice to
387 the Network idea.

388 However, four vulnerabilities emerged that limited institutionalisation efforts. First, the
389 consequences of losing partner support at the end of their funded project period was
390 described as a problem that weakened the Network as MOH struggled to fill the gap and
391 maintain momentum.

392 *"…what scares us most is the question 'If the partners left, would the initiative continue?'.*
393 *They are very supportive of QI projects. As I said if you go to the district level and observe*
394 *you may observe many QI projects. This is due to the partner organizations. … Sometimes I*
395 *wonder if the program only lasts as long as those partners exist. Perhaps if they left, I am not*
396 *sure about the continuity. But for now, it is good."* (Government-National- Ethiopia round 1)

397 Second, respondents mentioned that partner priorities did not always perfectly align with
398 the real-world needs in the country, especially at sub-national levels where de-centralised
399 decision making was needed. As reported in Uganda, multiple partners invested on the
400 same activity when it was known that it was not a priority for the district. A respondent
401 from Malawi also described existing misalignment between partner and government
402 priorities as follow:

403 *"the challenge with our partners when they are coming into they have their own objectives*

404 *to achieve that may be line with what we want but they are coming in the name of quality*

405 *but not on the specifics that we are targeting so thus what I can say over that one"*

406 (Government-Local case 1- Malawi round 2)

407 Third, some respondents reported fragmentation of implementation according to the

408 presence of different implementing partners who had different organizational missions and

409 vision. This was emphasised by respondents from Bangladesh, where the implementing

410 partners divided the implementing areas among themselves, but activities carried out

411 according to their own pace, with different level of intensity.

412 And finally, the COVID 19 pandemic shifted both emphasis and resources away from the

413 quality improvement activities and tested the strength and depth of institutionalization of

414 the Network activities within the health system. A respondent from national implementing

415 partner in Ethiopia reported that because of the COVID-19 outbreak, their organization had

416 to close all its program including QCN and transferred their budget to COVID-19 response.

417 **5. Managing financial uncertainties**

418 Initial Network initiatives in all countries were heavily supported by implementing

419 organizations through external funding. As seen at the global level, the funding for QCN

420 came primarily from the Bill and Melinda Gates foundation (BMGF) and USAID; the

421 contribution of WHO through its staff time was also noted. At national level, however, some

422 progress of financial commitment from government was observed, particularly for

423 coordination efforts, though less so for implementation, which was mostly still dependent

424 on partner organisation budgets. In Ethiopia and Uganda, there was some evidence of

425 government financial support or budget allocated to QI. And in Bangladesh, several

426 respondents noted the government's long-standing commitment to achieving universal
427 health coverage, consistent with the goals of the Network. Here, where QCN was observed
428 to be particularly well assimilated in government plans, it was impossible to see Network
429 activities separately from government QI actions, creating a strong belief that the
430 government would manage financial uncertainties, as exemplified by a respondent from a
431 partner organization:

432 *"It's a project that you are talking about, but we are not concerned about the time of QCN*
433 *project because the quality improvement initiative that we are doing is part of the*
434 *government plan, there is nothing with that QCN project. Even we don't use this term QCN,*
435 *so this is part of our sector programme. This is the way we are supporting; we are taking it*
436 *forward as part of their operational plan and sector plan. And now they have developed the*
437 *quality strategy and now we'll develop the action plan, and they will go beyond 2022…."*
438 (Implementing partner-National- Bangladesh round 4)

439 But other countries expressed concern about the continuity of QCN efforts in the absence of
440 external funding. Although Ethiopia did try to manage interruption of funding when an
441 individual support partner phased out by committing budget to QCN activities, this effort of
442 the government was jeopardised by external shocks such as COVID 19.

443 Similarly in Malawi, a respondent commented about the fate of QCN in the absence of
444 external funding:

445 *"But I find the issue to do with financing more of a cause for us to fail. This is because look at*
446 *all the components of the health system and I find… well… I was trying at this particular time*
447 *to think about the investments that have happened for example in Kasungu, as a learning*
448 *district. How much did government commit to the goal that we reduce the maternal*

449 *mortality rate by fifty per cent in the implementing (of the project) in the nation and districts*

450 *by 2022? If we are to be honest, success of every implementing district was dependant on*

451 *the kind of and the flexibility of partners that are in the district."* (Implementing partner-

452 National- Malawi round 3).

453 **6. Fostering community ownership and acceptance**

454 All four countries had a system for community engagement, but it was seldomly used for

455 the purpose of the QCN except in Bangladesh and Malawi. Similarly, there was little

456 emphasis on community engagement in relation to QCN at the global level, despite

457 community empowerment being a central pillar of WHO's theory of change for QCN.

458 Community engagement was particularly strong in Bangladesh, perhaps reflecting the

459 relatively strong health system there prior to QCN implementation. Community leaders

460 supported QI work in hospitals and took part in monthly coordination meetings organized

461 by the district leadership; members of the public participated in QI activities through

462 volunteer groups and clubs; partner organizations established suggestion boxes, help desks,

463 citizen charters and community score cards to promote community voice; and government

464 created platforms for community meetings to advocate for quality improvement. All these

465 initiatives were present prior to QCN but had been aligned and adapted for the same

466 purpose. However, few said that the community engagement part is still a working progress

467 and yet to be designed and implemented as part of the QCN work by their implementing

468 organization.

469 *"….WHO has released a stakeholder and community engagement module. And from that*

470 *module we have some ideas and some guidelines; how we should communicate with the*

471 *community for this quality improvement. Right now we are in a process of developing the*

472 *Bangladesh based context module based on that WHO module…"* (Implementing partner-
473 National-Bangladesh round 4*)*

474 In Malawi, community engagement was added as the ninth standard in the MNH QoC
475 standards. A formal structure to link the community members with service providers in
476 health facilities was established, called Health Centre Advisory Committee. This committee
477 was responsible not only for promoting accountability but mobilized resources for the QI
478 initiatives. Village Health Committees and Village Development Committees also played a
479 key role in mobilizing resources.

480 *"there is a feedback mechanism where like if clients are not satisfied with the services that*
481 *they are receiving or maybe a certain injustice has happened they do complain to the*
482 *ombudsman and their issues get resolved. The hospital ombudsman also conducts some exit*
483 *interviews where they check the satisfaction level of the quality of services that are being*
484 *offered at the facility. So at the end of the month, the HO produces an exit report on how*
485 *many clients they interviewed, how many were not satisfied with the services and the*
486 *reasons for lack of satisfaction and others things…"* (Government-National-Malawi round 2)

487 However, not all agreed on the extent of community engagement in Malawi.

488 *"…..it was found that standard nine(community engagement) is the one that is not being*
489 *implemented in almost all the districts. There is a big challenge on the one that talks about*
490 *community and accountability… so issues of score card is not done… so it's almost cut*
491 *across."* (Government-Local case 3-Malawi round 3)

492 Despite the existence of strong community engagement structures in Uganda and in
493 Ethiopia (for example through the Health Extension Programme in Ethiopia), community

494 involvement did not emerge as a strong component of Network activity. One participant

495 reflected that this might have been an oversight that could subsequently be addressed.

