USAID
FROM THE AMERICAN PEOPLE

FINAL EVALUATION REPORT

PARTNERSHIP FOR THE COMMUNITY MANAGEMENT OF CHILD HEALTH/PARTENARIAT POUR LA PRISE EN CHARGE COMMUNAUTAIRE DE LA SANTÉ INFANTILE (PRISE-C)

Benin, Health Zones of:

Allada/Ze/Toffo (AZT)

Dassa/Glazoue (DAGLA)

Save/Ouesse (SAO)

December 2014

This publication was produced at the request of the United States Agency for International Development. It was prepared independently by Renée Fiorentino with the support of Marthe Akogbeto, PRISE-C Director; Ramzia Akonde, PRISE-C Child Health and M&E Advisor; and Sara Riese, PRISE-C Technical Advisor.

Acknowledgements

The author wishes to acknowledge the Government of Benin and USAID for their commitment not only to decentralized heath care services, but to the evaluation and continuous improvement of them. Thank you to the representatives of each entity and to the community health care and formal heath sector workers in the regions of Allada/Ze/Toffo (AZT), Dassa/Glazoue (DAGLA), Save/Ouesse (SAO) who made time to speak to me about the PRISE-C program.

FINAL EVALUATION REPORT

PARTNERSHIP FOR THE COMMUNITY MANAGEMENT OF CHILD HEALTH/PARTENARIAT POUR LA PRISE EN CHARGE COMMUNAUTAIRE DE LA SANTÉ INFANTILE (PRISE-C)

Benin, Health Zones of:

Allada/Ze/Toffo (AZT)

Dassa/Glazoue (DAGLA)

Save/Ouesse (SAO)

December 29, 2014

Project Duration: September 30, 2010 – September 29, 2014

Cooperative Agreement Number: AID-OAA-A-10-00047-00

CONTENTS

Contents 4

Acronyms 5

Evaluation Purpose and Evaluation Questions 9

- Evaluation Purpose 9
- Evaluation Questions 9

Project Background 9

Evaluation Methods and Limitations 15

- Findings 19
- Conclusions 28
- Recommendations 31

Annexes 32

- Annex I. List of Publications and Presentations Related to the Project 33
- Annex II. Project Management Evaluation 34
- Annex III. Work Plan Table 35
- Annex IV. RapidCATCH Indicator Table 38
- Annex V. Final Knowledge, Practice, and Coverage Survey Report 40
- Annex VI. Community Health Worker Training Matrix 41
- Annex VII. Evaluation Scope of Work 42
- Annex VIII. Evaluation Methods/Data Source Mapping 48
- Annex IX. Data Collection Instruments 50
- Annex X. Sources of Information 56
- Annex XI. Disclosure of Any Conflicts of Interest 58
- Annex XII. Statement of Differences 60
- Annex XIII. Evaluation Team Members, Roles, and Their Titles 61
- Annex XIV. Final Operations Research Report 63
- Annex XV. Operations Research Brief 97
- Annex XVI. Stakeholder Debrief Powerpoint Presentation 98
- Annex XVII. Project Data Form 120
- Annex XVIII. PRISE-C Performance Monitoring Plan 121

ACRONYMS

ACT	Arteminisin-based combination therapy
ARI	Acute respiratory infection
AZT	Allada/Zè/Toffo health zone
CEID	Centre d'Expertise d'Ingenierie pour le Developpment Durable
CHW	Community health worker
CHS	Center for Human Services
C-IMCI	Community Integrated Management of Child Illnesses
CSHGP	Child Survival and Health Grants Program
DAGLA	Dassa/Glazoué health zone
DIP	Detailed implementation plan
FCFA	Communauté Financiere Africaine
FGD	Focus group discussion
HIIP-COM	High-impact intervention package for community
HMIS	Health management information system
ITN	Insecticide-treated mosquito net
KII	Key informant interview
KPC	Knowledge, practice, and coverage
LEADD	Leadership & Development research firm
MCHIP	Maternal and Child Health Integrated Program
MoH	Ministry of Health
OR	Operations research
ORS	Oral rehydration solution
PILP	Projet d'Intensification de la Lutte Contre le Paludisme
PISAF	Projet Intégré de Santé Familiale
PMP	Performance monitoring plan
PRISE-C	Partenariat pour la Prise en Charge Communautaire de la Santé Infantile
PROMUSAF	Promotion des Mutuelles de Santé en Afrique
QC	Quality collaborative
QIT	Quality improvement team
RAMU	Régime d'Assurance Maladie Universelle
RAS	Réseau Alliance Santé
SAO	Save/Ouesse health zone
SOW	Scope of work
TT	Tetanus toxoid vaccination
USAID	U.S. Agency for International Development
VHC	Village health committee

The Community Health Worker of Ahokpogon displays her stock of medical supplies during an education session

- **Evidence of project contribution to accelerated delivery of proven, low cost maternal and child health interventions by strengthening community health delivery systems**
- **Community engagement (as defined by the project) achieved**
- **Demand for community prevention and curative services is evident, but not well captured by PMP indicators**
- **Strong evidence that QI approach contributed to increased CHW performance**
- **Resolute attempts on the part of the project to facilitate sustainability were optimistic in the health sector context in Benin**

USAID FROM THE AMERICAN PEOPLE

CHS CENTER FOR HUMAN SERVICES

PRISE-C FINAL EVALUATION Report - Executive Summary

This project was funded by the U.S. Agency for International Development through the Child Survival and Health Grants Program.

December 2014

Evaluation, Purpose, and Evaluation Questions

The final evaluation of the Partnership for Community Child Survival (PRISE-C) was conceived as both a performance and a process evaluation. It serves as a source of evidence to help inform decisions about future program designs and policies including in-country partners at national, regional, and local levels (e.g., the Ministry of Health (MoH) of Benin, other relevant ministries, district health team, local organizations, communities in project areas, U.S. Agency for International Development (USAID) (Child Survival and Health Grants Program [CSHGP], Global Health Bureau, USAID Missions), other CSHGP grantees, and the international global health community at large.

The evaluation explores the extent to which the assumed causal pathways between the project's outcome objectives and its activities are sound and whether or not activities yielded the intended outcomes. It sought to identify bottlenecks and constraints experienced in pursuit of the outcomes and to provide an opportunity for project stakeholders to take stock of accomplishments and lessons learned to date.

The final evaluation sought to answer the following questions:

1. To what extent did the project accomplish and/or contribute to the results (goals/objectives) stated in the Detailed Implementation Plan (DIP)?
2. What were the key strategies and factors, including management issues, that contributed to what worked or did not work?
3. Which elements of the project have been or are likely to be sustained or expanded through the Beninese MoH (e.g., through institutionalization or policies)?
4. What are stakeholder perspectives on the OR implementation, and how did the OR study affect capacity, practices, and policy?

Project Background

In 2010, Benin's under-5 mortality was estimated to be 121 per 1000 live births, down from 184 in 1990, but far from the country's 2015 Millennium Development Goal of 64. Malaria remains the leading cause of hospitalization and death for children under 5, with pneumonia and diarrhea not far behind. Since 1999 the Government of Benin (GoB) has been following the Integrated Management of Childhood Illness (IMCI) strategy in an attempt to overcome these child-health challenges. More recently, the community-level portion of this strategy, Community Integrated Management of Childhood Illness (C-IMCI), was adapted to the Benin context in an effort to intensify and accelerate progress

Community Health Workers (CHWs) have been in place in Benin for over 20 years, yet their effectiveness has been difficult to demonstrate. In late 2010, the Center for Human Services (CHS) was awarded a 1.7m USD (with 25% partner match) innovation category grant by USAID's CSHGP. The grant funded implementation of the PRISE-C, a project designed to accelerate and sustain the delivery of proven, low-cost child and maternal health interventions between October 2010 and September 2014, in three of the thirty-four health zones of Benin: Allada/Ze/Toffo (AZT); Dassa/Glazoue (DAGLA); and Save/Ouesse (SAO). CHWs were the agents through which this accelerated delivery was to take place, according to the MoH's high-impact interventions package for community (HIIP- Com) guidelines.

PRISE-C's intermediate results are aligned with the Benin MoH directives and guidance on health services and care at the community-level. The overall goal of the innovation category grant is to contribute to improvements in maternal and child health outcomes in three health zones: AZT, DAGLA and SAO. To achieve this goal, the project's strategic objective was to accelerate delivery of proven, low cost maternal and child health interventions by strengthening community health delivery systems. The associated intermediate objectives were to increase community engagement with the community health delivery system, increase demand for community curative and preventive services, and strengthen the performance and sustainability of community health services

Evaluation Design, Methods, and Limitations

A mixed-methods approach was taken, in which desk review of existing data sources was complemented with supplemental key informant interviews (KIIs) and focus group discussions (FGDs), resulting in a balance of quantitative and qualitative data. Primary data sources included existing project documents and reports (DIP; Y1 and Y3 annual reports; mid term evaluation Report; baseline and end-line household-level knowledge, practice, and coverage (KPC) survey reports; operations research (OR) protocol and final report; and multiple routine monitoring and supervision reports).

In-depth qualitative interviews were conducted with 33 project stakeholders including project staff, MoH representatives, district health team members, community- and facility-based health workers, community members, and community leaders. Four FGDs were conducted with mothers of children under 5 years old in their communities. Women were recruited by the CHW based on their availability and willingness to participate.

As an OR Project, PRISE-C generated enormous amounts of data. The quality of quantitative and qualitative data in these existing sources was assessed to the extent possible to facilitate interpretation, and data sources included were varied and multiple. Limitations to the program reports included the project's effort to harmonize its Performance Monitoring Plan (PMP) with national level indicators leading to a very ambitious number of indicators, some of which were ill-suited to the level and periodicity at which they were collected. In addition, indicator definition refinements made to improve validity potentially caused confusion amongst project stakeholders. Sampling of the baseline and end-line household-level KPC was done by cluster sampling the entire health zones rather than focusing on intervention villages. Indicators with tenuous links to program activities were included in these surveys. The challenges to the OR were both intervention-related and design/data availability-related. Intervention-related limitations included discontinuation of certain intervention activities, such as group supervision, and the essentially voluntary nature of CHW work in Benin. On the research design/data availability side, the performance scores the primary outcome analysis is based on are potentially inflated, as precision of the percentages on which they are based decreases with small samples, and the research was ultimately unable to link CHW performance with health outcomes. The supplemental qualitative data collection was carried out post-hoc, in August 2014, after project activities had ended for the most part and was limited to a convenience sample of who was available during one in-country visit.

Findings and Conclusions

PRISE-C's overarching strategic objective was to accelerate delivery of proven low-cost MCH interventions. Given the paucity of resources within the health sector in Benin, PRISE-C did accelerate delivery of some of the core C-IMCI interventions in its intervention areas by serving as the partner agency/delivery mechanism in the villages in which it worked. Stakeholders spoken to in interviews and focus groups during supplemental qualitative data collection were nearly unanimous in stating "decreased infant sickness" as the primary achievement of the project. This achievement was due to less need to travel for treatment for common childhood illnesses, as well as accompaniment and help from the CHW and/or the larger community when a referral to a health center was needed.

The project's Intermediate Result 1, community engagement with the community health-delivery system, as defined by PRISE-C, was achieved, with 89 (100%) villages having a complete village health committee (VHC) and a health work plan (at both project mid-term and end-line, up from zero at baseline). The percent of villages with community representation of at least 75% at monthly CHW meetings increased progressively across the life of the project (61.5% at baseline, 75.6% at project mid-term and 100% at end-line).

The evidence on the project's Intermediate Result 2, demand for community-level preventive and curative services, is mixed. Qualitative data from beneficiaries unanimously underscores the value of not having to travel for services that can be delivered closer to home, which is well-appreciated by communities, CHWs and formal health sector health workers. The baseline/end-line household-level KPC survey data raise more questions than they answer, given the sampling strategy employed and the small area of overlap between the routinely tracked indicators and the rapid catch indicators. Analysis of indicators, such as use of ANC and skilled attendance at birth from the randomly selected sample of 90 villages, yield results that are difficult to interpret, as activities related to these maternal health outcomes are explicit in neither the GoB's HIIP-Com nor any of PRISE-C's annual work plans. Program reports and supplemental data indicate that hygiene messages appear to have taken hold quite well, a particularly encouraging finding, given the increased attention in the sub-region (and across the world) to community-based infection prevention in the context of the current Ebola epidemic.

The project's Intermediate Result 3, strengthened performance and sustainability of community health-delivery systems, combines two very distinct concepts- performance and sustainability. Findings from the routine data, the OR and the supplemental qualitative data coincide to demonstrate increased performance where intervention was the most intensive from PRISE-C, but evidence is inconclusive regarding sustainability.

Regarding performance, the overall >50% contribution to under-5 treatment of malaria, diarrhea, and acute respiratory infection (ARI) clearly illustrate PRISE-C's success. These indicators show facets of CHW performance and demand for the C-IMCI cornerstones. Preliminary results of the OR conclude that it is possible to improve CHW performance through applying a community-level quality improvement collaborative approach. The performance scores tested through this research are an innovative contribution to the larger community-health field and the health system in Benin.

Regarding sustainability, PRISE-C management was resolute about being integrated into the public health system for sustainability's sake, but given the current capacity of that system, a narrow community-based focus is not enough to realistically expect significant change in population-level behaviors in such a short period of time. The project has good qualitative evidence that the quality collaborative (QC) approach stimulates spontaneous diffusion of community-generated innovation- a promising indication of sustainability to be further explored. Whether or not the project's routinely collected data serve to measure inputs more than outcomes, reflecting the ebb and flow of materials needed for healthy behaviors, more than the behaviors themselves (e.g. availability of insecticide-treated mosquito nets (ITNs) and/or Arteminisin-based combination therapy [ACT]), rather than population-level appreciation of them), they point to the important role projects such as PRISE-C currently play in Benin.

The inherent data-use aspects of a quality improvement approach to health-seeking and promotion appear to have paid off in the case of PRISE-C. Where and when data-oriented supervision was most intense is when project results are the most clearly perceptible. Ownership of the community health work mandate does appear to be strongest in SAO, which is not surprising, given the fact that they received the strongest "dose" of project support.

The PRISE-C Project in Allada/Ze/Toffo, Dassa/Glazoue, and Save/Ouesse in Benin is supported by the American people through the United States Agency for International Development (USAID) through its Child Survival and Health Grants Program. The PRISE-C Project is managed by CHS under Cooperative Agreement No. AID-OAA-A-10-00047-00. The views expressed in this material do not necessarily reflect the views of USAID or the United States Government.

EVALUATION PURPOSE AND EVALUATION QUESTIONS

EVALUATION PURPOSE

The final evaluation of the Partnership for Community Child Survival (PRISE-C) is both a performance and a process evaluation. It is meant to be broadly accessible to and used by audiences, including in-country partners at national, regional, and local levels (e.g., Ministry of Health (MoH) and other relevant ministries, district health team, local organizations, and communities in project areas); U.S. Agency for International Development (USAID) (Child Survival and Health Grants Program [CSHGP], Global Health Bureau, USAID Missions), and other CSHGP grantees; as well as the international global health community at large. This evidence will help inform decisions about future program designs and policies, including but not limited to global initiatives, such as Ending Preventable Child and Maternal Death, the Global Health Initiative and Feed the Future.[1] The evaluation explores the extent to which the assumed causal pathways between the project's outcome objectives and its activities are sound and whether or not activities yielded the intended outcomes. It sought to identify bottlenecks and constraints and to provide an opportunity for stakeholders to take stock of accomplishments and lessons learned to date.

Renée Fiorentino, the external consultant engaged to conduct the final evaluation, was hired with project funds. The independence of her views was protected by having USAID approve and review her scope of work (SOW), as well as by having her submit draft and final reports directly to EnCompass/Maternal and Child Health Integrated Program (MCHIP) and CSHGP simultaneous to her providing them to the Center of Human Services (CHS). See Annexes VII and XI for the full final evaluation SOW and the consultant's disclosure of any conflicts of interest.

EVALUATION QUESTIONS

The final evaluation sought to answer the following questions:

1. To what extent did the project accomplish and/or contribute to the results (goals/objectives) stated in the Detailed Implementation Plan (DIP)?
2. What were the key strategies and factors, including management issues, that contributed to what worked or did not work?
3. Which elements of the project have been or are likely to be sustained or expanded through the Beninese MoH (e.g., through institutionalization or policies)?
4. What are stakeholder perspectives on the OR implementation, and how did the OR study affect capacity, practices, and policy?

See Annex VIII for a mapping of data sources to these questions.

PROJECT BACKGROUND

In 2010, Benin's under-5 mortality was estimated to be 121 per 1000 live births, down from 184 in 1990, but far from the countries 2015 Millennium Development Goal of 64. [2] Malaria remains the leading cause of hospitalization and death for children under 5, with pneumonia and diarrhea not far behind.[3]

Since 1999 the Government of Benin (GoB) has followed the Integrated Management of Childhood Illness (IMCI) strategy to overcome these child-health challenges. More recently, the community-level portion of this strategy,

---

[1] For more information on these two initiatives, visit www.usaid.gov; www.feedthefuture.gov and www.usaid.gov/sites/default/files/documents/1864/USAID_ActingOnTheCall_2014.pdf

[2] www.countdown2015mnch.org/documents/2010/2010-Benin.pdf [accessed 9/22/14]

[3] Governement of Benin. Annuaire des Statistiques Sanitaires 2009. Cotonou: 2010.

Community Integrated Management of Childhood Illness (C-IMCI), was adapted to the Benin context to intensify and accelerate progress after the multi-country retrospective evaluation of the Accelerated Child Survival and Development program in West Africa found that progress was lacking[4].

Benin has a long history of CHW initiatives and has made impressive progress toward better defining the role of this important cadre. More than 10,000 individuals have been trained using national training materials and trainers. Multiple structures, partners and projects have contributed to supervising, equipping and motivating CHWs. The 2009-2018 National Health Plan prioritizes decentralized health services to the community level and the 2010 National Guidelines for Community-level Health Promotion states that CHWs are to receive 10,000 Communauté Financiere Africaine (FCFA) francs (~$21 USD on 09/30/10) quarterly with the possibility of a supplemental 5,000 FCFA francs based on performance.[5],[6]

The shortage of human resources for health has helped cement recognition of the importance of the role that CHWs play in improving access to basic primary health care services, promoting positive health behaviors, and increasing the health status of underserved populations.[7] CHWs in Benin generally have a basic level of education, are chosen by their village to conduct health activities in their community, and specifically target mothers of children under five years old.

CHWs have been in place in Benin for over 20 years, yet their effectiveness has been difficult to demonstrate. Assessments of the community health delivery system completed by Projet Intégré de Santé Familiale (PISAF) – another USAID-funded project implemented by CHS in the Zou/Collines Department, showed lack of community satisfaction with the care provided by CHWs, undervalued by the community, and a lack of incentives.[8] Results from PRISE-C's baseline household-level knowledge, practice, and coverage (KPC) survey in the innovation zones, SAO and DAGLA, showed the percent of mothers who knew the CHW in their village to be 46.3% and 33.3% in SAO and DAGLA respectively. Of those who did know the CHW, only 6.5% of mothers in SAO and 29.3% in DAGLA had talked to the CHW in the past two months. No mothers of children who had had a fever in the past two weeks reported that their child received malaria treatment from a CHW. Large-scale program evaluations point to uneven coverage of high-impact community-level interventions, stock shortages of key commodities, and differing CHW compensation levels and strategies by different partners across health zones of the country as key challenges to overcome.[9]

In late 2010, CHS was awarded a 1.7m USD (with 25% partner match) innovation category grant by USAID's CSHGP. The grant funded implementation of PRISE-C, a project designed to accelerate and sustain the delivery of proven, low-cost child and maternal health interventions between October 2010 and September 2014 in three of the thirty-four health zones of Benin: Allada/Ze/Toffo (AZT); Dassa/Glazoue (DAGLA); and Save/Ouesse (SAO). CHWs were the agents through which this accelerated delivery was to take place, according to the MoH's High-impact Interventions Package (HIIP-Com) guidelines.[10] Table 1 below summarizes the MoH's CHW HIIP-Com.

Table 1: MoH's CHW High-impact Interventions Package

Preventive services (Hygiene included)	
Use of ITNs by children under-5	Promotion of tetanus toxoid vaccination (TT) for pregnant women
Use of ITNs by pregnant women	Promotion of children's vaccination
Tools for potable water in the household	Dispensing of some contraceptives and referral for
Use of potable water in the household	other methods
Use of latrines	Communication to improve adoption of healthy
Hand-washing with soap and potable water at critical points	behaviors

[4] Bryce J, Gilroy K, Jones G, Hazel E, Black R, Victora C. The Accelerated Child Survival and Development program in West Africa: a retrospective evaluation. Lancet; 375: February 2010.

[5] Sagbohan M. Rapport provisoire de la documentation de la mise en œuvre au niveau communautaire du paquet d'intervention a haut impact sur la santé de l'enfant au Benin : October 2012.

[6] www.oanda.com/currency/converter/

[7] Lehmann U SP. Community Health Workers: What do we know about them? Geneva: WHO; 2007.

[8] PISAF. Rapport de l'atelier de partage des experiences sure la fonctionnalité des relais communautaires et la systems de la supervision. Bohicon. 2011.

[9] Bryce J, et al. February 2010.

[10] Ministère de la Santé de la République du Benin, Direction National de la Protection Sanitaire, Directives Nationales pour la Promotion de la Santé au Niveau Communautaires. Cotonou : March 2010.

	Use of iodized salt
Neonatal health	
Clean delivery and cord care Breastfeeding within the 1st hour of birth Warming of the neonate	Case management of underweight neonates Promotion of vaccination of neonates Recognizing danger signs and referral
Infant and young child nutrition	
Exclusive breastfeeding (0-6 months) Prolonged Breastfeeding (6-12 months) Complementary foods Therapeutic case management of malnutrition Promotion of Vitamin A supplements	Promotion of deworming Recognition of danger signs and referral Communication to improve adoption of healthy behaviors Case management of orphans
Community Case Management of Illnesses	
Oral rehydration therapy Case management of diarrhea with ORS and zinc Case management of malaria with ACT for children under-5	Case management of ARIs with Cotrimoxazole Communication to improve adoption of healthy behaviors

PROJECT AND OPERATIONS RESEARCH DESIGN

PRISE-C's intermediate results are aligned with the Benin MoH directives and guidance on health services and care at the community-level. The overall goal of the innovation category grant is to contribute to improvements in maternal and child health outcomes in three health zones: AZT, DAGLA and SAO.

To achieve this goal, the project's strategic objective was to accelerate delivery of proven, low cost maternal and child health interventions by strengthening community health delivery systems. The associated intermediate objectives were:

- Increasing community engagement with the community health delivery system;
- Increasing demand for community curative and preventive services; and
- Strengthening the performance and sustainability of community health services.

Spending under PRISE-C was allocated 20% to immunizations, 15% to pneumonia case management, 20% to control of diarrheal diseases, 10% to malaria, 20% to maternal and newborn care, and 15% to infant and young child feeding. These percentages were finalized in September of 2011 (12 months after PRISE-C began) when the project baseline values had become available. Project targets for the first four categories were shifted accordingly, and maternal and newborn care and infant and young child feeding were added as priorities. This was made based on the fact that malaria inputs and activities were covered by other actors. Approximately 10% of the PRISE-C grant was dedicated to the OR.

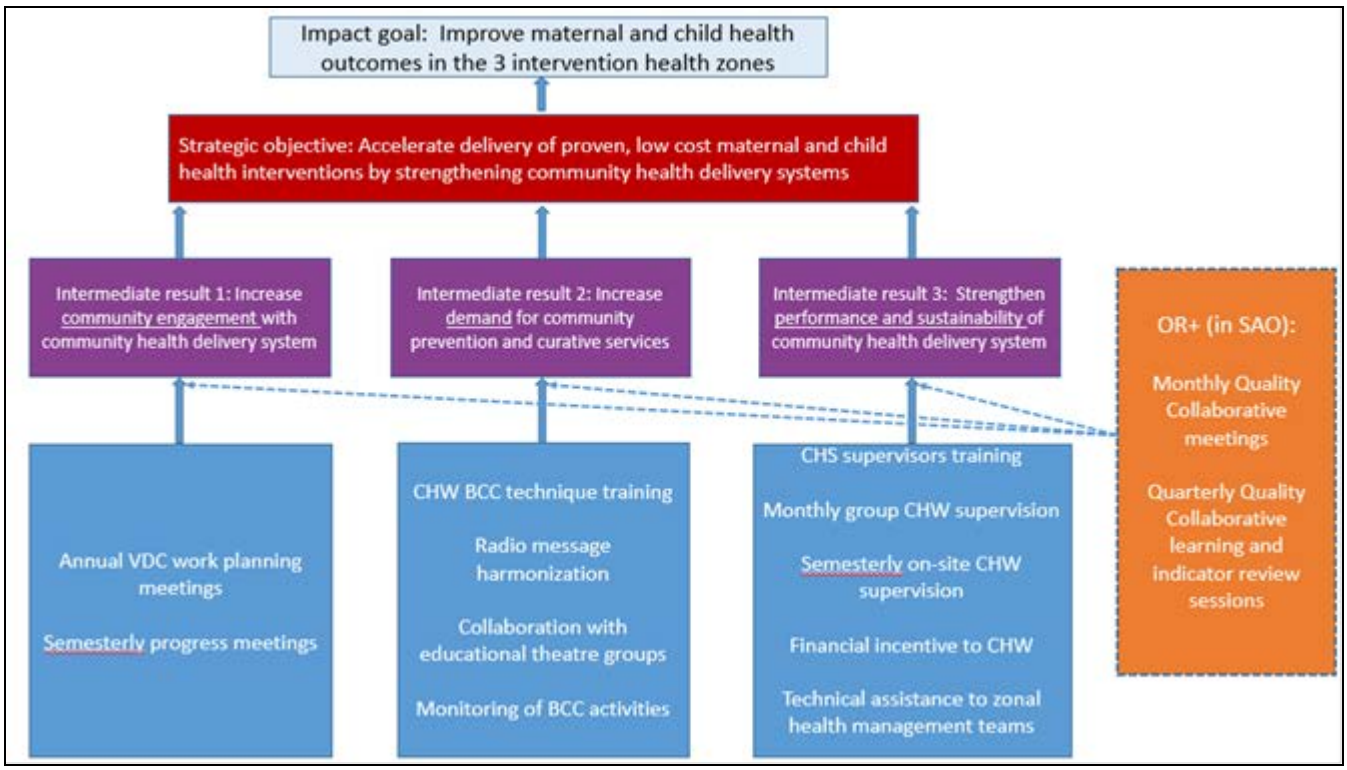
Figure 1 (below) summarizes the project's intermediate objectives and the activities PRISE-C carried out in pursuit of them. It also depicts the "extra" intervention carried out in the OR intervention area of SAO.

The overarching strategy by which PRISE-C sought to achieve these goals was implementation of the Government of Benin's adaptation of C-IMCI (HIIP-Com). CHS brought its long history of experience in quality improvement and assurance (and the micro-planning as well as data use principles at their core) to bear, as well as its local capacity and systems in place in Benin from PROSAF (1999 to 2006) and PISAF (2006 to 2012)[11].

Program work plans reflect strategic investments in community engagement and behavior change communication, with an accent on national ownership at all levels. The first year of the project was spent refining objectives and measurement plans and engaging in the stakeholder consensus building required of any project serious about national ownership. In year 2, the project was able to get into the meat of the trainings and establishment of the data-oriented supervision systems at the core of their approach. In year 3, the focus was on maintaining quality, short-course corrections, and joint advocacy with MoH counterparts and elected officials about project sustainability. Year 4 energy was focused primarily on project documentation and wrap up. See Annex III for a table summarizing the project's completion of year 4 activities.

[11] www.urc-chs.com/quality_improvement [accessed 12/01/14]

Figure 1: PRISE-C Results Framework



In addition to implementing the MoH's HIIP-Com in select villages of three health zones, as an OR project, CHS had the opportunity to test a community-level quality collaborative (QC) approach. The hypotheses for this OR project grew naturally out of CHS's successful application of quality improvement strategies in Benin (and other countries) under multiple other funding mechanisms.

Over the course of the three phases of USAID's Quality Assurance Project (QAP, 1990-2008), CHS adapted the collaborative approach initially introduced by the Institute for Healthcare Improvement (IHI) in 1994 in its "Breakthrough Series". IHI's original intent was to accelerate the pace and reach of quality improvement interventions and the mechanism proposed to do so was the collaborative. This approach was thought to be particularly relevant to situations where current practice deviated from best scientific evidence. Under QAP, CHS adapted IHI's collaborative approach to contexts such as Russia and Niger, paying particular attention to ensuring national ownership of collaboratives established, building local capacity for data collection and management, and supporting innovative communication channels in the absence of internet connectivity. [12]

The proposed innovation under PRISE-C was the application of the collaborative approach (proven to be successful and effective at health center-level) at community-level. The OR component of PRISE-C sought to compare the effect of the community-level quality improvement collaborative plus the MoH's financial motivation policy against the MoH's financial motivation policy alone, as measured through CHW performance and retention. Specifically, the OR portion of PRISE-C sought to evaluate the effect of a community-level quality improvement collaborative in improving the performance and retention of CHWs, as well as its incremental cost-effectiveness as compared to the MoHs financial motivation policy.

The "extra" interventions carried out in the OR intervention zone of SAO, by which these effects were hypothesized to occur, included:

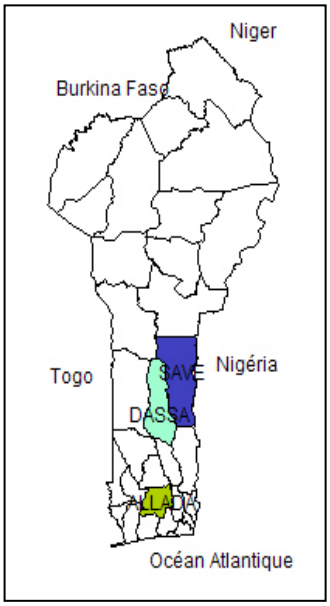
---

[12] Catsambas TT, LM Franco, M Gutmann, E Knebel, P Hill, and Y-S Lin. 2008. Evaluating Health Care Collaboratives: The Experience of the Quality Assurance Project. Collaborative Evaluation Series. Published by the USAID Health Care Improvement Project. Bethesda, MD: University Research Co., LLC (URC). June 2008. Retrieved from: www.encompassworld.com/sites/default/files/evaluatinghcollaboratives.pdf [accessed 12/01/14]

- Identification of the members of the community quality improvement team (QITs) of 8-10 people, (CHW, Village Chief, Secretary and Treasurer of the village health committee (VHC), women, youth, religious, village and ethnic representatives).
- Training of the community QITs by PRISE-C staff on quality improvement methodology (5 days)
- Quarterly quality improvement collaborative meetings (1-2 days), during which teams charted their performance on key indicators and share lessons learned, and which strategies which had an impact and which did not.
- Monthly QIT meetings to review indicators and reflect on how to improve them.
- Routine supervision from MoH supervisor and PRISE-C staff.
- Quarterly coaching visits to lower-performing CHWs by high-performing supervisors and CHWs with demonstrated ability to mentor others.

Both the intervention and control zones received support from the project to provide refresher trainings on the package of high-impact community interventions, as well as to provide routine supervision to CHWs. CHWs in both zones received performance-based financial incentives, which were initiated in both zones in 2011.

In SAO, the four collaboratives were organized and encouraged to focus their activities around one of the four technical sub-areas of the GoB's HIPP-Com: preventive services (including hygiene); neonatal health; infant and young child nutrition and community case management of illness. This approach was based on the idea that breadth of topic is often an obstacle to collaboratives' success.



GEOGRAPHIC AND POPULATION COVERAGE

Benin is organized administratively into 12 departments, which are then divided into communes (77 in total in the country), arrondissements, and finally, villages. The GoB's HIIP-Com strategy is specifically targeted at all villages more than five kilometers from a functional public health center. There is, however, great variation in terms of population and surface area of what constitutes a village, as well as in the capacity of "functional" health centers in Benin. CHS implemented PRISE-C in the heath zones of AZT, DAGLA and SAO. The map illustrates PRISE-C's intervention areas. The project worked in seven communes, thirty-one arondissements and eighty-nine villages. These three zones were selected in collaboration with the MoH based on relevant indicator values, community health partner presence, and geographic access. The MoH's *Operation Plan for National Scale-up of High Impact Interventions for the Reduction of Maternal, Neonatal and Child Mortality in Benin* (published in April 2011) further specified the high unmet need for CHWs in the administrative departments in which these health zones fall.[13]

Zonal level estimates of the target populations with which PRISE-C worked are summarized in Table 2 below.

Table 2: Project Beneficiary Estimates[14]

Beneficiary Category	AZT	DAGLA	SAO	Total
Total PRISE-C village population (% of total for the health zone)	41,234 (13%)	15,228 (6.37%)	21,997 (10.3%)	78,459 (10%)
Children aged <5 years (17.4% of total pop.)	7,175	2,724	3,827	13,726
Infants 0-11 months (4% of total pop.)	1,649	626	880	3,177
Women of reproductive age (15–49 years, 23% of total pop.)	9,484	3,601	5,059	18,144
Total direct beneficiaries	16,659	6,325	8,886	31,870

Intermediate beneficiaries and health structures with which PRISE-C worked throughout the three health zones are detailed in Table 3 below. CHWs work closely with and are supported in their work by VHC's. They are supervised by health workers, who are in turn supported by community-approach focal points, zonal medical coordinators,

[13] Ministère de la Santé de la République du Benin, Direction National de la Protection Sanitaire, Plan Operationelle pour la Mise à l'echelle des Intervention d'haut impact pour la réduction de mortalité maternelle, neonatal et infantile au Benin. April 2011.

[14] Institute National des Statiques et d'Analyse Economique (INSAE, 2011), for population proportions; based on 2002 census data + annual demographic growth rate of 2.6% (UNDP 2005).

department-level health directors and project staff. The project invested significantly in helping health sector managers engage their elected administrative counterparts: namely representatives of mayoral offices.

Table 3: Project Intermediate Beneficiaries and Health Structures in Intervention Zones[15]

Intermediate beneficiaries/Health structures*	Total	
Community Health Workers (CHWs), disaggregated by sex	M=64	F= 47
Health Facilities (Hospital to Sub Health Post)	32	
Community-Based Structures VHCs	111	

PARTNERSHIPS/COLLABORATION

PRISE-C was implemented by CHS in collaboration with a local NGO, Centre d'Expertise d'Ingenierie, for the Developpment Durable (CEID). Additional collaborating partners included the Benin MoH, USAID/Benin, UNICEF, Africare/ Projet d'Intensification de la Lutte Contre le Paludisme (PILP), Catholic Relief Services, the Benin Department of Statistics, Réseau Alliance Santé (RAS) and Promotion des Mutuelles de Santé en Afrique (PROMUSAF) Dimagi and Leadership & Development (LEADD).

Table 4 below, summarizes PRISE-C's partners and the principle results of the collaboration.

