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Research Article

Improving access to appropriate case management for common childhood illnesses in hard-to-reach areas of Abia State, Nigeria

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Background

Studies have demonstrated that trained community health workers can improve access to quality health services for under five children. Under the World Health Organization's Rapid Access Expansion Progamme, integrated community case management of childhood illnesses (iCCM) was introduced in Abia and Niger States, Nigeria in 2013. The objective of the program was to increase the number of children 2-59 months receiving quality life-saving treatment for malaria, pneumonia and diarrhoea by extending case management through community-oriented resource persons (CORPs). We present findings from household surveys comparing baseline and endline data to assess changes in sick child care-seeking, assessment, and treatment coverage provided over the project period in Abia State.

Methods

A baseline household survey was conducted in May 2014 and an endline survey in February 2017. The surveys used multi-stage cluster sampling of primary caregivers of children aged 2-59 months who had been recently sick with diarrhoea, fever, or cough with difficult breathing.

Results

Care-seeking from an appropriate provider improved significantly from 69% at baseline to 77% at endline (P<0.01). At baseline, patent and proprietary medicine vendors (PPMVs) (55%) and health centers (34%) were the main providers of care for iCCM services; by endline, CORPs became the main source (48%), followed by PPMVs (36%) and health centers (25%).

Conclusions

Overall, the findings demonstrate improvements in care-seeking. Care-seeking practices shifted over the course of the project, with more caregivers seeking care from CORPs by the end of the project. The findings suggest that scaling up iCCM in Nigeria may improve access to appropriate treatment for under five children living in hard-to-reach areas.

The United Nations Inter-agency Group for Child Mortality Estimation (UN-IGME) reported that globally there were approximately 5.6 million deaths of children under five years in 2016. Over 25% of those deaths were attributed to diarrheoa (8%), malaria (5%) and pneumonia (13%)[1]; these are diseases that are preventable and relatively simple to treat. Sub-Saharan Africa has the greatest burden of child mortality, with the highest number of under-five deaths occurring in Nigeria.[1] According to the 2013 Nigeria Demographic Health Survey about one in every eight children in Nigeria died before their fifth birthday—around 21 times the average rate in developed countries.[2]

The World Health Organization – United Nations Children's Fund (WHO–UNICEF) Joint statement on integrated community case management (iCCM), supports iCCM as an equity-focused strategy to improve access to essential treatment services for children under the age of five.[3] The strategy targets treatable diseases that are the main causes of childhood deaths in low and middle-income countries – pneumonia, diarrheoa, malaria and malnutrition, using available efficacious treatment. This involves administration of oral antibiotics for pneumonia, zinc and low osmolarity oral rehydration salts (ORS) for diarrheoa and artemisinin-combination therapy for malaria by community health workers (CHWs).[4,5]

In November 2013, the WHO Rapid Access Expansion Programme (RAcE) was launched in Nigeria.[6] The program, which pioneered iCCM in the country, supported Abia and Niger States to train and deploy community health workers (CHWs) referred as community-oriented resource persons (CORPs), in underserved hard-to-reach communities of the states. The iCCM programme in Abia State targeted children under five years of age across hard-to-reach communities in 15 out of 17 local government areas (LGAs). We present the results of the changes in care-seeking, diagnostic and treatment coverage, after the introduction of iCCM in Abia state.

METHODS

STUDY SETTING

Abia State is in the south eastern region of Nigeria. The state had an estimated population of 3.7 million in 2016. The population is predominantly rural (70%), with the agricultural sector employing a good proportion of the state's workforce.[7]

The State Ministry of Health (SMOH) provides overall direction for the health services in the state and is responsible for health staff development and organization; and implementation of secondary health care. The SMOH, through the Abia State Primary Health Care Development Agency (SPHCDA), provides policies and guidelines for primary health care service delivery and supervises its implementation in the 17 LGAs in the state. The primary health care (PHC) system provides basic health services and is often the only source of health care available to persons living in the rural areas. However, over the years, issues of equity and disparity between disease burden and health expenditure have led to sub-optimal utilization of the PHC system. To this end, the SPHCDA was established to improve access and quality of care provided at the PHC level. The SPHCDA, whose mandate is to also provide community health services, led the iCCM programme with support from Society for Family Health (SFH), Nigeria. Using the national iCCM guideline, the iCCM programme was implemented in hard-to-reach areas, defined as areas outside the five-kilometer radius of a functioning primary healthcare center that has road accessibility, 24-hour health service provision, and adequate availability of human resources and medical supplies in 15 of 17 LGAs in Abia State.