496 *"Then when we come to the stakeholders and community engagement, we are not doing so*

497 *well, UNICEF has done some work to this business of community engagement using Village*

498 *Health Teams [the lowest point of Uganda's health system]. But there is a gap of not*

499 *engaging the health unit management committees [HUMCs] which bridge the community*

500 *with facilities."* (Implementing partner-National-Uganda round 1)

501

502 **Discussion**

503 Our analysis examined the presence of six critical actions to support sustainability of QCN in
504 the limited number of implementation areas in four Network countries. Institutionalization
505 of the innovation with the health system and motivating micro-level actors were found in all
506 countries, while recognising that some vulnerability existed. There was also some evidence
507 of actions taken to plan opportunities for reflection and adaptation from the outset and to
508 support strong government ownership. However, these actions were stronger at national
509 than subnational level. Two actions were largely absent and weakened confidence in future
510 sustainability: managing financial uncertainties and fostering community ownership.

511 Institutionalization of QCN within existing systems was strong in all four countries, and
512 particularly to the extent that QCN in Bangladesh and Ethiopia was recognized as part of the
513 governments' QI initiative, not as a separate entity. The alignment of goals of QCN with
514 country priorities and their desire to improve the health of mothers and newborn in all four
515 countries positioned QCN as a favoured intervention. Building and sustaining institutional
516 capability including the local capability was reported as a means to sustain a scale-up of an
517 innovation [9,33]. However, we also witnessed that institutionalization could be affected in
518 the presence of financial uncertainty as in Ethiopia, poor harmonization of effort among
519 implementing partners as in Bangladesh, and suboptimal alignment of country needs with
520 implementing partners objectives at sub-national level as in Uganda and Malawi.

521 All countries took essential steps in motivating micro-level actors, although the sub-optimal
522 environment in which these actors worked sometimes operated against the motivating
523 actions as reported elsewhere [34]. But QCN was regarded as a beneficial initiative for staff.
524 The training and knowledge and skill sharing sessions were most appreciated sources of

525 motivation together with the financial incentives given to health facilities based on their
526 performance in QI. In many low-and middle-income countries there is an insufficient
527 number of health workforce, including in the case study countries [35]; actions to motivate
528 health workers are important for retention in the health system [11,14]. Training was
529 reported as a source of motivation for health workers in previous studies [36,37] as was
530 improving the environment they operated in [34,36].

531 Opportunities for reflection and adaptation of QCN were embedded in the design with
532 repeat learning forums at all levels. The fact that governments took the initiative to engage
533 in conversations before embarking on QCN activity in all countries created a strong starting
534 platform for country implementation. In addition, country commitment to global initiatives
535 such as the SDGs created a fertile ground for QCN to act as a catalyst to achieve these global
536 commitments. The learning forums and meetings that happened at the global, national, and
537 sub-national level set the stage for country adaptation of QCN, crucial for accommodation
538 of country specific contexts [11]. However, accountability for implementing learning was
539 not optimal everywhere because of weak systems and realising opportunities for learning
540 often relied on external support [38]. Further, more time, effort and engagement were
541 needed at the local level to secure leadership commitment and resource.

542 There was strong government ownership of the QI initiative in all countries [39]. From the
543 start, QCN was not rigidly prescribed by the global actors unlike many donor-funded
544 interventions. But two areas of vulnerability included that government ownership did not
545 extend to all levels of the health system [14,40]; and while there was confidence that QCN
546 would continue to be a government priority going forward, none of the countries had a plan
547 for phased transition from partner support to full government implementation. The lack of a

548 plan for phased transition had already affected the Ethiopia program as some of the
549 implementing partners had already completed their contracted support.

550 Of the two actions observed to be less present, financial uncertainty limited the ability of
551 the four countries to move forward in the absence of continuous support and none of the
552 countries had a financial sustainability plan. This limitation necessarily challenges the
553 question of the strength of ownership by country governments [10,13], but also challenges
554 global partners to ensure that achieving financial security was central to the design. In
555 Ethiopia and Uganda there were some attempts by the government to fill gaps in funding
556 during the QCN implementation period. However, we didn’t identify any plan laid out to
557 manage the financial uncertainties, except the strong optimism from respondents in
558 Bangladesh.

559 Finally, engaging the community as a sustainability action received relatively little attention,
560 except in Bangladesh and Malawi where there was some evidence of community
561 engagement to the extent of mobilizing domestic resources for the initiative. However, both
562 Ethiopia and Uganda made little effort to utilize their already well-established community
563 health system [41]. Other studies acknowledged the benefit of engaging the community in
564 such innovative interventions to ensure community acceptance and its sustainability
565 [10,11,14,42]. Defining community engagement or ownership in the context of QCN may be
566 crucial to maximize gain from the community engagement process, especially in the
567 countries where their roles in QCN was not yet defined [43].

568 Strengths and limitations of this study

569 This analysis triangulated data from key partners at the global, national, and sub-national
570 level in the four case study countries that improved the credibility of our findings.

571 Important insights were observed about actions taken that promoted the sustainability of
572 QCN. But the evaluation could only make inference in the context of implementation in a
573 relatively small number of implementation districts, and over a relatively short period of
574 implementation; it did not attempt to engage with sustainability at scale. Further, while
575 national level participant meetings were observed, meetings at the district level were not
576 included in the original plan: it is possible that this limited our understanding at the
577 implementation level however, given the depth of information from individual interviews, it
578 is unlikely to change our findings. The framework of six sustainability actions was a useful
579 tool with which to examine whether and how the innovation could be sustained for the
580 longer term, but some co-dependence was observed between actions such that, for
581 example, positive remarks about government ownership and institutionalisation were made
582 vulnerable by financial uncertainty.

583 **Conclusion**

584 The framework of six critical actions to promote sustainability was useful in revealing where
585 progress was made and what more could be done to sustain improvements in MNH
586 outcomes and quality of care. The innovation was observed to be relatively top-down, with
587 the drive being strongest at global and national levels but with much work – and time -
588 needed to embed QCN linked activities at the sub-national level. Crucially, it was revealed
589 that the absence of deliberate action to address financial uncertainty was an obstacle to the
590 sustainability of QCN. Nevertheless, the strong progress made to institutionalize some
591 characteristics of QCN in existing government systems should be supported to avoid any
592 stalling of progress.

593

Acknowledgment

We would like to thank all study respondents for their invaluable participation in the overall QCN evaluation. We also appreciate the participation of the QCN Evaluation Group, made of: Fatama Khatun, Abdul Kuddus, Kishwar Azad (BADAS-PCP Bangladesh), Gladson Monjeza, Racheal Magaleta, Zabvuta Moffolo, Charles Makwenda (Parent and Child Health Initiative, Malawi), Mary Kinney, Fidele Mukinda (independent researchers, South Africa), Will Payne, Jeremy Shiffman (Johns Hopkins University, USA), Hilda Namakula, Agnes Kyamulabi (Makerere University, Uganda) Anene Tesfa, Theodros Getachew, Geremew Gonfa (Ethiopia Public Health Institute, Ethiopia).