Table 4: Project Partners

Partner	Role in the project	Result of the collaboration
CEID	One FT staff was hired and based in SAO.	This staffing arrangement contributed to strong decentralized technical support and community mobilization in the intervention area.
MoH (Central-level)	The MoH's CHW directives have been the basis of PRISE-C's work plans in the interest of sustainability	The project's promising practices are poised to influence GoB community-health policy and operations.
MoH (Department-, Zonal- and Commune-levels)	PRISE-C staff and their decentralized MoH staff counterparts work closely together to support CHWs and VHCs, conducting joint supervisions, acting as co-trainers, assuring joint planning of project activities.	Coordination of multiple external actors is a challenge for overstretched MoH staff at these levels. MoH staff availability played a role in activity delays on multiple occasions.
VHCs	Sometimes called Village Health and Development Committees, these are existing community structures, the mandate of which is community mobilization around health promotion.	Committees provide essential support and legitimacy for CHWs, contributing to community mobilization and the adoption of health-seeking practices and behaviors promoted by the project, where it has taken place.
USAID/Benin	The project maintains good communication with the USAID Mission, attending all planned quarterly and ad-hoc meetings, responding to punctual requests in a timely fashion.	As a primary community health actors in Benin, funded to do OR, the project had a unique opportunity to help USAID learn about what is listed as the number one priority on USAID/Benin's website: helping the country to pioneer community-based primary health care.[16]
UNICEF	SAO and DAGLA were also UNICEF-supported zones during the same timeframe, thus coordination of inputs and activities between the two entities (PRISE-C and UNICEF) was essential.	88 CHWs were given kits containing a metal box (for storage of medication and/or money in the cases where a community health fund was created), timer, armband (for malnutrition monitoring), drugs (ACT, CTM, paracetamol, mebendazole , Aquatab, ORS, zinc) and a bag.
PISAF	Another USAID-funded CHS-implemented project in Benin, aimed at integrated family health, including promotion of comprehensive maternal and child health care seeking, mutual membership, quality improvement in Zou/Collines and Atlantique/Littoral.	In many ways PRISE-C built on to work started under PISAF (and PROSAF before PISAF). PISAF initiated some of the work identifying and re-invigorating VHCs in SAO and DAGLA. The BCC print materials used in PRISE-C were originally developed under PISAF.

[15] PRISE-C. Detailed Implementation Plan, September 2011.

[16] http://www.usaid.gov/benin/global-health [Accessed 9/1/14]

Partner	Role in the project	Result of the collaboration
PROMUSAF	Promotion of mutual subscription.	Families in project areas were provided with information about mutual membership. Collaboration with these organizations was suspended with the advent of the government's Universal Coverage scheme (RAMU). Details of how the informal sector will engage with these organizations and premiums schedules are in process.
RAS		
Africare/ Projet d'Intensification de la Lutte contre le Paludisme (PILP)	Two of the other large actors supporting community-based health care in Benin. PRISE-C coordinated with both to harmonize training, supervision and BCC activities.	Malaria prevention and treatment inputs (from PILP) as well as health promotion messages standardized across actors were delivered to families in project areas.
CRS		
Dimagi	MHealth partner funded to pilot "Texting for Maternal Wellbeing" in the Toffo and Zé communes of AZT.	Mobile health application helped CHWs and health workers generate increased demand for contraceptives in Toffo and Zè.
Benin Department of Statistics	Partner organization that carried out the baseline household survey.	Household-level pre- and post-project knowledge, attitude and practice data available.
Leadership & Développement (LEAAD)	Research firm engaged to conduct the end-line household survey.	

EVALUATION METHODS AND LIMITATIONS

The methodology for this final evaluation consisted of a mixed-methods approach, using both quantitative and qualitative data. The approach comprised both a desk review of existing data sources and the collection of supplemental qualitative data to complement existing data.

SECONDARY ANALYSIS OF EXITING DATA

The primary data sources for the final evaluation were existing project documents and reports (e.g., the DIP; the Y1 and Y3 annual reports; the mid-term evaluation report; the baseline and end-line household-level KPC survey reports; the OR protocol and final report; and multiple routine monitoring and supervision reports). As an OR Project, PRISE-C has generated an enormous amount of data. The quality of quantitative and qualitative data in these existing sources was assessed to the extent possible to facilitate interpretation. The evaluation team leader also reviewed key U.S. Government/USAID strategic documents at the global (MCHIP) and national levels relevant to the context of the project and all relevant policy and strategy documents at the national level (e.g., MoH CHW-related tools and strategies).

COLLECTION OF SUPPLEMENTAL QUALITATIVE DATA

In-depth qualitative interviews were conducted with 33 project stakeholders including project staff, MoH representatives, district health team members, community- and facility-based health workers, community members, and community leaders. Four focus group discussions (FGDs) were conducted with mothers of children under-5 year olds in their communities. Women were recruited by the CHWs based on their availability and willingness to participate. Communities to visit were randomly selected from a list provided by PRISE-C with some purposive consideration given to explore certain areas in more depth to investigate particular results (e.g., the diffusion of innovation from SAO to Tegbo, AZT and Tegbo's female CHW).

Table 5: Places Visited to Collect Supplemental Qualitative Data

Zone	Commune	Arrondissement	Village
AZT	Zé	Zé	Goulo

	Allada	Agbanou	Tegbo
DAGLA	Dassa	Paouingnan	Gbedavo
SAO	Savé	Adido	Igboyoko

Annexes I and X detail documents reviewed, key informants interviewed and focus groups participants.

DATA COLLECTION TOOLS

See Annex IX for interview and FGD scripts and consent forms. Tools were adapted from those used during the Mid-term evaluation, an evaluation of the Fistula Care project in Guinea (2011) and Core Group's community case management evaluation tool kit (2010). [17],[18],[19]

DATA QUALITY AND USE

Table 6 below summarizes the data sources used in the current evaluation and the main issues surrounding their quality.

Table 6: Data Sources and Quality Issues

Data source	Quality issue/limitation
Program reports[20] • Routine (quarterly) quantitative data o Process indicators o Performance/quality indicators o Outcome indicators • Quarterly narrative/qualitative data • Supervision and training reports	• An effort to harmonize the project's PMP (see Annex XVIII) with national level indicators to decrease reporting burden for CHWs and supervisors led to a very ambitious number of indicators, some of which were ill-suited to the level and periodicity at which they were collected • Indicator definition refinements made to improve validity, were carried out in June 2011 (nine months into project implementation) potentially causing confusion amongst project stakeholders
Baseline and end-line household-level knowledge, practice and coverage (KPC) survey data[21]	• Cluster sampling of entire health zones at both base- and end-line, rather than focusing on intervention villages • Inclusion of indicators with tenuous links to program activities • End-line analysis is incomplete and stakeholder validation is lacking
OR data[22] • Quantitate • Qualitative	• Discontinuation of certain project activities, such as group supervision Voluntary nature of CHW work in Benin • Non-randomization of CHWs into intervention or control (quasi-experimental design) • Selection of DAGLA as the comparison area • Composite performance scores are potentially inflated as precision of the percentages on which they are based decreases with small sample • Inability to link CHW performance with health outcomes • Stakeholder validation pending
Supplemental qualitative data • KIIs • FGDs	• Limited time and sample; some key informants were unavailable • Post-hoc evaluation (August 2014), after project activities had ended for the most part

Data use is central to the quality improvement approach at the root of all of PRISE-C's activities.

EXISTING DATA SOURCE LIMITATIONS

Program reports data

[17] PRISE-C. Midterm Evaluation Report. October 2012.
[18] Fistula Care. 2013. Guinea Fistula Care Program Evaluation. New York: EngenderHealth/Fistula Care. Retrieved from: pdf.usaid.gov/pdf_docs/pdacy061.pdf [accessed 12/01/14]
[19] CORE Group, Save the Children, BASICS and MCHIP, 2nd Edition 2012. Community Case Management Essentials: Treating Common Childhood Illnesses in the Community. A Guide for Program Managers. Washington, D.C. Retrieved from: www.coregroup.org/storage/documents/CCM/CCMEssentialsGuide/ccmbook2012-online.pdf [accessed 12/01/14]
[20] See Annex VIII for a full listing of all program reports reviewed
[21] See Annex V for the final knowledge, practice and coverage end-line survey report
[22] See Annex XIV for the final operations research report

The primary source for the routinely (quarterly) collected and analyzed program data was registers in which CHWs tracked treatments administered, referrals made, and households visited. Data from these categories were aggregated at monthly supervisory meetings and given to PRISE-C staff, who processed and reported them to USAID.

PRISE-C's final PMP reflects changes made in June 2011 to increase the validity of indicators such as the percent of infants from 0-6 months exclusively breastfed (included in PRISE-C's PMP because they were national-level GoB indicators). Originally, the denominator of this indicator was intended to be the number of infants from 0-6 months estimated in the period. It was updated to be those infants visited by the CHW. Indicators such as this one were retained as routine monitoring indicators, despite the fact that modest CHW quarterly caseloads render these indicators susceptible to reflecting inflated percentages in relation to very small denominators.

The project did not rely on the MoH's HMIS for monitoring data, except for the denominators of the percent contribution indicators, discussed below (not in the PRISE-C PMP, but in use by the GoB for tracking contribution of community-based activities to overall coverage of high-impact interventions). For these indicators, the percent contribution to under-5 coverage numerators for malaria, diarrhea, and ARI treatment; the health facility portion of this comes from the HMIS. Quality control of these numbers appears to be robust from interviews with the CHW supervisors who had a role in assuring the quality of these numbers.

Baseline and end-line household-level KPC survey data

The project's rapid catch indicators and corresponding household survey instruments were an attempt by MCHIP to collect standardized information on key maternal and child health interventions and outcomes across different country contexts. USAID/Benin and the GoB were interested in more frequent measurement of maternal and child health outcomes than the DHS currently affords, so PRISE-C's PMP included indicators such as ANC1 and 4, skilled attendance at birth, Penta 1 and 3, despite the fact that skilled attendance was promoted only indirectly through the GoB's HIIP-Com and the others were not emphasized by PRISE-C via routine tracking.

In early 2011 and again in the first half of 2014, a cross-sectional descriptive survey of 900 mothers of children 0-23 months of age was conducted across the 3 health zones, according to a multi-staged 30-cluster sampling design. At both baseline and end-line, ninety villages were randomly selected according to a probability proportionate to population size approach. Villages/clusters were selected from the list of villages for each of the three health zones in which the project worked. The baseline survey was carried out by 18 investigators with nine health workers (nurses or midwives) and nine sociologists divided into six teams of three. Supervision was provided by the Coordinators of the Health Zones and staff from the Family Health Service of the Departmental Directorate of Health. At baseline, 100% of the 900 mothers of children aged 0-23 months invited to participate agreed to be interviewed. At end-line, an external firm, LEADD, was engaged in the interest of objectivity, to replicate the survey. Response rate at end-line was 100%. Table 7 reflects the distribution of villages surveyed across the three health zones. The sampling of the baseline and end-line surveys (clusters/villages being randomly selected from the list of all villages for each of the three entire health zones) has a profound effect on how these data are interpreted. One must assume homogeneity across PRISE-C villages and non-PRISE-C villages, a challenge when trying to use these data to evaluate program effect.

Table 7: Villages Surveyed

Health Zone	# of villages surveyed (baseline)	# of villages surveyed (end-line)
AZT	19	26
DAGLA	29	24
SAO	30	23

Operations Research Data

The OR portion of PRISE-C was undertaken in SAO and DAGLA across 28 months, from December 2011 to April of 2014, using quasi-experimental quantitative and qualitative methods. The study was embedded directly into project activities, with SAO being the intervention zone selected to receive the extra collaborative approach intervention, and with DAGLA serving as comparison. Eighty-seven CHWs were recruited to participate in the study: 48 in DAGLA and 39 in SAO, and qualitative data collected on CHW performance and retention from purposively selected key informants.

Limitations of the OR data can be categorized as intervention-related and research design/data availability challenges. Intervention-related challenges included discontinuation of certain project activities in study areas (group supervision) and the voluntary nature of community health work in Benin. The research design/data

availability challenges were more extensive and included the non-randomization of CHWs into intervention or control (quasi-experimental design) and selection of DAGLA- a health zone adjacent to SAO, under the same administrative department, previously an intervention zone under PISAF- as the comparison area. Furthermore, the composite CHW performance score at the center of the operations research quantitative analysis is based on 12 quarterly-collected outcome percentages that have the same issue of small denominators that renders the project's routine monitoring indicators susceptible to inflation. This quality issue can be assumed to have affected the intervention and comparison areas similarly, but the composite index values must be interpreted bearing this in mind. Lastly, there is an inability to link the performance of the CHWs with the health outcomes of those whom they served. This information would allow comparison with other health interventions via calculation of DALYs. Details are available in the final OR report in Annex XIV.

ANALYSIS AND REPORTING

Program reports data

Analysis of programmatic data took place throughout the project on a quarterly basis. Data were archived in the PRISE-C data base, visualized graphically and written up for USAID narrative reports.

Baseline and end-line household-level KPC survey data

Frequencies of all rapid catch indicators, as well as indicators on the use of CHWs by the population, were generated and analyzed descriptively, using chi-square tests of differences between groups. At baseline, the GoB's Department of Maternal and Child Health was intimately involved in the analysis and use of the data, most concretely in the form of that offices' Child Survival Focus point at the time. At end-line, the outside firm LEADD was brought on in the interest of objectivity. Analysis and validation of end-line data is ongoing.

Operations research data

Twelve outcome variables (mandated by the MoH as the outcomes upon which each CHW's eligibility for the performance-based financial incentive is assessed) were tracked quarterly against established targets. A composite performance score was calculated (based on weights, the details of which are described in Annex XIV), and then repeated-measures analysis of variance (ANOVA) was used to examine the difference in the mean CHW performance between the two groups (intervention/SAO and comparison/DAGLA), vis à vis the effects of the intervention, time, and the interaction between them.

Post-hoc logistic regression was then used to further explore the data after the CHW performance scores were converted to the dichotomous "high score/low score" based on a cut-off of 50%. A generalized estimating equations (GEE) model was employed to assess the relationship between this outcome variable and a number of independent variables, including age, sex, marital status, education, number of trainings attended (training related to CHW position), number of other CHWs in the catchment area, number of under-5 children in the catchment area, number of households in the catchment area, occupation, salary level, duration of service, and the number of CHWs supported by other projects. Chi square and t-tests were used to determine if statistical differences existed on these variables between the two zones at baseline, which helped inform their inclusion in the model. GEE accounts for correlations between the CHWs (clustering) in each zone.

Qualitative data were collected in four rounds (July 2012, March 2013, Jan 2014, and July 2014) of focus groups and in-depth interviews with CHWs, their supervisors, and community members, including CHW beneficiaries. For each round of data collection, villages were classed as high, medium, or low performing, according to the MOH recognized "tracer" indicator: the "percentage of children ages 0-59 months in the catchment area who sleep under an insecticide-treated mosquito net (ITN)." Within each classification, a random sample of 3 villages was selected.

Lastly, data were collected on the unit costs of implementing the community collaborative intervention, in addition to the financial incentive program, versus the costs of implementing the financial incentive program alone in the control group. Incremental cost-effectiveness ratios (ICER) were calculated, facilitating determination of the marginal or incremental cost for an additional unit of health benefit when looking at two different interventions. The program outcome used was the difference in the proportion of CHWs achieving a high performance score (defined as above 50% of the performance score) at end-line compared to the proportion achieving a high score at baseline. Statistical analysis estimated the effect of higher performance scores attributable to the intervention. Cost data

were collected from the project's accounting records and divided by the number of CHWs involved. Sensitivity analysis was used to determine how much influence each of the cost inputs had on the cost-effectiveness model.

Supplemental qualitative data

Key informant interview and FGD data collected in August 2014 were manually coded and thematically analyzed for use in answering the evaluation questions. Multiple working sessions (both pre-travel and in-country) were held with the PRISE-C Director and the Child Health and M&E Advisor, to discuss key informant selection, as well as routine, baseline and end-line household-level KPC survey findings and supplemental qualitative data preliminary findings. See Annex XIII for further details of evaluation team member, their roles and titles. A debriefing meeting was held with Peter Thomas (USAID/CDC PMI Resident Advisor) and Kevin Armstrong (USAID Mission Director). Renée Fiorentino, Independent Evaluation Consultant; Marthe Akogbeto, PRISE-C Director and Dr. Ramzia Akonde, PRISE-C Child Health and M&E Advisor attended. The PowerPoint presentation used to facilitate this meeting can be found in Annex XVI.

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

FINDINGS

Project achievement of results (Evaluation question #1)

Stakeholders interviewed focus groups during supplemental qualitative data collection were nearly unanimous in stating "decreased infant sickness" as the primary achievement of the project. They were also clear that this achievement was due to less need to travel for treatment for common childhood illnesses, as well as accompaniment and help from the CHW and/or the larger community when a referral to a health center was needed.

Intermediate Result 1: Community engagement with the community health-delivery system

PRISE-C operationalized its first intermediate result objective aimed at the overarching strategic objective with the following indicators:

- Number of villages with complete (three member) VHC
- Number of villages with a health work plan
- Percent of villages with community representation at least 75% of monthly CHW meetings

Project data, verified at quarterly indicator review meeting, show 89 (100%) villages with a complete VHC and a health work plan (at both project mid-term and end-line, up from zero at baseline). The percent of villages with community representation of at least 75% at monthly CHW meetings increased progressively across the life of the project (61.5% at baseline, 75.6% at project mid-term and 100% at end-line).

Intermediate Result 2: Demand for community-level preventive and curative services.

Indicators aimed at capturing demand for community-level services make up the bulk of PRISE-C's PMP. Data sources are the baseline/end-line household-level KPC surveys and program data that originate in CHW registers. The indicator summary tables in Annex IV reflect the base- and end-line values for the project's rapid catch indicators (collected through the baseline and end-line household-level KPC surveys) and the base-, mid- and end-line values for the other key indicators (most of which were collected on a routine [quarterly] basis, throughout the life of the project). The three program elements tracked regularly via a routinely collected indicator and a baseline and end-line rapid catch indicator are exclusive breastfeeding, ITN use, and childhood vaccination. However, the definitions (age parameters specifically) of these indicators differed across the methods. Exclusive breastfeeding enjoyed the closest match, the rapid catch indicator being "the percent of children age 0-5 months who were exclusively breastfed during the last 24 hours", and the routine indicator being "the percent of infants 0-6 months exclusively breastfed". The ITN use indictors differ more substantially: the rapid catch indicator being "the percent of children aged 0-23 months who slept under a treated mosquito net the night before the survey" and the routine indicator being "the percent of children in the catchment area from 0-59 months who sleep under an ITN". Lastly,

for child vaccination, the rapid catch indicator is "the percent of children, ages 12-23 months, who received measles vaccine according to the vaccination card or mother's recall at the time of the survey" and the routine indicator, "the percent of children less than one year old who were vaccinated during outreach activities conducted according to the work plan in villages more than 5km from a health center".

Given the sampling strategy employed and the small area of overlap between the routinely tracked indicators and the rapid catch indicators, it is not surprising that the baseline/end-line household-level KPC survey data raise more questions than they answer about project achievement of objectives. As can be seen in the RapidCATCH indicator table (Annex IV) and the PMP indicators (Annex XVIII), there are many pre-post changes that are statistically significant, but some go in the undesirable direction. Annex V contains the full final KPC end-line survey report.

Changes baseline to end-line in the following demand indicators are encouraging:

- % of mothers who know the CHW in their village; 31.2→82.2% (across the three zones)
- % of mothers participating in health talks; 41.3→70.0% (across the three zones)
- % having interacted with the CHW in the past 2 months; 14.3→33.1% (across the three zones)

Two of the rapid catch indicators which appear to reflect clear-cut success (assuming the zonal-level sample reasonably represents the villages in which PRISE-C worked) are the following:

- % of mothers of children 0-23 months who live in a household with soap or a locally appropriate cleanser at a hand washing station (9.2→25.3% across the three zones, significant at p= 0.00)
- % of children aged 0-23 months with fever in the past two weeks who received ACT within 24 hours of onset of fever (9.8→23.8% across the three zones, significant at p= 0.00)

These findings sync with supplemental qualitative data collected, in which hand-washing stations and the bringing of essential medicines into communities to facilitate access were two of the interventions most mentioned by stakeholders as activities supported by the project that contributed to "decreasing child sickness".

The timely treatment of fever finding is especially impressive in light of the fact that there has been a national-level issue with getting ACT out to the field since at least January of 2014. Nearly everyone spoken to in the supplemental qualitative data collection interviews and FGDs mentioned access to ACT as one of the keys to the project's success, but also a recent challenge. There was a policy shift in 2013, which made ACT freely accessible, whether accessed at facility- or community-level. In addition, no ACT is now to be administered without a documented positive rapid-test result. The country is still in the process of ironing out the kinks that come along with getting all relevant human resources trained on rapid-test administration and updating supply management systems accordingly.

Other promising findings of the baseline/end-line household-level KPC survey, related to demand or uptake of services and health-seeking behaviors, include:

- % of children aged 0-5 months who were exclusively breastfed during the last 24 hours (26.3→43.4% across the three zones, p=0.00)
- Unchanged but consistently high values for % of children aged 0-23 months who slept under an ITN the night before the survey
- % of children aged 0-23 months with diarrhea in the last two weeks who were treated with ORS (42.6→62.9% in DAGLA, p=0.07[23])
- % of mothers of children aged 0-23 who had at least 4 ANC visits when they were pregnancy with their youngest children (31.9→44.5% in SAO, p=0.01)

Unfortunately, there are caveats to three of the promising findings listed above:

- % of children aged 0-5 months who were exclusively breastfed during the last 24 hours (35.8→ 21.8% in DAGLA, p=0.00)

[23] Included despite borderline significance, based on the known difficulty of capturing this and other diarrhea-related variables in coverage surveys, see Hazier et al and Campbell el al in the May 2013 PLOS Collection entitled "Measuring Covering in Maternal, Newborn and Child Health". Retrieved from: www.ploscollections.org/article/browseIssue.action?issue=info:doi/10.1371/issue.pcol.v01.i16 [accessed 12-1-14]

- % of children aged 0-23 months who slept under an ITN the night before the survey (77.0→ 65.6% in DAGLA, p=0.00)
- % of mothers of children aged 0-23 months who had at least 4 ANC visits when they were pregnant with their youngest child (55.0→37.0% in AZT, p=0.00)

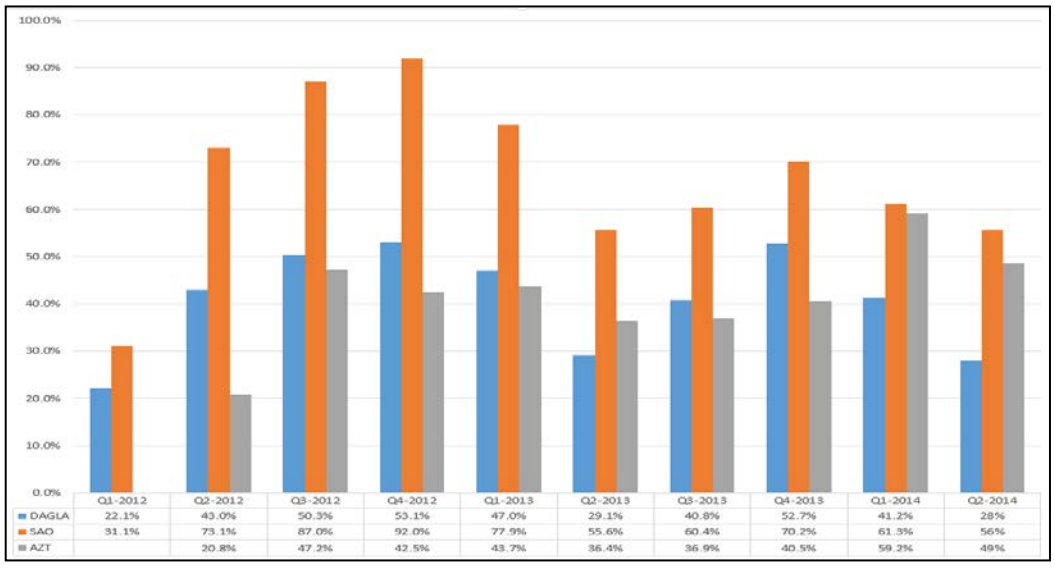
And other troubling findings include:

- % of children aged 0-23 months whose births attended by a skilled health worker (81.0→64.5% in AZT)
- % of children aged 12-23 months who received PENTA1 according to the vaccination card or mother's recall by the time of the survey (71.4→57.5% across the three zones; 76.9→55.4% in AZT; 72.5→51.6% in DAGLA)
- % of children age 12-23 months who received PENTA3 according to the vaccination card or mother's recall by the time of the survey (66.1→51.8% across the three zones; 70.2→45.3% in AZT; 69.7→48.4% in DAGLA)
- % of children aged 12-23 months who received measles vaccine according to the vaccination card or mother's recall by the time of the survey (61.4→50.4% across the three zones; 68.8→48.4% in DAGLA)

Triangulation across data sources (baseline/end-line household-level KPC survey and routinely collected programmatic data) yields the following puzzling inconsistency: exclusive breastfeeding levels of 96.2% for infants 0-6 months of age (routine data, March 2014) v. 43.4% of those 0-5 months (household-level end-line survey). Comparison with most recent DHS data on exclusive breastfeeding points to the project household survey data as the more reliable estimate. According to the 2012 DHS data, 33% of infants <6 months old were exclusively breastfed (across the entire 2012 national sample).[24]

Small sample sizes are likely at the root of the seemingly inflated routinely collected end-line exclusive breastfeeding percentages. Time series analysis of some of the other routinely collected indicators yield trends that very accurately match qualitative/narrative descriptions of incidents that occurred during the project lifecycle. For example, the following analysis of the percent of children 0-59 months old sleeping under an ITN (Figure 2 below), follows the trend alluded to by the national-level Division Chief of Community Services within the MoH, when he said, *"…when the project let's up on supervision, the indicators decline, the CHWs need supervision and support, we need an adequate number of CHWs, we need supervisors from the mayoral office (in addition to the health sector)."* The project went through a period in late 2012 to early 2013 when it scaled back supervision activities due to non-availability of counterparts. When the consequent decline in community-level behavior was perceived, efforts were re-intensified. This is a concrete example of data-based short-course correction by project management.

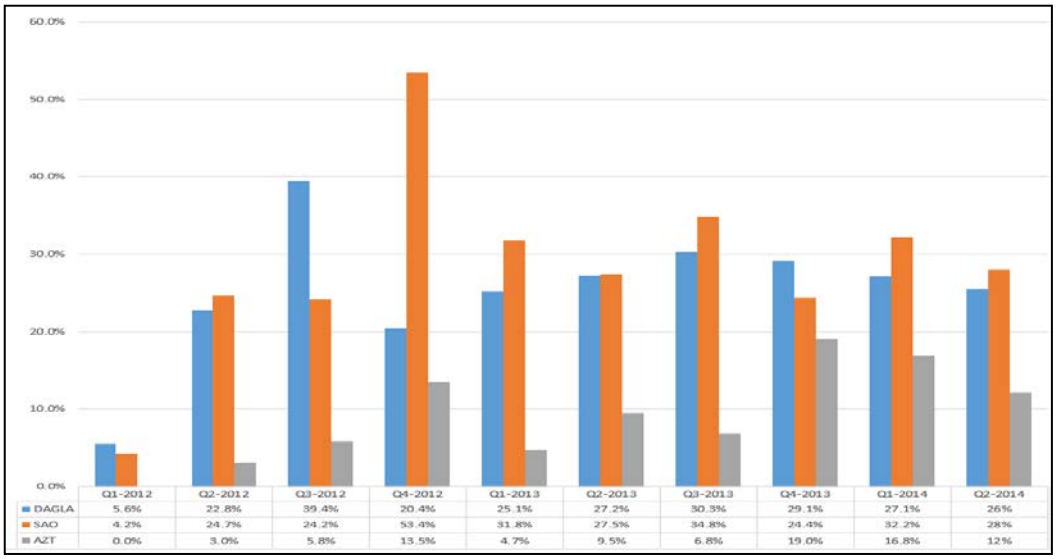
Figure 2: Percent of children 0-59 months old sleeping under an ITN (source: CHW registers)



Another indicator of the process by which the project attempted to increase demand for preventive and curative services, the percentage of newborns seen by the CHW at least twice during their first week of life, depicted in Figure 3 bears out a similar pattern, trending up and then down, but appearing to conclude at levels higher than pre-project.

[24] DHS 2012 Full report (p. 193). Retrieved from: dhsprogram.com/publications/publication-FR270-DHS-Final-Reports.cfm [accessed 12-1-14]

Figure 3: Percent of newborns seen by the CHW at least twice during their first week of life (source: CHW registers)



The number of health education talks given by the CHWs in PRISE-C intervention areas reached 4,249 by project end (March 2014).

Intermediate Result 3: Strengthened performance and sustainability of community health-delivery systems

A particularly compelling set of indicators of performance of the community-based delivery of health services is the percent contribution to under-5 coverage numerators for treatment of malaria, diarrhea, and ARI. These indicators are not part of PRISE-C's PMP, but the GoB's interest in tracking these values was brought to my attention by the MoH Focal Point for Community Services. She reported that they are currently using similar complete analysis of UNICEF-supported zones to demonstrate the contribution of community-based health care delivery to coverage numerators. PRISE-C had these data in CHW monthly reports and compiled them by arondissement for the areas they support. Table 8, below, reflects the summary of these data between October 2013 and March 2014.

Table 8: Percent Contribution to Under-5 Coverage Numerators, October 2013- March 2014 (source: Quarterly CHW reports)

Point of Service	Malaria			Diarrhea			ARI			Total			
	SAO	DAGLA	AZT	SAO	DAGLA	AZT	SAO	DAGLA	AZT	SAO	DAGLA	AZT	Total
Health facility	351	254	796	46	87	56	101	35	305	498	376	1157	2031
CHW	689	302	774	78	0	38	252	18	59	1019	320	871	2210
Total	1040	556	1570	124	87	94	353	53	364	1517	696	2028	4241
Percent contribution of the CHW	66%	54%	49%	63%	0%	40%	71%	34%	16%	67%	45%	43%	52%

If the 0 in DAGLA for CHW treatment of under-5's for diarrhea is a data gap rather than an indication of 0 diarrhea cases, it is artificially bringing down the overall percent. Regardless, these data point to more than half of high-impact core curative C-IMCI cornerstone interventions like symptomatic treatment of malaria, diarrhea, and ARI being administered by CHWs.

Additionally, findings from the OR and the supplemental qualitative data coincide to demonstrate increased performance where intervention was the most intensive from PRISE-C, but evidence is inconclusive regarding sustainability. Based on the project's formative socio-demographic data, we know that roughly 50% of PRISE-C villages in SAO and DAGLA are > 10 kms from the nearest health center. Given the essentially voluntary nature of community health work in Benin, the variable size of what constitutes a village, and the fact that the majority of CHWs have another occupations (formal or not), the obstacles to making community health care delivery work are formidable. Program data from the CHW register-fed routine information system indicate high (>96%) rates of correct treatment of under-5's for malaria, diarrhea, and ARI across the three zones where the project worked. The medicine and commodity inputs required to achieve these correct treatments (drugs and bednets) were supplied by partner organizations, with whom PRISE-C coordinated effectively.

Figure 4: Mean CHW performance score over time

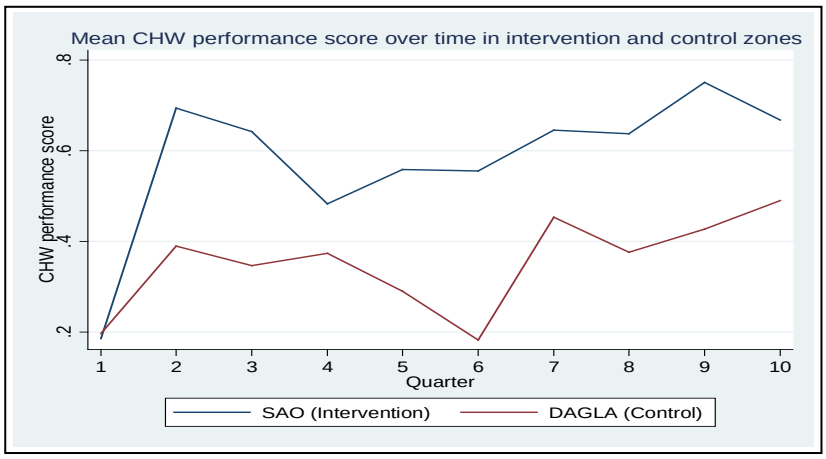


Figure 4 illustrates the performance (as captured by the composite weighted performance score) of CHW's in SAO and DAGLA across time, including the dip in quarters 2 through 4 in SAO, when payments for some of the CHWs were delayed, which may have demotivated them. Additionally, this period coincides with critical harvest and planting seasons for staple crops, which may have resulted in CHWs not being able to carry out their responsibilities. During this period, there were also a number of supervisors who were not available to conduct their monthly supervision visits.

The dramatic decline in mean performance in DAGLA during quarter 4 through 6 needs to be further explored. The drop-off in performance in both SAO and DAGLA from quarter 9 of the study period is likely due to the circulation of the news of the end of the project. Many CHWs and supervisors communicated that this was demotivating to them, since they did not know if the support they received, through supervision visits, QIT encouragement, and financial incentives would be sustained after the end of the project.

ANOVA results demonstrate that the mean CHW performance score differed significantly over time between the intervention and control group, and that this pattern held for 10 of the 12 performance outcomes, included in the overall performance score. [25] Logistic regression revealed that CHWs who received the community-level quality improvement collaborative intervention have over eleven times the odds of achieving a performance score above 50%, as compared to CHWs who received financial incentives alone.

The qualitative aspects of the research, in particular, highlight the importance of the simultaneous engagement of the CHW and the community at large, as well as competition/motivation and community recognition (resulting from tracking and sharing of information) as a determinant of CHW performance. A thematic analysis of determinants of CHW performance sheds light on the importance of various factors at different stages in the project's life, across the "tiers" of the intervention (DAGLA v. SAO). A sense of competition and community recognition were determinants of CHW performance at the start of the intervention, replaced over time with community engagement and improved CHW competency. Interestingly, supervision emerged as a determinant for both the intervention and control zone. This is likely due to the overall project focus on strengthening the CHW supervisory system. Details of key themes emerging from the qualitative data can be found in Annex XIV, the Final OR Report.

The retention hypothesis was not borne out by the OR in SAO and DAGLA, in the sense that during the study period, five of the 87 CHWs left their post (Table 9), with no statistically significant difference between the zones.

Table 9: Community Health Worker Retention

	DAGLA (Control Zone)	SAO (Intervention Zone)
CHWs leaving their post	4	1
CHWs retained	44	38

The qualitative data revealed that the majority (4/5) of CHWs left their post because they no longer lived in the village of service due to marriage, starting a job in another city, and/or other unspecified reasons. The remaining CHW left his post because of a health problem with his eyes, which left him unable to read and complete the registers. Four CHWs were able to be located to be asked further follow-up questions about their decision to leave. All responded that the financial incentives were not bad but were insufficient. Two out of the four (1/2) stated that their community encouraged them while they were in their role as CHW, while the other two (1/2) stated that their community did not encourage them.