After the baseline survey, CORPs were selected by community members and members of ward development committee based on the national criteria for CORPs selection.[8] The selected CORPs received a six-day training in iCCM at the Primary Health Centers (PHCs). The national MOH approved iCCM curriculum was used for training the CORPs. The Nigeria iCCM curriculum has been adopted from the WHO "Caring for sick child in the community" training. The CORPs training comprised of didactic and clinical sessions. The clinical sessions, comprise assessment, classification and treatment of malaria, diarrheoa, and pneumonia, screening and referral of children with severe acute malnutrition, and severe illnesses. Following the training, CORPs were provided with medicines- artemisinin-based combination therapy (ACT) for malaria, oral amoxicillin for pneumonia and ORS and zinc for diarrhoea, diagnostics – Rapid Diagnostic Test for malaria and respiratory rate timers for pneumonia and recording and reporting tools and deployed to their respective communities. The CORPs were supervised and mentored by community health extension workers (CHEWs) based at the PHCs. The CHEWs were supervised by LGA iCCM focal persons, who are trained nurses. At the time of the endline survey 1,251 iCCM-trained CORPs were active out of the 1,351 trained at the start of the programme.

CASE DEFINITION

CARE SEEKING

Defined as seeking care for malaria, diarrhoea and pneumonia from an appropriate provider, including community-oriented resource person. An appropriate provider was defined as seeking care from a public or private health facilities, a community-oriented resource person, or proprietary and patent medicine vendors.

ASSESSMENT/DIAGNOSIS

Children presenting with fever were tested and diagnosed using a Rapid Diagnostic Test for malaria by a CORP. To assess for fast breathing pneumonia, children with cough/difficult or rapid breathing had their respiratory rate counted by a CORP for one minute using a respiratory rate counting timer. Cases with respiratory rate above the WHO age-specific cut-off point were classified as fast-breathing or pneumonia. (50 breaths or more per minute in a child age 2 months up to 12 months and 40 breaths or more per minute in a child age 12 months up to 5 years are considered fast breathing).

TREATMENT

Children between 6-59 months with a positive RDT for malaria receive artemether-lumefantrine (AL). Children with fast-breathing pneumonia were treated with amoxicillin dispersible tablet. Children aged 2-59 months presenting with diarrhoea were treated with ORS and zinc.

STUDY DESIGN AND SAMPLING

HOUSEHOLD SURVEYS

Baseline and endline cross-sectional cluster-based household surveys were conducted in the iCCM programme areas at the start of the project in May-June 2014 and in February 2017. The aim of the household surveys was to assess changes in sick child care-seeking, assessment, and treatment coverage as well as caregivers' knowledge of childhood illnesses and perceptions of CORP services over the project period. The surveys interviewed primary caregivers of children age 2-59 months who had been sick with diarrhoea, fever, or cough with difficult or fast breathing in the two weeks prior to the survey. Information on background characteristics of the caregivers and children, and care-seeking, assessment, and treatment for the three illnesses was collected.

A 30x30 multi-stage cluster sampling methodology was used for both surveys. Thirty clusters were selected using probability proportional to size. Within each cluster, 10 interviews were conducted for each of the three illnesses (diarrhoea, fever, or cough with difficult or fast breathing) for a total of 30 interviews per cluster. Due to some changes in the project areas between the baseline and endline surveys, the clusters were redrawn at endline with an updated sampling frame that only included communities where the project was implemented.

DATA MANAGEMENT

Data collection for the baseline household survey was completed between May and June 2014 and for the endline household survey in February 2017. All survey team members were trained prior to the conduct of the surveys. The trainings included a pre-test of the survey instruments in one of the LGAs. For the household surveys, written informed consent was sought from each respondent prior to the administration of the questionnaire.

The household survey data were collected using paper questionnaires and entered into a CSPro database developed by the U.S. Census Bureau and ICF International with funding from U.S. Agency for International Development USA. Data were double-entered and checked for consistency. Any discrepancies were checked and resolved.

DATA ANALYSIS

Survey data were analyzed using Stata version 14. Frequency estimates and 95% confidence intervals were calculated for all household survey indicators collected. Estimates were adjusted for cluster effects. Pearson's chi-square test was computed to assess significant changes between baseline and endline indicator estimates.