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736

737 Supplement materials

738 S1: Text. PLOS Global Public Health QCN Evaluation Collection 2-page summary.

739 S2: Text. PLOS Global Public Health QCN papers common methods section.

740 S3: Table. Data coding and analysis matrix

741

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Data coding and analysis matrix

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S3_Table.docx

1 **Opportunities to sustain a multi-country quality of care network: lessons on the actions of**
2 **four countries Bangladesh, Ethiopia, Malawi, and Uganda**
3

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24 **Abstract**

25 The Quality of Care Network (QCN) is a global initiative that was established in 2017 under
26 the leadership of WHO in 11 low-and- middle income countries to improve maternal,
27 newborn, and child health. The vision was that the Quality of Care Network would be
28 embedded within member countries and continued beyond the initial implementation
29 period: that the Network would be sustained. This paper investigated the experience of
30 actions taken to sustain QCN in four Network countries (Bangladesh, Ethiopia, Malawi, and
31 Uganda) and reports on lessons learned. Multiple iterative rounds of data collection were
32 conducted through qualitative interviews with global and national stakeholders, and non-
33 participatory observation of health facilities and meetings. A total of 241 interviews, 42
34 facility and four meeting observations were carried out. We conducted a thematic analysis
35 of all data using a framework approach that defined six critical actions that can be taken to
36 promote sustainability. The analysis revealed that these critical actions were present with
37 varying degrees in each of the four countries. Although vulnerabilities were observed, there
38 was good evidence to support that actions were taken to institutionalize the innovation
39 within the health system, to motivate micro-level actors, plan opportunities for reflection
40 and adaptation from the outset, and to support strong government ownership. Two actions
41 were largely absent and weakened confidence in future sustainability: managing financial
42 uncertainties and fostering community ownership.

43 Evidence from four countries suggested that the QCN model would not be sustained in its
44 original format, largely because of financial vulnerability and insufficient time to embed the
45 innovation at the sub-national level. But especially the efforts made to institutionalize the

46 innovation in existing systems meant that some characteristics of QCN may be carried

47 forward within broader government quality improvement initiatives.

48 **Key Words:** government ownership, institutionalization, community engagement, adoption,

49 financial sustainability, quality of care, Network, maternal and newborn health, Bangladesh,

50 Ethiopia, Malawi, Uganda

51

52 **Introduction**

53 The Quality of Care Network (QCN) is a global initiative that was established in 2017,
54 motivated by the slow progress of countries in reducing maternal and newborn mortality,
55 especially from preventable causes[1]. Evidence on the lack of equitable access to high
56 quality health services for mothers, newborn and children [2] prompted the publication of
57 standards and guidelines that promote high quality care [3,4]. Support for country-driven
58 action plans for sustainable, high-quality care was recognised as a gap. Under the leadership
59 of the World Health Organization (WHO), QCN was established to address that gap, with
60 eleven participating Network countries namely Bangladesh, Côte d'Ivoire, Ethiopia, Ghana,
61 India, Kenya, Malawi, Nigeria, Sierra Leone, Uganda, and the United Republic of Tanzania. In
62 addition to these country governments and the WHO, QCN also encompassed
63 implementing, technical and donor partner organisations. Together these countries and
64 partners created a platform for learning to understand how to implement and sustain
65 quality of care initiatives at national and sub-national levels [1]. This paper concludes the
66 collection of papers to examine the performance of QCN, focusing on four Network
67 countries: Bangladesh, Ethiopia, Malawi, and Uganda (Supplement 1). Here, we focused on
68 the sustainability of the Network after five years of development and implementation.
69 Despite its importance, the concept of sustainability is not yet well defined and there is
70 inadequate effort to measure sustainability of innovations [5–7]. In this paper we take
71 sustainability of health programs to mean the continuity of a program after the
72 implementation phase [5]. It is important that this continuity be planned alongside program
73 implementation in order for communities to reap the long term benefit of interventions
74 [8,5,9]. Without planning for sustainability, externally funded innovations that do not have

75 strong government ownership are likely to lose momentum and cease to function when the
76 funding agency withdraws or stops its support [9–11].

77 In an attempt to understand and potentially pre-empt this, studies have tried to identify the
78 factors affecting sustainability and scaleup [5,7,10–14]. Building from these,
79 Wickremasinghe and colleagues refined and summarized six actions that a donor funded
80 innovation can implement to promote sustainability. These actions are (1) planning
81 opportunities for reflection and adaptation from the outset (to ensure that innovations are
82 fit for purpose through continuous engagement with government, and relevant
83 stakeholders); (2) supporting strong government ownership with a plan for a phased
84 transition of responsibilities as external partners withdraw (to ensure government support
85 for and commitment to current and future implementation success); (3) motivating micro-
86 level actors (to ensure that the needs and gaps of local level actors are understood such that
87 they are enabled to engage and implement the innovation. In this paper, micro-level actors
88 are health care workers and the supporting team at the lower level of the health system);
89 (4) institutionalizing the innovation within the health system (to ensure that implementation
90 is embedded within existing systems to enhance ownership, efficiency and reduce
91 duplication); (5) managing financial uncertainties (to ensure financial commitment from
92 governments such that innovation costs are included in the government budget plan); and
93 (6) fostering community ownership (to ensure that community groups, for example clients
94 of the health service or community groups, have the opportunity to catalyse the continuity
95 of the innovation through advocacy and ensure accountability in the implementation of the
96 innovation [10].

97 Here we report on the presence or absence of these actions in the context of QCN
98 implementation, reflecting on how the potential for Network sustainability in four countries
99 was affected.

100 **Method**

101 This analysis was part of the multi-country evaluation of QCN, the methods of which are
102 reported in our common methods supplement for our QCN Evaluation collection of papers
103 (Supplement 2). Key aspects of the methods in relation to this paper are summarized here.

104 **Study setting:**

105 The study was conducted in four QCN countries, namely Bangladesh, Ethiopia, Malawi, and
106 Uganda; the study was started in 2018 except in Ethiopia that joined the study in 2019. An
107 overview of key country characteristics is provided in Table 1.

108 *Bangladesh:* Maternal, newborn and child health (MNCH) is a priority agenda for Bangladesh
109 with a population of more than 165 million [15]. According to the national health,
110 population, and nutrition sector plan for the year 2017-2022, the government of Bangladesh
111 has striven to improve the health of mothers and newborns through making home delivery
112 safe, improving access to and utilization of emergency obstetric services, and improving
113 access to newborn and child health care at the lower level of the health system [16]. Since
114 2017, the government of Bangladesh with implementing partners launched the QCN; it
115 currently has 28 learning districts out of 62 districts, where Quality Improvement (QI)
116 activities have been implemented (Table 1).

117 *Ethiopia:* The second most-populous country in Africa, Ethiopia achieved its Millennium
118 Development Goals (MDGs) for maternal and child health [17]. There have been a number

119 of government-led initiatives that explicitly address quality improvement and most recently,
120 the Ministry of Health (MOH) adopted the national maternal and newborn quality of care
121 roadmap for the year 2017-2020 [18]. This roadmap closely aligns with QCN activities which
122 have been implemented in 14 learning districts out of 770 districts [19].

123 *Malawi:* Malawi is less populous compared to the other case study countries [20] (Table 1).
124 Following its success in achieving its MDG target for child health, the MOH in Malawi
125 engaged in initiatives that aimed to improve the health of mothers and newborns. The
126 country established the Quality Management Directorate (QMD) within the MOH to
127 improve service quality, addressed quality of service in its Health Sector Strategic Plan
128 (HSSP-II) and developed its National Quality Policy and Strategy [21]. The MOH along with its
129 partners have been implementing QI interventions in six learning districts out of 28 total
130 districts in the country.

131 *Uganda:* Uganda with a population size of more than 47 million[22] is also striving to
132 improve quality of health service provision to improve the health of mothers and newborns.
133 Uganda's adoption of various components of quality in healthcare dates back to 1994 [23]
134 initially driven by quality management interventions in HIV/AIDS, TB and malaria. In the
135 recent past, the national standards, guidelines, and policies on maternal and newborn
136 health (MNH) quality of care (QoC) as well as the health sector QI framework and health
137 sector strategic plan 2015/16–2019/20 have been developed. The MOH has begun to
138 implement QI interventions in six learning districts out of 111 total districts in the country
139 [24].