[25] Means for % of children sleeping under a ITN and % of children correctly treated for diarrhea were not significantly different over time. ITN use may not have been counted if the ITN was damaged.

Regarding cost-effectiveness, the ICER result was 650,000 FCFA ($1 290 USD) per CHW who achieved a high performance score (95% CI 463,000 – 964,000). The variable with the greatest influence on cost-effectiveness is the effect of the intervention: as the effect of the intervention diminishes to 0, the incremental cost-effectiveness ratio increases significantly from the baseline of 650,000 FCFA per CHW who achieved a high performance score to nearly 5,000,000 FCFA per CHW who achieved a high performance score, holding all other variables constant. The number of CHWs trained in both the intervention and control groups has the next most significant effect on the overall result. All of the cost variables considered individually have a relatively insignificant effect on the overall result, with performance-based incentives cost being the most influential. The baseline of 650,000 FCFA is slightly less than two times the gross domestic product per capita of Benin according to the World Bank. The World Health Organization's guidance states that for a health intervention to be considered "highly cost-effective," the cost-effectiveness must be less than the gross domestic product per capita for each disability adjusted life year saved (DALYS), i.e., in Benin, each CHW achieving a high performance score would need to avert 1.7 DALYs more than a CHW achieving a low performance score.

Interestingly, the MoH recently trained 100 additional CHWs in the intervention zone. These CHWs did not participate in the intervention during the study period, but if these 100 additional CHWs were included in a future improvement intervention, the cost-effectiveness would improve to approximately 30,800 FCFA per CHW who achieved a high performance score (95% confidence interval: 23,000 – 39,000). With the current data available, we cannot estimate the value in DALYS for improved CHW performance. We can, however, state that, assuming a higher CHW participation level, the quality improvement intervention appears to increase CHW performance at a cost that may be acceptable to the MoH.

PRISE-C's OR findings contribute to the consensus that data-based supervision is an important determinant of performance.

One of the MoH supervisors in SAO, who also functions as the Community Services Focal Point for the zone, stated, *"I now (after having been involved in PRISE-C) have another vision of what it is to be Major (Supervisor) of this center…to get out, to circulate in the community. Due to lack of transport means, we didn't do it before. The idea was there as part of the advanced strategy for vaccination coverage, but now we're stimulating demand at the same time, which is better, real integration."*

By March of 2014, however, supervision of CHWs had had to be scaled back and the only support CHWs, VHCs and QITs were receiving was directly from the project.

Lastly, the project has good qualitative evidence that the QC approach stimulates spontaneous diffusion of community-generated innovation- a promising indication of sustainability. At the community level, at a punctual "best practices" learning session in SAO during the first quarter of 2014, the QITs shared experience about practices that had emerge from their communities during the course of the project, including:

- Redistribution of ITNs according to need
- An incentive system for use of jerry cans to carry water (instead of open basins)
- Mass malnutrition screening sessions
- Creation of a community health fund to cover transport fees when referrals to health facilities are necessary
- Construction of public latrines as well as hand washing facilities
- Involvement of the QIT in alerting the CHW to newborn arrival and in tracking things such as exclusive breast feeding and ITN use.

There is evidence that these "innovations" have diffused across villages in SAO, and even to villages in other health zones. The project team is integrating these findings into their OR brief.

Strategies and factors that contributed to project achievements (Evaluation question #2)

The three IRs all contributed to project achievements in various ways. *IR1*- A community engagement strategy, as operationalized through the establishment of a national steering committee, joint project/GoB project assessments, planning and orientation sessions, led to all stakeholders being implicated in PRISE-C's final work plan and outcome targets. *IR2*- Behavior change communication messages promoted through the project were numerous and CHWs' ability to convey these door to door was variable depending on village size and competing obligations. *IR3*- Community health human resources were reinforced through capacity building strategies- trainings, but also data-based supervision. See Annex VI for a matrix summarizing all CHW training activities. Local ownership was

consistently prioritized via joint (GoB, PRISE-C, and communities) continuous analysis of monitoring indicators and refinement of appropriate tools.

The efficacy of the quality improvement approach that was the foundation of all of PRISE-C's activities was well captured through the various OR methods used. Not only were 100% of QITs operational as of March 2014, CHWs who received the community-level quality improvement collaborative intervention had over 11 times the odds of achieving a performance score above 50% as compared to CHWs who received financial incentives alone.

When asked about innovation and unforeseen results of PRISE-C, the Service Director of Community Health within in the MoH immediately spoke of the hand washing stations that were locally inspired but indirectly supported by the project.

Table 10 (below) summarizes the principle outputs of the project across the implementation period and their links to the outcomes and strategies discussed above.

Table 10. Summary Table of Inputs, Activities, and Outputs that Contributed to Key Outcomes

Project Objective No. 1 : Increase community engagement with community health delivery system			
Project Inputs	**Activities**	**Outputs**	**Outcome**
Draft PRISE-C results framework and work plan	Orientation sessions with zonal- and commune-level health teams, community- and national MoH- level leaders	All key stakeholder (184)—health care providers, opinion leaders, community groups and CHWs—oriented and involved in results framework and work plan refinement	89 (100%) of PRISE-C villages with a complete VHC and a health work plan (at both project mid-term and end-line, up from zero at baseline) The percent of villages with community representation of at least 75% at monthly CHW meetings increased progressively across the life of the project (61.5% at baseline, 75.6% at mid-term and 100% at end-line)
		National steering committee established	
		Technical teams in place	
		PRISE-C project details discussed with 48 members of zonal consultative committees	
Assessment tool	Community participation diagnostic activity	95 villages assessed	
		118 CHW selected by their villages	
		63 VHC established (AZT and DAGLA)	
		32 QIT established (SAO)	
ToT plan and training materials	Training of zonal trainers	38 trainers established	
Supervisory training materials	Training of CHW supervisors	38 supervisors trained	
Technical assistance to VHC in DAGLA and AZT villages	Quarterly VHC meetings Annual work plan follow-up	69 % of VHC operational in AZT; 75% in DAGLA in Y4	
Technical assistance to QIT in SAO villages	Monthly QIT meetings Indicator values reviewed and activities planned for next month	100% of QIT operational in SAO in Y4	

Project Objective No. 2 : Increase demand for community preventive and curative services			
Project Inputs	**Activities**	**Outputs**	**Outcome**[26]
BCC strategy	Distribution and use of BCC materials, including counseling cards, radio programs	Healthy behaviors reinforced at 4249 group education sessions and 31778 home visits	31.2→82.2% of mothers know the CHW in their village 41.3→70.0% of mothers participating in health talks; 14.3→33.1% of mothers having interacted with the CHW in the past 2 months 9.2→25.3% of mothers of children 0-23 months who live in
Community-level BCC work plans		Regular airing of radio spot on SAO radio station	
BCC materials			

[26] All measurements reflect base- to end-line trends, aggregated across the three zones

2 BCC specialists	BCC support to CHWs	Supervisions and meetings	a household with soap or a locally appropriate cleanser at a hand washing station 9.8→23.8% of children aged 0-23 months with fever in the past two weeks who received ACT within 24 hours of onset of fever
Trained/competent CHWs	Proximate support to mothers and other care takers of children for key health seeking and disease prevention behaviors	4 249 education sessions by the CHWs	
		31 778 home visits by the CHWs	
		48 women's groups trained	

Project Objective No. 3 : Strengthen performance and sustainability of the community health delivery system			
Project Inputs	**Activities**	**Outputs**	**Outcome**
MoH HIIP- Com Guidelines	CHW training in HIIP-Com	118 CHW trained in the three zones	>50% contribution of CHWs to treatment of <5s for malaria, diarrhea and ARI
HIIP-Com training materials and tools			
C-IMCI and FP training materials	C-IMCI and FP refresher training for CHWs (AZT)	23 CHWs trained	
	C-IMCI refresher training for CHWs (SAO and DAGLA)	86 CHWs trained	
Counseling cards	Briefing of health center clinical assistant staff (all 3 zones) on communication of C-IMCI messages during vaccination days (in the health center or community)	100% of clinical assistant staff of health centers in intervention zones briefed	
Drugs and supplies	Distribution of ACT	32,867 courses of ACT distributed across the three zones and the life of the project	
	Distribution of ITNs	77,316 ITNs distributed	
Supervision tools and logistics	Monthly group supervision of CHWs in each zone	18 monthly supervisions in each arrondissement (sub-commune)	
	Quarterly on-site supervision of CHWs	10 quarterly visits to CHWs in their villages	
TA to zonal health management teams in working with elected officials	Advocacy sessions with the mayoral offices of the 7 communes	Budget line introduced in 4/7 communal 2014 work plan for the financial incentives for the CHW	

Operations Research (SAO only)			
Project Inputs	**Activities**	**Outputs**	**Outcome**
Formative research tools	Formative research conducted with CHWs and their communities	4 FGDs	CHWs who received the community-level quality improvement collaborative intervention have over eleven times the odds of achieving a performance score above 50% as compared to CHWs who received financial incentives alone.
		CHW socio demographic database	
	Target group census in SAO and DAGLA villages	Target group data base	
QI Implementation manual	Orientation sessions on quality improvement	81 participants from 31 villages	
		4 QCs established	
	Training of coaches	11 coaches trained	
	Coaching of QIT	QIT in 31 villages coached every six months	
	Exchange meetings for QITs to share innovative practices emerging from local monthly meetings	4 learning sessions including documentation of community-level innovations	
OR PMP	Quarterly monitoring of OR PMP indicators	Routine analysis of monitoring indicators	
Qualitative research	Data collection and	4 qualitative research reports	

protocol and tools	analysis		
MoH CHW supervision toolkit	Community health systems monitoring indicators and mechanisms meeting	Integrated monitoring tools adopted by health management staff of all 3 zones	
OR preliminary results	OR innovation documentation	Scale-up plans developed by health management staff of all 3 zones	

Additional communication tools/products created by the project include:

- A documentary film about PRISE-C implementation (produced and used for global advocacy about C-IMCI by PRISE-C and MCHIP more broadly)
- Production of a CD of awareness raising songs on ITN use, malaria prevention and treatment, vaccination, exclusive breastfeeding and household hygiene- used at mass awareness-raising sessions

The only significant divergence from the DIP, as noted in Annex III, was the mutuelle activities being stopped at the mutual organizations' request. With the advent of the GoB's Universal Health Insurance Scheme (Regime d'Assurance Maladie Universelle [RAMU]) in 2011, the services offered by these organizations became redundant.

Regarding gender, there is no evidence that the ratio of male to female CHWs established at the beginning of the project (64 men and 47 women) was unsuccessful. Attempts to probe, during KIIs and FGDs, into questions such as whether or not men were involved in project activities and how the results of the project affected women and men differently, was met largely with confusion about the questions. One has the impression, at least in the villages visited during supplemental qualitative data collection, that decision-making about health-seeking for children is influenced more strongly by socioeconomics than by gender.

That said, one female member of a VHC in a village where the CHW is a man reported, "*The project has drawn attention to something that was, in the past, just a women's issue- sick kids. Having chosen a man has not been a problem."*

Project elements likely to be sustained or expanded by the MoH (Evaluation question #3)

Despite the fact that four of the seven communes PRISE-C worked in included a budget line in their 2014 work plan for the financial incentives of CHWs, there was no evidence at the time of supplemental qualitative data collection for the final evaluation that these funds were forthcoming.

Work remains to integrate health (community-based and formal sector) into the agenda of elected officials. The Secretary General of the Commune of Allada implored,*"…[the project] must expand, they must involve the mayoral offices, we don't know their management systems…"*

Yet the SAO Medical Coordinator assured me, *"The budget lines will be there, you'll see. And we're going to continue to try to harmonize and simplify monitoring systems. But the household surveys… without PRISE-C, we wouldn't have been able to do it, one can't rationalize too much or quality will be affected. State resources are not currently sufficient to fund the health system as it needs to be funded. Since I have been in this position [2010], we've only seen our budget lines go down, arrondissement- and facility-level supervisors, I hold them responsible for their duties, but they need resources with which to work."*

The sudden death of the Head of the Community Health Services Division in November 2013 negatively affected PRISE-C's ability to facilitate sustainability of its achievements. The new leadership does seem to be on the right track. The new Community Health Service Director told me, "*By definition things that are simple are more sustainable"*. PRISE-C has provided models and tools that are consistent with such a vision.

Stakeholder perspectives on the operations research implementation (Evaluation question #4)

In the October 2012 national evaluation of the GoB's HIIP-Com (October 2011), the PRISE-C QC approach was called a promising practice. The following quotes from the Departmental Health Director of Zou-Collines were noted about SAO:

- *"Strong community engagement: one of the visible results is the implication of community members in the process."*
- *"The CHWs feel more supported, have more confidence in themselves, feel valued."*

- *"The strong positive modeling has seen between QITs due to the monthly interpretation of results achieved by their respective villages and decisions taken regarding improvement: it's the performance and the honor of the village (not just that of the CHW) at stake. No village wants to be the last of the arrondissement or the commune!"*
- *"The extent of implication of the different stakeholders was decisive and did not fail. The government intervenes on the political side and the partners on the funding side.[27]"*

During the current evaluation, several key informants mentioned selection of the CHWs by their communities as something PRISE-C had brought in with their community-engagement/mutual-learning approach. This attribution is plausible in that the sequence of events was such that a community-engagement approach was codified into the GoB's Community Health guidance in 2011 after PRISE-C began.

Again, the SAO Medical Coordinator said, *"PRISE-C has been able to bring out original ideas…it's the first project I've seen concretize it [a community-driven quality improvement approach], they respond to demand and the subjectivity of things (one can see this in the management of human resources, which is very subjective), there's so much need that can't be quantified by surveys."*

The following excerpts from the qualitative portions of the OR convey some of the beneficiaries' and intermediate beneficiaries' perspectives.

One CHW in a high performing village in SAO (intervention zone) said: *"In the process of our work, we conduct evaluations (learning sessions). During the first evaluation (learning session), I was ranked x[28] out of 9 CHWs. I wasn't ready for that. Because of this, I reapplied myself to my work to be able to be first or to keep my place in the rankings."*

A CHW from a high performing village in SAO (intervention zone) said: *"After each training, I come back and brief the QIT, and they help me to spread the message among the population as well as do the work. The QIT members help a lot so that during the next learning sessions we can remain on top. We can't allow our activities to slip; we have to continue to do better."*

Two beneficiaries, mothers of children under the age of 5, in a focus group in a high performing village in SAO said: *"The members of the QIT also play their role…They come with me to conduct health education sessions. If there are certain members of the community who don't want to adopt healthy behaviors, they lead the way to help convince them."*

And *"When it was only her telling us, we ignored her; sometimes we would send her away. But now that she works with the community members, we understand that [what she is telling us] is for our own good."*

CONCLUSIONS

PRISE-C's overarching strategic objective was to accelerate delivery of proven low-cost MCH interventions. Given the paucity of resources for the health sector in Benin, PRISE-C did accelerate delivery of some of the core C-IMCI interventions in its intervention areas by serving as the partner agency/delivery mechanism in the project villages. PRISE-C's challenges appear to be measurement short-comings more than implementation difficulties. Some of the challenges presented by PRISE-C's quantitative data may be due to slight changes in indicators definitions throughout the course of the project, but the household survey data collection instruments used at baseline and end-line are nearly identical, and the change management documents by which the PMP was updated and definitions were communicated seem clear enough. The baseline and end-line surveys were implemented by different organizations due to the requirement that the end-line survey be executed by an external party, and that project M&E staff had turned over in the course of the project The real challenge, however, seems to stem from the volume of data collected (both routinely and through the household surveys at base- and end-line) and the validity of attempting to collect things like coverage through a community-based monitoring system.

The project's household survey and routinely collected quantitative data illustrate some important lessons. It is tempting and logical to routinely track the same indicators that one designates as the longer-term outcome

[27] Sagbohan, October 2012, page 82

[28] Rank not indicated to anonymize the data.

indicators, as the project did with exclusive breastfeeding and ITN use, the definitional discrepancies notwithstanding. Population level methods, however, include sampling strategies designed to supply adequate power to measure things that do not respond well to shorter-term, low sample size measurement, as most clearly illustrated by PRISE-C's exclusive breastfeeding data.

Regarding sampling, it is understandable that the 30-cluster sample design was applied at the health zone level at baseline, given the fact that intervention villages has not been decided upon at the time of the survey. At end-line, however, a more stratified approach, emphasizing only villages in which the project had worked to more precisely reflect knowledge and behavior in project intervention areas, would have been desirable, as recommended in the MTE when LQAS was suggested, and may still be possible in sub-analysis of the household data.

Overall, PRISE-C's PMP was too ambitious. In their October 2014 editorial in JAMA, Mcglynn and Adams call for parsimony as a critical selection criteria when choosing indicators. [29] PRISE-C attempted to avoid undue burden on CHWs and supervisors by adopting MoH indicators, but was not kept up to date when the GoB simplified to output counts (% contribution numbers) rather than coverage percentages for routine monitoring.

Intermediate Result 1: Community engagement with the community health-delivery system

Community engagement with the community health-delivery systems as it was defined by the project's routinely collected process indicators was achieved, but the GoB, supported by projects like PRISE-C, could go further not only capturing the process of community engagement, but also the links between these processes and health outcomes of interest. In a recent literature review summary, Rifkin suggests that evidence of the links between community participation and improved health outcomes remains weak.[30] Benin could make a significant contrition to the field by delving more deeply into the population-level data that it collected, such as that collected from the baseline/end-line household-level KPC surveys. One could potentially look for links between use of the CHWs and key outcomes, as well as more stratified analysis on distance to a health facility. Non-PRISE-C villages that were sampled could potentially be used as a post-hoc comparison group.

Intermediate Result 2: Demand for community-level preventive and curative services.

At present, the evidence on demand for community-level preventive and curative services is decidedly mixed. Qualitative data from both beneficiaries and intermediate beneficiaries unanimously point to the fact that not having to travel for services that can be delivered closer to home is well-appreciated by communities, CHWs, and formal health sector health workers alike, and all parties appear to be satisfied and to want to continue this work.

It is not surprising that analysis of indicators, such as use of ANC and skilled attendance at birth, from the randomly selected sample of 90 villages, yield results that are difficult to interpret, as activities related to these maternal health outcomes are explicit in neither the GoB's HIIP/Com nor any of PRISE-C's annual work plans. It begs the question of why maternal health indicators were included in PRISE-C's PMP and promoted via supports such as the counseling cards.

The overall >50% contribution to <5 treatment of malaria, diarrhea, and ARI more clearly illustrate PRISE-C's success. These indicators communicate a lot about not only performance of CHWs, but demand for the C-IMCI cornerstones.

Hygiene messages also appear to have taken hold quite well, a particularly encouraging finding given the increased attention in the sub-region (and across the world) to community-based infection prevention in the context of the current Ebola epidemic.

The Cape Town Statement from the Third Global Symposium on Health System Research (October 2014) recently called for health systems to be reoriented to respond more directly to people's emerging needs and to be accountable to ordinary people.[31] In the spirit of this statement (as well as that at the heart of many of the newly introduced research agenda items in Hammer et al's closing article in the 2012 18 article supplement to the

---

[29] McGlynn EA, Adams JL, What Makes a Good Quality Measure, JAMA, 312 (15): October 2014. Retrieved from: jama.jamanetwork.com/article.aspx?articleid=1915591 [accessed 11-20-14]

[30] Rifkin SB, Examining the links between community participation and health outcomes: a review of the literature. Health Policy and Planning 2014; 29:ii98–ii106 doi:10.1093/heapol/czu076. Retrieved from: heapol.oxfordjournals.org/content/29/suppl_2/ii98.full [accessed 12/01/14]

[31] hsr2014.healthsystemsresearch.org/sites/default/files/Cape-Town-Statement.pdf [accessed 12/01/14]

American Journal of Tropical Medicine and Hygiene on Integrated Community Case Management), CHW safety and standardized remuneration (i.e. not allowing different partner organizations to compensate on different scales) are issues that governments, including Benin's, need to take up immediately if they are to hold on to progress made by ordinary citizens under projects such as PRISE-C.[32]

Intermediate Result 3: Strengthened performance and sustainability of community health-delivery systems

PRISE-C management was resolute about being integrated into Benin's public health system for sustainability's sake, but given the current capacity of that system, a narrow community-based focus is not enough to realistically expect significant changes in population-level behaviors in such a short period of time.

Whether or not the project's routinely collected data serve to measure inputs more than outcomes, reflecting the ebb and flow of materials needed for healthy behaviors, more than the behaviors themselves (e.g. availability of ITNs and/or ACT, rather than population-level appreciation of them), they point to the important role projects such as PRISE-C play currently in Benin.

The inherent data-use aspects of a quality improvement approach to health-seeking and promotion appear to have paid off in the case of PRISE-C. Where and when data-oriented supervision was most intense is where and when project results are the most clearly perceptible.

Ownership of the community health work mandate does appear to be strongest in SAO, which is not surprising, given the fact that they received the strongest "dose" of project support. Both SAO and DAGLA benefited from the continuity of having been intervention zones under PISAF, which raises the question- did being identified as the comparison zone under the PRISE-C OR, predispose DAGLA to feeling "demoted"? Or is staff turnover more centrally at the root of the DAGLA's performance? The Medical Coordinator of DAGLA (in his post since October 2012) clearly told me that he viewed the ACT stock issue as a matter to be resolved between PRISE-C and Africare/PILP.

PRISE-C staff knew that AZT was going to be a challenge, but fought to include the zone, due to the great need there (despite its proximity to Cotonou) and told me they would do it again if given the choice again. The zone had had no previous integrated community-based health care delivery and indications such as the 43% contribution to <5 coverage numerators are encouraging. If even 12% of newborns are being seen by a CHW at least twice during their first week of life (up from 0% in AZT according to routine data), this is important momentum to not lose.

The Government of Benin's package of high-impact interventions for CHWs, an ensemble of interventions that take an integrated approach to reducing maternal and child mortality and morbidity, with an accent on health promotion, has 31 principle components. The counseling cards used to communicate key health-seeking and promotion actions contain at least 19 key messages. Integration is a blessing and a curse. It is inherently appealing to consider beneficiaries in their entirety. In weak health systems, however, where access to basic primary health care is not a reality for a significant portion of the population, and essentially voluntary CHW's are the frontline agents, delivery of a truly integrated package-no less documentation of the same- is a lot to expect. Greenhalgh et al in their "Diffusion of Innovation in Service Organizations: Systematic Review and Recommendations" allude to the same need for an ecological approach to measuring system readiness for innovation that Victora et al, in their 2005 article entitled "Context Matters: interpreting impact findings in child survival evaluation", spoke of when they called for more attention to measuring contextual factors including implementation-related factors such as the characteristics of the health systems where C-IMCI has been implemented.[33,34]

Regardless of any project/partner's relative strengths/weaknesses, a vertical community-health strategy does not currently suffice in a context such as Benin, nor should it be expected to do so. Regarding sustainability, until its formal public health and transport systems are stronger, the GoB needs more comprehensive support including a data-oriented quality approach such as the one tested under PRISE-C, but also standardly available health supplies and human resources.

---

[32] Hamer DH, Marsh DH, Peterson S, Pagnoni F, Integrated Community Case Management: Next Steps in Addressing the Implementation Research Agenda, Am J Trop Med Hyg 2012; 87:151-153; doi:10.4269/ajtmh.2012.12-0505; Retrieved from:www.ajtmh.org/content/87/5_Suppl.toc [accessed 12/01/14]

[33] Greenhalgh T, Robert G, Macfarlane F, et al; Diffusion of Innovations in Service Organizations: Systematic Review and Recommendations; The Milank Quarterly 2004; 82 (4); 581-629; Retrieved from:www.ncbi.nlm.nih.gov/pmc/articles/PMC2690184/pdf/milq0082-0581.pdf [accessed 12/01/14]

[34] Victora CG, Schellenberg JA, Huicho L et al; Context matters: interpreting impact findings in child survival evaluations; Health Policy Plan 2005; 20 (1): i18-i31. doi: 10.1093/heapol/czi050; Retrieved from: heapol.oxfordjournals.org/content/20/suppl_1/i18.full.pdf+html [accessed 12/01/14]

RECOMMENDATIONS

Table 11: Final Evaluation Recommendations

Finding	Conclusion	Recommended Action
SO		
Accelerated delivery, of malaria- and ARI-related high-impact interventions, in particular, was achieved, albeit on a modest scale	CHW performance was most evident in SAO, which received most investment	Take lessons learned from SAO and expand, saturating health zones with emphasis on villages >10kms from a health center
PRISE-C demonstrated strong partnerships, and solid management systems[35]	It is difficult to expect population-level results from such a multi-faceted/integrated program, in such a short period of time	Streamlined output monitoring and richer qualitative data systems (e.g., video, multi-media) would capture project achievement and be more informative in the short-term Oversample intervention zones for DHS/MICS or similar for measurement of outcome/coverage-level changes
PRISE-C's PMP was overly ambitious and ultimately skewed toward outcome measurement instead of process	Parsimony is generally recognized as a facilitating characteristic especially in community-based monitoring systems	Invest in PMP and information systems, bringing advantage of being within MCHIP network to bear, upfront in the design stage and more throughout life of the project, aiming to measure simultaneously less and more; fewer outcome indicators and more easy to digest detail of the complexities in which interventions are being rolled out
IR1		
Community engagement (as defined by the project) was achieved	Potentially richer analysis of household survey data possible	Exploration of household data using use of CHW and other measures of community engagement as intermediate measures of outcomes of interest
IR2/IR3		
Re: demand and performance of CHWs, >50% contribution to under-5 coverage numerators	GoB using this indicator to track progress in other zones	Support GoB to focus community-based monitoring systems on output elements such as these in future. Time series analysis of these data would be desirable.
IR3/OR		
CHWs who received the community-level quality improvement collaborative intervention have over eleven times the odds of achieving a performance score above 50% as compared to CHWs who received financial incentives alone.	The QC approach is applicable at community-level and appears, in SAO, to have led to strong ownership of community health delivery mandate including spontaneous innovations to key health-seeking and promotion actions, in turn, diffused	Diffusion of innovation phenomenon worthy of further investigation/ documentation Intentional network analysis and capture of spontaneous diffusion of innovation in the context of future QC implementations
The CHW performance scores tested in the OR portion of PRISE-C are a potentially innovative contribution to implementation research field	Indices like these address the need for more creative methods given the impracticalities involved in randomization in MCH programs and that "finding 'virgin' comparison areas is increasingly challenging"[36]	Further testing and refinement of them in different contexts bearing in mind the recent recommendations and advances being made in the formulation of coverage measurement methods, instruments and questions[37]
Retention was a small, but insignificantly different issue across study zones. The qualitative analysis raises important factors like the insufficiency of government compensation scale	If CHWs are to reliably serve as front line agents in any health system, they must enjoy sufficiently motivating protections and compensation	QI other non-monetary motivating factors are important systems to plan for in decentralized health care systems but do not negate the need for standardized and sufficiently motivating monetary compensation scales.
Assuming high CHW participation and fixed costs of training and supervision, the quality improvement intervention can increase CHW performance at a level which qualifies as "highly cost effective"	Training and supervision are the foundation of capacity building and merit investment at a level that achieves an economy of scale	Deeper saturation of community health worker trainings to achieve critical mass and the cost-effectiveness that these analyses imply, accompanied by a robust, data-oriented supervision system
Without project support of supervision, indicators decline	Benin's public health system is in need of even more integrated support, not less	More saturated (community as well as formal health system) support to intervention zones

[35] See Annex II for further details of the assessment of PRISE-C management systems.
[36] Bryce J, Victora CG, Boerma T et al. 2011. Evaluating the scale-up for maternal and child survival: a common framework. International Health 3: 139–46.
[37] PLOS, Measuring Covering in Maternal, Newborn and Child Health Collection, 2013.

ANNEXES

I. List of Publications and Presentations Related to the Project

II. Project Management Evaluation

III. Work Plan Table

IV. Rapid CATCH Indicator Table

V. Final Knowledge, Practice and Coverage Survey Report

VI. Community Health Worker Training Matrix

VII. Evaluation Scope of Work

VIII. Evaluation Methods/Data Source Mapping

IX. Data Collection Instruments

X. Sources of Information

XI. Disclosure of Any Conflicts of Interest

XII. Statement of Differences

XIII. Evaluation Team Members, Roles, and Their Titles

XIV. Final Operations Research Report

XV. Operations Research Brief

XVI. Stakeholder Debrief PowerPoint Presentation

XVII. Project Data Form

XVIII. PRISE-C Performance Monitoring Plan

ANNEX I. LIST OF PUBLICATIONS AND PRESENTATIONS RELATED TO THE PROJECT

Presentations:

- Presentation on OR at Spring 2012 CORE Group meeting: *http://www.slideshare.net/COREGroup1/bringing-operations-research-to-lifeakogbetoriese5212*
- Brownbag presentation at USAID Washington, "Lessons Learned on CHW Performance and Motivation", October 2012
- Presentation on at APHA 2013*: https://apha.confex.com/apha/141am/webprogram/Session39057.html*
- Presentation on PRISE-C Innovations Formative Research at Integrated Community Case Management Evidence Review Symposium, Accra, Ghana, March 2014
- Presentation on mhealth work at "Throughout the Reproductive Life Course: Opportunities and Challenges for Empowering Girls and Women" *: http://www.scribd.com/doc/217021967/Mobile-Tools-for-Family-Planning-in-Benin-Texting-for-Maternal-Wellbeing-Sara-Riese-Empowerment-Plenary*, April 2014

Learning Briefs:

- Texting for Maternal Wellbeing: Use of mobile phones by CHWs to offer family planning services (Annex 5, Y3 Annual Report)
- Improving Community Health Worker Performance and Retention in Benin via Community-level Quality Improvement Collaboratives (Annex 1, Midterm Evaluation Report)

ANNEX II. PROJECT MANAGEMENT EVALUATION

PRISE-C appears to have responded nimbly to field realities such as: government partners thinly stretched as they juggle working with multiple partner organizations; MoH and project staff turnover, changes in national policies and protocols regarding distribution of medications and other supplies/equipment (e.g. mosquito nets).

Planning and Implementation

Annual project work plans are ambitious, but logical given the project's objectives.

Resounding praise was expressed in the supplemental data collection regarding project management's "approachability", "technical expertise", "energy" and "dedication". When asked how she achieves stakeholder engagement, PRISE-C Project Director, Marthe Akogbeto, says, "I tug at the patriotic string". She is well positioned to do so, as a respected, seasoned member of the health care community in Benin. She has demonstrated strong leadership ability in her handing of challenges ranging from coordination of commodities with partners organizations to annual cost-sharing calculations to end-line household survey data cleaning.

Supervision of Project Staff

PRISE-C has suffered, it seems, during the last year, from attrition typical of project ends. This phenomenon notwithstanding, stable management and staffing across multiple projects was apparent. There is strong institutional memory represented currently by everyone including the technical (Project Director and Child Health and M&E Officer) as well as the administrative staff (Financial Officer, Administrative Assistant [formerly a Driver], current Drivers). URC/CHS appears to have robust systems for staff advancement and performance appraisal.

Supervision of CHWs

Multiple data sources (including key informants spoken to during supplemental qualitative data collection) indicate the project staff's presence in the field contributing to CHW and CHW supervisor motivation.

Information Management

As was previously noted in the MTE and the conclusions of the current evaluation, PRISE-C's PMP was ambitious in indicator targets, but also in number of indicators. The project's commitment to strong qualitative/narrative/programmatic documentation has served it well and is especially important in light of the difficulty of interpreting its quantitative data.

The routine quantitative data that the project compiled for percent contribution to <5 coverage numerators as well as the other routine quantitative PMP indicators, appears very complete. Quality assurance exercises have been conducted annually at the project level and punctually with the Ministry of Health for indicators that are also national level indicators. In a future phase, honing the number of routine quantitative indicators even further, limiting them to counts rather than percentages, and assuring coherence across routine and baseline/end-line measures is advisable.

The project appears to have received strong technical backstopping from the US, especially for conception and data analysis associated with the operations research. It is unfortunate that more technical assistance was not invested into helping the project limit the number of indicators in the overarching PMP, assuring coherence across routinely collected measures and baseline/end-line measures and reorienting the sampling and analysis strategies for the end-line survey.

Financial Management

The current Finance Officer was a Financial Assistant on a previous URC/Benin project. Budget forecasting and tracking of both expenditures and variances appear to run smoothly under hers and the Project Director's leadership and long-standing tenure with URC/CHS. Backstopping from the US office of URC/CHS for finance appears to be strong and well-integrated with technical backstopping.