ETHICAL APPROVAL

The household survey protocol was reviewed and approved by the ICF Institutional Review Board and from the National Health Research Ethics Committee in Nigeria.

RESULTS

CHARACTERISTICS OF SICK CHILDREN AND CAREGIVERS

At baseline and endline, there was an equal representation of sick children by sex and an even distribution across the age groups (Table 1). The most commonly reported illness at both baseline and endline was fever (66.0% and 74.3%, respectively). There was a higher report of all three illnesses at endline compared to baseline. Majority of caregivers were between the age 25-34 (just under 50% in both surveys), had a secondary or higher level of education (68.7% and 75.5% at baseline and endline, respectively), and were currently married or living with a partner as if married (just under 90% in both surveys) (Table 2). Overall, the characteristics of the sick children and caregivers were similar across the baseline and endline household surveys.

CAREGIVER KNOWLEDGE OF ILLNESSES

Caregiver knowledge of two or more childhood illness danger signs increased significantly, from 65% at baseline to 78% at endline ($P<0.01$) (Table 3). Knowledge on the cause and signs and symptoms of malaria, however, remained relatively stable between baseline and endline, at around 70% at baseline and slightly under 70% at endline. Caregiver knowledge of correct malaria treatment (artemisinin-based combination therapy [ACT]) improved significantly between baseline and endline, increasing from 30% at baseline to 54% at endline ($P<0.0001$). Caregiver knowledge of correct diarrhoea treatment (oral rehydration solution [ORS] and zinc) also increased significantly, from 1% at baseline to 25% at endline ($P<0.0001$).

CAREGIVER PERCEPTIONS OF ICCM-TRAINED CORP

Overall, most caregivers had good perceptions of the CORPs working in their community by endline, with more than 80% of caregivers reporting that they viewed the CORP as a trusted health care provider, that CORPs provide quality services, and that CORPs are a convenient source of treatment. In addition, at endline, 88% of caregivers reported that they found the CORP at their first visit, demonstrating high accessibility (Table 4).

CARE-SEEKING FOR FEVER, DIARRHOEA, AND COUGH WITH DIFFICULT OR FAST BREATHING

Overall, care-seeking from an appropriate provider, defined as seeking care from a public or private health facilities, a community-oriented resource person, or proprietary and patent medicine vendors increased over the course of the RAcE project from 68.7% to 76.8% ($P<0.01$); primarily due to increases in care-seeking for children with diarrhoea ($P<0.05$) and children with cough with difficult or fast breathing ($P<0.0001$) (Table 5). Source of care-seeking shifted substantially over the project period; with more caregivers selecting to seek care from CORPs in their communities by endline (48.1%) and fewer seeking care from hospitals (10.8% at baseline to 6.6% at endline), health centers (decreased from 34.0% to 24.8%) and propriety and patent medicine vendors (decreased from 55.1% to 36.2%).

ASSESSMENT OF SICK CHILDREN

The percentage of children with fever in the two weeks preceding the survey who had blood drawn (proxy measure for receipt of an RDT) increased from 9.3% at baseline to 41.0% at endline ($P<0.0001$) (Table 6). Among the children with fever that had a blood test, the percentage of caregivers that received the result of the test also improved from 72.2% at baseline to 90.3% at endline ($P<0.01$). Among the children with fever for which care was sought from a CORP, 77.3% had blood drawn at endline and 93.8% of caregivers reported having received the result of the test. A similar increase was also observed in assessment of cough with difficult or fast breathing; improving from 21.2% to 42.8% over the project period (Table 6). Among the children with of cough with difficult or fast breathing for which care was

Table 1. Characteristics of sick children from household surveys at baseline and endline

Characteristic	Baseline	Endline
Sex (%):		
Female	50.9	50.8
Age (months, %):		
2-11	21.5	18.9
12-23	17.6	17.4
24-35	22.2	18.8
36-47	17.9	20.3
48-59	20.8	24.6
Two-week history of illness (%):		
Had fever	66.0	74.3
Had diarrhoea	45.1	58.9
Had cough with difficult or fast breathing	49.9	62.8
Total number of sick children in survey	585	506
Cases of illness among sick children (number):		
Fever	386	376
Diarrhoea	264	298
Cough with difficult or fast breathing	292	318
Total number of sick child cases	942	992

Table 2. Characteristics of caregivers of sick children from household surveys at baseline and endline