140

141 **Table 1: Demographic and mortality characteristics for the four case study countries**

Characteristics	Bangladesh	Ethiopia	Malawi	Uganda
Total population size (million)[1]	166.3	117.9	19.6	47.1
Total number of districts	64	832	28	136
Maternal Mortality Ratio per 100,000[2]	173	401	349	336
Under 5 Mortality Rate per1000[3]	29.3	59	59.1	58.4
Neonatal Mortality rate per 1000[4]	17	33	19	19
Date launched QCN	2017	2017	2017	2017
Number of QCN learning districts	28	14	6	6
Number of QCN learning facilities	298	48	25	18

142 [1] Population size from World Bank 2021 https://data.worldbank.org/indicator[17,20,22,15]

143 [2] Bangladesh, Ethiopia, and Malawi MMR estimates from World Bank 2017[25,26]; Uganda
144 from UDHS2016[27]

145 [3] Under 5 MR Bangladesh, Malawi and Uganda(global age -sex-specific fertility and
146 mortality rate 2019) [28]; Ethiopia (Mini-DHS 2019)[29]

147 [4]NMR Ethiopia (Mini-DHS 2019), UNICEF DATA (2020) Bangladesh, Malawi and Uganda
148 [25,26,29,30]

149

150 **Design:**

151 To explore the actions taken by the QCN actors that affect the potential for sustainability, a
152 thematic analysis [31] of qualitative interview data and observations from the participating
153 four countries and from interviews with global-level actors was conducted.

154 **Data Collection:**

155 For the purpose of this analysis, tTwo data collection sources were methods accessed were
156 applied across the four countries (Table 2), and described below.

157 *Semi-structured interviews*

158 First, semi-structured qualitative interviews with national (n=122) and sub-national (107)
159 level Network members and key stakeholders were conducted. Several iterative rounds of
160 interviews were conducted in each country, typically at least six months apart, to capture (a)

161 changes in how the Network was operating, (ii) views pertaining to Network activities at the

162 time of interview, and (iii) follow-up on emerging findings from the previous round. The

163 participants were recruited purposively by identifying MOH and partner organizations

164 involved in QCN who could provide rich information about the Network (Table 2).

165 **Table 2: Qualitative interviews and health facility observations completed, by time, in**

166 **each country.**

Case-study Country	Data collection dates	National interviewee (n)	Sub-national Interviewee (n)	Facility Observation (n)
Bangladesh	1 (Oct 2019 – Mar 2020)	13	7	3
	2 (Oct 2020 – Jan 2021)	14	11	0
	3 (May 2021 – Sep 2021)	10	12	4
	4 (Jan 2022 – Mar 2022)	8	0	0
Ethiopia	1 (Jan 2021– Mar 2021)	8	11	4
	2 (Nov 2021 – Dec 2021)	10	11	3
Malawi	1 (Oct 2019 – Mar 2020)	7	12	4
	2 (Nov 2020 – Jan 2021)	10	7	4
	3 (Aug 2021 – Nov 2021)	9	7	4
	4 (Mar 2022)	2	3	0
Uganda	1 (Nov 2020 – Mar 2021)	7	13	4
	2 (Jun 2021 – Sep 2021)	12	8	4
	3 (Feb 2022 – Mar 2022)	10	5	4

167

168 Concurrently, semi-structured interviews were also conducted with QCN global actors (n=7

169 in Mar-2021 and n=14 during Nov-2021–Feb-2022). The number of interviews at each

170 settinh was based on having suffiecent information saturation to answer our research

171 questions. These interviews explored views on attributes of QCN and its operational

172 strategy and performance that might affect the sustainability of QCN, among other things

173 (Supplement 2).

174 *Non-participant observations*

175 Second, non-participant observations were conducted. In QCN health facilities, these were
176 conducted via visits to two well and two least performing QCN health facilities in each case
177 study country in two to three iterative rounds (Table 2). Well and least performing QCN
178 health facilities were purposively selected through discussion with key stakeholders and
179 review of facility-level maternal and newborn health outcome and other quality of care data
180 (e.g., those used in national schemes). During these facility observations, structured
181 templates were used to capture key processes relevant to the focus of the Network in each
182 country, as well as unstructured notes. In addition, non-participant observations of key
183 national-level and district level meetings were conducted during which processes and
184 priority discussion topics were captured through unstructured notes. These meetings were
185 usually organized by national level actors such as MOH and the schedule and purpose of the
186 meeting was communicated by the host or during partner interviews. Finally, one global
187 level QCN meeting was observed during the study period.

188 **Analysis:**

189 We performed a thematic analysis of the qualitative interviews and observations. A
190 framework approach[32] was used to analyse the data based on a priori themes around six
191 critical actions summarised by Wickremasinghe and others to define the actions that actors
192 at different levels can take to help sustain innovations (table 3). We developed a matrix
193 based on the themes, and codes that fall under each theme were assigned (supplement 3).
194 All the co-authors reviewed and approved the matrix. Then the data was charted into the
195 matrix for each country including the quotes that represent the summary data. We analysed
196 and interpretated the data for each country first and after receiving feedback from each
197 country data lead, the results were further analysed and interpreted, identifying similarities

198 and differences across countries and results were presented using the six sustainability
199 actions. We defined community as patients, clients of the health service, families or
200 members of local community who have stake in the health service provision.

201 Table 3: Six critical actions to help sustain innovations [10]

#	Critical action	Rationale
1	Planning opportunities for reflection and adaptation from the outset	Building in the expectation that there will be a need to continuously learn, reflect and adapt processes can help innovations be fit for purpose in the real world
2	Strong government ownership	Enabling government leadership in planning, inception and implementation strengthens the potential for commitment to, and responsibility for, innovations in the longer term
3	Motivating micro-level actors	Consideration of the needs and preferences of local-level implementers is essential for most innovations
4	Institutionalizing the innovation within the health system	Integration of processes (eg supervision, supply chain, data) within existing systems promotes ownership, reduces duplication, improves efficiency
5	Managing financial uncertainties	Seeking sustained financial commitment from government, e.g. adding innovation costs to strategic plans and budgets, works alongside institutionalization and can help to minimise the impact of system shocks, e.g. a change in government.
6	Fostering community ownership	Community groups can be important advocates for the continuation of innovations and hold leaders to account

202

203 **Ethics**

204 All data collection was conducted after obtaining ~~informed~~ written consent, including
205 separate consent for tape recording. Patients' privacy was respected during hospital
206 observations. Our study didn't include minors as study participants. All data is confidential
207 and anonymised. Ethical approval was obtained from the Research Ethics Committee at

208 University College London (3433/003); institutional review boards in Bangladesh, BADAS

209 Ethical Review Committee (ref: BADAS-ERC/EC/19/00274), Ethiopian Public Health Institute

210 Institutional Review Board (ref: EPHI-IRB-240-2020), National Health Sciences Research

211 Committee in Malawi (ref: 19/03/2264) and Uganda Makerere University School of Public

212 Health- Higher degrees Research Ethics Committee in Uganda (ref: Protocol 869)

213

Results

Results are synthesized across the experience of the learning districts and health system of four QCN countries. We draw on the evidence described in Table 2, in addition to the interviews and observations with global level actors to identify whether each action was present and how it influenced the potential for Network sustainability at the scale it had been implemented at during this investigation. To give a snapshot of experience by country, we also present a high-level summary of these actions by country (Table 4). Overall, the evidence from Bangladesh suggested that all sustainability actions were present during QCN implementation to a certain degree. Other countries experienced more limited engagement across the set of actions, especially apparent around managing financial uncertainty and fostering community engagement.