ANNEX III. WORK PLAN TABLE

Activity	*Activity Status*
Project management	
Present the project to health authorities	*Completed*
Orient Project management team and conduct team building/work planning workshop	*Completed*
Orient Community and Facility Activities Coordinators, department MOH partner staff	*Completed*
Develop 1st detailed annual work plan in harmony with MOH work plan at zonal levels	*Completed*
Implementation of the baseline survey	*Completed*
Analyze baseline survey and study results	*Completed*
Share survey results with stakeholders and community representatives	*Completed*
Develop detailed implementation plan (DIP) with stakeholders and community representatives	*Completed*
Finalize training and supervision schedule	*Completed*
M&E training for Zonal data managers	*Completed*
Quarterly Meetings with USAID Mission	*Completed*
Regular Data collection	*Completed*
Implementation of endline survey	*Completed*
Analyze endline survey and study results	*Ongoing*
Share endline results with stakeholders and community representatives	*Date pending*
Close out conference	*Date pending*
IR1	
Orientation for CHW Zonal Trainers on participative community diagnosis	*Completed*
Annual Community Development Action work planning by VHC	*Completed*
Annual VHC Meetings (every 6 months between the work planning meeting)	*Completed*
Execution of community development actions plans	*Completed*
IR2	
2.1 Improving knowledge, attitudes and practices towards child health	
Adapt a behavior change strategy from MOH's, PISAF documents and baseline survey results	*Completed*

Identify, train and put in place zonal field agents for SAO and DAGLA	*Completed*
IEC package training for Health Care Workers	*Completed*
Provide IEC materials to Health Care Workers (from MOH/PISAF)	*Completed*
BCC refresher training for CHWs and select women's group members	*Completed*
Provide BCC materials to CHWs (from MOH/PISAF)	*Completed*
Collaborate with local partners to harmonize maternal and child health radio messages	*Completed*
Work with women's theater groups to educate mothers on key practices for children's health	*Completed*
Follow up BCC activities in the villages and health facilities	*Completed*
2.2 Promote the uptake of mutuelle membership	
Collaborate with mutuelles to ensure key children's health practice messages for mothers	*Mutuelle activities were stopped by mutuelle organizations*
Discussions with community leaders to raise awareness about mutuelles services	
Facilitate community and mutuelle organizations (PROMUSAF, RAS etc) links in AZT	
Work to improve relations between health facility staff and members of mutuelles	
IR3	
CHW Training Package and Facilitators preparation - all zones	*Completed*
IMCI supervision refresher for health center supervisors of CHWs	*Completed*
Follow-up visits to health centers to assure proper supervision of CHWs	*Completed*
Monthly meetings of CHWs and health center supervisors (co-supported by Africare)	*Delayed but ongoing*
Support for quarterly on-site supervision visits by CHW supervisors to CHWs	*Completed*
CHWs Financial Incentive	*Ongoing*
Identification of zonal level community health committee	*Completed*
Reinforce the knowledge and skills of CHWs	*Completed*
TOT for CHW Integrated case management trainings in AZT	*Completed*
Integrated case management training for CHWs	*Completed*
CHW Post training follow up	*Completed*
Provide refresher training on identified gaps in knowledge and skills	*Completed*
Follow-up visits to CHWs to reinforce knowledge and skills	*Completed*
OR	

Develop research protocol and discuss with stakeholders	*Completed*
Submit approved OR concept paper to the Comite d'Ethique in Benin for approval	*Completed*
Formative research-initial phase	*Completed*
QI methodology training	*Completed*
Introduce collaborative approach and identify priority health issues in OR zone (SAO)	*Completed*
Routine data collection of CHW performance indicators	*Completed*
Annual completion of the CHW system functionality assessment tool	*Completed*
Quarterly focus groups with hi/mid/low performing CHWs, VHDC members, CHW supervisor	*Completed*
Quarterly Learning Sessions of Community level Collaborative	*Completed*
Monthly QIT meetings at village level-CHWs and QIT members	*Completed*
Quarterly meetings at village level-CHWs and VHDC members	*Completed*
In-depth interviews with CHWs on retention (as needed with any CHWs who leave their post)	*Completed*

ANNEX IV. RAPIDCATCH INDICATOR TABLE

Indicator	SAO			DAGLA			AZT			TOTAL		
	Baseline	Final	P	Baseline	Final	P	Baseline	Final	P	Baseline	Final	P
% of children age 0-5 months who were exclusively breastfed during the last 24 hours	22.1	76.9	0.000*	35.8	21.8	0.03	19.4	20.8	0.82	26.3	43.4	0.00*
% children ages 0-23 who present symptoms of pneumonia in the past two weeks and who were taken to an appropriate health provider	57.9	50.0	0.71	33.3	46.7	0.40	56.5	41.4	0.28	48.5	44.2	0.64
% of children ages 0-23 months with diarrhea in the last two weeks who were treated with ORS	57.1	52.0	0.76	42.6	62.9	0.07	12.5	10.5	0.83	39.0	39.8	0.91
% of mothers of children 0-23 months who live in a household with soap or a locally appropriate cleanser at a hand washing station	22.3	37.0	0.00*	5.3	16.3	0.00*	0.0	22.7	0.00*	9.2	25.3	0.00*
% of children age 0-23 who slept under a treated mosquito net the night before survey	87.7	88.7	0.7	77.0	65.6	0.00*	72.7	78.3	0.11	79.1	77.4	0.38
% of children ages 0-23 with fever in the past two weeks who received ACT within 24 hours of onset of fever	8.3	24.3	0.05*	10.0	27.8	0.00*	10.3	19.8	0.12	9.8	23.8	0.00*
% of children who received Vitamin A in the last 6 months	87.4	88.0	0.86	80.9	84.9	0.29	77.7	86.5	0.01*	82.5	86.4	0.04*
% of mothers of children ages 0-23 who had at least 4 ANC visits when they were pregnant with their youngest child	31.9	44.5	0.01*	37.9	43.5	0.23	55.0	37.0	0.00*	42.3	41.6	0.79
% of mothers of children ages 0-23 months who had at least 2 TT doses before the birth of their youngest child	71.5	63.9	0.09	83.3	80.8	0.49	77.7	64.8	0.00*	78.0	69.3	0.00*
% of children ages 0-23 months whose births were attended by a skilled health worker	58.1	59.7	0.69	52.3	75.7	0.00*	81.0	64.5	0.00*	63.8	66.6	0.21

Indicator	SAO			DAGLA			AZT			TOTAL		
	Baseline	Final	P	Baseline	Final	P	Baseline	Final	P	Baseline	Final	P
% of children 0-23 months who are underweight (-2 SD for the median weight for age)	2.4	1.8	0.62	4.8	2.2	0.09	2.4	2.1	0.81	3.2	2.0	0.12
% of children aged 12-23 months who received PENTA1 according to the vaccination card or mother's recall by the time of the survey	65.4	67.0	0.8	72.5	51.6	0.00*	76.9	55.4	0.00*	71.4	57.5	0.00*
% of children age 12-23 months who received PENTA3 according to the vaccination card or mother's recall by the time of the survey	59.2	64.2	0.43	69.7	48.4	0.00*	70.2	45.3	0.00*	66.1	51.8	0.00*
% of children aged 12-23 months who received measles vaccine according to the vaccination card or mother's recall by the time of the survey	56.2	54.7	0.82	68.8	48.4	0.00*	60.3	48.9	0.07	61.4	50.4	0.00*

ANNEX V. FINAL KNOWLEDGE, PRACTICE, AND COVERAGE SURVEY REPORT

REPUBLIC OF BENIN

MINISTRY OF HEALTH

Partnership for the Community Management of Child Health

Final Knowledge, Practices, and Coverage Survey Report

Partnership for the Community Management of Child Health Project (PRISE-C)

Evaluation report presented by
LEADD consultancy firm, September 2014

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table of Contents

Acronyms and Abbreviations 4

Introduction 5

I. SURVEY OBJECTIVES 5

1.1 Overall Goal 5

1.2 Specific objectives 5

II. METHODOLOGY 6

2.1 Context and type of study 6

2.2 Study population 7

2.3 Sampling 7

2.4 Sample size 8

2.5 Organization of data collection 8

2.6 Data processing and analysis 10

III. ETHICAL DIMENSION 10

IV. CHALLENGES AND LIMITATIONS OF THE STUDY 10

V. RESULTS 11

5.1 General characteristics 11

5.2 Maternal and child health care 13

5.3 Breastfeeding and infant nutrition 18

5.5 Malaria prevention with LLINs 22

5.6 Childhood illness 23

5.7 Hygiene and sanitation 27

5.8 Community health workers' relationship with the community 30

5.8 Tables comparing baseline and final findings 33

VI. COMMENTS/DISCUSSION 38

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

6.1 Maternal and child health care 38

6.2 Immunization status of children..... 39

6.3 Case management of childhood diseases 39

6.4 Breastfeeding and infant feeding..... 40

6.5 Hygiene..... 40

6.6. Community health workers' relationship with the community..... 41

Conclusion 41

Recommendations 41

Annex 1: Survey questionnaire 42

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Acronyms and Abbreviations

ACT	Artemisinin-based Combination Therapy
ANC	Antenatal Care
ARI	Acute Respiratory Infection
AZT	Allada-Zè-Toffo
BCG	Bacille Calmette-Guerin (anti-tuberculosis vaccine)
DAGLA	Dassa-Zoumé-Glazoué
DNK	Does Not Know
EMS	Emergency Medical Services
HC	Health Center
IPT	Intermittent Preventive Treatment of Malaria
IUD	Intrauterine Device
KPC	Knowledge Practices Coverage
LLIN	Long-Lasting Insecticide-treated bednet
MCHIP	Maternal and Child Health Integrated Program
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Treatment
Penta	Pentavalent Vaccine
PISAF	Integrated Family Health Project in Benin (Projet Intégré de Santé Familiale au Bénin)
SAO	Savè-Ouèssè
SP	Sulfadoxine-Pyrimethamine
USAID	United States Agency for International Development
UVS	Village Health Unit (Unité Villageoise de Santé)
WHO	World Health Organization

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Introduction

The four-year, USAID-funded Partnership for the Community Management of Child Health (PRISE-C) project was implemented by the Center for Human Services (CHS) in three zones of Benin, in partnership with the Ministry of Health of the Republic of Benin and the Centre d ’Expertise d’Ingénierie pour le Developpement Durable (CEID). Project interventions sought to improve the delivery of maternal and child health services through strengthening the community-based health care system. Specifically, PRISE-C aimed to support the survival of children 0–5 years old within their communities in the health zones of Allada-Zè-Toffo (AZT) (Atlantique Department) and Savè-Ouèssè (SAO) and Dassa-Zoumé-Glazoué (DAGLA) (Collines Department).

The project goals are, firstly, to increase community engagement with the community health delivery system, to increase demand for community preventive and curative services, and to strengthen the performance and sustainability of the community health delivery system.

The operational principles for project interventions are based on the 2010 Ministry of Health guidelines for Health Promotion at the Community Level, which define the roles and responsibilities, performance indicators, and incentive policy for community health workers. A baseline knowledge, practices, and coverage survey was conducted at the start of the project to assess the initial levels for specific project indicators. After three years of activities, the project was nearing its end, and it was important to assess the progress made and to identify major lessons learned following the implementation of project interventions.

This document describes the process used to carry out this final survey as well as the findings.

I. SURVEY OBJECTIVES

1.1 Overall Goal

The overall goal is to assess the progress on selected indicators for project implementation and to identify lessons learned.

1.2 Specific objectives

The specific objectives of this evaluation are to:

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

- Measure the knowledge, attitudes, and practices of mothers of children 0–23 months old in terms of prevention (vaccination, ante- and post-natal care, child feeding, hygiene measures, the use of LLINs, the use of water disinfectants, etc.); and
- Measure the knowledge, attitudes, and practices of mothers of children 0–23 months old regarding community-based treatment in case of the onset of targeted diseases such as malaria, diarrhea, ARI, and malnutrition.

II. METHODOLOGY

2.1 Context and type of study

This is a cross-sectional descriptive and analytical study. Each of the three project intervention health zones were taken into account for this study. These are the Dassa-Glazoué and Savè-Ouèssè (Collines Department) and the Allada-Zè-Toffo (Atlantique Department) health zones.

The Dassa-Glazoué (DAGLA) health zone combines the Dassa-Zoumè and Glazoué communes. It covers a total area of 3475 km^2. Its borders are:

- Ouèssè commune to the north,
- Djidja commune to the south,
- Savalou and Bantè communes to the west, and
- Savè and Zagnanado communes to the east.

The health zone has one hospital and serves 30 public health facilities and three faith-based health centers.

The Savè-Ouèssè (SAO) health zone covers a total area of 5428 km^2. It includes the Savè and Ouèssè communes. Its geographic borders are:

- Tchaourou commune to the north,
- Kétou commune to the south,
- Bassila, Dassa-Zoumè, and Glazoué communes to the west, and
- The Federal Republic of Nigeria to the east.

The health zone has one hospital, serving 22 public health facilities.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

The Allada-Zè-Toffo (AZT) health zone covers the Allada, Zè, and Toffo communes and covers a total area of 1439 km^2. It is bordered by:

- Zogbodomey and Ouinhi communes to the north,
- Kpomassè, Tori-Bossito, and Abomey-Calavi communes to the south,
- Bopa and Lalo communes to the west, and
- Bonou and Adjohoun communes to the east.

The health zone has one hospital, serving 30 public health facilities and 3 faith-based health centers.

2.2 Study population

This is a household survey targeting mothers and caregivers of children 0–23 months old who live in the project intervention health zones. Therefore, the selection criteria for households include: households with children 0–23 months old and whose mothers and caregivers permanently reside in the study area (at least for the duration of the project intervention).

2.3 Sampling

For reasons of comparability, the sampling method used was a WHO 30-cluster design with 10 individuals each, similar to the method used in the baseline study. Each health zone has 30 clusters of 10 children 0-23 months old.

The sampling unit is the household, and the statistical unit is the child 0–23 months old (as given by his or her mother or caregiver). The sampling frame is the list of villages where the PRISE-C project intervened in each health zone. The clusters were chosen using a probability proportional to the size of the population approach.

In the first stage, clusters were drawn at random and by health zone. Then, based on the sampling frame and the total population of the villages, the sampling interval was calculated, determined by the total population divided by the number of clusters (30).

Next, a random drawing was conducted for the first cluster by drawing a number between 1 and the sampling interval. The number drawn determines the village or neighborhood of the village in which the first cluster will be chosen. The other clusters were then chosen based on the sampling interval, until 30 clusters per health zone had been selected.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

In the second stage, 10 target households with children 0–23 months were chosen per cluster. To do this, starting in the center of a village that has a cluster, a direction was selected using the technique of turning a bottle or pen toward the sun. The interviewer headed in that direction and identified all households with children 0–23 months and whose mothers or caregivers reside permanently in the village (at least for the duration of the project intervention). Then, based on the identified households, the interviewer chose the first household to interview at random. Using a sampling interval of two (or every other household), the interviewer identified the rest of the households one by one.

For the villages and neighborhoods that have more than one cluster, the interviewer had to repeat the household selection process by first choosing another direction to follow. Only one child of 0–23 months old was chosen per household, placing priority on the youngest if more than one child under 2 years old lived in the household.

2.4 Sample size

Using the WHO cluster technique, the sample size is set by considering the number of clusters and the number of statistical units to investigate. This technique is a compromise between the cost and expected results.

2.5 Organization of data collection

2.5.1 Preparatory activities

PRISE-C engaged all stakeholders in the survey preparatory activities. Political and government officials (mayors, heads of arrondissements) and heads of selected city or village neighborhoods were officially informed that the activity would be conducted. Similarly, the Departmental Health Directors, the zone coordinator doctors and the head doctors of commune health centers were informed. In particular, the heads of villages or city neighborhoods were asked to make announcements in their respective locations one and two days before teams arrived in the field. Various measures to inform and sensitize the communities covered by the survey were implemented to increase acceptance of the survey in the field.

2.5.2 Recruitment of interviewers and supervisors

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

18 interviewers with experience included training in social sciences or health care (nurse or midwife, sociologist or social worker) were recruited. The recruitment criteria were based on mastery of the required data-collection techniques and fluency in the languages commonly spoken in the study areas.

Resource persons from LEADD organized the supervision of data collection in conjunction with the PRISE-C team. This supervision covered staff training activities through to the data-collection activities.

2.5.3 Review of the data collection tools

In order to meet scientific criteria, the data-collection tools used were the same tools used in the baseline study, which have been updated in collaboration with the PRISE-C project team. New headings have been added in order to cover all indicators used in the project.

2.5.4 Interviewer training and tool pre-testing

Training for data-collection staff took place in Cotonou over three days, including one day to pre-test the tools. The training covered the study objectives, study methodology, the data-collection techniques, and how to use the tools, and was conducted by members of the consulting firm.

The pre-test was conducted in a neighborhood in the city of Cotonou that was not part of the project's intervention area. This pre-test enabled the revision and finalization of the data-collection tool.

2.5.5 Data collection in the field

Data collection took place in May 2014 and lasted nine days. Nine pair teams were set up with one health worker (nurse or midwife) and a data collector trained in social sciences (sociologist or social worker). In each health zone, 3 pairs were deployed to investigate 30 clusters (300 households).

This data collection process concluded with a debriefing stage for the teams, lasting one day for the interviewers in each health zone. Interviewers and supervisors attended this debriefing session, which allowed participants to discuss challenges and solutions.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

2.6 Data processing and analysis

Data processing began first with the preparation of the input database. Data were processed and analyzed using SPSS software. Double entry of data was conducted to improve data quality.
Data processing was done by referring to the information needs of the study. Data analysis comprised two stages: one stage to describe the sample and another to compare data from this study with data from the baseline study. When the zones are compared, the Save-Ouesse health zone is used as the reference group throughout this report. The significance level was set at .05.

III. ETHICAL DIMENSION

Participation for all respondents is strictly voluntary. Informed consent was obtained from respondents without any form of coercion. Respondents gave their consent to participate in the study by signing the consent form after being informed in detail about the study objectives. Complete confidentiality of information from interviews was guaranteed.

IV. CHALLENGES AND LIMITATIONS OF THE STUDY

The study's limitations are summarized in the following points:

- This is a quantitative study. The findings for some indicators may require a qualitative study to better understand the determinants for these indicator levels.
- Some questions rely on the mothers' memory: such questions may lead to recall bias even if the period considered is relatively short.
- Several indicators must be calculated based on a review of health cards. Lack of health cards or health cards with incomplete information will result in bias for the achievement levels of indicators.
- The lack of supply of ACTs and amoxicillin (due to stock-outs) for community health workers was noted among CHWs. This likely impacted the findings for treatment indicators.
- The change in the policy for malaria case management, which requires confirmation of cases of fever using a rapid diagnostic test before administering any ACT treatment, is not a reality yet in the health zones. This will cause bias in the indicators for treatment of fever cases with ACT.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Challenges in implementation of the survey were as follows:

- Revisits to absent households in the sample in order to reach the targets;
- Administrative and health officials in the survey areas were not informed about the data-collection process in a timely manner; and
- Weighing scales were unavailable at the start of data collect, requiring interviewers to return to the first survey clusters to collect weight data.

V. RESULTS

5.1 General characteristics

A total of 900 mothers of children under 24 months old were interviewed during data collection in the three health zones. All the mothers agreed to participate in the interviews with the data collection workers, resulting in a 100% response rate.

The mothers' average (SD) age is 26.6 years (± 5.95). The average (SD) number of live children for the entire population of mothers is 3.28 (± 1.9).

The majority (97.9%) of these mothers who were interviewed live with a partner. Also, most (74.1%) of these mothers have no formal education.

Tables 1, 2, and 3 below present the respondents' general characteristics in the three health zones.

Table 1: General characteristics of mothers of children 0–23 months old in the PRISE-C intervention health zones, KPC Survey, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè HZ N=300		**Dassa-Glazoué HZ N=300**		**Allada-Zè-Toffo HZ N=300**		**Total N=900**	
	Average	**SD**	**Average**	**SD**	**Average**	**SD**	**Average**	**SD**
Mother's age (years)	26.48	5.964	26.77	6.004	26.57	5.887	26.60	5.946
Number of live children	3.12	1.873	3.42	1.921	3.30	1.907	3.28	1.902
Number of children <5 years	1.56	0.596	1.58	0.702	1.58	0.587	1.57	0.630
Child's age (months)	8.76	6.455	10.05	7.039	11.19	6.839	10.00	6.847

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 2: Additional general characteristics of mothers of children 0–23 months old in the PRISE-C intervention health zones, KPC survey, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè HZ		Dassa-Glazoué HZ		Allada-Zè-Toffo HZ		Total	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Marital status	N=299		N=300		N=300		N=899	
Lives with partner	293	98.0	299	99.7	289	96.3	881	97.9
Divorced	0	0	0	0	1	0.3	1	0.1
Widow	1	0.3	1	0.3	2	0.7	4	0.4
Single	5	1.7	0	0	8	2.7	13	1.4
Education level	N=300		N=300		N=300		N=900	
No formal education	221	73.7	249	83.0	197	65.7	667	74.1
Literate	2	0.7	2	0.7	10	3.3	14	1.6
Primary school	43	14.3	25	8.3	62	20.7	130	14.4
Secondary school	34	11.3	24	8.0	31	10.3	89	9.9
Higher Education	0	0	0	0	0	0	0	0

Table 3: Average number of live children and children under 5 years old according to maternal education level, KPC Survey, PRISE-C Project, Benin, May 2014

Education level	**Number of live children**	**Number of children < 5 years**

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

	Average	SD	p	Average	SD	p
No formal education	3.52	1.924	0.000	1.60	0.649	0.000
Literate	4.21	2.045		1.79	0.579	
Primary school	2.83	1.671		1.56	0.584	
Secondary school	1.96	1.251		1.36	0.506	
Higher education	0	0		0	0	

5.2 Maternal and child health care

5.2.1 Antenatal Care

Antenatal Care (ANC) was conducted in all health zones by a trained professional in the majority of cases, or 69.9% for all respondents.

Among all respondents, 41.6% of those had at least four ANC visits. The level is similar ($p>0.05$) for all three zones: Dassa-Glazoué (43.5%), the Savè-Ouèssè health zone (44.5%), and the Allada-Zè-Toffo health zone (37%).

In terms of tetanus vaccination, 69.3% of mothers received at least two doses during their last pregnancy: the SAO health zone had the lowest percentage (63.9%) with a similar rate (64.8%) seen in the AZT health zone. The DAGLA health zone had a statistically higher rate (80.8%) as compared to the SAO health zone.

For Sulfadoxine-Pyrimethamine (SP) coverage among pregnant women, the DAGLA health zone (69.1%) shows a statistically higher rate ($p<0.0000$) compared to the Savè-Ouèssè health zone (47.7%), which in turn has a statistically higher rate compared to the Allada-Zè-Toffo health zone (33%).

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 4: ANC indicators from last pregnancy, KPC Survey, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè HZ		Dassa-Glazoué HZ		Allada-Zè-Toffo HZ		Total	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Personnel seen for ANC during last pregnancy								
Trained personnel	190	64.6	226	76.9	200	68.0	616	69.9
Health aide	103	35.0	67	22.8	92	31.3	262	29.7
Traditional midwife	1	0.3	1	0.3	2	0.7	4	0.4
Denominator	294	100	294	100	294	100.0	882	100
Number of ANC visits according to the ANC card								
No ANC visit	3	1.3	2	1.0	3	1.4	8	1.3
One ANC visit	29	12.8	20	10.4	35	16.0	84	13.1
Two ANC visits	51	22.5	46	23.8	47	21.5	144	22.5
Three ANC visits	43	18.9	41	21.2	53	24.2	137	21.4
Four or more ANC visits	101	44.5	84	43.5	81	37.0	266	41.6
Denominator	227	100	193	100	219	100	639	100
Number of doses of tetanus (TT) vaccine received according to the ANC card								
0 doses	9	4.0	13	6.7	27	12.3	49	7.7
One dose	73	32.2	24	12.4	50	22.8	147	23.0
At least two doses	145	63.9	156	80.8	142	64.8	443	69.3
Denominator	227	100	193	100	219	100	639	100
Number of SP doses received								
One time	123	52.3	65	30.4	128	65.0	316	48.9
Two or more times	112	47.7	148	69.1	65	33.0	330	51.1
Does not know	0	0	1	0.5	4	2.0	5	0.8
Denominator	235	100	214	100	197	100	646	100

Table 5: Comparison of levels of ANC indicators between health zones based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	**SAO**	**DAGLA**	p	**SAO**	**AZT**	p
% of mothers of children 0–23 months old who attended at least four ANC visits during their last pregnancy according to the card	44.5%	43.5%	0.8370	44.5%	37.0%	0.1072
% of mothers of children 0–23 months old who received at least two doses of tetanus vaccine before the birth of their youngest child based on the ANC card	63.9%	80.8%	0.0000	63.9%	64.8%	0.8428
% of mothers who received anti-malarial prophylactic IPT during their last pregnancy (two doses)	47.7%	69.1%	0.0000	47.7%	33.0%	0.0007

5.2.2 Labor, Delivery, and newborn care

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 6 shows that that 94.7% of deliveries took place in a health facility, and in 66.6% of cases, the person assisting the birth was a trained professional. For these newborns, 63.1% received a newborn exam in the first 48 hours of life by trained personnel. In 20.4% of cases, this exam was performed by a health aide (Table 6).

The percentage of births of children 0–23 months old which were assisted by trained personnel is higher in the DAGLA health zone (75.7%) compared to SAO (59.7%), where the percentage is comparable to that of AZT (Table 7).

For the newborn examination within 48 hours of birth, DAGLA (94.3%) has a much higher percentage compared to SAO (89.3%), which also has a higher percentage compared to AZT ($p<0.05$).

Table 6: Key Labor and Delivery Indicators, KPC Survey, PRISE-C Project, Benin, May 2014

	Health Zones						Total	
	Savè-Ouèssè HZ		Dassa-Glazoué HZ		Allada-Zè-Toffo HZ			
	Number	%	Number	%	Number	%	Number	%
Location of delivery								
Health center, private clinic, hospital	271	81.3	284	94.7	297	99.3	852	94.7
Home	26	8.7	7	2.3	0	0	33	3.7
Other (UVS with health aid or matrone)	3	1.0	9	3.0	2	0.7	14	1.6
Denominator	300	100	300	100	299	100	899	100
Person who assisted the delivery								
Trained personnel	179	59.7	227	75.7	193	64.5	599	66.6
Health aid	96	32.0	68	22.7	99	33.1	263	29.3
Traditional midwife	1	0.3	0	0	4	1.3	5	0.6
Other (matrone, EMS personnel)	24	8.0	5	1.7	3	1.0	32	3.6
Denominator	300	100	300	100	299	100	899	100
Person who performed the newborn examination within 48 hours								
None, no exam	32	10.7	17	5.7	91	30.3	140	15.6
Trained personnel	187	62.3	225	75.0	156	52.0	568	63.1
Health aid	78	26.0	58	19.3	48	16.0	184	20.4
Traditional midwife	0	0	0	0	3	1.0	3	0.3
Other (matrone, EMS personnel)	3	1.0	0	0	2	0.7	5	0.6
Denominator	300	100	300	100	300	100	900	100

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 7: Comparison of indicator levels for deliveries between health zones based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of children 0–23 months old whose birth was assisted by trained personnel	59.7%	75.7%	0.0000	59.7%	64.5%	0.2260
% of children 0–23 months old who received a newborn examination within the first 48 hours of life	89.3%	94.3%	0.0256	89.3%	69.9%	0.0000

5.2.3 Family Planning

Over eighty-eight percent (88.4%) of mothers do not use a contraceptive method. These high rates of non-use of contraceptives were seen across the three health zones: 89.0% in SAO, 92.3% in DAGLA, and 84% in AZT. The percentage for use of modern contraceptive methods is 9.30%. Among the modern contraceptive methods, the implant and injectables are the most frequently used (Table 8).

Compared to the reference health zone (SAO), the use of modern contraceptive methods does not vary significantly from one zone to another (Table 10).

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 8: Contraceptive use by mothers of children 0–23 months old, KPC Survey, PRISE-C Project, Benin, May 2014

		Modern Methods									Traditional methods	Total
		Pill	IUD	Injectable methods	Implants	Male condom	Lactational Amenorrhea Method	CycleBeads	No method	Other, not specified	Calendar or Billings method	
AZT HZ	Number	6	0	1	16	3	7	1	252	11	3	300
	%	2.00%	0.00%	0.30%	5.30%	1.00%	2.30%	0.30%	84.00%	3.70%	1.00%	100.00%
DAGLA HZ	Number	4	0	14	3	0	0	0	277	0	2	300
	%	1.30%	0.00%	4.70%	1.00%	0.00%	0.00%	0.00%	92.30%	0.00%	0.70%	100.00%
SAO HZ	Number	6	3	12	7	0	1	0	267	3	1	300
	%	2.00%	1.00%	4.00%	2.30%	0.00%	0.30%	0.00%	89.00%	1.00%	0.30%	100.00%
Total	Number	16	3	27	26	3	8	1	796	14	6	900
	%	1.80%	0.30%	3.00%	2.90%	0.30%	0.90%	0.10%	88.40%	1.60%	0.70%	100.00%

Among all the women interviewed, 24.9% discussed contraception with a health care professional compared to 12.4% who discussed it with a community health worker and 3.2% with a women's group member. Contraceptive methods were discussed most frequently with community actors in the DAGLA health zone (14.3%), versus 11.7% for SAO and 11.3% for AZT (Table 9). The percentage of mothers who discuss contraception with their husbands is relatively high (31.9%). Variations from one zone to another based on the reference health zone is not significant (Table 10).

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 9: Individual with whom the woman discussed contraception according to health zone, KPC Survey, PRISE-C Project, Benin, May 2014

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Health care staff	30	10.0	132	44.0	62	20.7	224	24.9
Community health worker	35	11.7	43	14.3	34	11.3	112	12.4
Women's group member	8	2.7	9	3.0	12	4.0	29	3.2
Parent, friend, or family member	7	2.3	57	19.0	28	9.3	92	10.2
Other	0	0	6	2.0	1	0.3	7	0.8
Denominator	300		300		300		900	

Table 10: Comparison of contraceptive access between health zones and based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of mothers of children 0–23 months old who use a modern contraceptive method (tubal ligation, vasectomy, pill, IUD, injectables, implants, condom, diaphragm, spermicides, CycleBeads)	9.3%	7.0%	0.3032	9.3%	9.0%	0.8986
% of mothers who discuss contraception with their husbands	32.3%	25.3%	0.0583	32.3%	38.1%	0.1372

5.3 Breastfeeding and infant nutrition

5.3.1 Practice of exclusive breastfeeding

Overall, the percentage of children 0-5 months of age who were exclusively breastfed in the 24 hours before the survey is 43.4%. This percentage is very high in the SAO health zone, where over three-quarters of children 0-5 months of age were exclusively breastfed (76.9%) and very low in the DAGLA (21.8%) and in AZT (20.8%) health zones.

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 11: Proportion of infants 0-5 months of age who exclusively breastfed in the 24 hours before the survey, KPC Survey, PRISE-C Project, Benin, May 2014

Exclusive breastfeeding	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Yes	90	76.9	22	21.8	16	20.8	128	43.4
No	27	23.1	79	78.2	61	79.2	167	56.60
Denominator	117		101		77		295	

5.3.2 Infant feeding

Using the standards adopted for the baseline study, adequate nutrition has been modeled on the Rapid CATCH standards. Thus, a child who receives adequate nutrition is one who meets the following conditions:

- Children 6–8 months old who are breastfed twice daily or children 9–23 months old fed solid foods three times per day from at least four of the eight food groups; and
- Children 6–23 months old who are not breastfed but who receive milk or a milk derivative and are fed solid foods at least four times per day from at least four of the eight food groups.

The data from Table 12 below show that 38.7% of children 6–23 months old received adequate nutrition.

Table 12: Children 6–23 months old who received adequate nutrition, KPC Survey, PRISE-C Project, Benin, May 2014

Adequate nutrition	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Yes	59	32.4	72	36.4	102	45.9	233	38.7
No	123	67.7	126	63.6	120	54.1	369	61.3
Denominator	182		198		222		602	

The results presented in Table 13 show that slightly more than half of children 6–8 months old (55.9%) received adequate nutrition. For this indicator, a significant gap exists between the SAO health zone (36.1%) and the two other health zones.
For children 9–23 months old, only one-third received adequate nutrition (34.5%) with very little variation between the health zones.

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 13: Children 6–23 months old who received adequate nutrition, KPC Survey, PRISE-C Project, Benin, May 2014

Age	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
6–8 months	13	36.1	22	59.5	31	68.9	66	55.9
Denominator	36		37		45		118	
9–23 months	46	31.5	50	31.1	71	40.1	167	34.5
Denominator	146		161		177		484	

Table 14: Comparison of child nutrition indicators between the health zones and based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of children 0–5 months old who were fed exclusively with breast milk in the last 24 hours	76.9%	21.8%	0.0000	76.9%	20.8%	0.0000
% of children 6–23 months old who receive adequate nutrition	32.4%	36.4%	0.4125	32.4%	45.9%	0.0058
% of children 6–23 months old who received one dose of Vitamin A in the last 6 months	88.0%	84.9%	0.3775	88.0%	86.5%	0.6529
% of children 0-23 months who are underweight (-2 SD for the median weight for age)	1.8%	2.2%	0.7372	1.8%	2.1%	0.7981

5.3.4 Vitamin-A supplementation

When taking into account all respondents from the three health zones, vitamin-A supplementation was given at least one time for 90.1% of the sample population. This supplement was given in the last six months, for 86.4% of children older than 6 months (Table 15). There is no significant statistical difference between the health zones.

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 15: Vitamin-A supplementation among children older than 6 months, KPC Survey, PRISE-C Project, Benin, May 2014

Variables	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo		Total	
	Number	%	Number	%	Number	%	Number	%
Vit. A at least once	165	90.2	184	92.5	196	87.9	545	90.1
Denominator	183		199		223		605	
Vit. A in the last six months	161	88.0	169	84.9	193	86.5	523	86.4
Denominator	183		199		223		605	

Table 16: Vitamin-A supplementation between health zones and based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicator	SAO	DAGLA	p	SAO	AZT	p
% of children 6–23 months old who received one dose of Vitamin A in the last 6 months	88.0%	84.9%	0.3775	88.0%	86.5%	0.6529

5.4 Immunization status of children

Across the entire sample, immunization coverage is low. The SAO health zone had the highest coverage with significant variations in comparison to other health zones, particularly for Penta-1 and Penta-3.

The AZT health zone has a fairly high drop-out rate: 18.2% for the Penta-1-Penta-3 drop-out rate and 25.3% for BCG-measles

Table 17: Immunization status for children 12–23 months old, KPC Survey, PRISE-C Project, Benin, May 2014

Variables	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
BCG	71	67.0	63	50.8	91	65.5	225	61.0
PENTA-1	71	67.0	64	51.6	77	55.4	212	57.5
PENTA-2	69	65.1	63	50.8	83	59.7	215	58.3
PENTA-3	68	64.2	60	48.4	63	45.3	191	51.8
Measles	58	54.7	60	48.4	68	48.9	186	50.4
Denominator	106		124		139		369	
Penta-1-Penta-3 lost to follow-up rate	3	4.22	4	6.35	14	18.18	21	9.9
Denominator	71		64		77		212	
BCG-Measles drop-out rate	13	18.31	3	4.76	23	25.27	39	17.77
Denominator	71		63		91		225	

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 18: Immunization status of children between health zones and based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of children 12–23 months old who received a measles vaccination	54.7%	48.4%	0.3407	54.7%	48.9%	0.3682
% of children 12–23 months old who received their dose of Penta-1	67.0%	51.6%	0.0181	67.0%	55.4%	0.0658
% of children 12–23 months old who received the dose of Penta-3	64.2%	48.4%	0.0162	64.2%	45.3%	0.0033
Penta-1-Penta-3 drop-out rate	4.22%	6.35%	0.5788	4.22%	18.18%	0.0078

5.5 Malaria prevention with LLINs

In households where children slept under bednets, 87.9% of them slept under an LLIN the night before the survey.

The SAO health zone has a relatively high LLIN-use rate (88.7%) compared to the other zones. When taking into account the condition of LLINs, the SAO health zone has the highest percentage (76.7%) of children who slept under an LLIN that is in good condition with a statistically significant difference compared to other zones.