Characteristic	Baseline (%)	Endline (%)
Age (years):		
15-24	19.7	18.8
25-34	49.9	46.6
35-44	22.7	25.1
45+	7.7	9.5
Education level:		
None	6.7	4.4
Primary	24.6	20.2
Secondary or higher	68.7	75.5
Marital status:		
Currently married or living with partner as if married	88.7	86.8
Not in union	11.3	13.2
Total number of caregivers (n):	585	506

Table 3. Caregiver knowledge of childhood illnesses

Indicator	Baseline % (95% CI)	Endline % (95% CI)	*P*-value	Baseline N	Endline N
Knows 2+ child illness danger signs	65.3 (60.3-70.0)	77.5 (70.3-83.3)	0.0044	**585**	**506**
Knows cause of malaria	69.2 (64.8-73.4)	70.8 (65.3-75.7)	0.6795	**585**	**506**
Knows malaria signs and symptoms	62.7 (56.3-68.8)	68.6 (62.2-74.3)	0.1413	**585**	**506**
Knows malaria treatment	30.1 (24.7-36.1)	53.6 (46.5-60.5)	0.0000	**585**	**506**
Knows diarrhoea treatment	0.7 (0.2-2.2)	25.1 (20.3-30.6)	0.0000	**585**	**506**

CI – confidence interval

Table 4. Caregiver perceptions of CORPs

Indicator	Baseline % (95% CI)	Endline % (95% CI)	*P*-value	Baseline N	Endline N
View CORPs as trusted health care providers	na	82.8 (77.7-86.9)	na	12	331
Believe CORPs provide quality services	na	84.0 (77.5-88.9)	na	12	331
Found the CORP at first visit	na	87.8 (82.3-91.8)	na	2	230
Cite the CORP as a convenient source of treatment	na	88.2 (82.4-92.3)	na	12	331
View CORPs as trusted health care providers	na	82.8 (77.7-86.9)	na	12	331

CORP – community-oriented resource person, CI – confidence interval, na – not applicable

Table 5. Care-seeking from an appropriate provider* and by specific source of care sought

	Baseline % (95% CI)	Endline % (95% CI)	*P*-value	Baseline N	Endline N
Care-seeking from an appropriate provider:					
Overall	68.7 (4.5-72.6)	76.8 (71.8-81.2)	0.0032	942	992
Fever	86.0 (81.5-89.6)	84.0 (79.1-88.0)	0.4721	386	376
Diarrhoea	74.2 (68.3-79.4)	81.9 (76.6-86.2)	0.0172	264	298
Cough with difficult or fast breathing	40.8 (34.4-47.4)	63.5 (56.1-70.3)	<0.0001	292	318
Care-seeking by source of care (all illnesses):					
Hospital	10.8 (8.2-14.0)	6.6 (4.5-9.6)	0.0389		
Health center	34.0 (26.9-42.0)	24.8 (19.8-30.5)	0.0753		
Health clinic or post	2.9 (1.6-4.9)	1.5 (0.8-3.0)	0.1476		
CORP	0.0	48.1 (38.5-57.9)	<0.0001	808	852
Traditional practitioner	1.0 (0.4-2.6)	0.7 (0.3-1.7)	0.6307		
Propriety and patent medicine vendor (PPMV)	55.1 (47.9-62.0)	36.2 (29.9-42.9)	0.0001		
Pharmacy	2.4 (1.3-4.1)	4.5 (2.5-7.8)	0.1112		
Other	6.0 (4.1-8.6)	4.8 (3.2-7.3)	0.3617		

CI – confidence interval, CORP – community-oriented resource person
*****Appropriate provider included seeking care from a public or private health facilities, a CORP, and PPMV.

sought from a CORP, 70.1% had their respiratory rate assessed at endline.

TREATMENT COVERAGE

Receipt of treatment among all cases of confirmed malaria (fever cases that had a positive RDT), diarrhoea, and cough with difficult or fast breathing increased significantly between baseline and endline (Table 7). Among confirmed malaria cases, receipt of ACT within 2 days increased from 25.0% to 66.9% ($P<0.01$) over the project period. Among confirmed malaria, diarrhoea, and cough with difficult or fast breathing cases for which care was sought from a CORP, 69.8%, 64.7%, and 66.1%, respectively received the appropriate treatment (ACT within 2 days, ORS and zinc, and amoxicillin, respectively) from a CORP at endline.