Table 4: Status of the sustainability actions in the four QCN countries

Sustainability actions	Bangladesh	Ethiopia	Malawi	Uganda
1. Planning opportunities for reflection and adaptation				
2. Government ownership with a plan for a phased transition				
3. Motivating micro-level actors				
4. Institutionalizing the innovation within the health system,				
5. Managing financial Uncertainties				
6. Fostering community engagement				

***Green** represents the weight of evidence suggest the presence of the action on multiple accounts, if not all. **Yellow** represents that evidence indicates the action to be present to some degree, but with some vulnerability or weakness**. Red** represents there is no evidence in the data to indicate the action exists.

1. **Planning opportunities for reflection and adaptation**

All respondent types interviewed reported that opportunities for planning, reflection and adaptation were embedded in the Network approach at the global, national, and sub-national levels, although some vulnerability was described in Malawi and Uganda.

At the global level, between countries, respondents recalled the importance of holding repeat, joint international meetings with global partners, held in Malawi in 2017, Tanzania in 2018, and Ethiopia in 2019. These meetings promoted the importance of country engagement with the Network and encouraged learning. A ~~UNICEF~~ respondent ~~working~~ in Bangladesh noted:

"But I was in that [QCN] meeting along with the government …. the ministry agreed, and the team participated in that Malawi workshop. …. we had highest policy level commitment to participant in the QCN network" (Implementing Partner- National-Bangladesh Round 1~~-BGD-Partner-01~~).

However, some respondents commented that there was limited follow-up and support from the global actors to see if the learning at the global level was adopted at the national level.

At the national level, respondents acknowledged opportunities for reflection and adaptation from the outset in the form of joint consultative meetings and joint assessments. During these meetings, activities were planned, learning sites selected, and then partner organisations contributions discussed and coordinated. This type of national level engagement was particularly strongly reported in Ethiopia, including the MOH and partner organizations organising a joint quality summit in the country.

In all countries there was also evidence that the generic quality of care standards from the WHO Quality of Care framework were adapted to meet the needs of government quality management directorates. A respondent capitalized on the importance of contextualizing interventions at the country level as follows:

"…economically we are different, the setups of the government are different. For instance, we take Malawi, and we compare it with South Africa its [implementation] will be totally different but the standards will be the same." (Government-Local case 1-Malawi round 2~~Round2-Local-MWI-Site 01-Gov't-01-F~~)

Finally, at sub-national levels in all countries, the restriction of implementation to a small number of learning health facilities, with the intention to foster learning for future scale-up, automatically implied built in opportunity for reflection and adaptation. These learning sites also had opportunities for reflection during the learning forums where health facilities with better performance in QI work shared their experience. However, linkages between reflective learning at national and sub-national levels did not always lead to adaptation in practice, for example in Uganda and Malawi where QCN structures at the sub-national and local level were reported to be less strong respectively.

"At the district level, they have known their part in the Network but at facility level we don't really mention the Network. We mention it during training, but they are not that conscious about it, although they know that there are facilities within the district that are also implementing and that they need learn and share and thus should hold meetings every quarter to come together and learn from each other. The importance of the Network at the district level is not so high, it is more at the national level." (Government-National-Uganda round 2~~Round 2-National-UGA-MOH-01~~)

275

2. Strong government ownership with a plan for a phased transition

All countries demonstrated strong ownership of the QCN, at least in terms of political and normative commitments. However, none of the countries had a plan for transition when QCN partners had completed their contract of implementation.

At the global level, there was a push for country governments to take ownership of their respective QI activity. WHO provided technical support, developing guidelines and frameworks such as the LALA (leadership, action, learning and accountability) framework which facilitated the implementation and monitoring of the Network activity at national and sub-national levels. WHO's approach of leadership was also appreciated as being non-prescriptive, actively seeking buy-in and ownership from partners and country governments.

At the national level, the MOH of each country took ownership of the QCN initiative and enlisted partner support. In Ethiopia, QCN was reported as the Ministry's flagship program, creating technical committees and organizing partners' efforts. Similarly, in Bangladesh a government academic institution, National Institute of Preventive and Social Medicine (NIPSOM) supported MoH in the implementation of the Network, together with other partners.

"The Government has many initiatives especially in the context of quality of care. It's basically a government program." (Implementing Partner-National-Bangladesh round 1~~National_BGD_SAVE_01~~).

However, a vulnerability that was reported across countries was the fact that the national MOH quality directorates worked in isolation; it was thought that better integration of quality across directorates could further strengthen ownership of the Network.

298

299 *"I think one other problem we have in higher offices in the ministry is that programs are*
300 *working in isolation. And we know worldwide that we cannot achieve quality, or we cannot*
301 *make quality improvement if we try to work as individuals. So, the departments need to*
302 *come together and be seen of the ground together and move forward" (Health facility*
303 *worker-Local case 4-Malawi round 3~~Round3-Local-MWI-Site 04-HCW-02-F~~)*

304 Between countries, government ownership was not uniform at the sub-national level. In
305 Malawi, the structure that was established at the national level went to the lower-level
306 health system, down to the community. In Bangladesh, the Civil Surgeons took leadership of
307 the QI activities at sub-national level. But in Ethiopia and Uganda government ownership
308 was relatively weaker at the sub national level. In Uganda, the system didn't cascade down
309 to the lower level of the health system and in Ethiopia a lack of commitment was observed
310 from the regional health system. A respondent from Ethiopia commented:

311 *"We have no role in the Network so there cannot be conflict of interest. We do mentorship &*
312 *coaching at three hospitals. Other than that, the structure is not stretched down. At the*
313 *office level, we are not required to provide support. …… to be frank the plan is not ours; it is*
314 *MOH's plan."* (Government-Local-Ethiopia Round 1~~Round1-ETH-Local-RHB-08~~)

315 Although the MOH of the respective countries took ownership of the Network, and activities
316 took place within existing structures, a particular vulnerability was that implementation was
317 usually facilitated by the implementing partners through individual projects.

318 *"… regionalized support like UNICEF is already in certain districts, so they have been*
319 *supporting that work in their districts. That's how it's been working and then Government*
320 *sort of takes the middle piece where if there is capacity building, they support that, although*

other partners have also done their part in capacity building and trainings within their budgets." (Government-National-Uganda round 2~~Round-2-National-UGA-Gov't-01~~)

While the strong ownership and coordination at national level was positive, the more fragmented ownership sub-nationally, and the approach of partners implementing activities on a project basis, limited the opportunity for a phased transition of responsibilities in all countries. Some partners did not have a vision for long term engagement, beyond their current funding, and sub-national leaders did not feel confident that they would have the resources to implement without partner support.

"…you know some other partners just come and then disappear. So sometime other partners are inactive, and some partners will come and say, I think our funding has finished. And when their funding has finished they just disappear, and they even don't say anything and this has been a problem" (Government-Local case 2-Malawi round 2~~Round2-Local-MWI-Site 02-MoH-03-F~~)

3. Motivating micro-level actors

All four countries employed various mechanisms to motivate the healthcare workers and those supporting the work of health facilities at a grass root level in relation to the QCN work. An incentive mechanism in the form of small funding or grants for health facilities was reported in Bangladesh, Ethiopia, and Uganda as part of the QCN intervention. This incentive approach was appreciated by the respondents because it created an enabling environment for the health workers to be innovative in identifying, prioritizing, and solving problems within their health facility. The incentive was also given to their health facility as a form of reward for the best performer in quality service provision.