Table 19: Bednet use among children 0–23 months old the night before the survey, KPC Survey, PRISE-C Project, Benin, May 2014

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Does not sleep under a bednet (all categories)	26	8.7	23	7.7	60	20.0	109	12.1
Sleeps under a/an:								
Untreated bednet	6	2.0	18	6.0	4	1.3	28	3.1
Treated bednet	2	0.7	63	21.0	1	0.3	66	7.3
LLIN	266	88.7	196	65.3	235	78.3	697	77.4
Denominator	300	100	300	100	300	100	900	100
Condition of bednet								
Hung up, good condition	230	76.7	200	66.7	178	59.3	608	67.6
Hung up, poor condition	34	11.3	54	18.0	39	13.0	127	14.1
Not hung up, good condition	7	2.3	11	3.7	14	4.7	32	3.6
Not hung up, poor condition	3	1.0	12	4.0	9	3.0	24	2.7

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Denominator	300	100	300	100	300	100	900	100

Table 20: Use of LLINs among children 0–23 months old, between health zones and based on the reference health zone (SAO), KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of children 0–23 months old who slept under an LLIN the night before the survey	88.7%	65.3%	0.0000	88.7%	78.3%	0.0004
% of children who slept under an LLIN in good condition	76.7%	55.0%	0.0000	76.3%	62.7%	0.0002

5.6 Childhood illness

5.6.1 Prevalence of childhood illnesses and care seeking

For the three health zones, fever is the most prevalent childhood illness (29.4%); cough is the second highest (18.7%). Compared to the two zones, the SAO health zone generally has the lowest prevalence with a significant difference compared to the AZT health zone in terms of the cough symptom (cough prevalence = 16.0% versus 25% for AZT).

Table 21: Prevalence of fever, diarrhea, and cough among children 0–23 months old based on health zone, KPC Survey of 900 mothers of children 0–23 months old, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo		p	Total	
	Number	%	Number	%	Number	%		Number	%
Fever	74	24.7	90	30.0	101	33.7	0.052	265	29.4
Diarrhea	25	8.3	35	11.7	38	12.7	0.204	98	10.9
Cough	48	16.0	45	15.0	75	25.0	0.002	168	18.7
Cough with difficulty breathing	8	2.7	15	5.0	29	9.7	0.001	52	5.8
Denominator	300		300		300			900	

Symptoms that require an emergency consultation are assessed in Table 22. It was noted that when taking into account all respondents, high fever (89.3%) is the number one reason for an emergency consultation.

Other danger or warning signs resulting in care seeking behaviors represent less than 25%.

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 22: Symptoms that lead to seeking emergency care according to mothers of children 0–23 months old, KPC Survey, PRISE-C Project, Benin, May 2014

Symptoms	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo		Total	
	Number	%	Number	%	Number	%	Number	%
Difficulty breathing, rapid breaths, or heaving	37	12.3	58	19.3	88	29.3	183	20.3
Blood in stools	22	7.3	32	10.7	84	28.0	138	15.3
Unable to drink/breastfeed/eat	98	32.7	88	29.3	106	35.3	292	32.4
Lethargy/unconsciousness (doesn't respond to pinching)	61	20.3	55	18.3	72	24.0	188	20.9
Convulsions	140	46.7	87	29.0	88	29.3	315	35.0
Vomiting all consumed food and drink	92	30.7	132	44.0	150	50.0	374	41.6
High fever	232	77.3	278	92.7	294	98.0	804	89.3
Other (anemia, constant crying, diarrhea, abdominal pain, and coughing)	62	20.7	82	27.3	86	28.7	230	25.6
* Total	300		300		300		900	

* Several responses are possible

5.6.2 Management of fever

Less than half of the children who had a fever during the reference period received treatment, either on the same day of onset (21.9%) or the day after (26.4%).

Mothers of children 0–23 months old turned more frequently to health centers (22.6%) and community health workers (14.7%) than to other actors. Rates of careseeking from community health workers is comparable between the health zones of SAO (20.1%) and DAGLA (21.1%) and fairly low in the AZT health zone (5%).

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 23: Time elapsed before treatment of fever and the place or person providing the treatment according to health zone, KPC Survey of 900 mothers of children 0–23 months old, PRISE-C Project, Benin, May 2014

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Sought care outside of the home to treat fever	43	58.1	55	61.1	59	58.4	157	59.2
Denominator	74		90		101		265	
Time delay before the treatment (p=0.02)								
The same day	19	25.7	25	27.8	14	13.9	58	21.9
The following day	20	27.0	25	27.8	25	24.8	70	26.4
More than two days after	4	5.4	5	5.6	20	19.8	29	10.9
Denominator	74		90		101		265	
Location/person mother turned to for treatment								
Health facilities/CHW								
HC	14	18.9	25	27.8	21	20.8	60	22.6
Hospital	3	4.1	0	0	0	0	3	1.1
Community health worker	15	20.3	19	21.1	5	5.0	39	14.7
Private clinic	2	2.7	7	7.8	14	13.9	23	8.7
Other								
Pharmacy	1	1.4	1	1.1	0	0	2	0.8
Neighbor	1	1.4	1	1.1	4	4.0	6	2.3
Street vendor	5	6.8	2	2.2	14	13.9	21	7.9
Traditional healer	0	0	0	0	0	0	0	0
Other	2	2.7	0	0	1	1.0	3	1.1
Denominator	74		90		101		265	

5.6.3 Management of diarrhea

For case management of diarrhea, among children 0–23 months old who had diarrhea in the last two weeks, less than half (39.8%) of children received oral rehydration salts and Zinc (ORS/Zinc).

The use of ORS/Zinc in case of diarrhea is fairly low in the AZT health zone (10.5%) with a significant difference from the SAO health zone, where the percentage is comparable to the DAGLA health zone.

Table 24: Case management of diarrhea for children 0–23 months old according to health zone, KPC Survey of 900 mothers of children 0–23 months old, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo		Total	
	Number	%	Number	%	Number	%	Number	%
Children who received ORS+Zinc	13	52.0	22	62.9	4	10.5	39	39.8
Denominator	25		35		35		98	

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Table 25: Case management of diarrhea between health zones and based on the reference health zone, KPC Survey, PRISE-C Project, Benin, May 2014

Indicator	SAO	DAGLA	p	SAO	AZT	p
% of children 0–23 months old who had diarrhea during the last two weeks and who were treated with Orasel	52.0%	62.9%	0.3985	52.0%	10.5%	0.0003
Denominator	25	35		25	38	

5.6.4 Case management of cough with difficulty breathing

In the case of cough with difficulty breathing, 61.5% of children received care. For those who sought care, only 5.8% went to a community health worker compared to 30.8% who went to health centers (Table 26).

The percentage of children 0–23 months old who had a cough with difficulty breathing during the last two weeks and for whom their mothers sought a community health worker is significantly higher in SAO (25.0%) compared to the other health zones.

Table 26: Case management of cough with difficulty breathing among children 0–23 months old, KPC Survey, PRISE-C Project, Benin, May 2014

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Sought care	6	75.0	8	53.3	18	62.1	32	61.5
Denominator	8		15		29		52	
Place or person whom the mother sought for care								
HC	3	37.5	7	46.7	6	20.7	16	30.8
Hospital	1	12.5	0	0	0	0	1	1.9
CHW	2	25.0	1	6.7	0	0	3	5.8
Private clinic	0	0	0	0	6	20.7	6	11.5
Pharmacy	1	12.5	0	0	0	0	1	1.9
Neighbor/Family	0	0	0	0	2	6.9	2	3.8
Street vendor	0	0	1	6.7	4	13.8	5	9.6
Traditional healer	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
Denominator	8		15		29		52	
*** First-line antibiotic received**								
Amoxicillin	5	62.5	5	33.3	5	17.2	15	28.8
Co-trimoxazole	0	0.0	1	6.7	2	6.9	3	5.8

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Other antibiotic	1	12.5	3	20.0	12	41.4	16	30.8
Denominator	8		15		29		52	

Table 27: Case management of cough with difficulty breathing between health zones and based on the reference health zone, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of children 0–23 months old who had a cough with difficulty breathing during the last two weeks and whose mothers sought care from a health facility	50.0%	46.7%	0.8801	50.0%	41.4%	0.6638
Denominator	8	15		8	29	

5.7 Hygiene and sanitation

Well water is the main source of water supply for those interviewed in the three health zones (70.9%), followed distantly by tap water (14.8%).

Table 28: Different sources of water supply, KPC Survey, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo		Total	
	No.	%	No.	%	No.	%	No.	%
Tap water	42	14.0	2	0.7	89	29.7	133	14.8
Well water	240	80.0	289	96.3	109	36.3	638	70.9
Collected rain water	15	5.0	3	1.0	26	8.7	44	4.9
Private or public closed-well water	0	0	2	0.7	32	10.7	34	3.8
Open-well water	3	1.0	1	0.3	33	11.0	37	4.1
Surface water (lake, river, etc.)	0	0	3	1.0	11	3.7	14	1.6
Denominator	300		300		300		900	

06BP1961 Cotonou prisec@urc-chs.com Tel: (229) 96 63 39 54

Among the households that treat their drinking water, 70.7% add Aquatabs and chlorine.

The assessment of whether or not a hand-washing station exists found that nearly 58.0% of those surveyed do not have such a place. This assessment is more pronounced in the DAGLA health zone with 73.7% of households that do not have such a place.

The times when hand washing is most frequently observed are: after defecating (83.4%) and just before eating (65.85%).

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 29: Hygiene and household sanitation, KPC Survey, PRISE-C Project, Benin, May 2014

	Health zones						Total	
	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo			
	Number	%	Number	%	Number	%	Number	%
Households that treat water	20	6.7	7	2.3	14	4.7	41	4.6
Denominator	300		300		300		900	
Process for treating water								
Leaving it to settle	0	0	0	0	7	50.0	7	17.1
Boiling	1	5.0	0	0	0	0	1	2.4
Adding Aquatabs/chlorine	19	95.0	6	85.7	4	28.6	29	70.7
Other (alum stone)	0	0	1	14.3	3	21.4	4	9.8
Denominator	20		7		14		41	
Existence of a hand-washing station								
Yes	147	49.0	79	26.3	152	50.7	378	42.0
No	153	51.0	221	73.7	148	49.3	522	58.0
Denominator	300		300		300		900	
Timing of hand washing								
Before preparing food	76	25.3	118	39.3	112	37.3	306	34.0
Before feeding children	163	54.3	146	48.7	150	50.0	459	51.0
After defecating	261	87.0	270	90.0	220	73.3	751	83.4
After cleaning a child who has defecated	191	63.7	168	56.0	135	45.0	494	54.9
Before eating	211	70.3	177	59.0	204	68.0	592	65.8
After a meal	70	23.3	60	20.0	66	22.0	196	21.8
Other	25	8.3	49	16.3	39	13.0	113	12.6
Denominator	300		300		300		900	
Quantitative variable	**Average**	**SD**	**Minimum**	**Maximum**				
Average number of times the mother used soap to wash her hands	4.07	2.220	1	18				

* Several responses are possible

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Regarding the percentage of households that have a designated location with water and soap or detergent or ashes to wash hands, the SAO health zone has the highest percentage (37%) with a significant difference compared to the other zones.

Table 30: Hygiene and sanitation practices between health zones and based on the reference health zone, KPC Survey, PRISE-C Project, Benin, May 2014

	SAO	DAGLA	p	SAO	AZT	p
% of households that have a space with soap or detergent or ashes to wash hands	37.0%	16.3%	0.0000	37.0%	22.7%	0.0001
Denominator	300	300		300	300	

5.8 Community health workers' relationship with the community

In the three project health zones, more than four out of five mothers who were interviewed know the community health workers. Among these, the proportion who participated in CHW activities are, respectively, 83% for the Savè-Ouèssè health zone, 70% for Dassa-Glazoué, and 53% for Allada-Zè-Toffo. However, only one-third of the respondents from all three health zones claimed to have spoken to CHWs during the two months prior to the survey.

The reasons why mothers spoke to CHWs are, among others: purchase of an LLIN (4.9%), medical care (60.4%), advice (76.7%), purchase of contraceptive products (2.4%), and home visits (31.8%). To thank the CHWs, the majority of women do not make any donations or give gifts of any kind. Gratitude is usually expressed verbally.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 31: Relationship between community health workers and mothers, KPC Survey, PRISE-C Project, Benin, May 2014

	Savè-Ouèssè		Dassa-Glazoué		Allada-Zè-Toffo		Total	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Mothers who know the village CHW	284	94.67	241	80.33	215	71.67	740	82.22
Denominator	300		300		300		900	
Mothers who participate in the CHW activities	236	83.10	169	70.12	113	52.56	518	70.00
Denominator	284		241		215		740	
Mothers who have spoken to the CHW in the last two months	101	35.56	109	45.23	35	16.28	245	33.11
Denominator	284		241		215		740	
*** Reasons why mothers spoke with CHWs**								
Purchase of LLIN	1	0.99	11	10.09	0	0.00	12	4.90
Medical care	41	40.59	85	77.98	22	62.86	148	60.41
Advice	95	94.06	73	66.97	20	57.14	188	76.73
Purchase of contraceptive products	1	0.99	5	4.59	0	0.00	6	2.45
Home visit	26	25.74	42	38.53	10	28.57	78	31.84
Reason unrelated to health	1	0.99	2	1.83	0	0.00	3	1.22
Denominator	101		109		35		245	
*** Actions taken to thank the CHW**								
I did nothing to express gratitude	69	68.32	41	37.61	9	25.71	119	48.57
Compliment or thank the CHW verbally	54	53.47	67	61.47	23	65.71	144	58.78
Give money	1	0.99	4	3.67	2	5.71	7	2.86
Work in his/her field or home	2	1.98	5	4.59	0	0.00	7	2.86
Spend time helping him/her with CHW activities	2	1.98	1	0.92	2	5.71	5	2.04
Other	2	1.98	0	0.00	0	0.00	2	0.82
Denominator	101		109		35		245	

* Several responses are possible for one person

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 32: The community's relationship with CHWs between health zones and based on the reference health zone, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO	DAGLA	p	SAO	AZT	p
% of mothers who know the village CHW	94.67	80.33	0.0000	94.67	71.67	0.0000
Denominator	300	300		300	300	
% of mothers who participate in CHW activities	83.10	70.12	0.0004	83.10	52.56	0.0000
Denominator	284	241		284	215	
% of mothers who have spoken to the CHW in the last two months	35.56	45.23	0.0242	35.56	16.28	0.0000
Denominator	284	241		284	215	

Overall it was observed the knowledge of and engagement with community health workers was higher in SAO as compared to other health zones.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

5.8 Tables comparing baseline and final findings

Tables 33 to 37 below present the baseline and final findings for the KPC indicators in the intervention areas.

Table 33: Baseline and final findings for monitoring indicators for maternal and child health care, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators for maternal and child health care	SAO			DAGLA			AZT			Total		
	Baseline value (2011)	Final value (2014)	P	Baseline value (2011)	Final value (2014)	p	Baseline value (2011)	Final value (2014)	P	Baseline value (2011)	Final value (2014)	p
% of mothers of children 0–23 months old who attended at least four ANC visits during their last pregnancy according to the card	31.9%	**44.5%**	0.0070	37.9%	**43.5%**	0.2279	55.0%	**37.0%**	0.0001	42.3%	**41.6%**	0.7934
% of children 0–23 months old whose birth was assisted by trained personnel	58.1%	**59.7%**	0.6909	52.2%	**75.7%**	0.0000	81.0%	**64.5%**	0.0000	63.8%	**66.6%**	0.2129
% of mothers of children 0–23 months old who received at least two doses of tetanus vaccine before the birth of their youngest child based on the ANC card	71.5%	**63.9%**	0.0913	83.3%	**80.8%**	0.4897	77.7%	**64.8%**	0.0018	78.0%	**69.3%**	0.0003
% of children 0–23 months old who had a newborn examination within two days of their birth	82.3%	**89.3%**	0.0141	95.0%	**94.3%**	0.7032	87.0%	**69.9%**	0.0000	88.1%	**84.5%**	0.0264
% of children 0–23 months old who received a postnatal examination by a trained professional within two days of their birth	50.0%	**62.3%**	0.0024	52.7%	**75.0%**	0.0000	71.7%	**52.0%**	0.0000	58.1%	**63.1%**	0.0300
% of mothers of children 0–23 months old who used a modern contraceptive method (tubal ligation, vasectomy, pill, IUD, injectables, implants, condom, diaphragm, spermicides, CycleBeads)	5.7%	**9.3%**	0.0941	6.0%	**7.0%**	0.6193	4.0%	**9.0%**	0.0130	5.2%	**8.4%**	0.0070
% of mothers who discuss contraception with their husbands	31.7%	**32.3%**	0.8748	43.3%	**25.3%**	0.0000	10.7%	**38.0%**	0.0000	28.6%	**31.9%**	0.1275

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 34: Baseline and final levels for vaccination follow-up indicators for children 0–23 months old, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators for maternal and child health care	SAO			DAGLA			AZT			Total		
	Baseline value (2011)	**Final value (2014)**	p	**Baseline value (2011)**	**Final value (2014)**	p	**Baseline value (2011)**	**Final value (2014)**	p	**Baseline value (2011)**	**Final value (2014)**	p
% of children 12–23 months old who received a measles vaccination according to the health card	56.2%	**54.7%**	0.8176	68.8%	**48.4%**	0.0016	60.3%	**48.9%**	0.0657	61.4%	**50.4%**	0.0028
% of children 12–23 months old who received their dose of Penta-1 according to the health card	65.4%	**67.0%**	0.7962	72.5%	**51.6%**	0.0011	76.9%	**55.4%**	0.0003	71.4%	**57.5%**	0.0001
% of children 12–23 months old who received the Penta-3 dose according to the health card	59.2%	**64.2%**	0.4325	69.7%	**48.4%**	0.0010	70.2%	**45.3%**	0.0001	66.1%	**51.8%**	0.0001
Penta-1-Penta-3 drop-out rate	9.4%	**4.2%**	0.2059	3.8%	**6.3%**	0.4918	9.7%	**18.2%**	0.1070	7.8%	**9.9%**	0.4231

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 35: Baseline and final values of indicators of childhood illnesses case management, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators for maternal and child health care	SAO			DAGLA			AZT			Total		
	Baseline value (2011)	Final value (2014)	p	Baseline value (2011)	Final value (2014)	p	Baseline value (2011)	Final value (2014)	p	Baseline value (2011)	Final value (2014)	p
% of children 0–23 months old who slept under an LLIN the night before the study	87.7%	**88.7%**	0.7042	77.0%	**65.3%**	0.0016	72.7%	**78.3%**	0.1108	79.1%	**77.4%**	0.3820
% of children 0–23 months old who had a fever during the last two weeks and who received ACT within 24 hours of onset of fever	8.3%	**24.3%**	0.0450	10.0%	**27.8%**	0.0034	10.3%	**19.8%**	0.1188	9.8%	**23.8%**	0.0002
% of children 0–23 months old who had a cough with difficulty breathing during the last two weeks and whose mothers sought care from a health facility (among all children who had coughs and difficulty breathing)	57.9%	**50.0%**	0.7060	33.3%	**46.7%**	0.4027	56.5%	**41.4%**	0.2791	48.5%	**44.2%**	0.6402
% of children 0–23 months old who had diarrhea during the last two weeks and who were treated with Orasel	57.1%	**52.0%**	0.7593	42.6%	**62.9%**	0.0689	12.5%	**10.5%**	0.8308	39.0%	**39.8%**	0.9144

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 36: Baseline and final values of indicators for breastfeeding and infant feeding, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO			DAGLA			AZT			Total		
	Baseline value (2011)	**Final value (2014)**	**p**	**Baseline value (2011)**	**Final value (2014)**	**p**	**Baseline value (2011)**	**Final value (2014)**	**p**	**Baseline value (2011)**	**Final value (2014)**	**p**
% of children 0–5 months old who were fed exclusively with breast milk in the last 24 hours	22.1%	**76.9%**	0.0000	35.8%	**21.8%**	0.0267	19.4%	**20.8%**	0.8204	26.3%	**43.4%**	0.0000
% of children 6–23 months old who received one dose of Vitamin A in the last 6 months	87.4%	**88.0%**	0.8561	80.9%	**84.9%**	0.2921	77.3%	**86.5%**	0.0130	82.0%	**86.4%**	0.0352
% of children 6–23 months old who receive adequate nutrition	63.4%	**32.4%**	0.0000	35.9%	**36.4%**	0.9182	34.3%	**45.9%**	0.0156	45.1%	**38.4%**	0.0184
% of children 0-23 months who are underweight (-2 SD for the median weight for age)	2.4%	**1.8%**	0.6211	4.8%	**2.2%**	0.0926	2.4%	**2.1%**	0.8088	3.2%	**2.0%**	0.1205

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Table 37: Baseline and final values for hygiene indicators, KPC Survey, PRISE-C Project, Benin, May 2014

Indicators	SAO			DAGLA			AZT			Total		
	Baseline value (2011)	**Final value (2014)**	p	**Baseline value (2011)**	**Final value (2014)**	p	**Baseline value (2011)**	**Final value (2014)**	p	**Baseline value (2011)**	**Final value (2014)**	p
% of households that have a space with soap or detergent or ashes to wash hands	22.3%	**37.0%**	0.0001	5.3%	**16.3%**	0.0000	0.0%	**22.7%**	0.0000	9.2%	**25.3%**	0.0000
% of mothers of children 0–23 months old who do not have access to drinking water and who actually treat water	2.75%	**0.7%**	0.0538	3.3%	**0.7%**	0.0366	0.3%	**3.3%**	0.0057	2.1%	**1.6%**	0.4312

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

VI. COMMENTS/DISCUSSION

6.1 Maternal and child health care

Maternal and child care was assessed using seven indicators:

- Percentage of mothers of children 0–23 months old who attended at least four antenatal consultations during their last pregnancy according to the ANC card;
- Percentage of children 0–23 months old whose birth was assisted by trained personnel;
- Percentage of mothers of children 0–23 months old who received at least two doses of tetanus vaccine before the birth of their youngest child according to the ANC card;
- Percentage of children 0–23 months old who received a postnatal examination within two days of their birth;
- Percentage of children 0–23 months old who received a postnatal examination by a trained professional within two days of their birth;
- Percentage of mothers of children 0–23 months old who use a modern contraceptive method; and
- Percentage of mothers who discuss contraception with their husbands.

Compared to the baseline study and for all health zones, four of the seven indicators for maternal health care improved. Among the four indicators, three saw significant improvement. These were:

- Percentage of mothers of children 0–23 months old who use a modern contraceptive method (5.20% to 8.40%);
- Percentage of children 0–23 months old who received a postnatal examination by a trained professional within two days of their birth (58.1% to 63.1%);
- Percentage of children 0–23 months old whose birth was assisted by trained personnel (63.8% to 66.6%).

By contrast, one indicator saw a significant decline: the percentage of mothers of children 0–23 months old who received at least two doses of tetanus vaccine before the birth of their youngest child according to the ANC card (78.0% to 69.3%). This indicator is also the only one that saw a drop in the SAO health zone, contrary to DAGLA and AZT, which reported drops in, respectively, three and five indicators.

This improvement in the indicator levels may be linked to the quality improvement collaborative developed in this health zone.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

6.2 Immunization status of children

The immunization status of children was assessed using the following indicators:

- Percentage of children 12–23 months old who received a measles vaccination;
- Percentage of children 12–23 months old who received their dose of Penta-1;
- Percentage of children 12–23 months old who received their dose of Penta-3; and
- Penta-1-Penta-3 drop-out rate

Compared to the baseline study and for all health zones, there was a significant decline in indicators related to child immunization. This trend was observed in the health zones of DAGLA and AZT. For SAO, only the indicator for "percentage of children 12–23 months old who received a measles vaccination according to the health card" dropped (56.2% to 54.7%). Moreover, the SAO health zone is the only one that reported a decline in the Penta-1-Penta-3 drop-out rate (9.4% to 4.2%). Similarly, the coverage rates for the SAO health zone are higher compared to the other health zones with significant differences for Penta-1 and Penta-3.

This improvement in the levels of immunization indicators in SAO may be linked to the collaborative.

6.3 Case management of childhood diseases

The indicators for case management of childhood diseases are:

- Percentage of children 0–23 months old who slept under an LLIN the night before the study;
- Percentage of children 0–23 months old who had a fever during the last two weeks and who received ACT within 24 hours of onset of fever;
- Percentage of children 0–23 months old who had a cough with difficulty breathing during the last two weeks and whose mothers sought care from a health facility (among all children who had coughs and difficulty breathing); and
- Percentage of children 0–23 months old who had diarrhea during the last two weeks and who were treated with Orasel.

For the three health zones overall, 50% of indicators improved.

Implementation of community-based interventions for ACT enabled people to seek care from community health workers for cases of fever. Care seeking within 24 hours (the same day or day after) the onset of fever for children is quite low. Children who received basic ACT treatment within 24 hours from community health workers or at health centers is also low: 23.8%

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

The level for use of ORS/Zinc for children 0–23 months old who have diarrhea in the AZT zone raises serious concerns: 10.5%. By contrast, in the SAO and DAGLA health zones, it is 52% and 62.9%, respectively.

For the case management of cough, the percentage of children 0–23 months old who had a cough with difficulty breathing and whose mothers sought care from a health facility is significantly higher in SAO (50%) compared to the other health zones. It is similar for the percentage of children 0–23 months old who slept under an LLIN the night before the survey (88.7%) in SAO), in the context of malaria prevention.

6.4 Breastfeeding and infant feeding

The indicators assessed in the context of breastfeeding and infant feeding are:

- Percentage of children 0–5 months old who were fed exclusively with breast milk in the last 24 hours;
- Percentage of children 6–23 months old who received one dose of Vitamin A in the last 6 months; and
- Percentage of children 6–23 months old who receive adequate nutrition.

Overall for the three health zones, the indicator for "percentage of children 6–23 months old who receive adequate nutrition" declined (45.1% to 38.4%). Therefore, infant feeding remains a serious problem for all three health zones. Only DAGLA saw a slight improvement for this indicator at the health zone level (35.9% to 36.5%).

The SAO health zone has a higher percentage of children 0–5 months old who were fed exclusively with breast milk in the last 24 hours: 76.9% versus 21.8% for DAGLA and 20.8% for AZT.

Regarding the percentage of children 6–23 months old who received one dose of vitamin A in the last 6 months, the overall level increased, from 82% to 86.4%. This rate is higher in the SAO health zone than in the two other zones.

6.5 Hygiene

In the final survey, the indicator for the percentage of households that have a space with soap or detergent or ashes to wash hands, there was an improvement, both for the three health zones overall (9.2% to 25.3%) and in each health zone individually. The SAO health zone has the highest rate (37% versus 16.3% for DAGLA and 22.7% for AZT ($p<0.05$)). Despite this improvement, people need greater awareness about when to wash hands.

By contrast, the situation is far from ideal relative to the indicator for the percentage of mothers of children 0–23 months old who do not have access to drinking water and who actually treat water. It has become progressively worse, going from 2.1% to 1.6% for all three health zones.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

6.6. Community health workers' relationship with the community

The implementation of project interventions has helped to considerably strengthen relationships between CHWs and communities. All assessment indicators for this collaboration rose significantly: The percentage of mothers who know the village CHW went from 31.2% to 82.2%; mothers who participate in CHW activities went from 41.3% to 70%, and those who have spoken to the CHW in the last two months went from 14.3% to 33.11%. Other than for this last indicator, the highest increases were noted in the SAO health zone.

Conclusion

Project interventions for the Partnership for the Community Management of Child Health (PRISE-C) helped ensure and improve the availability of certain health care services at the community level in the three health zones.

The quality improvement collaborative implemented in the Savè-Ouèssè health zone seems to have had a positive impact on levels for several indicators.

Recommendations

Upon completion of this final survey, the following recommendations can be made:

- Supplement this quantitative survey with a qualitative assessment to understand the determinants causing low levels for some indicators;
- Ensure the availability of drugs and medical products (ACT, amoxicillin, ORS/Zinc) among community health workers;
- Define the indicators that fall within the scope of planned interventions at the start of any project;
- Sensitize people about properly storing their health and vaccination cards;
- Raise greater awareness about the signs that require seeking emergency care; and
- Assess the functionality of quality improvement teams implemented in the Savè-Ouèssè health zone within the framework of the collaborative.

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

Annex 1: Survey questionnaire

Final survey for the Partnership for the Community Management of Child Health (PRISE-C) Project

SECTION 1: GENERAL INFORMATION

Identification	/__/__/___/___/ __/ __/
Date: Day /__/__/ Month /__/__/ Year /____/____/____/____/	
Cluster number	|____|____|
Department: _____	Department Code: /___/
Health Zone: _____	Health Zone Code: /__/__/
Commune: _____	Commune Code : /__/__/
Arrondissement: _____	Arrondissement Code: /___/___/__/__/
Village or city neighborhood: _____	Village Code/__/__/___/___/ __/ __/
Household number	|____|____|
Note what time the interview began	|____|____| Hour |____|____|Minutes
Note what time the interview ended	|____|____| Hour |____|____|Minutes

No.	QUESTIONS	CODES	SKIP TO
Q1	How old are you? (in years)	/_____/_____/ years	
Q2	Marital status **(Circle the code for the correct response)**	1. Lives with partner 2. Divorced 3. Widow 4. Single	
Q3	Ethnic group	1. Fon/Mahi 2. Mina 3. Nagot/Tchabe 4. Idatcha 5. Itcha/Ifè 6. Yoruba 7. Fulani 8. Bariba 9. Dendi 10. Hausa 11. Adja 12. Aïzo 13. Other: _____ (specify)	
Q4	Education level **(Circle the code for the correct response)**	1. No formal education 2. Literate 3. Primary school 4. Secondary school 5. College	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES		SKIP TO
Q5	How many live children do you have?	|_____|_____|		
Q6	How many children under 5 years old do you have now?	/____/		
Q7	What is the date of birth of your youngest child? (IF THERE IS NO CARD, ASK THE APPROXIMATE AGE AND NOTE IT)	**Date of birth** Day.……|___|___| Month.....|___|___| Year |__|__|__|__| Age |___|___| (months)		

SECTION 2: MATERNAL AND CHILD HEALTH CARE

No.	QUESTIONS	CODES	SKIP TO
Q8	Did you attend antenatal consultations during your last pregnancy?	Yes……..……1 No..…….……2	If no, go to Q16
Q9	If yes, who did you see? (MENTION ONLY ONE PERSON. IF MORE THAN ONE PERSON, MENTION THE MOST QUALIFIED)	Doctor.....1 Nurse.....2 Midwife.....3 Health aid.....4 Traditional midwife.....5 Other_____ 6 (specify)	
Q10	Do you have a maternal health card for the pregnancy of your last child?	YES, VIEWED.....1 Yes, but not available.....2 No.……..…...3	**If no or not available, go to Q13**
Q11	Look at the card and note the number of ANC visits made while the mother was pregnant with the child	Number of visits|_____|_____|	
Q12	Look at the card and record the number of tetanus vaccine injections written on the card	/_____/	
Q13	How many antenatal visits did you have? (IF CARD IS SEEN, DO NOT ASK THIS QUESTION)	/____/____/	
Q14	During this pregnancy, did you receive an injection in the arm to prevent you or your child from getting tetanus (convulsions)? (IF YOU SEE TETANUS VACCINATION, DO NOT ASK THIS QUESTION)	Yes……..…….……1 No..……...……2 No longer knows.....9	**If no or no longer knows, go to Q16**

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
Q15	If yes, during this pregnancy, how many times did you receive this injection? (IF CARD IS SEEN, DO NOT ASK THIS QUESTION)	One time……..…….……1 Two times…….…..……2 Three or more times…….....…...3 No longer knows.....9	
Q16	Before this pregnancy, did you receive this injection for tetanus either during earlier pregnancies or between pregnancies?	Yes…….…….……1 No..…….…….2 No longer knows.....9	If no, go to Q18
Q17	If yes, how many times did you receive this tetanus injection BEFORE this last pregnancy?	One time……..……..…….…….1 Two times…….……2 Three or more times……..3 No longer knows.....9	
Q18	Did you receive medicines at the health center to prevent malaria during your last pregnancy?	Yes……..……1 No..…….……2 No longer knows.....9	If no, go to Q21
Q19	If yes, what did you take? (ASK IF THE TABLETS WERE TAKEN IN FRONT OF THE MIDWIFE: IF YES, CHECK 1. IF NO, CHECK 2 AND FILL OUT)	SP, observed.....1 Other (_____) 2 Medicine unknown.....3	If medicine unknown, go to Q21
Q20	If you received SP under supervision, how many times did you receive it during this pregnancy?	1 time……..1 2 times…….…...…..2 3 times……..……..……3 DNK…….……..9	
Q21	Where did you give birth?	Public health center.....……..1 Private health center.....2 Home.....3 Other (specify)_____4	
Q22	Who assisted you during your last delivery? **Do not suggest a response** (Only one response; if several people, write the most qualified one) (IF THE RESPONSE IS "NO ONE," PROBE TO FIND OUT IF THIS MEANS NO ADULTS PRESENT)	Doctor……..……..……1 Nurse/midwife.....……..2 Traditional midwife.....3 Health aid.....4 Family member.....5 Another person (specify status):_____6 No one.....7	
Q23	Was your child examined within 48 hours of birth?	Yes…….……..…1 No……...…….2 Does not know.....9	If no, go to Q25
Q24	If yes, by whom? (CHECK THE MOST QUALIFIED PERSON IF SERVERAL ANSWERS ARE GIVEN)	Doctor.....1 Nurse/midwife....…….…...…2 Traditional midwife.....3 Health aid.....4 Other (specify):_____ 5	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
Q25	Have you already discussed the subject of birth spacing or family planning with your husband?	1 = Yes 2 = No	
Q26	Have you already discussed the subject of birth spacing/family planning with other people?	1 = Yes 2 = No	If no, go to Q28
Q27	If yes, with whom? (check all responses given)	Health care staff……....a Community health workers.....b Women's group member.....c Parent or friend.....d Other (specify):_____e	
Q28	Currently, do you use a method to delay or avoid becoming pregnant?	1 = Yes 2 = No	If no, go to Q30
Q29	If yes, what is the main method you and your husband/partner use to delay/avoid becoming pregnant? (DO NOT READ ANSWERS; CHOOSE ONLY ONE ANSWER) IF THE WOMAN GIVES MORE THAN ONE RESPONSE, ASK WHAT IS THE MAIN FREQUENTLY USED METHOD? IF THE ANSWER IS CONDOM AND CYCLE METHOD, CHECK "12" FOR CYCLE METHOD. If the answer is breastfeeding, check "11" for other and specify breastfeeding. If the response is abstinence, check "14" for other and specify.	Tubal ligation.....1 Vasectomy.……...…2 Pills.....3 IUD.....4 Injectable methods……..…….5 Implants…….....6 Male condom.....7 Female condom.....8 Diaphragm……..…..……..9 Spermicides……..…….....10 Lactational Amenorrhea Method.....11 CycleBeads……...…..12 Calendar or Billings method.....13 Other (specify) _____14	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