Among the children who sought care from a CORP for the three illnesses at endline, 62.3% received the first dose of treatment in the presence of a CORP, 98.4% of caregivers received counseling on how to administer the treatment (among children who received treatment), and 69.8% of children received a follow-up visit from the CORP (Table 8). Provision of the first dose of treatment, counseling, or follow-up visits by a CORP was similar across all illnesses.

Table 6. Assessment coverage among children with fever and with cough and difficult or fast breathing for all providers and for care sought by CORP

Indicator	Baseline % (95% CI)	Endline % (95% CI)	*P*-value	Baseline N	Endline N
All fever cases					
Child had blood drawn	9.3 (6.3-13.6)	41.0 (32.2-50.4)	<0.0001	386	376
Caregiver received result of blood test	72.2 (51.9-86.3)	90.3 (84.5-94.1)	0.0031	36	154
Fever cases in which care was sought from CORP:					
Child had blood drawn	0.0	77.3 (68.7-84.0)	na	0	167
Caregiver received result of blood test	0.0	93.8 (86.1-97.4)	na	0	129
All cough with difficult or fast breathing cases:					
Respiratory rate assessed	21.2 (15.6-28.2)	42.8 (34.9-51.0)	0.0001	292	318
All cough with difficult or fast breathing cases in which care was sought from a CORP					
Respiratory rate assessed	0.0	70.1 (59.5-78.9)	na	0	127

na – not applicable, CI – confidence interval, CORP – community-oriented resource person

Table 7. Treatment coverage among children with confirmed malaria, diarrhoea, and cough with difficult or fast breathing for all providers and for care sought by CORP

	Baseline % (95% CI)	Endline % (95% CI)	*P*-value	Baseline N	Endline N
Received treatment from any provider:					
Confirmed malaria received ACT	41.7 (15.9-72.9)	90.2 (82.7-94.7)	0.0003	24	133
Confirmed malaria received ACT within 2 days	25.0 (9.6-51.0)	66.9 (60.1-73.1)	0.0016	24	133
Diarrhoea case received ORS and zinc	6.4 (3.7-11.0)	35.2 (27.9-43.4)	<0.0001	264	298
Cough with difficult or fast breathing received amoxicillin	8.6 (5.3-13.6)	35.5 (28.3-43.5)	<0.0001	292	318
Overall (received treatment across all three illnesses) *	8.3 (6.1-11.1)	41.0 (35.2-47.0)	<0.0001	580	749
Received treatment among those that sought care from a CORP:					
Confirmed malaria received ACT	0.0	93.1 (85.5-96.9)	na	0	116
Confirmed malaria received ACT within 2 days	0.0	69.8 (61.3-77.2)	na	0	116
Diarrhoea case received ORS and zinc	0.0	64.7 (53.0-74.8)	na	0	116
Cough with difficult or fast breathing received amoxicillin	0.0	66.1 (56.0-75.0)	na	0	127
Overall (received treatment across all three illnesses) *	0.0	66.1 (60.8-71.1)	na	0	365

ACT – artemisinin-based combination therapy, na – not applicable, ORS – oral rehydration salts, CORP – community-oriented resource person
*The overall indicator was calculated to include the percentage of children with confirmed malaria that received an ACT within two days, children with diarrhoea that received ORS and zinc, and children with cough with difficult or fast breathing that received amoxicillin.

Table 8. Characteristics of the provision of treatment by CORP at endline, across all illnesses

Illness (treatment received)	First dose of treatment received in presence of CORP	Caregiver counseled on treatment administration	CORP conducted follow-up visit with sick child	Endline N
Fever (ACT)	59.2 (49.5-68.1)	99.3 (94.9-99.9)	71.9 (62.2-79.9)	97
Diarrhoea (ORS and zinc)	64.6 (54.1-73.8)	98.7 (90.6-99.8)	69.0 (57.7-78.4)	79
Cough with difficult or fast breathing (amoxicillin)	65.5 (50.4-78.0)	96.4 (89.3-98.9)	67.7 (60.0-74.5)	84
Overall for all three illnesses	62.3 (53.6-70.3)	98.4 (96.1-99.3)	69.8 (61.7-76.8)	305

ORS – oral rehydration salts, ACT – artemisinin-based combination therapy, CORP - community-oriented resource person