" They [facility workers] come [to a fair] and participate in a competition. Whose performance is the best according to the report? An award is given according to the [facility] performance. It is given facility wise and inter-district wise." (Government-Local case 1-Bangladesh round 1~~Round 1 Local-BDG-Site 01-Gov't-02~~)

In addition, several respondents confirmed that the knowledge and skills gained through the extensive training linked to the Network activities further fostered motivation.

"Without having knowledge, there is no motivation to do the work. Now when they realized that they could do better, now they do the work with more enthusiasm and do the work with more quality." (Government-Local case 1-Bangladesh round 1).

"The activities[training] are nice because it fills the skill gaps. As you know even though most of our workers have theoretical knowledge they lack skills. ….In the process of filling the skill gaps indicators are presented, detail technical works are also included. Because of this, I am interested in the activities. These are technical duties that help professionals to follow every step to provide health services." (Government-Local-Ethiopia round 1)

Nonetheless, despite the positive comments on QCN actions to motivate micro-level actors, two areas of concern were broadly noted. First that while such incentives were observed to positively motivate micro-level actors during this phase of QCN, the use of financial incentives for individuals might not be sustainable in the longer term or if QCN activities were scaled up beyond the current learning areas. And second, if deficiencies in health facility structural quality persisted into the future, or if career progression for health workers was limited, then the QCN actions to motivate the workforce would be weakened.

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"…there are a lot of demotivators yah? Maybe career paths. Frustrations also come with small issues like infrastructure in which the staff are working in." (Government-National-Malari round 2~~Round2-National-MWI-Gov't-04-F~~)

4. Institutionalizing the innovation within the health system

Implementers in all four countries were keen to work within the existing health system, to avoid creating parallel systems, and to enable the physical environment for QI through investment in existing infrastructure, job aids and guidelines. In each country, Network activities were located within a designated government unit or department that was responsible for health care quality. For example, in Ethiopia, QCN had a designated person at each level of the health system, and activities were coordinated as part of the national plan, with some variation at sub-national levels. In Malawian hospitals, Network activities were integrated in Quality Management Units, working through pre-existing Quality Improvement Support Teams. However, the institutionalization of QI in Malawi was not perceived to be adequate and respondents suggested to have QI as part of the tertiary level education, so that health workers would have adequate knowledge and understanding of QI when they joined the workforce.

"My best bet would be to have as many officers, as many frontline workers playing in quality …We should be really thinking about… if graduates are coming straight from college, they should already know that quality is built in every clinical program and that it's not something that is separate, but it is part of that clinical training. So, the training in MNH, then QI is part of it because quality is eventually what we need… that's how we serve a customer." (Implementing partner-National-Malawi round 3~~Round3-National-MWI-Maikhanda-02-F~~)

Learning forums and training were thought to play an important role in institutionalizing QI in the health system. The learning forums allowed transfer of knowledge and skill within and across health facilities and these were shared by health workers and managers with their colleagues and remained in the health system. As was the advocacy work that partners carried out to raise awareness about the initiative. An example was reported from Ethiopia of a region that had started to prepare a quality improvement bulletin to give more voice to the Network idea.

However, four vulnerabilities emerged that limited institutionalisation efforts. First, the consequences of losing partner support at the end of their funded project period was described as a problem that weakened the Network as MOH struggled to fill the gap and maintain momentum.

"…what scares us most is the question 'If the partners left, would the initiative continue?'. They are very supportive of QI projects. As I said if you go to the district level and observe you may observe many QI projects. This is due to the partner organizations. … Sometimes I wonder if the program only lasts as long as those partners exist. Perhaps if they left, I am not sure about the continuity. But for now, it is good." (Government-National- Ethiopia round 1~~Round1-ETH-National-Gov't-02~~)

Second, respondents mentioned that partner priorities did not always perfectly align with the real-world needs in the country, especially at sub-national levels where de-centralised decision making was needed. As reported in Uganda, multiple partners invested on the same activity when it was known that it was not a priority for the district. A respondent from Malawi also described existing misalignment between partner and government priorities as follow:

"the challenge with our partners when they are coming into they have their own objectives to achieve that may be line with what we want but they are coming in the name of quality but not on the specifics that we are targeting so thus what I can say over that one" (Government-Local case 1- Malawi round 2)~~Round2-Local-MWI-Site 01-MoH-01-F)~~

Third, some respondents reported fragmentation of implementation according to the presence of different implementing partners who had different organizational missions and vision. This was emphasised by respondents from Bangladesh, where the implementing partners divided the implementing areas among themselves, but activities carried out according to their own pace, with different level of intensity.

And finally, the COVID 19 pandemic shifted both emphasis and resources away from the quality improvement activities and tested the strength and depth of institutionalization of the Network activities within the health system. A respondent from national implementing partner in Ethiopia reported that because of the COVID-19 outbreak, their organization had to close all its program including QCN and transferred their budget to COVID-19 response.

5. Managing financial uncertainties

Initial Network initiatives in all countries were heavily supported by implementing organizations through external funding. As seen at the global level, the funding for QCN came primarily from the Bill and Melinda Gates foundation (BMGF) and USAID; the contribution of WHO through its staff time was also noted. At national level, however, some progress of financial commitment from government was observed, particularly for coordination efforts, though less so for implementation, which was mostly still dependent on partner organisation budgets. In Ethiopia and Uganda, there was some evidence of government financial support or budget allocated to QI. And in Bangladesh, several

respondents noted the government's long-standing commitment to achieving universal health coverage, consistent with the goals of the Network. Here, where QCN was observed to be particularly well assimilated in government plans, it was impossible to see Network activities separately from government QI actions, creating a strong belief that the government would manage financial uncertainties, as exemplified by a respondent from a partner organization:

"It's a project that you are talking about, but we are not concerned about the time of QCN project because the quality improvement initiative that we are doing is part of the government plan, there is nothing with that QCN project. Even we don't use this term QCN, so this is part of our sector programme. This is the way we are supporting; we are taking it forward as part of their operational plan and sector plan. And now they have developed the quality strategy and now we'll develop the action plan, and they will go beyond 2022…." (Implementing partner-National- Bangladesh round 4~~Round4-National-BGD-Implementing partner-01 F~~)

But other countries expressed concern about the continuity of QCN efforts in the absence of external funding. Although Ethiopia did try to manage interruption of funding when an individual support partner phased out by committing budget to QCN activities, this effort of the government was jeopardised by external shocks such as COVID 19.

Similarly in Malawi, a respondent commented about the fate of QCN in the absence of external funding:

"But I find the issue to do with financing more of a cause for us to fail. This is because look at all the components of the health system and I find… well… I was trying at this particular time to think about the investments that have happened for example in Kasungu, as a learning

455 *district. How much did government commit to the goal that we reduce the maternal*
456 *mortality rate by fifty per cent in the implementing (of the project) in the nation and districts*
457 *by 2022? If we are to be honest, success of every implementing district was dependant on*
458 *the kind of and the flexibility of partners that are in the district."* (Implementing partner-
459 National- Malawi round 3~~Round3-National-MWI-implementing partner-01~~).