SECTION 3. BREASTFEEDING AND CHILD NUTRITION

No.	QUESTIONS	CODES	SKIP TO
Q30	I would like to ask you questions about fluids and foods that your (last) child drank or ate yesterday during the day or night. **Did your child drink or eat:** (read the responses to the mother, beginning with breast milk)	Yes No Does not know	
	A. Breast milk	……..…1 2 9	
	B. Water	……..…1 2 9	
	C. Packaged infant foods? (Infant formula)	……..…1 2 9	
	D. Other packaged foods for infants and children? (Ex. Cerelac, mixed Ouando flour)	……..…1 2 9	
	E. Porridge	……..…1 2 9	
Q31	FILL OUT THE TABLE BELOW WITH THE ANSWERS TO THE FOLLOWING QUESTIONS: I would like to ask you about other liquids and foods that your child drank or ate yesterday during the day or night. I'm interested in knowing if your child ate these foods alone or in combination with other foods. **Did your child drink or eat the following:**		
	GROUP 1: MILK PRODUCTS	**YES NO**	
	A. LOOK BACK AT Q30C; IF YES, CHECK YES HERE ALSO Packaged infant foods?	……1 2	
	B. Milk, such as fresh cows milk or powered cow's milk?	……1 2	
	C. Cheese, yogurt, or other milk products?	……1 2	
	GROUP 2: CEREALS AND STARCHES	**YES NO DNK**	
	D. LOOK BACK AT Q30D; IF YES, CHECK YES HERE ALSO Other available packaged foods for infants and children? (Ex. Cerelac)	……1 2 9	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

	E. LOOK BACK AT Q30E; IF YES, CHECK YES HERE ALSO Any other porridge?	……1	2	9	
	F. Corn or millet meal, rice, bread, macaroni, or other grain-based products?	……1	2	9	
	G. Potatoes, yams, manioc, or other tuber products?	……1	2	9	
	GROUP 3: VEGETABLES RICH in Vitamin A	**YES**	**NO**	**DNK**	
	H. Squash, carrots, or sweet potatoes?	……1	2	9	
	I. Leafy greens (such as manioc, baobab, or *amavivè*)?	……1	2	9	
	J. Mangos or papayas	……1	2	9	
	K. Foods made with palm oil?	……1	2	9	
	GROUP 4: OTHER FRUITS/VEGETABLES	**YES**	**NO**	**DNK**	
	L. Any other fruit or vegetable, such as: banana, orange, grapefruit, pineapple, and watermelon?	……1	2	9	
	GROUP 5: EGGS	**YES**	**NO**	**DNK**	
	M. Eggs?	……1	2	9	
	GROUP 6: MEAT, POULTRY, FISH	**YES**	**NO**	**DNK**	
	N. Offal (liver, kidneys, heart, gizzard, etc.)?	……1	2	9	
	O. Any meat, such as beef, pork, lamb, goat, chicken, or duck?	……1	2	9	
	P. Fresh or dried fish or other shellfish or seafood (ex. mussels, shrimp)?	……1	2	9	
	Q. Snails, caterpillars, termites, larvae, or other insects or small animals?	……1	2	9	
	GROUP 7: BEANS/NUTS	**YES**	**NO**	**DNK**	
	R. Any foods based on beans, peas, lentils, peanuts, or nuts?	……1	2	9	
	GROUP 8: OILS AND FATS	**YES**	**NO**	**DNK**	
	S. Any oils, fats, butter, or any food made with oil or fat?	……1	2	9	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

	T. FOR QUESTIONS 31A–31S: HOW MANY FOOD GROUPS HAVE AT LEAST ONE "YES" CIRCLED?	Number of groups ☐	
	GROUP 9: OTHER FOODS	**YES NO DNK**	
	U. Tea or coffee	……1 2 9	
	V. Other liquid: specify_____	……1 2 9	
	W. Other sweet food such as chocolate, candy, cookies, or cake	……1 2 9	
	X. Other solid or soft food	……1 2 9	
Q32	How many times did your child eat solid, semi-solid, soft, or any food other than liquid foods yesterday during the day or night? We want to know how many times your child ate solid food in order to satisfy his or her hunger. (Snacks or bites taken from the mother's or a family member's meal are not counted. Do not include: soup, liquid porridge, and other liquids.) PROBE TO HELP THE RESPONDENT REMEMBER ALL THE TIMES THE CHILD ATE YESTERDAY	Number of times ☐ (If the number is greater than or equal to 7, mark "7") Does not know.....9	

SECTION 4. VITAMIN-A SUPPLEMENTATION

No.	QUESTIONS	CODES	SKIP TO
Q33	Has your child received a dose of vitamin A at least once (show the capsule)?	1 = Yes 2 = No NA (0–5 months) = 3 9 = Does not know	If no, go to Q35
Q34	Has your child received a dose of vitamin A in the last six months? (Verify in the health card if possible.)	1 = Yes 2 = No NA = 3 9 = Does not know	

SECTION 5. CHILDREN'S IMMUNIZATION (ask this question to mothers of children age 12–23 months old)

No.	QUESTIONS	CODES	SKIP TO
Q35	Do you have a health card where the vaccinations of your last child have been recorded? IF YES: May I see it?	Yes, seen by interviewer ..... 1 Not available/lost/misplaced ..... 2 Never had a card..... 3	If not available, go to Q50

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
	Copy the dates in the health card. Write "44" in the "day" column if the date is not recorded.	**DAY MONTH YEAR**	
Q36	BCG		
Q37	Polio 0		
Q38	Polio 1		
Q39	Penta-1		
Q40	PCV13.1		
Q41	Polio 2		
Q42	Penta-2		
Q43	PCV13.2		
Q44	Polio 3		
Q45	Penta-3		
Q46	PCV13.3		
Q47	Measles vaccination		
Q48	Yellow fever vaccination		
Q49	VITAMIN A (most recent)		
Q50	Has your last child received vaccinations that are not written on the health card?	Yes……..1 No……..….2 Does not know……9	If no, go to Q54
Q51	If yes to Q50, did your child receive a vaccination (Penta) injected into the left arm that is given together with oral polio at the health center or through an outreach strategy?	Yes……..1 No……...2 Does not know……9	If no or does not know, go to Q53
Q52	If yes, how many times?	/___/____/	
Q53	Has your child had an injection in the right arm for measles?	Yes…….1 No……..2 Does not know……...9	

SECTION 6. MALARIA

No.	QUESTIONS	CODES	SKIP TO
Q54	Did your children under 2 years old sleep under a bednet last night?	<u>Child 1</u> Yes..... 1 No ..... 2 <u>Child 2</u> Yes..... 1 No 2	If no, go to Q57

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
Q55	If yes, what type of bednet?	Child 1 (youngest): Untreated....……2 Treated……..……..….....3 LLIN….……..….....4 Child 2: Untreated....……...……2 Treated……..…….....3 LLIN....……..…..…...4	
Q56	Can I see the bednets that the children slept under last night? (GOOD CONDITION = NO HOLES LARGER THAN THE INDEX FINGER; POOR CONDITION = AT LEAST ONE HOLE LARGER THAN THE INDEX FINGER)	Bednet 1 (youngest child): Hung up, good condition.....1 Hung up, poor condition.....2 Not hung up, good condition.....3 Not hung up, poor condition.....4	
		Bednet 2: Hung up, good condition.....1 Hung up, poor condition.....2 Not hung up, good condition.....3 Hung up, poor condition.....4	

SECTION 7. CHILDHOOD ILLNESSES

No.	QUESTIONS	CODES	SKIP TO
Q57	What are the symptoms in children that you consider to be danger signs, that is, those that would make you run for help at night? DO NOT SUGGEST ANY ANSWERS	Difficulty breathing, rapid breathing, heaving……..……....…...a Blood in stools..……..……...…..b Unable to drink/breastfeed/eat……...c Lethargy (doesn't respond to pinching).....d Convulsions……..……...…..e Vomiting all consumed food and drink……..…f High fever……..…g Other (specify)_____h Does not know.....i	
Q58	Has one of your children under 2 years old had a fever in the last two weeks?	Yes.....……1 No.....2	**If no, go to Q63**
Q59	If yes, did you go to someone outside the house to treat your child?	Yes.....1 No.....2	**If no, go to Q62**
Q60	If yes, how long after the onset of fever?	- The same day.....1 -The following day.....2 - More than two days after.....3	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
Q61	Who did you go to see?	HC……..……1 Hospital……..……..……2 Community health worker.....3 Private clinic.....4 Pharmacy.……..……...5 Neighbor.....6 Street vendor.....7 Traditional healer.....8 Other (specify):_____	
Q62	What drugs have been given to your child to treat fever? (MENTION ALL DRUGS INDICATED OR SEEN ON THE HEALTH CARD) ASK TO SEE THE DRUG IF YOU DO NOT KNOW ITS NAME. FOR EACH ANTIMALARIAL, ASK HOW MUCH TIME ELAPSED BETWEEN THE ONSET OF FEVER AND THE FIRST DOSE OF MEDICINE CHECK THE APPROPRIATE CODE: - The same day = 0 - The day after the onset of fever = 1 - Two days after the onset of fever = 2 - Does not know = 9	<u>ANTI-MALARIAL</u> A. SP/Fansidar……..…..0 1 2 9 B. Chloroquine……..….0 1 2 9 C. Amodiaquine……0 1 2 9 D. Quinine…….0 1 2 9 E. ACT……..……0 1 2 9 F. Artequin……..…..0 1 2 9 G. Other _____0 1 2 9 <u>OTHER MEDICINES</u> H. ASPIRIN..……0 1 2 9 I. PARACETAMOL…...0 1 2 9 X. Other_____0 1 2 9	
Q63	Has your child had **diarrhea** (more than three liquid bowel movements during the day) over the last two weeks?	Yes.....1 No.....2	**If no, go to Q65**
Q64	If yes, did he or she receive any of the following fluids to drink since the onset of diarrhea? (Read the following three choices aloud) a) Orasel with Zinc b) ORT (water + sugar + salt) c) Rice water	YES NO DNK A. Orasel with Zinc...…….1 2 9 B. ORT...…….....1 2 9 C. RICE WATER.....1 2 9	
Q65	In the last two weeks, has (your last child) had **a cough or cold?**	Yes.....1 No.....2	**If no, go to Q70**
Q66	If yes, has your child also had difficulty breathing, either faster than normal with short, quick breaths or heaving?	Yes.....1 No.....2 DNK.....9	**If no, go to Q70**

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
Q67	If yes, have you sought someone outside your house for advice or treatment?	Yes.....1 No.....2	**If no, go to Q70**
Q68	If yes, to whom? (LET THE WOMAN RESPOND TO THIS AND CHECK)	HC……a Hospital…….....b Community health worker.....c Private clinic…….……...d Pharmacy.……..……..e Neighbor/family.....f Street vendor.....g Traditional healer.....h Other (specify)_____i	
Q69	What drug did he or she receive? (See if there is one in the health card.)	Amoxicillin..……...a Co-trimoxazole…….....b Other (specify)_____c	
Q70	You have probably heard about community health workers, who lead discussions about health, the promotion of treated bednets, treatment of malaria, etc.?	Yes……1 No……..……...2	If no, go to Q78
Q71	Do you know at least one CHW in your village?	Yes……. ……1 No....……..2	If no, go to Q78
Q72	What activities does the CHW lead in the village?	Discussions.....a Home visit for sick children.....b Visit to pregnant women.....c Visit to newborns.....d Visit to healthy child.....e Selling contraceptive products.....f Other (specify)_____ g	
Q73	Have you ever participated in their activities such as discussions about health?	1 = Yes 2 = No	
Q74	Have you sought their services in the last two months?	1 = Yes 2 = No	
Q75	Have you spoken to them in the last two months?	1 = Yes 2 = No	If no, go to Q78
Q76	What are the reasons you have called on them?	Purchase of an LLIN.....a Medical care.....b Advice....……..……..…..c Purchase of contraceptive products.....d Home visit.....……..…e Other (specify):_____f Non-health related reason.....g	
Q77	Did you do something to thank or support the CHW in your village for his or her work?	I did nothing to show thanks.....a Complimented or thanked him/her verbally.....b Made a monetary contribution.....c	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

No.	QUESTIONS	CODES	SKIP TO
		Worked in his/her field or home……....d Spent time helping him/her with CHW activities……..f Other (specify)_____g	

SECTION 8. HYGIENE AND HOUSEHOLD SANITATION

No.	QUESTIONS	CODES	SKIP TO
Q78	What is your source for drinking water?	Tap water (Benin National Water Company).....1 Collected rain water…….....……..2 Water from a private or public covered well.....3 Water from an open well…….....…….4 Pump water...……..……5 Surface water (spring, pond, river, lake, or stream).....6	
Q79	Do you treat your water before drinking it?	YES……..1 NO..……..……2	If no, go to Q81
Q80	Can you tell us what you use to treat water? (CIRCLE ALL RESPONSES THAT THE MOTHER GIVES YOU)	1. Leaving it to settle 2. Filtering through a clean cloth 3. Boiling 4. By adding Aquatabs/chlorine 5. Other: _____	
Q81	Can you show me where you usually wash your hands and what you use to wash them? ASK TO SEE THE PLACE AND JUST LOOK	Next to or inside the latrines or sanitation areas….1 Next to or inside the kitchen.....2 Inside the courtyard.....3 Outside the concession.....4 No specific place.....5 Not permitted to verify.....6	If 5 or 6, go **to Q83**
Q82	CHECK IF THE FOLLOWING ITEMS ARE FOUND IN THE DESIGNATED AREA FOR WASHING AND CHECK THEM ON THE RIGHT *(The material must be in place during the interview or brought within one minute by the respondent. If it cannot be brought within that time, mark "5".)*	Soap……..……..1 Detergents……...2 Ashes……..……3 Mud/sand…..…….……4 None……....5 Other.....6	
Q83	When do you wash your hands with soap/ashes? (RECORD EVERYTHING THAT IS MENTIONED)	Never.....a Before preparing meals.....b Before feeding children…….....c After defecating.....d After cleaning a child who has defecated……..e Before eating.....f After eating.....g	

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

		Other_____h (SPECIFY)	
Q84	Did you use soap for any reason at all during the day or night yesterday?	Yes……..1 No.…….….2	If no, go to Q87
Q85	If yes, how many times?	/_____/_____/	
Q86	At what instances? (DO NOT READ THE OPTIONS FOR ANSWERS)	Before preparing food…….……a Before feeding children.....b After defecating…….……..c When washing dishes.....d When showering.....e Other _____f	

Anthropometry			
Q87	May I weigh your child?	Yes……..……1 No.…..……...….…….....2 |___|___| . |___| KILOGRAMS	**The end**

THANK THE PERSON FOR PARTICIPATING IN THE SURVEY

06BP1961 Cotonou **prisec@urc-chs.com** **Tel: (229) 96 63 39 54**

ANNEX VI. COMMUNITY HEALTH WORKER TRAINING MATRIX

Training Month/Year	Focus of Training	Project Area	Participants	Number Trained
March 2011	ToT for Integrated Package of High Impact Interventions at community level (PIHI-comm)	**SAO and DAGLA**	Trainers and supervisors	22
April 2011	PIHI-comm	**SAO and DAGLA**	Community health workers (CHW)	45
September 2011	PIHI-comm	**SAO and DAGLA**	CHW	45
September 2011	ToT for PIHI-comm	**AZT**	Trainers and supervisors	11
October 2011	PIHI-comm	**AZT**	CHW	33
November 2011	Supervision techniques and tools	**SAO and DAGLA**	CHW supervisors	28
November 2011	Supervision techniques and tools	**AZT**	CHW supervisors	8
December 2011	Quality Improvement	**SAO**	CHW in OR intervention zone	34
December 2011	Quality Improvement	**SAO**	Members of VHDC	90
December 2011	BCC and mutuelles	**AZT**	CHW supervisors	9
April 2012	BCC and mutuelles	**AZT**	CHW	26
May 2012	BCC and mutuelles	**SAO and DAGLA**	CHW	35
May 2012	BCC and mutuelles	**SAO and DAGLA**	CHW	49
July 2012	Training of coaches	**SAO**	CHW and CHW supervisors	11
February 2013	MHealth Training	**AZT**	CHW	7
March 2013	Family Planning Training	**AZT**	CHW	21
June 2013	PIHI-comm refresher training	**SAO DAGLA AZT**	CHW	96
June 2014	Malaria Rapid Test Training	**AZT**	CHW	22

ANNEX VII. EVALUATION SCOPE OF WORK

Terms of Reference for

Final Evaluator External Consultant for the PRISE-C Project in Benin

May 30, 2014

I. Introduction

Center for Human Services will hire an independent consultant to conduct a final performance evaluation (FE) for the PRISE-C project funded by USAID's Child Survival and Health Grants Program (CSHGP) Cooperative Agreement No.AID-OAA-A-10-00047-00 in Benin. USAID's CSHGP supports community-oriented projects implemented by U.S. private voluntary organizations (PVOs) and nongovernmental organizations (NGOs) and their local partners. The purpose of this program is to contribute to sustained improvements in child survival and health outcomes by supporting the innovations of PVOs/NGOs and their in-country partners in reaching vulnerable populations.

This document describes the Final Evaluator's SOW for the PRISE-C FE.

II. Background

Since October 2010, the Center for Human Services (CHS) has been implementing a four-year child survival innovation grant funded by the Child Survival and Health Grants Program (CSHGP) through the Partnership for Community Child Survival (PRISE-C). The aim of this project is to improve maternal and child health outcomes in the three health zones of Save/Ouesse (SAO), Dassa/Glazoue (DAGLA) and Allada/Ze/Toffo (AZT) in Benin.

PRISE-C's intermediate results are aligned with the Benin Ministry of Health directives and guidance on health services and care at the community level. These intermediate results are to:

- Increase community engagement with community health delivery system;
- Increase demand for curative and preventive services; and
- Strengthen the performance and sustainability of community health services.

PRISE-C is implemented by CHS in collaboration with a local NGO, Centre d'Expertise d'Ingenierie pour le Developpment Durable (CEID).

III. Project Population

Beneficiaries*	Total	
Total Population	762,928	
Infants aged 0–11 Months	3,177	
Children aged <5 Years	13,821	
Women of Reproductive Age (15–49 years)	18,269	
Total Beneficiaries	78,459	
Community Health Workers or Volunteers (CHWs), Disaggregated by Sex	M	F
	64	47
	Health	Zones

Health Facilities (Hospital to Sub Health Post)	Facilities	
	32	3
Community-Based Structures (e.g., Village Development Committees [VDCs])	111	

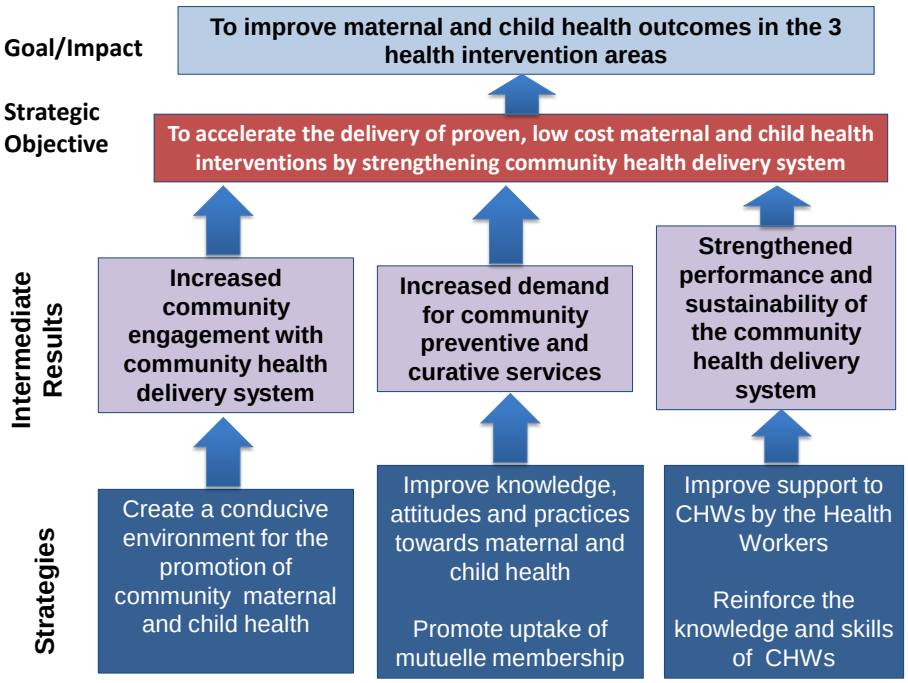
*Source: INSAE 2011, for population proportions. Populations based on 2002 census data + demographic growth rate of 2.6% (UNDP 2005). PRISE-C data for CHW, health facility, and community-base structure numbers.

IV. Partners

PRISE-C has worked in close collaboration with our sub-contractor Centre d'Expertise d'Ingenierie pour le Developpment Durable (CEID). CEID was created in February 2006 by a group of former field staff who had worked on a previous CHS/URC project as sub-contractors, using participatory methods for community mobilization activities, training health care workers and community health management committees on planning and implementation of community based health activities and building capacity for community mobilization. They have also held contracts with other organizations to integrate participatory methods for the implementation of community integrated management of child illness (IMCI-C) in other health zones of Benin. They have been engaged since the inception of the PRISE-C project in the development of the community mobilization strategy and the activity workplan and are crucial to the successful implementation of the PRISE-C strategies and key activities.

V. Key Strategies

The below results framework shows the key strategies identified to achieve the project intermediate results and objectives.



VI. Purpose of the Final Evaluation

The purpose of USAID's CSHGP is to contribute to advancing the health system strengthening goals of Ministries of Health toward achieving sustained improvements in child survival and health outcomes, particularly among vulnerable populations, by supporting the innovative, integrated community-oriented programming of PVOs/NGOs and their in-country partners. CSHGP cooperative agreements offer unique opportunities to demonstrate the links between specific delivery strategies and measured outcomes. The FE is intended as a performance evaluation but should be broadly accessible to various audiences including Ministries of Health (MOHs), and findings will

contribute evidence relevant to global initiatives such as the Global Health Initiative and Feed the Future.1 It is important that the final evaluator consider the audiences listed below, when conducting the evaluation and writing the report.

The FE provides an opportunity for all project stakeholders to take stock of accomplishments to date and to listen to the beneficiaries at all levels, including mothers and caregivers, other community members and opinion leaders, health workers, health system administrators, local partners, other organizations, and donors. The FE Report will be used by the following audiences as a source of evidence to help inform decisions about future program designs and policies:

- In-country partners at national, regional, and local levels (e.g., MOH and other relevant ministries, district health team, local organizations, communities in project areas).
- USAID (CSHGP, Global Health Bureau, USAID Missions), and other CSHGP grantees.
- The international global health community. The FE report will be posted for public use at http://www.mchipngo.net and the USAID Development Experience Clearinghouse at https://dec.usaid.gov.

VII. Methodology

The evaluation methodology consists of a mixed-methods approach using both quantitative and qualitative data. The approach comprises both a desk review of secondary data sources and the collection of qualitative data to complement existing data. The written design of the evaluation must be further defined and specified by the final evaluator (e.g., number of key informant interviews, focus groups discussions, observations, and locations) and must be shared with project stakeholders and implementing partners for comment before the evaluation commences. CHS will facilitate this sharing and feedback.

Secondary Data:

The final evaluator will review project reports (e.g., Detailed Implementation Plan; annual reports; Mid Term Evaluation knowledge, practice, and coverage baseline; and final survey and any monitoring reports) to assess the quality of quantitative and qualitative data and make assessments of project results in relation to the project design and targets set. The final evaluator should also review key U.S. Government/USAID strategic documents at the global and national levels relevant to the content of project. All relevant policy and strategy documents at the national level (e.g., MOH policies and strategies) are also crucial and should be used and referenced.

Qualitative Data:

In-depth qualitative interviews or focus group discussions may be conducted with stakeholders, including project staff, MOH, local NGOs and community-based organizations, district health teams, community- and facility-based health workers, community members, community leaders, and mothers (exit interviews). If possible, the assessment will also include observations of activities supported by the project. This will involve site visits to one or more implementation areas. It is recommended that the final evaluator randomly select communities to visit from a list provided by CHS. However, purposive sampling may be warranted in addition to explore certain areas in more depth to investigate particular results (e.g., high or low performance or unexpected results).

Limitations:

The evaluation report must include a discussion of the methodological limitations of the evaluation.

Additional guidance on reporting format is provided in the CSHGP Guidelines for Final Evaluations, specifically in the Final Evaluation Report Template included therein.

VIII. Evaluation Questions

The final evaluator and the evaluation team will use existing data collected or compiled during the life of the project, as well as additional data collected during the evaluation to answer the following questions:

---

[1] For more information on these two initiatives, visit http://www.usaid.gov and http://www.feedthefuture.gov.

1. To what extent did the project accomplish and/or contribute to the results (goals/objectives) stated in the DIP?

    - What is the quality of evidence for project results?
    - How were results achieved? If the project improved coverage of high-impact interventions simultaneously, what types of integration enabled this? Specifically, refer to project strategies and approaches and construct a logic model describing inputs, process/activities, outputs, and outcomes. Describe the extent to which the project was implemented as planned, any changes to the planned implementation, and why those changes were made.

2. What were the key strategies and factors, including management issues, that contributed to what worked or did not work?

    - Was community engagement with the community health delivery system increased (as measured by the project)? Was increased community engagement associated with increased performance by CHWs? Which strategies for community engagement with CHWs were associated with better performance? Were there any factors in CHW performance that community engagement was not able to address? What are key lessons learned for community engagement with CHWs through PRISE-C?
    - Describe the strategies and approaches used to strengthen performance and sustainability of the community health delivery system. Were there particular strategies and approaches which were more effective than others? Which actors within the community health delivery system did these strategies target? Were there additional actors who should have been targeted for project support to strengthen the system? What barriers or factors may have impacted the effect of the project's strategies and approaches on the community health delivery system? What were additional factors which impacted CHW motivation and performance?
    - What were the contextual factors such as socioeconomic factors, gender, demographic factors, environmental characteristics, baseline health conditions, health services characteristics,[2] and so forth that affected implementation and outcomes?
    - Were gender considerations incorporated into the project at the design phase or midway through the project? If so, how? Are there any specific gender-related outcomes? Are there any unintended consequences (positive and negative) related to gender?

3. Which elements of the project have been or are likely to be sustained or expanded through the Beninese MOH (e.g., through institutionalization or policies)?

    - For elements which have been/are likely to be scaled-up, describe the process identification of promising practices, how these practices were advocated for to the MOH, and how they wereAnalyze the elements of scaling-up and types of scaling-up that have occurred or could likely occur (dissemination and advocacy, organizational process, costs and/resource mobilization, monitoring and evaluation using the ExpandNet resource for reference).[3]
    - If there are no elements which will be scaled-up, describe what issues may be blocking uptake of interventions by the MOH

4. What are stakeholder perspectives on the OR implementation, and how did the OR study affect capacity, practices, and policy?

These questions above are required for framing the evaluation but should be tailored to the specific project context and to address the needs of in-country government and USAID stakeholders, by CHS and/or USAID when the evaluation methodology is shared for comment.

[2]See Table 1 in the document here: http://heapol.oxfordjournals.org/content/20/suppl_1/i18.long

[3]http://expandnet.net/PDFs/ExpandNet-WHO%20Nine%20Step%20Guide%20published.pdf

IX. Final Evaluator Characteristics and Expected Timeline

The consultant will serve as the evaluation team leader and is welcome to propose additional evaluation team members to round out the evaluation team's skill set in order to ensure adequate representation of evaluation, technical, geographic, cultural and language skills. Team members, their affiliations, and disclosure of conflicts of interest must be listed in an annex to the evaluation report. The consultant will coordinate closely with the CHS team regarding tool finalization, evaluation methodology, timeline, and draft report finalization.

Requirements:

The consultant must be approved by USAID CSHGP and should meet the following minimum requirements:

- Proven expertise and leadership in
  - integrated community-oriented reproductive, maternal, newborn, and child health projects
  - conduct of evaluations (baseline, endline) using mixed methods
- Experience with design, collection, and analysis using applied research methods in a program implementation context
- Familiarity with public health system in Benin
- Demonstrated ability to communicate with and lead a team of stakeholders, staff, and national experts in participatory evaluation
- Familiarity with USAID programming
- Skill or familiarity with cost analysis methods for program assessments
- Excellent analytical and writing skills (English)
- Ability to communicate in French (written and oral)
- Signed statement explaining any conflict of interest4

Key Tasks of the Evaluation Team Leader:

- Review project documents and resources to understand the project.
- Refine the evaluation objectives and key questions based on the CSHGP guidelines in coordination with CHS team and its partners.
- Based on objectives and key questions, develop an evaluation plan including a field evaluation schedule and assessment tools.
- Complete the collection, analysis, and synthesis of supplemental information regarding the program performance.
- Interpret both quantitative and qualitative results and draw conclusions, lessons learned, and recommendations regarding project outcome.
- Lead an in-country debriefing meeting with key stakeholders, with a PowerPoint slideshow deliverable, no longer than 20 slides (with USAID/Washington, DC, participation remotely, as able).
- Prepare draft report in line with the CSHGP guidelines and submit to CHS on or before September 1.
- Prepare and submit the final report, which is due at the USAID CSHGP GH/HIDN/NUT office on or before 90 days after the end of the project.

Proposed Timeline:

[4] CSHGP grantees are required to hire an external evaluator for the final evaluation. That fiduciary relationship creates a conflict of interest that is minimized by the CSHGP requirement of submission of a draft evaluation report directly to the CSHGP.

Month	Activity	Deliverables
June	Review project documents and program performance data. Initial discussions with PRISE-C team Refine evaluation objectives and key questions.	
July	Develop field evaluation schedule and tools Country visit to Benin	Evaluation Plan (July 18) Debriefing PowerPoint (End of Benin Visit)
August	Prepare draft report	Draft Report (September 1)
September	Finalize report	Final report (ideally by October 1, but on or before 90 days after the end of the project)

X. Final Evaluation Report

The FE report should follow the outline in USAID CSHGP's Guidelines for Final Evaluations. A draft and final report, written by the final evaluator, must be submitted directly to the CSHGP. Draft and final reports should be submitted according to the submission instructions as indicated in the guidelines.

XI. Budget

Consultant will be paid the amount outlined below upon receipt of each deliverable. The consultant will be reimbursed for their effort at an agreed upon daily rate. In addition, international and local travel as well as lodging and MI&E for the duration of required travel will be covered by CHS.

Deliverable	Date expected
Evaluation Plan	July 18, 2014
Debriefing PowerPoint	August 8, 2014 (tentative)
Draft of the final report	September 1, 2014
Final report	October 1, 2014

XII. Deliverables

At the conclusion of the consultancy period, the consultant is expected to complete the following deliverables:

- Lead an in-country debriefing meeting with key stakeholders (and remote participation by USAID/Washington, DC) with a PowerPoint presentation no longer than 20 slides for distribution.
- Prepare a draft report in line with the CSHGP guidelines and submit to CSHGP and CHS simultaneously on or before September 1.
- Prepare and submit the final report, which is due at the USAID CSHGP GH/HIDN/NUT office on or before 90 days after the end of the project.

ANNEX VIII. EVALUATION METHODS/DATA SOURCE MAPPING

Evaluation question	Data sources
1. To what extent did the project accomplish and/or contribute to the results (goals/objectives) stated in the DIP?	Program reports
What is the quality of evidence for project results?	Routine PMP data, PMP update, supplemental qualitative data
How were results achieved?	Routine PMP data, quarterly reports, supervision reports, punctual reports, OR reports
If the project improved coverage of high-impact interventions simultaneously, what types of integration enabled this?	Work plans, annual reports, supplemental qualitative data
Specifically, refer to project strategies and approaches and construct a logic model describing inputs, process/activities, outputs, and outcomes.	
Describe the extent to which the project was implemented as planned, any changes to the planned implementation, and why those changes were made.	
2. What were the key strategies and factors, including management issues, that contributed to what worked or did not work?	Routine PMP data, annual reports, OR reports, supplemental qualitative data
Was community engagement with the community health delivery system increased (as measured by the project)?	
Was increased community engagement associated with increased performance by CHWs?	
Which strategies for community engagement with CHWs were associated with better performance?	
Were there any factors in CHW performance that community engagement was not able to address?	
What are key lessons learned for community engagement with CHWs through PRISE-C?	
Describe the strategies and approaches used to strengthen performance and sustainability of the community health delivery system.	
Were there particular strategies and approaches which were more effective than others?	
Which actors within the community health delivery system did these strategies target?	
Were there additional actors who should have been targeted for project support to strengthen the system?	
What barriers or factors may have impacted the effect of the project's strategies and approaches on the community health delivery system?	
What were additional factors which impacted CHW motivation and performance?	

What were the contextual factors such as socioeconomic factors, gender, demographic factors, environmental characteristics, baseline health conditions, health services characteristics, and so forth that affected implementation and outcomes?	
Were gender considerations incorporated into the project at the design phase or midway through the project? If so, how? Are there any specific gender-related outcomes? Are there any unintended consequences (positive and negative) related to gender?	Evaluation scope of work; supplemental qualitative data
3. Which elements of the project have been or are likely to be sustained or expanded through the Beninese MOH (e.g., through institutionalization or policies)?	Quarterly and program reports; supplemental qualitative data
For elements which have been/are likely to be scaled-up, describe the process identification of promising practices, how these practices were advocated for to the MOH, and how they were implemented. Analyze the elements of scaling-up and types of scaling-up that have occurred or could likely occur (dissemination and advocacy, organizational process, costs and/resource mobilization, monitoring and evaluation using the ExpandNet resource for reference).	OR reports; supplemental qualitative data
If there are no elements which will be scaled-up, describe what issues may be blocking uptake of interventions by the MOH	
4. What are stakeholder perspectives on the OR implementation, and how did the OR study affect capacity, practices, and policy?	OR reports, supplemental qualitative data

ANNEX IX. DATA COLLECTION INSTRUMENTS

Program partner interview script

Date of the interview:

Name of interviewer:

Hello, my name is _____. I represent the team conducting an evaluation of the PRISE-C program. We are interested in collecting information from key informants such as yourself about project accomplishments and challenges and the extent to which project results and activities have or could be institutionalized.

This will be a short interview, requiring about 20-30 minutes of your time. Your participation in this study is voluntary and there is no penalty for refusing to take part. The information you provide will be confidential. We will not divulge your name to anyone outside the study, unless you would like to be identified.

You may refuse to answer any question in the interview or stop the interview at any time

There is no financial compensation or other personal benefits from participating in the interview. However, the information learned in this study may help us to improve community-based health services in Benin.

There are no known risks to you resulting from your participation in the study.

Do you agree to participate? Yes ____ No ____

****

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this study have been explained to the volunteer.

_____ _____

Date *Signature of person obtaining consent*

1. Name and position of interviewee (include as much detail as possible, including affiliation with PRISE-C supported site and or geographic coverage area(s) if applicable):
2. Time in that position: _____ years_____months
3. How did you get into this work?
4. What motivates you in your work?
5. In your opinion, what are top three accomplishments of this project?
6. What challenges has the project faced that you know of?
7. Do you have a sense of the extent to which the interventions that the project has undertaken have been institutionalized or integrated into existing local institutions?
8. To your knowledge are there policies or policy changes relevant to or as a result of PRISE-C that could contribute to the institutionalization of activities?
9. If no institutionalization so far, what would it take to institutionalize the services that PRISE-C has focused on?
10. Do you know of any unforeseen results of the project, that is to say, ways in which the health system and/or women and children in the intervention communities benefitted that may not have been explicit project objectives?
11. Is there anything else you would like to add?
12. Would you mind if we attributed what you've said to you in our reports?

THANK YOU!