DISCUSSION

This study examined changes in coverage of care-seeking and diagnostic and treatment services for diarrhoea, malaria, and pneumonia over the course of iCCM implementation in Abia state. The results demonstrate substantial improvements in access to appropriate case management of childhood illness between 2013 and 2017. Our results showed that in areas with access to iCCM, CORPs were the main source of care. Overall, care-seeking practices shifted over the course of the project, with more caregivers choosing to access care from a CORP by endline and less seeking care from PPMVs. The observed shift is likely due to proximity of caregivers to the CORPs, perceived quality and cost-savings, as PPMVs charge money for treatment, whereas treatment is provided free of charge by the CORPs. Several studies also have shown lower or sub-standard quality care provided by PPMVs; thus, perceived lower quality of care may also have influenced the shift away from PPMVs to CORPs.[9–13]

Overall, caregivers also had good perceptions of the CORP working in their communities, with more than 80% reporting that they view the CORPs as trusted health care providers, that CORPs provide quality services, and that CORPs are a convenient source of treatment. Caregiver knowledge of child illness danger signs and knowledge of the correct treatment for malaria and diarrhoea all improved significantly between baseline and endline in the project areas.

Improvements in the appropriate assessment of children with fever and cough with difficult breathing were also observed over the RAcE project period, with higher coverage observed of administration of RDTs to assess for malaria and respiratory rate counting to assess for pneumonia among CORPs compared to coverage among all providers. Significant improvements in treatment coverage across all iCCM illnesses were also observed; with similarly higher coverage of appropriate treatment provided by CORPs compared to coverage among all providers. Of all iCCM illnesses, coverage of ACT treatment for confirmed malaria experienced the greatest improvement over the project period; though coverage of timely ACT treatment (within 24 hours) was lower among both CORPs and all providers. This signifies that greater efforts to enhance community awareness of the importance of early care seeking for febrile illness in children and the availability of trained and adequately supplied CORPs are needed to improve timely care-seeking. Our results provide evidence that well-supported CORPs can provide iCCM services consistent with country iCCM protocols. Other studies have demonstrated similar results to ours, indicating that when CHWs are trained and equipped, they can positively influence care-seeking behavior and improve access to appropriate treatment of common childhood illnesses, especially in hard-to-reach areas across sub-Saharan Africa.[14–21]

While substantial increases were observed in care-seeking and appropriate case management of childhood illnesses over the life of the RAcE project; the results indicate that there are still areas for further improvement. Providing refresher trainings to CHWs and regular supervision and mentorship, ensuring CHWs have commodities, and providing recognition and other incentives to CHWs are strategies that have been shown to help improve the appropriate care provided by CHWs and their overall satisfaction and motivation for the work they do.[22–25] When CHWs are well-trained, supplied, and supervised, they can increase access to prompt and appropriate treatment of preventable childhood illnesses.[22,26–28] These findings also highlight the importance of supporting CHWs as results were achieved within a well-supported iCCM program.

There are a few survey limitations to note. First, the survey findings are representative of the project areas as a whole; the survey was not powered to provide lower sub-national-level estimates (eg, at the LGA level), and therefore we are not able to report on any differences in coverage across the project areas. Second, some programme areas changed from the initially selected areas at the start of the programme in Abia. These changes caused us to have to re-draw the sample for the endline household survey, rather than using the same selected clusters for the baseline survey. Despite these changes, we do not believe this effected the results or the comparability of the baseline and endline surveys, as CORPs had not yet been operating in the programme areas at baseline and the initially selected areas were very similar in sociodemographic characteristics as the final selected areas for the programme. Last, there are known potential biases and limitations with the indicators that assess caregiver recall of malaria diagnostic testing and coverage of appropriate treatment for children with fever and cough with difficult or fast breathing.

CONCLUSIONS

The study results demonstrate that CHWs improve access to treatment of diarrhoea, malaria and pneumonia among children under five living in communities located far from health facilities. Across the implementation sites, they provided appropriate treatment and reduced caregiver dependence on non-quality alternatives in the communities. The health system in Nigeria is plagued with acute shortages in healthcare personnel and long distances to health facilities. The availability of CORPs can help address health access issues, especially in the rural areas, and support the Nigeria's policy goal to meet the universal health coverage and the health needs of the Nigerian population.

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DISCLAIMER

The content of this publication is solely the responsibility of the authors and does not necessarily reflect the views or policies of World Health Organization or Global Affairs Canada.

ETHICS APPROVAL

For each household survey, ethical approval was obtained from ICF's Institutional Review Board and the Nigerian National Health Research Ethics Committee.

COMPETING INTERESTS

The authors have completed the Unified Competing Interest form at http://www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declare no conflicts of interest.

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