460 **6. Fostering community ownership and acceptance**

461 All four countries had a system for community engagement, but it was seldomly used for
462 the purpose of the QCN except in Bangladesh and Malawi. Similarly, there was little
463 emphasis on community engagement in relation to QCN at the global level, despite
464 community empowerment being a central pillar of WHO's theory of change for QCN.
465 Community engagement was particularly strong in Bangladesh, perhaps reflecting the
466 relatively strong health system there prior to QCN implementation. Community leaders
467 supported QI work in hospitals and took part in monthly coordination meetings organized
468 by the district leadership; members of the public participated in QI activities through
469 volunteer groups and clubs; partner organizations established suggestion boxes, help desks,
470 citizen charters and community score cards to promote community voice; and government
471 created platforms for community meetings to advocate for quality improvement. All these
472 initiatives were present prior to QCN but had been aligned and adapted for the same
473 purpose. However, few said that the community engagement part is still a working progress
474 and yet to be designed and implemented as part of the QCN work by their implementing
475 organization.

476 *"….WHO has released a stakeholder and community engagement module. And from that*
477 *module we have some ideas and some guidelines; how we should communicate with the*

community for this quality improvement. Right now we are in a process of developing the Bangladesh based context module based on that WHO module…” (Implementing partner-National-Bangladesh round 4~~Round4-*National-BGD-partner-04*~~*)*

In Malawi, community engagement was added as the ninth standard in the MNH QoC standards. A formal structure to link the community members with service providers in health facilities was established, called Health Centre Advisory Committee. This committee was responsible not only for promoting accountability but mobilized resources for the QI initiatives. Village Health Committees and Village Development Committees also played a key role in mobilizing resources.

“there is a feedback mechanism where like if clients are not satisfied with the services that they are receiving or maybe a certain injustice has happened they do complain to the ombudsman and their issues get resolved. The hospital ombudsman also conducts some exit interviews where they check the satisfaction level of the quality of services that are being offered at the facility. So at the end of the month, the HO produces an exit report on how many clients they interviewed, how many were not satisfied with the services and the reasons for lack of satisfaction and others things…" (Government-National-Malawi round 2~~Round2-National-MWI-MoH-06~~)

However, not all agreed on the extent of community engagement in Malawi.

“…..it was found that standard nine(community engagement) is the one that is not being implemented in almost all the districts. There is a big challenge on the one that talks about community and accountability… so issues of score card is not done… so it’s almost cut across.” (Government-Local case 3-Malawi round 3~~Round3-Local-MWI-Site 03-MoH-01-F~~)

Despite the existence of strong community engagement structures in Uganda and in Ethiopia (for example through the Health Extension Programme in Ethiopia), community involvement did not emerge as a strong component of Network activity. One participant reflected that this might have been an oversight that could subsequently be addressed.

"Then when we come to the stakeholders and community engagement, we are not doing so well, UNICEF has done some work to this business of community engagement using Village Health Teams [the lowest point of Uganda's health system]. But there is a gap of not engaging the health unit management committees [HUMCs] which bridge the community with facilities." (Implementing partner-National-Uganda round 1~~Round1-National-UGA-implementing partner-03~~)

511 **Discussion**

512 Our analysis examined the presence of six critical actions to support sustainability of QCN in
513 the limited number of implementation areas in four Network countries. Institutionalization
514 of the innovation with the health system and motivating micro-level actors were found in all
515 countries, while recognising that some vulnerability existed. There was also some evidence
516 of actions taken to plan opportunities for reflection and adaptation from the outset and to
517 support strong government ownership. However, these actions were stronger at national
518 than subnational level. Two actions were largely absent and weakened confidence in future
519 sustainability: managing financial uncertainties and fostering community ownership.

520 Institutionalization of QCN within existing systems was strong in all four countries, and
521 particularly to the extent that QCN in Bangladesh and Ethiopia was recognized as part of the
522 governments' QI initiative, not as a separate entity. The alignment of goals of QCN with
523 country priorities and their desire to improve the health of mothers and newborn in all four
524 countries positioned QCN as a favoured intervention. Building and sustaining institutional
525 capability including the local capability was reported as a means to sustain a scale-up of an
526 innovation [9,33]. However, we also witnessed that institutionalization could be affected in
527 the presence of financial uncertainty as in Ethiopia, poor harmonization of effort among
528 implementing partners as in Bangladesh, and suboptimal alignment of country needs with
529 implementing partners objectives at sub-national level as in Uganda and Malawi.

530 All countries took essential steps in motivating micro-level actors, although the sub-optimal
531 environment in which these actors worked sometimes operated against the motivating
532 actions as reported elsewhere [34]. But QCN was regarded as a beneficial initiative for staff.
533 The training and knowledge and skill sharing sessions were most appreciated sources of

534 motivation together with the financial incentives given to health facilities based on their
535 performance in QI. In many low-and middle-income countries there is an insufficient
536 number of health workforce, including in the case study countries [35]; actions to motivate
537 health workers are important for retention in the health system [11,14]. Training was
538 reported as a source of motivation for health workers in previous studies [36,37] as was
539 improving the environment they operated in [34,36].

540 Opportunities for reflection and adaptation of QCN were embedded in the design with
541 repeat learning forums at all levels. The fact that governments took the initiative to engage
542 in conversations before embarking on QCN activity in all countries created a strong starting
543 platform for country implementation. In addition, country commitment to global initiatives
544 such as the SDGs created a fertile ground for QCN to act as a catalyst to achieve these global
545 commitments. The learning forums and meetings that happened at the global, national, and
546 sub-national level set the stage for country adaptation of QCN, crucial for accommodation
547 of country specific contexts [11]. However, accountability for implementing learning was
548 not optimal everywhere because of weak systems and realising opportunities for learning
549 often relied on external support [38]. Further, more time, effort and engagement were
550 needed at the local level to secure leadership commitment and resource.

551 There was strong government ownership of the QI initiative in all countries [39]. From the
552 start, QCN was not rigidly prescribed by the global actors unlike many donor-funded
553 interventions. But two areas of vulnerability included that government ownership did not
554 extend to all levels of the health system [14,40]; and while there was confidence that QCN
555 would continue to be a government priority going forward, none of the countries had a plan
556 for phased transition from partner support to full government implementation. The lack of a

557 plan for phased transition had already affected the Ethiopia program as some of the
558 implementing partners had already completed their contracted support.

559 Of the two actions observed to be less present, financial uncertainty limited the ability of
560 the four countries to move forward in the absence of continuous support and none of the
561 countries had a financial sustainability plan. This limitation necessarily challenges the
562 question of the strength of ownership by country governments [10,13], but also challenges
563 global partners to ensure that achieving financial security was central to the design. In
564 Ethiopia and Uganda there were some attempts by the government to fill gaps in funding
565 during the QCN implementation period. However, we didn't identify any plan laid out to
566 manage the financial uncertainties, except the strong optimism from respondents in
567 Bangladesh.

568 Finally, engaging the community as a sustainability action received relatively little attention,
569 except in Bangladesh and Malawi where there was some evidence of community
570 engagement to the extent of mobilizing domestic resources for the initiative. However, both
571 Ethiopia and Uganda made little effort to utilize their already well-established community
572 health system [41]. Other studies acknowledged the benefit of engaging the community in
573 such innovative interventions to ensure community acceptance and its sustainability
574 [10,11,14,42]. Defining community engagement or ownership in the context of QCN may be
575 crucial to maximize gain from the community engagement process, especially in the
576 countries where their roles in QCN was not yet defined [43].

577 Strengths and limitations of this study

578 This analysis triangulated data from key partners at the global, national, and sub-national
579 level in the four case study countries that improved the credibility of our findings.