BENEFICIARY FOCUS GROUP DISCUSSION PARTICIPANT CONSENT FORM

Title of study: *Final Evaluation of the PRISE-C Project in Benin*

Introduction

*Hello, my name is [***say your name***] and I am working with the team evaluating the PRISE-C Project, a project that is strengthening community-based mother and child health services in Benin. We are conducting an evaluation to look at the effectiveness of the project and its sustainability. We would like to participate in a group discussion in which we will ask the group a series of questions and you can answer as you feel comfortable to do so.*

Questions include inquiries into your background and family situation, as well as access to and interactions with community health workers. This information may be more detailed than what you would normally be asked to provide if you did not participate in the evaluation.

Please understand that your participation in this focus group discussion is entirely voluntary. There is no penalty to you if you decide not to participate, and your decision not to take part will not affect any care that you would normally receive. If you do agree to participate, you only need to respond to those questions that you wish to answer during the interviews. You do not need to answer questions that make you feel uncomfortable. You are free to ask questions at any time. You can also tell us you no longer wish to participate in the focus group discussion at any time.

Possible risks and benefits

The risks to you if you agree to participate in the study are minimal and related only to some discomfort you may feel responding to some of the detailed questions during the focus group discussion. Benefits include contributing to learning that will inform programs to help other families access health services.

Confidentiality

If you decide to participate, we will protect information about you to the best of our ability. What is said in the focus group discussion will be held in confidence and you will be identified only by a number in the study records. In addition, your name will not be recorded anywhere in the focus group transcripts or used anywhere in study reports or documents,

Compensation

You will not be paid to participate in the study, but you will be offered a small in kind gesture.

Contact for questions or problems

You will be provided with the contact information for the PRISE-C Project Manager on a separate sheet of paper. You may contact her with any questions at any time. Also, please contact them if you have any problems that you think might be related to taking part in this study.

Volunteer Agreement

Are you interested in participating in this study? If so, you will be asked to sign below.

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this study as described in this document have been read and explained to me.

_____ _____

Signature or thumb print of study participant Date

If the volunteer cannot read the form herself, a witness must sign here:

I was present while the benefits, risk and procedures were read to the volunteer. All questions she had were answered and she has agreed to participate in the study.

_____ _____

Signature of witness Date

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this study have been explained to the above individual and that she has voluntarily agreed to participate.

_____ _____

Signature of person obtaining consent Date

Annex 3

Focus group discussion guide (*MOTHERS OF <5)*

Name(s) of Leader(s):

Number of participants:

Date of the FGD:

Time: from_____to_____

Commune_____Village_____

Distance to nearest :

- health post :
- facility w/ maternity:
- facility w/ surgical capacity:

CHW(s) in the area_____

Frequency of outreach_____

Other sources of health care or health info_____

Say: This is part of a study to document lessons learned during the implementation of the PRISE-C Project, which aimed to improve maternal and child health in _____ (SAY AREA). I want to ask you questions about what people in your community think about the project and the health issues it aimed to address.

Theme	*Qs and Probes*
Perceived need of project	- What are the most important health concerns in this area ? - Has health seeking for these concerns changed since beginning of the project ?
Access	- Who is consulted once the decision to seek care has been made? Others ? - Distance to nearest : o health post : o facility w/ maternity: o facility w/ surgical capacity: - CHW(s) in the area ? - Frequency of outreach ? - What do they do ? - Other sources of health care or health info ?
Home care	- What do you do at home for the health concerns mentioned earlier ? - For childhood fever ? - Diarrhea ?
Decision making about outside care	- Who is involved in the decision to seek care outside the home for these health concerns ? - What health concerns are prioritized in this area if not all can be treated?

	- What different issues do men and women face when seeking health services ?
Quality of care	- What makes you feel satisfied with care you receive ? - If not already mentioned : o Effective ? o Clean ? o Private ? o Price ? o Other ? o Which of these is most important ?
Referral	- Sometimes health workers recommend referral to a higher level facility- did this ever happen ? - What was the reason ? - Did the referring worker help with the referral ? How ? - Did you follow through on the referral ? Why or why not ? - What happened at the referral site ?
A death	- This can be difficult to talk about, but did any children die in your village in the last year ? - Can you describe the circumstances ? - How long was the baby sick ? - When was care for the baby outside the home first sought ? - Did the community decide to do anything differently in the future because of this event ?
PRISE-C	- What did you like about the project ? - What did you like least about the project ?
Scale up	- If the MoH were considering training community health care workers to do health promotion in other areas similar to what has been done here, what advice would you have to give ?

THANK YOU VERY MUCH FOR TAKING THE TIME TO TALK TO ME/US.
Your answers have been very helpful. Maybe you have thought of something that we have left out.
Is there anything else that you'd like to tell me/ us about your experience?

Interviewer Comments:

ANNEX X. SOURCES OF INFORMATION

Name	*Title*	*Permission to use name/consent obtained*
National		
Dr. Olga Agbohoui (by email)	Director, Maternal and Child Health Services, MoH	Y
Karamatou Bangbola	Focal Point, Community Services, MoH	Y
Assomption Hounsa	Division Chief, Community Services, MoH	Y
Peter Thomas	USAID/CDC PMI Resident Advisor	Y
Marie Pascale Agboton	USAID (Former Activity Manager, ~2010)	Y
AZT		
Dr. Puis Gounadon	Administrative Health Department Director, Atlantique et Littoral	Y
Dr. Didier T. Agbosobnigbe	Medecal Coordinator of AZT	Y
Salomon Tonegnikes	Secretary General, Mayoral Office of Allada	Y
Mr. Allozé	Zé CHW Supervisor	Y
Bouraima Djede	Goulo CHW	Y
Group of 16 mothers (including Treasurer of VHC, others involved in ITN distribution campaign)	Goulo	Y
Jocelyne Akrota	Agbanou CHW Supervisor	Y
Paulette Houetchekpo	Tegbo CHW	Y
Group of 9 mothers of <5s	Tegbo	Y
4 members of VHC	Tegbo	Y
SAO		
Dr. Francois Kossouoh	Administrative Health Department Director, Zou et Colliines	Y
Mrs. Hussou	Focal Point, Community Services, Health Department of Zou et Collines	Y
Dr. Affoukou	Medical Coordinator of SAO	Y

Name	*Title*	*Permission to use name/consent obtained*
David Aicheau	Community Approach Focal Point, Adido CHW Supervisor	Y
Nicholas Yoro	Igboyoko CHW	Y
Raoul Kouajon	Igboyoko Village Chief	Y
Adieu Keikoua	Secretary, Igboykok VHC	
Group of 14 mothers of <5s	Igboyoko	Y
DAGLA		
Dr. Hypocrate Fatimbo	Medical Coordinator of DAGLA	Y
Constant Adjoui	Community Approach Focal Point	Y
Paulus Nougbologni	Paouingnan CHW Supervisor	Y
Albain Bigo	Gbedavo CHW	Y
Helene Adonde	Gbedavo CHW	Y
Group of 6 mothers of <5s	Gbedavo	Y
5 members of VHC	Gbedavo	Y
PRISE-C		
Marthe Akogbeto	PRISE-C Director	Y
Dr. Ramzia Akonde	M&E Officer	Y
Julianna Ganmadoualo	Finance Officer	Y
Jean Samson Dovi Akpaka	Administrative Assistant	Y
Calixte Dossou Sognon	Driver	Y
Aimée Agbogbe	Interpreter for FGDs in AZT	Y

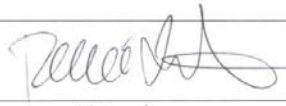
ANNEX XI. DISCLOSURE OF ANY CONFLICTS OF INTEREST

ANNEX XII. DISCLOSURE OF ANY CONFLICTS OF INTEREST

Name	Renée Fiorentino
Title	Final Evaluation Consultant
Organization	Independent
Evaluation Position	Team Leader
Evaluation Award Number *(Contract or other instrument)*	
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Partnership for the Community Management of Child Health/Partenariat pour la prise en charge communautaire de la santé infantile (PRISE-C) Implementer : Center for Human Services Cooperative Agreement Number: AID-OAA-A-10-00047-00
I have real or potential conflicts of interest to disclose.	☑ Yes ☐ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to the following:* 1. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated* 2. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation* 3. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project*	*I have, for approximately 6 of the 10 years, worked for JSI, Inc. and/or JSI Research & Training, Inc. I gave up full time employment with them to go back to school in 2013.*

4. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated* 5. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated* 6. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	8/31/14

ANNEX XII. STATEMENT OF DIFFERENCES

In general the PRISE-C team is in agreement with the statements of the final evaluator included in this final evaluation report. We appreciate her effort to provide insight into the impact of the PRISE-C project on mothers and children in Benin. Despite this, we would like to highlight certain points where we differ with the findings of the report, or feel that the findings were not stated with enough strength.

- We agree with and would like to reinforce the observation that many of the RapidCATCH indicators are not an appropriate measure of the project's activities. Our areas of focus for project activities were identified through close collaboration with the Ministry of Health, and did not necessarily align directly with the RapidCATCH indicators. For many of the RapidCATCH indicators, it is difficult to see change over the limited period of performance of the Child Survival projects.

- We would like to respond to the finding that "PRISE-C's PMP was overly ambitious and ultimately skewed toward outcome measurement instead of process" (pg 27). We felt that it was important for sustainability and to limit the additional data collection work load to align our PMP as much as possible with the existing community health indicators prescribed by the MOH. Taking these indicators and adding the RapidCATCH indicators required by USAID did not leave adequate room to include numerous additional process indicators. Process indicators on Village Health Committee meetings and work plans were included in order to round out the PMP and have some measures on process.

- We feel that the characterization of the "extra" interventions (pg 8) do not appropriately describe the operations research intervention. What is described as the intervention are the innate components of the quality improvement collaborative itself. It would have been more fitting to detail these as the mechanisms of the quality improvement collaborative. In addition, one of these "extra" interventions, "routine supervision from MOH supervisor and PRISE-C staff" was in fact done in both the intervention and control zones.

ANNEX XIII. EVALUATION TEAM MEMBERS, ROLES, AND THEIR TITLES

Renée Fiorentino is a public health evaluation specialist with sixteen years of experience, having worked in more than 20 countries planning, implementing, and coordinating program monitoring and evaluation and applied research. Her technical areas of expertise include maternal, newborn and child health; HIV prevention and mitigation; reproductive and sexual health; adolescent health; integrated primary care; tuberculosis control and community engagement. She served as the evaluation team leader for this evaluation, working closely with the CHS team to develop the evaluation methodology, finalize and translate tools, conduct supplemental qualitative data collection, and compile the draft report.

Aimée Agbogbe interpreted during the focus group discussions in AZT.

Calixte Dossou Sognon facilitated transport and logistics for supplemental qualitative data collection.

Marthe Akogbeto, PRISE-C Director, is a midwife with a bachelor's degree in public health and ten years of experience assuring technical quality of public health interventions, coordinating in-country communication as well as that between the Benin-based team and URC-CHS headquarters in the US. She served as MNCH advisor on PISAF and clinical specialist on QAP/HCI.

Dr. Ramzia Akonde, PRISE-C's Child Health and M&E Advisor, is a medical doctor with a masters in epidemiology. Since November 2013, she has overseen project monitoring and evaluation, in addition to the child health aspects of the project. Her role includes collaborating actively with other members of the project team to assure achievement of project results and maintaining a learning team spirit during report and information project preparation

Sara Riese has served as the technical backstop for the Benin Child Survival Project, implemented by the Center for Human Services (CHS) since 2011, and played a key role in the development of the detailed implementation plan and the operations research component of the project. In addition, she worked closely with the Benin team to create and implement the family planning mhealth pilot, with the support of Dimagi.

ANNEX XIV. FINAL OPERATIONS RESEARCH REPORT

A Community Collaborative Approach to Improving Community Health Worker Performance and Retention in Benin

Sara Riese, Marthe Akogbeto, Ramzia Akonde
Center for Human Services

September 2014

The Partnership for Community Management of Child Health (PRISE-C) in the Sao, Dagla, and AZT Health Zones of Benin is supported by the American people through the United States Agency for International Development (USAID) through its Child Survival and Health Grants Program. PRISE-C is managed by the Center for Human Services under Cooperative Agreement No. AID-OAA-A-10-00047-00.The views expressed in this material do not necessarily reflect the views of USAID or the United States Government.

Table of Contents

Acknowledgements vii

Study Team vii

Introduction 1

Methods 3

Results 6

Discussion 18

References 25

Annexes 27

Final Protocol With Research Instruments and Data 27

QIT members prepare to share their results at a learning session. A.Antayhua

Key Findings:

- **CHWs in the intervention zone have 11.5 times the odds of having a high performance score as compared to the control zone**
- **High retention in both zones resulted in non-significant retention findings.**
- **The incremental cost-effectiveness ratio was 650,000 FCFA per CHW who achieved a high performance score.**

Testing a community-based quality improvement collaborative to improve community health worker performance in Benin

This operations research was funded by the U.S. Agency for International Development through the Child Survival and Health Grants Program from October 2010–September 2014.

December 2014

Background and Setting

Motivating CHWs to high performance and retaining them in their position have been long-standing challenges for ministries of health, and countries have responded with a variety of strategies and approaches. In Benin, CHWs have been in place for over 20 years and are seen as an essential part of the health system. They provide a package of high-impact interventions focused on treatment of priority child illnesses as well as health education and promotion, although there are low rates of care seeking for child illness, with less than 40% of mothers of children under 5 with acute respiratory infection, fever, or diarrhea seeking care with a health care worker.

Within this context, Center for Human Services implemented a USAID Child Survival and Health Grants Program-funded initiative from 2010-2014, working with community health workers and their supervisors in three health zones of Benin. The objectives of the project were to increase community engagement with the community health delivery system, increase demand for community preventive and curative services, and strengthen performance and sustainability of the community health delivery system. These CHWs served a population of over 13,500 children under 5 years of age, and over 18,000 women of reproductive age (15-49).

Problem and Solution

In 2010, Benin implemented a policy to provide a performance-based financial motivation to their community health workers, in an attempt to address evidence of low performance of CHWs in the country. According to previous data, there was a lack of satisfaction of the community with the work of the CHW and insufficient acknowledgement of the work of CHWs by the community. This was reflected in the PRISE-C baseline Knowledge, Practices, and Coverage survey which showed that less than 50% of mothers who knew of the CHW in their village actually participated in any of the CHW's activities.

The quality improvement collaborative is an approach which has been shown to be effective in improving performance at the health facility level, but there was limited data on its application at the community level.

The project sought to test whether the addition of a community level quality improvement collaborative to the performance-based financial motivation would result in higher performance and retention as compared to the financial motivation alone. The project also assessed the incremental cost-effectiveness of implementing the collaborative approach and the financial motivation policy.

Intervention

CHS implemented a community-level quality improvement collaborative intervention in 31 villages in the SAO health zone, using structured mutual learning and sharing of experiences to rapidly improve and scale-up quality health services. The team used formative research was used to identify members of the village-level quality improvement teams (QIT). The QITs would assess village performance on certain health indicators, identify and implement appropriate strategies to improve upon low indicators, then come together at quarterly quality improvement collaborative meetings to chart their performance on key indicators and share lessons learned as well as strategies which had an impact and those which did not with the larger collaborative.

In DAGLA, the control zone, the PRISE-C team convened annual meetings with community leaders and members of the community health and development committee to develop an annual health workplan based on priority areas for intervention.

CHWs from both the intervention and control zones received a refresher training on the package of high-impact community interventions. The performance-based financial motivation was provided quarterly to CHWs in both health zones. In addition, all supervisors received supervision refresher training, and routine supervisions were conducted in both zones.

Methods

The research was conducted in the SAO and DAGLA health zones of Benin from December of 2011 until April of 2014. The study used a quasi-experimental study design, with assignment to intervention (SAO) and control (DAGLA) groups made based on a coin toss.

CHW performance data was collected by CHW supervisors, and was measured by a composite score consisting of 12 performance outcomes. Retention data was also reported by CHW supervisors throughout the study period. Qualitative data were also collected with CHWs, their supervisors, and community members, including CHW beneficiaries. Cost data for both the intervention and control zone were collected by the CHS staff throughout the project period.

Statistical analyses were conducted to determine if there was a statistically different change in performance and retention in the two zones. Incremental cost-effectiveness analysis was conducted to calculate a cost per high-performing CHW, as well as to determine the influence of each of the cost inputs on the cost-effectiveness model.

Findings

Performance

CHWs in the intervention zone had over 11 times the odds of having a high performance score as CHWs in the control zone. The mean CHW performance scores were significantly different over time, with greater differences early in the study, and variable differences later.

Retention

Retention levels in both intervention and control zones were very high, so no statistically significant differences could be identified between them.

Cost-Effectiveness

The incremental cost-effectiveness ratio was 650,000 FCFA per CHW who achieved a high performance score (95% CI 463,000 – 964,000).

Conclusions

The results of this operations research study shed a new light on how to motivate community health workers to remain committed to their work, and to reach and maintain strong performance. This study results demonstrate that in a low-resource setting a community-level quality improvement collaborative combined with financial incentives provided to the health works is a feasible and effective strategy to improve CHW performance as compared to financial incentives alone in a low-resource setting, though further research is needed to ensure that improved performance can be sustained over time.

Recommendations

- Scale up of community-based quality improvement collaboratives could be a key component of future effective community health worker programs.

- Future operations research in this area is recommended to better understand the processes of performance improvement. Including the use of existing community structures as QITs

Use of Evidence

PRISE-C worked closely with the Ministry of Health throughout the operations research, from the development of the concept through the period of implementation. The findings of the OR will be shared with them for consideration, although the national MOH as well as zonal health teams have already shown great interest in replicating the quality improvement collaborative.

The Partnership for Community Management of Child Health (PRISE-C) in the Sao, Dagla, and AZT Health Zones of Benin is supported by the American people through the United States Agency for International Development (USAID) through its Child Survival and Health Grants Program. PRISE-C is managed by the Center for Human Services under Cooperative Agreement No. AID-OAA-A-10-00047-00.The views expressed in this material do not necessarily reflect the views of USAID or the United States Government.

For more information about PRISE-C, visit: www.chs-urc.com

Acknowledgements

This operations research was funded by the U.S Agency for International Development through the Child Survival and Health Grants Program (CSHGP). The research and implementation of CSHGP in Benin was carried out jointly by the grantee, Center for Human Services, and Benin's Ministry of Health (MOH) through its departmental and zonal offices and health centers. We also acknowledge the participation of over 80 community health workers as well as other community members and mothers of children under the age of five in the research areas. The project team extends deep appreciation to Gwyneth Vance and Dr. Edward Broughton who assisted with the data analysis, and Dr Tisna Veldhuijzen van Zanten and Cheryl Combest who provided valuable editorial support.

Study Team

Marthe Akogbeto (CHS Benin Project Director), Sara Riese (CHS technical backstop, Bethesda), Dr. Ramzia Akonde (CHS Benin Child Health Advisor)

Introduction

Motivating Community Health Workers (CHWs) to high performance and retaining them in their position have been long-standing challenges for ministries of health. Countries have responded with a variety of strategies and approaches (Bhattacharyya K et al., 2001). Since CHWs can be formal or informal members of the health system, volunteer or paid, and can provide different packages of services depending on the program, finding a standardized response can be a complicated exercise (George et al., 2012). In addition, motivation and retention are themselves the result of a complex combination of psychological, interpersonal, and contextual factors (Colvin, CJ, 2013). Many of the strategies to improve motivation and retention have focused on providing some kind of incentive to CHWS, either financial or non-financial. Financial incentives have been linked with higher rates of retention, although their link with motivation and performance is not clear (Alam et al., 2012; Gray, DHH and Ciroma J, 19897; Wubneh H, 1999). There are other programmatic challenges that arise when providing financial incentives, such as sustainability of the payments and an expectation of increasing the incentive over time. Non-financial incentives address other factors that have an influence on the performance of the CHW. These strategies may focus on improving supervision structures, providing growth and development opportunities, or strengthening the relationship between the CHW and the community. Non-monetary factors motivating individual CHWs, such as community recognition and respect of CHW work, as well as peer support, have been shown to have a large impact on CHW motivation for performance and retention in countries across the globe (Banek et al., 2014; Kaseje et al., 1987; Ludwick et al., 2014; Walt et al., 1989). Community-level factors, such as a structured approach to community engagement in CHW work, can also play a role in motivating individual CHWs (Greenspan et al., 2013; Olayo et al., 2014). It has been postulated that multiple incentives, potentially combining financial and non-financial approaches, would be required to maximally motivate CHWs, and this hypothesis is supported by the systems approach developed by Bhattacharyya and colleagues (2001).

In Benin, community health workers (or *relais communautaires* in French) have been in place for over 20 years and are seen as an essential part of the health system, providing a link between the formal health sector and their communities. Despite this important role, they are not formal members of the health sector. Benin's 2011 Operational Plan for National Scale-up of High Impact Interventions for the Reduction of Maternal, Neonatal and Child Mortality states that one of the main gaps in the health care system concerns CHWs, whose work is an absolute necessity in the implementation of community family health activities. The 2010 National Directives for Community Based Health Promotion for the first time clearly defines community structures involved in the community health delivery system, roles and responsibilities of a CHW, CHW performance indicators, and a policy on motivation of CHWs. This financial incentive includes both a base incentive of 10,000 FCFA[a] per quarter as well as a performance-based incentive up to a maximum of an additional 5,000 FCFA per quarter. The amount of money received out of this 5,000 FCFA is calculated based on performance as measured by a set of performance outcomes. Each outcome measure is assigned a monetary value, and once the CHW achieves above 50% on any individual outcome, they receive money. The 50% cut-off for incentives is the same across outcome measures, for all CHWs. CHWs collect data on their activities using Ministry of Health registers, but supervisors conduct quarterly

[a] Average exchange rate of 492 FCFA= $ 1. 10,000 FCFA= $20.32.

on-site data collection and verification visits for quality control and to ensure that reports are accurate. These financial incentives were operationalized in project zones for the first time through the PRISE-C project.

This incentive policy was an attempt to implement a successful motivation strategy for CHWs, in response to data reflecting low performance of CHWs in the country. According to an assessment done by PISAF, a USAID-funded project implemented by URC-CHS in Benin from 2006-2012, there was a lack of satisfaction of the community with the work of the CHW and insufficient acknowledgement of the work of CHWs by the community (PISAF, 2011). This was reflected in the PRISE-C baseline Knowledge, Practices, and Coverage survey which showed that less than 50% of mothers who knew of the CHW in their village actually participated in any of the CHW's activities.

Financial incentives alone are unlikely to sustain high levels of CHW performance and retention without other non-financial complementary approaches. The quality improvement collaborative approach to quality improvement has been successfully applied at the health center level in Benin under numerous previous projects, and has been demonstrated as an effective means for creating an environment where sustained behavior change can be achieved, specifically with malaria prevention (Catsambas T et al., 2008; Lynn Miller-Franco and Lani Marquez, 2011; Mamadou A and Anato M, 2009; University Research Co., LLC, 2012). We will examine the application of the quality improvement collaborative approach at the community level, in combination with the financial incentives, to motivate CHWs for improved performance and retention. Results will be analyzed in comparison to CHWs performance and retention with financial incentives alone.

The objectives of this research are:

Objective 1: To determine if the addition of a community-level quality improvement collaborative to the Ministry of Health's financial incentive policy results in higher performance than the financial incentives alone.

Objective 2: To determine if the addition of a community-level quality improvement collaborative to the Ministry of Health's financial incentive policy results in better retention of CHWs than the financial incentives alone.

Objective 3: To determine the incremental cost-effectiveness of implementing the collaborative and the Ministry of Health's financial incentive policy.

What is an improvement collaborative?

In a collaborative, multiple quality improvement teams work independently to test changes in how services can be delivered, implementing best practices and accepted standards for the collaborative's topic area. Teams use a common set of indicators to measure the quality of the care processes in which the collaborative is trying to improve and, where possible, the desired health outcomes. The collaborative organizes regular sharing of results among teams through learning sessions in which teams learn from each other about which changes have been successful and which were not. This results in a dynamic improvement strategy in which many teams working on related problem areas can learn from each other in a way that facilitates rapid dissemination of successful practices.

Methods

Setting

The research was conducted in the SAO and DAGLA health zones of Benin, with SAO receiving the intervention and DAGLA serving as the control. Assignment to the intervention group or the control group was made based on a coin toss at the beginning of the project. The two zones are both principally rural, with similar ethnic and religious population breakdown as well as similar languages. SAO has a total of 14 health centers with 14,832 inhabitants per health center , and DAGLA has 18 health centers with 16,797 inhabitants per health center (2013 Population Estimates, Ministere de la Sante, Benin).

Study Design and Methods

The study used a quasi-experimental study design, with an intervention and a control group.

Eighty-seven (87) trained community health workers were recruited to participate in the study; 48 in DAGLA, and 39 in SAO. This accounts for approximately one-third of all CHWs in the zones. CHWs were chosen based on prior training. In both zones, CHWs previously trained as comprehensive CHWs through the prior PISAF project or as malaria CHWs through Africare's malaria program were selected. All CHWs consented to participate at the initiation of the study or when they were recruited as a CHW during the study period. Additional respondents who participated in qualitative data collection also completed informed consent forms. Approval was obtained from University Research Company IRB and from the Comité d'Ethique at the Benin Ministry of Health.

The study took place over 28 months, from December of 2011 until April of 2014.

Intervention

This operations research was embedded within overall project activities in two of the three project intervention zones. The quality improvement collaborative intervention uses structured mutual learning and sharing of experiences to rapidly improve and scale-up quality health services. Formative research was used to identify appropriate members of the communities' quality improvement teams (QIT). Each village had an 8-10 member QIT. These QITs received a 5-day training on quality improvement methodology from the PRISE-C staff. Teams were to conduct team meetings at a minimum once a month to review indicators and identify strategies to improve upon low indicators. The team would then implement these strategies in their community. At 1-2 day quarterly quality improvement collaborative meetings, the different quality improvement teams would come together and review the data from the past 3 months. Teams would chart their performance on key indicators and share lessons learned with the larger collaborative, strategies which had an impact and those which did not. Graphs of the team's performance would be posted at the health center to encourage transparency and accountability to the community. Two members of the QIT and the CHW attended these meetings, and they received a per diem. Quarterly coaching visits were conducted with CHWs and QITs by certain supervisors and CHWs who were chosen based on their good results and ability to mentor others. These coaching visits were stopped for financial reasons after March of 2013.

In the control zone, the PRISE-C team convened annual meetings with community leaders and members of the community health and development committee to develop an annual health workplan based on priority areas for intervention.

Both the intervention and control zones received support from the project to provide a 5 day refresher training on the package of high-impact community interventions, as well as to provide routine supervision to CHWs. CHW supervisors, typically a MOH nurse or health staff from the nearest health center, received a 3 day supervision refresher training at the project outset. Routine supervisions were conducted in both zones. This consisted of monthly grouped supervisions[b] and quarterly on-site supervisions. The monthly grouped supervisions were stopped for financial reasons after March of 2013, while the quarterly on-site supervisions continued through the life of the study. The team also developed guidelines for implementation of the performance-based financial incentives, which were implemented in both zones starting in 2011 and managed by the mayor's offices. Table 1 lists the program inputs by intervention and control zones.

Table 1: Differences between intervention and control zones

Program Inputs	Intervention	Control
- Training on IMCI-C	Yes	Yes
- Supervision refresher for head of health center team	Yes	Yes
- Supervision refresher for head of commune focal person	Yes	Yes
- Monthly supervision meetings at health facilities[c]	Yes	Yes
- Quarterly on-site supervisions	Yes	Yes
- PRISE-C zonal staff member providing support	Yes	Yes
- Performance-based incentives	Yes	Yes
- Annual meetings to develop community health action plan	No	Yes
- Community level collaborative	Yes	No
- Monthly QIT meetings	Yes	No
- QI methodology training	Yes	No
- Coaching Visits[d]	Yes	No
- Learning Sessions[e]	Yes	No

PRISE-C staff participated in monitoring the intervention and reported on the implementation and outcome of all activities through the project period.

Data on CHWs' performance were collected, monitored, and validated during routine on-site supervisory visits by CHW supervisors. During these on-site supervisions, there were four data validation activities:

1. Supervisor would directly observe the CHW with a case
2. Supervisor would review all data collection forms and inquire about any suspicious entries
3. Supervisor would validate a recent case with a visit to the home of the sick child and interview with the child's mother
4. Supervisor would validate one of the home visits with a visit to the home

[b] Grouped supervisions were meetings of all the CHWs who reported to one supervisor. The CHWs would meet at the supervisor's health center, where the supervisor would review the registers of each CHW and address any common issues they were having.

[c] Stopped after March 2013 due to financial reasons

[d] Stopped after March 2013 due to financial reasons

[e] Quarterly learning sessions conducted until December 2012, then activities were integrated into zonal indicator review sessions

These measures allowed the supervisor to ensure that the data collected were valid and to limit fraud and inflation of indicators.

Outcome Variables

Table 2: CHW performance outcomes

Outcome
1. % of mothers of children 0-23 months in the catchment area can name two danger signs
2. % of children estimated to have malnutrition monitored for acute malnutrition
3. % of children from 0-59 months who live in a household with a handwashing station at/near the latrine
4. % of children ages 0-59 months who live in a household who drink water from a pump or who treat their drinking water with Aquatabs
5. % of children ages 0-59 months in the catchment area who sleep under LLIN
6. % of infants less than 1 year old who were vaccinated during outreach activities
7. % of health education talks held
8. % of children under 5 who had a home visit from a CHW in the quarter
9. % of children 6-59 months correctly treated for malaria
10. % of children 2-59 months correctly treated for diarrhea
11. % of children 2-59 months correctly treated for ARI
12. % of referrals for malaria, diarrhea, ARI, and malnutrition in children 2-59 months which were justified

The dependent variables were:

- **CHW performance**, as measured by a composite score consisting of 12 performance outcomes related to CHW health promotion and case management activities. The 12 performance outcomes, taken directly from the 2010 National Directives for Community Based Health Promotion, are the outcomes upon which the CHW is assessed in order to determine his/her performance-based financial incentive. The CHW performance score was calculated by first assessing whether or not CHWs had achieved the target for the specific performance outcome in that quarter. Targets for each performance outcome were set at the beginning of the project based on baseline levels and planned project effort in each area. These targets were the same for all CHWs and were not modified throughout the project period. CHW performance on each indicator was coded "1" if the target was achieved in the quarter, and "0" if the target was not achieved. The composite performance ratio scale was then created by allocating weight to each of the 12 performance outcomes as were assigned to calculate the value of the performance-based incentive. The home visit, vaccination, referral, potable water, and home visit outcomes were weighted heaviest, with the other outcomes having weights of less than half of those. (See Table 2 for complete list of the 12 performance outcomes)

- **Number of CHW who permanently left their post during the study period**. This drop-out was reported by CHW supervisors throughout the study period and was defined as "CHWs who declare or who are confirmed to no longer be working".

Quantitative and qualitative methods were used to assess the effectiveness of the community-level collaborative on CHW performance and retention. Quantitative data were collected through the routine quarterly collection of the CHW performance outcomes mandated by the MOH. Community Health Workers routinely entered data into 6 different Ministry of Health data collection forms (Child Case Management, Home Visits, Pregnant Women, Recently delivered women, Newborns, and Medicine Stock) based on the kind of activity they performed. Each quarter, the CHW supervisor would collect the data from these forms and send this report to the PRISE-C team for data entry and analysis. The health zone would then review the data received from PRISE-C. For performance outcomes which have a population

level denominator (eg, number of children from 0-59 months), the zonal statisticians provided an appropriate denominator on an annual basis.

Qualitative data were collected through four rounds (July 2012, March 2013, Jan 2014, and July 2014), of focus groups and in-depth interviews with CHWs, their supervisors, and community members, including CHW beneficiaries. For each round of data collection, villages were classed as high, medium, or low performing according to a MOH recognized "tracer" indicator: the "percentage of children ages 0-59 months in the catchment area who sleep under LLIN." Within each classification a random sample of 3 villages was selected. In each village, in-depth interviews were conducted with the CHW and his/her supervisor as well as 2 members of the quality improvement team (in the intervention zone) and 2 members of the village health and development committee (in the control zone). In each village, a focus group was also held with 4 mothers of children under the age of 5.

Data were also collected on the costs of implementing the intervention, the community collaborative in addition to the financial incentive program, as well as the costs of implementing the financial incentive program alone in the control group, in order to calculate the cost-effectiveness of the improvement intervention when used in combination with the performance-based incentive program for CHWs compared to using only the performance-based incentive without additional intervention (Figure 1). Costs and effects were considered from the point of view of the program funder; therefore, the effects on the patients and others in the health care system and society in general were not included in the calculations.

The program outcome used was the difference in the proportion of CHWs achieving a high performance score (defined as above 50% of the performance score) at end line compared to the proportion achieving a high score at baseline. We used statistical analysis to estimate the effect of higher performance scores attributable to the intervention. Cost data were collected from the project's accounting records and divided by the number of CHWs involved in the incentive program alone or the incentive program with the improvement intervention. We used sensitivity analysis to determine how much influence each of the cost inputs had on the cost-effectiveness model.

Results

Intervention Monitoring

In order to develop the intervention, formative research was conducted in the research area to determine the demographic characteristics of both the CHWs and the beneficiary populations in the intervention and control zones. Key community stakeholders were interviewed to develop quality improvement teams whose composition was contextually appropriate.

In December 2011, the 31 villages in the intervention zone were divided into 4 collaboratives, and each collaborative received a training in quality improvement. Thirty-four (34) of the 40 CHWs in the intervention zone received the quality improvement training, along with approximately 2 community representatives from each village. In January 2012, the project team traveled to each village to establish the village Quality Improvement Teams, which would participate in the collaborative. One village had 2 QITS. Each QIT was composed of:

- Community Health Worker
- Village Chief
- Secretary and Treasurer of the Village Health Committee
- Representative of the women
- Representative of the youth
- Representative from each village hamlet
- Representative from each ethnic group
- Representative from each religious group

PRISE-C monitored QITs from January 2012 until April 2014. Over the period, 75% of QITs held monthly meetings with the CHW to review community health data, prioritize community health issues, and identify strategies to address them.

Supervisors in the intervention zone received a 2 day coaching training in July of 2012, and worked with the QIT at least once a month to present the performance outcome data back to the QIT.

Baseline

At baseline, there were no significant differences in number of trainings received, number of children covered by each CHW, or number of households covered by each CHW between the two zones (Table 3). Age was found to be significantly different, with the control zone having a slightly higher mean age than the intervention zone (44 vs 37, $p<.05$).

Table 3: CHW background information

	DAGLA		SAO		
	Total N=48		Total N=39		
	N	Mean	N	Mean	p
Age	44	37	37	33	***0.0283***
Number of trainings received	44	3	37	3	*0.1321*
Number of children covered by each CHW	44	111	31	100	*0.5489*
Number of households covered by each CHW	44	74	31	83	*0.5771*

Gender, occupation, and years of service as a CHW were all additionally found to be statistically different at baseline. The control zone had more male CHWs and more farmer CHWs than the intervention zone. The CHWs in the control zone also had been serving as CHWs for a longer period of time (Table 4).