580 Important insights were observed about actions taken that promoted the sustainability of
581 QCN. But the evaluation could only make inference in the context of implementation in a
582 relatively small number of implementation districts, and over a relatively short period of
583 implementation; it did not attempt to engage with sustainability at scale. Further, while
584 national level participant meetings were observed, meetings at the district level were not
585 included in the original plan: it is possible that this limited our understanding at the
586 implementation level however, given the depth of information from individual interviews, it
587 is unlikely to change our findings. The framework of six sustainability actions was a useful
588 tool with which to examine whether and how the innovation could be sustained for the
589 longer term, but some co-dependence was observed between actions such that, for
590 example, positive remarks about government ownership and institutionalisation were made
591 vulnerable by financial uncertainty.

592 **Conclusion**

593 The framework of six critical actions to promote sustainability was useful in revealing where
594 progress was made and what more could be done to sustain improvements in MNH
595 outcomes and quality of care. The innovation was observed to be relatively top-down, with
596 the drive being strongest at global and national levels but with much work – and time -
597 needed to embed QCN linked activities at the sub-national level. Crucially, it was revealed
598 that the absence of deliberate action to address financial uncertainty was an obstacle to the
599 sustainability of QCN. Nevertheless, the strong progress made to institutionalize some
600 characteristics of QCN in existing government systems should be supported to avoid any
601 stalling of progress.

602 **Acknowledgment**

We would like to thank all study respondents for their invaluable participation in the overall QCN evaluation. We also appreciate the participation of the QCN Evaluation Group, made of: Fatama Khatun, Abdul Kuddus, Kishwar Azad (BADAS-PCP Bangladesh), Gladson Monjeza, Racheal Magaleta, Zabvuta Moffolo, Charles Makwenda (Parent and Child Health Initiative, Malawi), Mary Kinney, Fidele Mukinda (independent researchers, South Africa), Will Payne, Jeremy Shiffman (Johns Hopkins University, USA), Hilda Namakula, Agnes Kyamulabi (Makerere University, Uganda) Anene Tesfa, Theodros Getachew, Geremew Gonfa (Ethiopia Public Health Institute, Ethiopia).

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744

745 Supplement materials

746 S1: Text. PLOS Global Public Health QCN Evaluation Collection 2-page summary.

747 S2: Text. PLOS Global Public Health QCN papers common methods section.

748 S3: Table. Data coding and analysis matrix

749

Rebuttal letter

Vanessa Carels
Staff Editor
PLOS Global Public Health

Submission date: April 10, 2023

Dear Dr. Carels,

Thank you for inviting us to address reviewer's comments and submit a revised manuscript entitled: "Opportunities to sustain a multi-country quality of care network: lessons on the actions of four countries Bangladesh, Ethiopia, Malawi, and Uganda"
We appreciate the time and effort you and the reviewer have dedicated to providing insightful feedback. Thus, it is with great pleasure that we resubmit our article for further consideration. We have incorporated the comments and indicated the revisions we made in the manuscript. We also attached the manuscript with track change as well as the cleaned version.
The following is point by point response to the comments and questions you sent us on March 09, 2023.

Journal Requirements:

1. Please provide additional details regarding participant consent. In the ethics statement, please ensure that you have specified what type you obtained (for instance, written or verbal, and if verbal, how it was documented and witnessed). If your study included minors, state whether you obtained consent from parents or guardians. If the need for consent was waived by the ethics committee, please include this information."

Response: We have now addressed this issue in the Ethics session of the manuscript (Line number 208 & 210).

2. Please ensure that Funding Information and Financial Disclosure Statement are matched.

Response: yes, the funding information and financial disclosure statement are the same.

Edits from our side: we did some edits specifically on the naming of our sources of excerpts. In the earlier version we used short names now clearly wrote full names and replaced organization names by 'partner or government'. We have indicated those changes with track change.

Reviewer #1:

1. Why were there variations in the data collection dates and the number of times data was collected for the different countries?

Response: Thank you for pointing this out, the study in each country received ethical approval from local institution review board at different times which created different starting dates for each country. In addition, the data collection dates and the number of times data was collected was further impacted by local COVID 19 restrictions.

2. there should be an explanation. What is the rationale behind the number of participants interviewed or the number of transcripts analyzed in the member countries.

Response: The main goal of participant selection was to identify key informants with the depth of information needed to answer our research questions. The final number of participants interviewed was based on the saturation level of information we were getting from the participants. We have now included a sentence describing this in the method section, line number 155 and 173-175.

3. The 1st sustainability action states "At the global level, between countries, respondents recalled the importance of holding repeat, joint international meetings with global partners" but according to table 2 of the methods supplement, global meeting minutes were not reviewed, is this because they don't exist or is there another specific reason? In Uganda also no minutes were reviewed, why?

Response: The QCN evaluation group had access to multiple potential sources of data and care was taken to identify the best sources to answer specific research questions. As such, for the purpose of this paper, it was decided that we use the wealth of information that we collected through the qualitative interviews and nonparticipant observations.

4. There were no observations made at local/district level meetings, would it not have been critical to this study to undertake those observations at the implementation level?

Response: It is true that such observations could have been a beneficial additional data collection point and we have addressed this in the limitation section line number (601-05).

5. Regarding sustainability action 3,
It says all four countries employed various mechanisms but then only discusses one i.e small grants for health facilities what are the other types of motivating factors used and were such incentives applied in all countries, is there a quote to support that? this makes one skeptical about the all green scoring in table four for this particular theme, wouldn't you say?

Response: As described in that section, giving small grants as an incentive was one of the methods widely employed in three countries. The other method of motivation was

the training and skill transfer opportunity that was described in line 358-59. We have now added an excerpt to support our assessment (line 360-67).

6. There were missed opportunities to ask WHY and go deeper into understanding the root causes of such findings.

Response: Despite our efforts to reach saturation, we agree there might be places where we could have gone deeper: this is almost always possible with qualitative methods. Nonetheless, we believe that the rich data we gathered revealed important insights. This is a multi-country study, that involved several study sites within each country, and there is a limit to how much detail can be included. However, we did show the commonalities as well as differences pertaining to the sustainability actions across countries in our analysis.

7. How do the findings inform future program design and possibly evaluation, for instance seeing that Learning is an essential pillar of the LALA framework but this study indicated that some countries were doing good in one category and others in other categories, why did they fail to learn from one another?

Response: We are actively engaged in discussions with global and national actors to make sure that these findings have the opportunity to inform decisions. Recently there was a global meeting in Ghana (March 14-16), and the results were presented for the global audience and the research team were engaged in a fruitful dialogue during the event. Regarding the learning between countries and within, a deeper analysis was made by the research team and submitted for publication (paper two and three).

8. With the exception of Ethiopia, all countries had at least three rounds of interviews, were there any changes in the responded across time, how is that reflected in this study?

Response: We didn't fully understand this question; if it is about changes to the respondents over time, at each round we went to the same facilities and engaged the same staff but we also interviewed new people where staff changes meant that new key informants could be identified. Similarly, at the national level, we identified the main QCN actors and followed-up with them in subsequent rounds, as well as any new important national actors that had joined the network in the meantime. In our analysis, we used data from all rounds, including in Ethiopia where we had two iterative rounds of data collection and as a result were able to see how things changed over time.

Again, thank you for the detailed and valuable comment. I hope this revision satisfactorily address all the concerns you and the reviewer have raised.

Sincerely,

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