Table 4: CHW socio-demographic information

	DAGLA (Control)			SAO (Intervention)				
	Total N	N	%	Total N	N	%	x2	p
Gender	48			39			7.8219	***0.005***
Male		34	70.83%		16	41.03%		
Female		14	29.17%		23	58.97%		
Occupation	48			38			10.5959	***0.014***
Farmer		34	70.83%		18	47.37%		
Health Aide		1	2.08%		0	0%		
Small Business		5	10.42%		15	39.47%		
Housewife		8	16.67%		5	13.16%		
Education Level	47			38			1.5221	*0.467*
Literate		2	4.26%		1	2.63%		
No schooling		4	8.51%		1	2.63%		
Attended School		41	87.23%		36	94.74%		
Marital Status	47			37			3.6614	*0.16*
Single		3	6.40%		0			
Divorced		0			1	2.70%		
Married		44	93.60%		36	97.30%		
Income Level	44			37			0.6602	*0.883*
<10,000 cfa		9	20.45%		7	18.92%		
10,000-29,000 cfa		13	29.55%		14	37.84%		
30,000-50,000 cfa		17	38.64%		12	32.43%		
>50,000 cfa		5	11.36%		4	10.81%		
Years as a CHW	43			37			8.5586	***0.014***
< 1 year		8	18.60%		16	43.24%		
1-3 years		20	46.51%		7	62.16%		
>3 years		15	34.88%		14	37.84%		

Performance

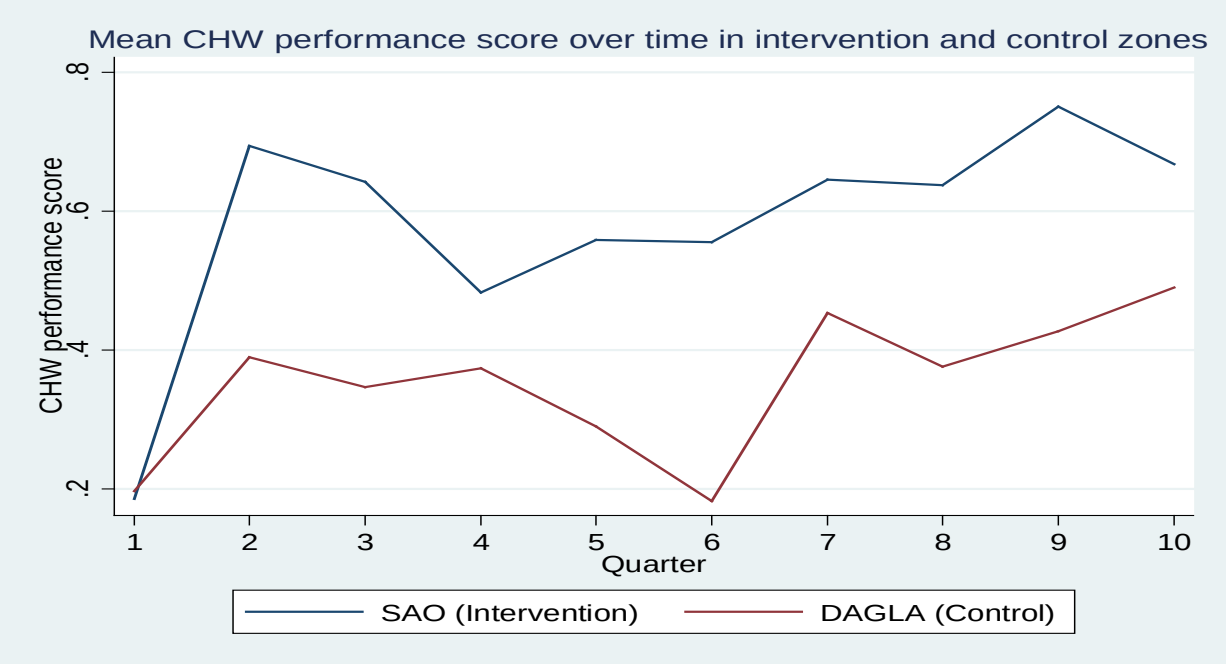
The mean CHW performance scores in the 2 zones were compared using a t-test, and no statistical difference was found at baseline (*p=0.7723*). Mean CHW performance scores were statistically different at endline (*p=0.0003*) (Table 5). Trends over time in mean CHW performance score are shown in Figure 1.

Table 5: Mean CHW Performance Score

	Baseline		**Endline**	
	Mean CHW performance score	Range	Mean CHW performance score	Range
Dagla (Control)	n=48		n=42	
	0.197	.0014-.8874	0.490	.1094-.8874
Sao (Intervention)	n=39		n=39	
	0.186	.0014-.5734	0.668	.1634-.9634

Since we were looking to see if there was a difference in the mean CHW performance over time between the two groups, a repeated-measures analysis of variance (ANOVA) was used to examine the effects of the intervention, time, and the interaction between them. Results showed a significant effect of the interaction between the intervention and time on CHW performance score ($F_{9, 86}=8.23$, $p < .01$). There was also a significant effect of time ($F_{9, 86}=34.59$, $p < .01$), but the effect of the intervention alone, not taking time into account, was not significant ($F_{1, 86}=0.39$, $p = 0.535$).

Figure 1: Mean CHW performance score over time



Based on the results showing a significant effect of the interaction of time and the intervention, we conducted post-hoc logistic regression to further explore the data (Table 6). We converted the CHW performance score data to a dichotomous "high score/low score" based on a cut-off of 50%. Fifty percent (50%) is the threshold at which the Ministry of Health has directed that CHWs begin receiving a financial incentive for any individual performance outcome, and therefore we applied this same threshold here to be able to have a dichotomous outcome "high score/low score". The number of high performing CHWs in each quarter is presented in Table 6. In order to assess the relationship between this outcome variable and a number of independent variables, we used one multivariable logistic regression model to estimate odds ratios and 95% confidence intervals. This generalized estimating equations (GEE) model is preferable for this type of data as it accounts for correlations between the CHWs in each zone. The model treated baseline performance level as well as time post-baseline as covariates. A variable for intervention zone was included in the model.

Since CHWs were not randomized to the intervention zone, it was important to account for potential confounders in the model. Data were collected on a number of other aspects that might confound the outcome if the two groups varied on these aspects by zone. These included age, sex, marital status, education, number of trainings attended (training related to CHW position), number of other CHWs in a catchment area, number of children under the age of 5 in a catchment area, number of households in a catchment area, occupation, salary level, duration of service, or CHW supported by other projects. Chi square and t-tests were used to determine if statistical differences existed on these variables between the two zones at baseline. Statistically significant variables included: age, sex, number of households in a CHWs catchment area, duration of service, and occupation. These were then included in the model. Additional variables considered by the project team to strongly affect performance were also included in the model. These variables were number of trainings attended, education, and the existence of other CHWs in a CHW's catchment area.

Table 6: Number of high performing CHWs

Number of high performing CHWs				
Quarter	***SAO***	*N*	***DAGLA***	*N*
1	2	39	4	48
2	33	39	18	48
3	30	38	11	44
4	22	39	15	48
5	25	39	4	48
6	21	37	2	38
7	30	39	21	48
8	28	39	14	48
9	35	39	23	48
10	31	39	22	42

Table 7 : The adjusted effect of intervention/control group and baseline CHW performance on endline CHW performance

Variable	Adjusted Odds Ratio	95% CI	p-value
Intervention zone REF: DAGLA (Control Zone)	11.56	6.21-21.52	**0.00**
Baseline high performance score (Yes/No) REF: No high score at baseline	6.33	2.41-16.62	**0.00**
Time (Quarter)	1.09	1.02-1.17	**0.01**
Age[f]	1.05	1.01-1.10	**0.007**
Number of trainings received[g]	0.92	0.78-1.10	0.364
Number of other CHWs in the village	1.19	0.79-1.77	0.405
Education level[h] REF: No schooling	3.35	0.75-14.96	0.113
Sex REF: Female	1.04	0.46-2.35	0.918
Number of households in the catchment area	1.00	.99-1.00	0.535
Years of service as a CHW	1.22	0.87-1.71	0.247
Occupation[i] REF: Farmer	1.17	0.83-1.64	0.369

We also conducted analyses for each of the performance outcomes in the overall performance indicator. We used t-test analysis to determine if there was a statistically significant difference between the means of each indicator at baseline (quarter 1) and endline (Quarter 10) (Table 8). Statistically significant differences in the means at each quarter are bold.

[f] Age in years at initiation of study

[g] Number of trainings related to the CHW's work that he/she ever has participated in

[h] No schooling(REF)/Literate/Attended school

[i] Farmer/Health Aide/Small Business Person/Housewife

Table 8: Mean Performance Outcomes at Quarter 1 and 10

Performance Outcome	Zone	Mean at Quarter 1	Mean at Quarter 10
% of mothers of children 0-23 months in the catchment area can name two danger signs	SAO	63%	97%
	DAGLA	62%	93%
% of children estimated to have malnutrition monitored for acute malnutrition	SAO	0%	5%
	DAGLA	0%	0%
% of children from 0-59 months who live in a household with a handwashing station at/near the latrine	SAO	0%	3%
	DAGLA	.3%	3%
% of children ages 0-59 months who live in a household who drink water from a pump or who treat their drinking water with Aquatabs	SAO	27%	**55%**
	DAGLA	20%	**18%**
% of children ages 0-59 months in the catchment area who sleep under LLIN	SAO	31%	**56%**
	DAGLA	22%	**26%**
% of infants less than 1 year old who were vaccinated during outreach activities	SAO	34%	**92%**
	DAGLA	41%	**26%**
% of health education talks held	SAO	**41%**	**87%**
	DAGLA	**63%**	**46%**
% of children under 5 who had a home visit from a CHW in the quarter	SAO	19%	**55%**
	DAGLA	21%	**22%**
% of children 6-59 months correctly treated for malaria	SAO	75%	**98%**
	DAGLA	70%	**83%**
% of children 2-59 months correctly treated for diarrhea	SAO	31%	69%
	DAGLA	19%	52%
% of children 2-59 months correctly treated for ARI	SAO	30%	**68%**
	DAGLA	31%	**39%**
% of referrals for malaria, diarrhea, ARI, and malnutrition in children 2-59 months which were justified	SAO	15%	**34%**
	DAGLA	8%	**3%**

We also looked at the effect of the intervention on the performance outcomes over time by using a repeated measures ANOVA (Table 9).

Table 9: Repeated Measures ANOVA for the performance outcomes

Performance Outcome	Variables	F-statistic	p-value
% of mothers of children 0-23 months in the catchment area can name two danger signs	Intervention	$F_{(1, 86)}=0.57$	0.45
	Time	$F_{(9, 86)}=13.35$	**0.00**
	Time*Intervention	$F_{(9, 86)}=3.10$	**0.00**
	Intervention	$F_{(1, 86)}=0.00$	1.00

% of children estimated to have malnutrition monitored for acute malnutrition	Time	$F_{(9, 86)}$=6.26	**0.00**
	Time*Intervention	$F_{(9, 86)}$=7.16	**0.00**
% of children from 0-59 months who live in a household with a handwashing station at/near the latrine	Intervention	$F_{(1, 86)}$=0.00	1.00
	Time	$F_{(9, 86)}$=7.01	**0.00**
	Time*Intervention	$F_{(9, 86)}$=7.00	**0.00**
% of children ages 0-59 months who live in a household who drink water from a pump or who treat their drinking water with Aquatabs	Intervention	$F_{(1, 86)}$=0.51	0.48
	Time	$F_{(9, 86)}$=12.25	**0.00**
	Time*Intervention	$F_{(9, 86)}$=2.59	**0.01**
% of children ages 0-59 months in the catchment area who sleep under LLIN	Intervention	$F_{(1, 86)}$=0.42	0.52
	Time	$F_{(9, 86)}$=13.43	0.00
	Time*Intervention	$F_{(9, 86)}$=1.42	0.18
% of infants less than 1 year old who were vaccinated during outreach activities	Intervention	$F_{(1, 86)}$=0.91	0.34
	Time	$F_{(9, 86)}$=4.58	**0.00**
	Time*Intervention	$F_{(9, 86)}$=4.77	**0.00**
% of health education talks held	Intervention	$F_{(1, 86)}$=3.50	0.06
	Time	$F_{(9, 86)}$=6.51	**0.00**
	Time*Intervention	$F_{(9, 86)}$=9.46	**0.00**
% of children under 5 who had a home visit from a CHW in the quarter	Intervention	$F_{(1, 86)}$=0.26	0.61
	Time	$F_{(9, 86)}$=29.25	**0.00**
	Time*Intervention	$F_{(9, 86)}$=4.56	**0.00**
% of children 6-59 months correctly treated for malaria	Intervention	$F_{(1, 86)}$=3.47	0.07
	Time	$F_{(9, 86)}$=7.13	**0.00**
	Time*Intervention	$F_{(9, 86)}$=2.95	**0.00**
% of children 2-59 months correctly treated for diarrhea	Intervention	$F_{(1, 86)}$=0.02	0.88
	Time	$F_{(9, 86)}$=12.20	0.00
	Time*Intervention	$F_{(9, 86)}$=1.22	0.28
% of children 2-59 months correctly treated for ARI	Intervention	$F_{(1, 86)}$=0.09	0.76
	Time	$F_{(9, 86)}$=16.38	**0.00**
	Time*Intervention	$F_{(9, 86)}$=2.72	**0.00**
% of referrals for malaria, diarrhea, ARI, and malnutrition in children 2-59 months which were justified	Intervention	$F_{(1, 86)}$=0.00	1.00
	Time	$F_{(9, 86)}$=7.49	**0.00**
	Time*Intervention	$F_{(9, 86)}$=4.35	**0.00**

The qualitative data reveal how the CHWs, supervisors, and beneficiaries feel about the different approaches to CHW motivation; the different ways that the approaches served to engage the community with the CHW; and how the approaches impacted the performance of the CHWs.

One CHW in a high performing village in SAO (intervention zone) said:

> *"In the process of our work, we conduct evaluations (learning sessions). During the first evaluation (learning session), I was ranked x[j] out of 9 CHWs. I wasn't ready for that. Because of this, I reapplied myself to my work to be able to be first or to keep my place in the rankings."*

A CHW from a high performing village in SAO (intervention zone) said:

> *"After each training, I come back and brief the QIT, and they help me to spread the message among the population as well as do the work. The QIT members help a lot so that during the next learning sessions we can remain on top. We can't allow our activities to slip; we have to continue to do better."*

Two beneficiaries, mothers of children under the age of 5, in a focus group in a high performing village in SAO said:

> *"The members of the QIT also play their role…They come with me to conduct health education sessions. If there are certain members of the community who don't want to adopt healthy behaviors, they lead the way to help convince them."*

And:

> *"When it was only her telling us, we ignored her; sometimes we would send her away. But now that she works with the community members, we understand that [what she is telling us] is for our own good."*

A CHW from a high performing village in DAGLA (control zone) said:

> *"(What motivates me?)…The first thing is training; the second is the financial incentives; and the third is the support of the CVS (Village Health Committee), which manages everything."*

A supervisor from DAGLA (Control zone) observed:

> *"There is a change in the CHWs, which has to do with the incentives they now receive. In addition, there is supervision during which we tell them that we're assessing the best performers and that their incentive will be increased [if they perform]. Then they do their work better."*

A CHW from a low performing village in DAGLA (control zone) said:

> *"The fact that I am referred to as a health worker even though I am not, I am honored. When they bring me a sick or malnourished child, I can care for them; that makes me happy, I have never been so honored."*

Qualitative data on performance were also collected at regular intervals throughout the study period. Table 9 presents the themes that emerged in interviews on determinants of CHW performance, as cited by the CHWs over the period of the research.

[j] Rank not indicated to anonymize the data.

Table 10: Determinants of CHW performance (Key themes)

	DAGLA (Control Zone)		SAO (Intervention Zone)	
	Early in project	Late in the project	Early in the project	Late in the project
High Performing CHWs	• Financial motivation • Community support • Self-respect	• Supervision • Support of the village health committee • Financial motivation • Improved health of the community	• Recognition by the community • Sense of competition between CHWs • Financial motivation* • Training/Learning sessions • Community support	• Supervision • Community engagement • Improved health of the community • Increased competency (of CHW)
Low Performing CHWs	• Lack of community support • Problems with transport for the CHW	• Medicine stock-outs • Low financial motivation • Lack of community support • CHW motivation	• Lack of community support • Difficult accessibility of populations	• Medicine stock-outs • Difficult accessibility of populations • Sense of defeatism from QITs

*Financial motivation was mentioned by supervisors as a determinant of CHW performance in SAO early in the project but not by CHWs themselves.

Retention

During the study period, 5 of the 87 CHWs left their post (Table 11), with no statistically significant difference between the zones (*p=0.3741*).

Table 11: CHW attrition

	DAGLA (Control Zone)	SAO (Intervention Zone)
CHWs leaving their post	4	1
CHWs retained	44	38

The qualitative data revealed that the majority (4/5) of CHWs left their post because they no longer lived in the village of service. This was due to marriage, starting a job in another city, and other unspecified reasons. The remaining CHW left his post because of a health problem with his eyes, which left him unable to read and complete the registers. Four CHWs were able to be located to be asked further follow-up questions about their decision to leave. All responded that the financial incentives were not bad but were insufficient. Two out of the four (1/2) stated that their community encouraged them while they were in their role as CHW, while the other two (1/2) stated that their community did not encourage them.

Cost-Effectiveness

The baseline proportion of CHWs who had a high performance score was 0.069. The increase in the proportion attributable to the improvement intervention when combined with the incentive program was 0.92 compared to the effect of incentives alone. The cost of training and providing performance-based incentives to the 48 CHWs in the control group was 5.3 million FCFA or 110,000 FCFA per CHW. The

cost of the training, performance-based incentive package, and improvement intervention combined was 13 million FCFA for the 39 CHWs or 340,000 FCFA per CHW participant (Table 12). Incremental cost-effectiveness analysis allows us to determine the marginal or incremental cost for an additional unit of health benefit when looking at two different interventions. The incremental cost-effectiveness ratio (ICER) in this case tells us the cost per CHW achieving a high performance score. The ICER result was 650,000 FCFA per CHW who achieved a high performance score (95% CI 463,000 – 964,000).

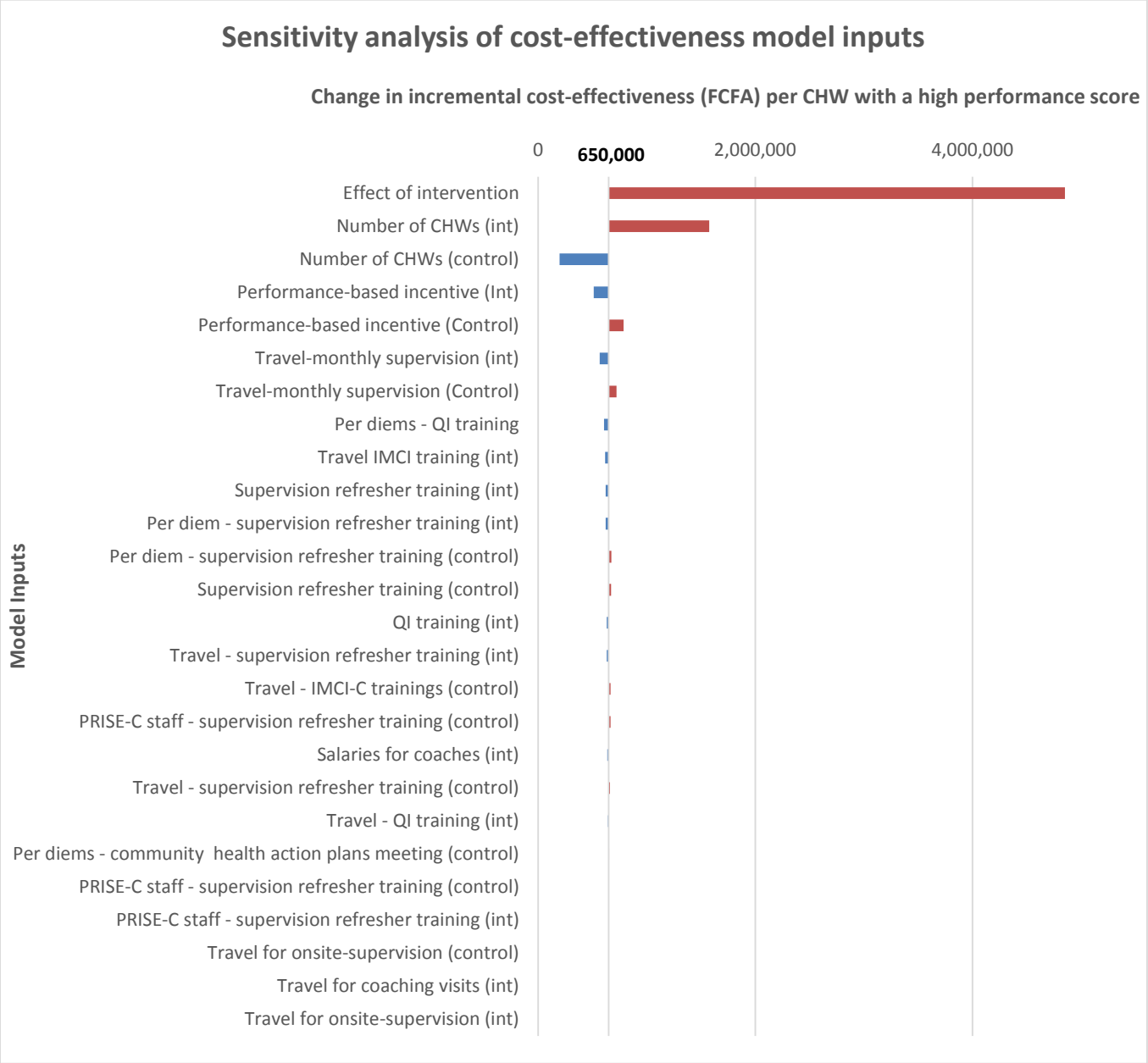
Table 12: Observed costs in the intervention and control regions

	Cost Item	Costs (X 1,000 FCFA)	Costs (USD)
DAGLA (Dassa-Glazoue) **Control Zone**	Travel - community health action plan meeting	84	$ 178
	Per diems - community health action plan meeting	242	$ 512
	Travel - IMCI-C trainings	288	$ 609
	Travel & material - supervision refresher training	168	$ 355
	Per diem - supervision refresher training	408	$ 863
	Meals etc - supervision refresher training	349	$ 738
	PRISE-C staff - supervision refresher training	264	$ 558
	Travel / per diem - monthly supervision meetings	1176	$ 2,487
	Travel - onsite-supervision	18	$ 38
	PRISE-C staff providing support	32	$ 68
	Performance-based incentives	2240	$ 4,737
Total Costs DAGLA		5269	$ 11,142
SAO (Save-Ouesse) **Intervention Zone**	Travel - IMCI-C trainings	432	$ 914
	Per diem - supervision refresher training	384	$ 812
	Travel & material - supervision refresher training	239	$ 505
	Meals etc - supervision refresher training	392	$ 829
	PRISE-C staff - supervision refresher training	264	$ 558
	Travel / per diem - monthly supervision meetings	1103	$ 2,332
	Travel - onsite-supervision	25	$ 53
	PRISE-C staff providing support to on-site supervisions	32	$ 68
	Performance-based incentives	1822	$ 3,853
	Travel for QI training	114	$ 241
	Per diems for QI training	591	$ 1,250
	Meals and other costs for the QI training	260	$ 550
	Travel for coaching visits	34	$ 72
	Salaries for coaches	178	$ 376
	PRISE-C staff providing support to on-site coaching visits	63	$ 133
	Travel for learning sessions	1121	$ 2,370

	Per diems for learning sessions	2607	$	5,513
	Meals and other costs for learning sessions	2126	$	4,496
	PRISE-C staff providing support to learning sessions	1468	$	3,104
	Communication costs for learning sessions	20	$	42
Total Costs SAO		13273	$	28,067

The tornado diagram in Figure 2 shows the relative effect of each variable on the incremental cost-effectiveness ratio as the specified input decreases from the value in the model down to 0. The variable with the greatest influence on cost-effectiveness is the effect of the intervention: as the effect of the intervention diminishes to 0, the incremental cost-effectiveness ratio increases significantly from the baseline of 650,000 FCFA per CHW who achieved a high performance score to nearly 5,000,000 FCFA per CHW who achieved a high performance score, holding all other variables constant. The number of CHWs trained in both the intervention and control groups has the next most significant effect on the overall result. All of the cost variables considered individually have a relatively insignificant effect on the overall result, with performance-based incentives cost being the most influential.

Figure 2: Sensitivity analysis of cost-effectiveness model inputs



Discussion

Performance

The study demonstrates that it is possible to improve CHW performance through application of a community-level quality improvement collaborative approach. The data demonstrate that the mean CHW performance score differed significantly over time between the intervention and control group, and that this

pattern held for 10 of the 12[k] performance outcomes included in the overall performance score. Based on observing the trend lines for mean CHW performance over time in the two zones (Figure 1) we can see a large difference initially which then varies over time, diminishing in certain quarters. This variability in the difference between performance in the two zones is likely the reason behind the significance of the intervention over time, but the lack of significance of the intervention alone in the Repeated Measures ANOVA analysis.

CHWs who received the community-level quality improvement collaborative intervention have over 11 times the odds of achieving a performance score above 50% as compared to CHWs who received financial incentives alone. These results are likely due to certain activities of the intervention that drove an appropriation of the indicators and by extension, the work of the CHWs, by the community itself. The creation of the quality improvement team created a new kind of engagement for community. As opposed to simply discussing community health activities once a year as a part of the annual work planning, as is generally the case with the Village Health Committees (CVSs), the QIT is engaged in monthly meetings with the CHW to analyze their indicators with the CHW and together make decisions on how to improve on those indicators. In addition, QIT members expressed a feeling of responsibility for the health status of the community, and provided instrumental support to the CHW to do his or her work. This instrumental support was guided by discussions during coaching visits by supervisors, which allowed for facilitated identification of problems and development of improvements which the QIT and CHW could undertake. The quarterly learning sessions were a venue for CHWs and QITs to share experiences, and accelerated up-take of improvements which worked. The learning sessions also created a sense of healthy competition between the communities towards improvement on the indicators.

The two performance outcomes which did not show significant differences at endline were for proportion of children under 5 sleeping under a long-lasting insecticide treated bednets and proportion of children correctly treated for diarrhea. During data collection in both zones, it was observed that many mosquito nets being used were damaged, which excluded them from being counted in the numerator. Unfortunately, there was no distribution campaigns for nets after the initiation of the research, and health centers did not have any in stock. The low performance on correct treatment for diarrhea may also be attributed to challenges in the stock of ORS across the zones. These issues would have limited the number of CHWs in either zone who could achieve a "high score" in each outcome.

Plateaus or drops in performance were observed over certain time periods, as mentioned above, typically in both SAO and DAGLA. In quarters 2 through 4 of the study period, there were challenges in facilitating the payments for some of the CHWs which caused delays in their payments and may have demotivated them. Additionally this period coincides with critical harvest and planting seasons for staple crops (cashew nuts and ignames) in Benin, and this may have resulted in CHWs not being able to carry out their responsibilities. During this period there were also a number of supervisors who were not available to

[k] Means for % of children sleeping under a LLIN and % of children correctly treated for diarrhea were not significantly different over time.

conduct their monthly supervision visits, and so these visits did not occur with the required frequency during this time.

The dramatic decline in mean performance in DAGLA during quarter 4 through 6 of the study period need to be further explored. The drop-off in performance in both SAO and DAGLA from quarter 9 of the study period is likely due to the circulation of the news of the end of the project. Many CHWs and supervisors communicated that this was demotivating to them, since they did not know if the support they received, through supervision visits, QIT encouragement, and financial incentives would be sustained after the end of the project.

Qualitative data bear this out, as the sense of competition and community recognition were determinants of CHW performance at the start of the intervention. Over the life of the intervention, though, these determinants were replaced with community engagement and improved competency of the CHW. Interestingly, supervision emerged as a determinant for both the intervention and control zone. This is likely due to the overall project focus on strengthening the CHW supervisory system.

Our overall findings are in line with past evaluations in Benin, which have demonstrated that the collaborative approach can show results in CHW performance indicators (Freeman P et al., 2012), as well as findings that have shown the success of the collaborative approach to improve health worker performance in health centers and hospitals in developing country settings, including Benin (Catsambas T et al., 2008; Lynn Miller-Franco and Lani Marquez, 2011). This accomplishment is likely due to the way in which the collaborative approach fosters the engagement of both the community health worker and the community itself in the process of improvement and helps both sides understand how processes work and how to make changes at the community level that have the potential to improve the community's health (Catsambas T et al., 2008). Furthermore, the sharing of changes and results motivates communities to work hard and produce good results in a sustained manner.

It is important to note, however, that CHWs who started out with a high score at baseline have 6.33 times the odds of having a high score at endline. This indicates that independent of the intervention, there is a pattern in CHW performance that high performing CHWs at the beginning of this intervention are likely to sustain that high performance throughout the intervention. There was no significant difference in the proportion of CHWs with a high performance score at baseline between the intervention and control zone.

Retention

The study results do not demonstrate that the intervention is associated with higher rates of CHW retention. Attrition rates for CHWs from 3.4% to 77% have been reported in the literature, with higher rates generally associated with volunteer CHWs (Bhattacharyya K et al., 2001). Previous findings from other areas of Benin report a 7% CHW annual attrition rate (Freeman P et al., 2012), although it is unclear how this number was calculated. Our findings reflect even lower annual attrition rates (1%-3%) in the study zones over the study period. With these low attrition rates, it would be difficult for an intervention to demonstrate significant change in CHW retention.

The qualitative data show that the primary reason for the limited attrition in CHWs in the study zones is relocation because of a new/different job which would provide a more consistent salary. Since the reason behind the majority of the attrition was financial, it is logical that the intervention would not have a significant impact on attrition. If alternatively, the reason for most of the attrition was poor motivation or lack of community support, in that case, we would expect to see differences in the levels of attrition between the intervention and control zones.

The fact that economics were the main driver for CHW attrition in this study reinforces the idea that one of the challenges of the CHW role as it currently exists is that it is not a formal salaried position. The limited financial incentive provided under the performance based incentives is primarily a recognition of time and effort expended and is not sufficient to allow the worker to be able to support themselves. It is important to differentiate these financial reasons for attrition which were seen in this study, from reasons which have more to do with lack of interest in the content.

These data also demonstrate that the CHW is seen to be the holder of certain knowledge in the community, and that this affords him or her a certain status in the community, which can motivate them to perform well as shown in some of the qualitative data, and also keep the CHW in their position for a longer period of time. This can have positive or negative impacts, depending on the level of performance of the CHW over time. For example, if a CHW gained a high status in the community and then stated performing poorly, their high status could make it difficult to replace them, unless the poor performance then resulted in a diminished status in the community.

Cost-Effectiveness

Even though CHW programs are expected to improve the cost-effectiveness of health care systems by reaching large numbers of previously underserved people with high-impact services at low cost, there is a dearth of cost-effectiveness data on community health worker programs (Berman et al., 1987; Lehmann U and Sanders D, 2007). This study found that the cost per additional CHW achieving a high performance score is 650,000 or $1 290 USD, which is slightly less than two times the Gross Domestic Product per capita of Benin (World Bank). The World Health Organization's guidance states that for a health intervention to be considered "highly cost-effective," the cost-effectiveness must be less than the gross domestic product per capita for each disability adjusted life year saved. This would mean that for the program to be considered highly cost-effective, each CHW achieving a high performance score would need to avert 1.7 DALYs more than a CHW achieving lower than the high score.

The Ministry of Health recently trained 100 additional CHWs in the intervention zone. These CHWs did not participate in the intervention during the study period, but if these 100 additional CHWs were included in a future improvement intervention, the cost-effectiveness would improve to approximately 30,800 FCFA per CHW who achieved a high performance score (95% confidence interval: 23,000 – 39,000). The large difference between this scenario and the one observed is because one of the main determinants of the result is the number of CHWs participating at a given cost. The overall cost of the intervention is dependent on a number of fixed costs which do not increase based on the number of participants, therefore increasing the number of CHW participants from 39 to 139 for the same cost made for a dramatically more efficient improvement intervention.

If 100 additional CHWs participate in the improvement intervention at no additional expense, the high-scoring CHW would then only need to avert 0.07 DALYS, because the ICER drops to 30,000 CFA or $61 per additional CHW achieving a high score. With the current data available, we cannot estimate the value in DALYs for improved CHW performance. Therefore we rely heavily on the validity of the performance score in measuring their effectiveness at improving health outcomes among those under their care. A more extensive, long term study is required to firmly establish the link between participation in the improvement intervention with the incentive program and health outcomes among those served by the CHWs. Without this additional information, we can only state that, with higher levels of CHW participation, cost of the intervention per high performing CHW would decrease, which would increase the likelihood that the improvement intervention may be acceptable to the Ministry of Health. Further assessment would be needed to establish the number of CHWs needed for this intervention to be cost-effective according to the Ministry of Health

From the sensitivity analysis, it appears that the cost of the performance-based incentives is a small part of the overall cost of the intervention. Since the beginning of project activities, PRISE-C worked closely with the mayor's office in each zone, setting up the payment systems for the performance-based incentives in collaboration with the mayor's office, with the end goal of ultimately transitioning the budget for the performance-based incentives to the mayor's office in order to make the system more sustainable. This effort has been successful, as it is planned, and has been budgeted, that the costs of the performance-based incentives will be borne by the mayor's offices in the project research zones starting in the next calendar year. We believe that this contributes to the sustainability of these payments, since the mayor's office is a permanent structure, unlike project which are time-bound. Future funders of this intervention, be they external or the MOH, would therefore likely see very little difference in the cost-effectiveness result, as compared with results presented here, if they continue with implementing the intervention. The difference would increase, though, if for some reason the mayor's office is unable to cover the costs of the performance-based incentives in the future.

Limitations

This research has several limitations. The study was limited by the choice of intervention and control zone based on the zones in which the overall project was working. SAO and DAGLA share a border and the control zone could potentially have been contaminated through hearing of the collaborative and its activities. Choosing zones further apart could have reduced the likelihood of contamination. Furthermore, the zones of SAO and DAGLA may not adequately represent the overall population of CHWs throughout Benin.

A general limitation of the project is that since CHWs are not a part of the formal health system and are not salaried workers, but rather receive a limited financial incentive to do their work, the level of effort they can expend on CHW duties is often limited by the needs of their family. As seen in the sociodemographic data, 52 of the 86 CHWs are farmers, who need to dedicate a significant amount of time to their fields. Therefore, the performance of these farmer CHWs may be hampered by these competing activities and it may never be able to reach the targets proposed by the project.

A limitation of the data analysis methodology is also that the chi-square tests for independence are based on an assumption of randomization in the study design, which we were not able to do for this study.

As noted above, there was no direct way to link the performance of the CHWs with the health outcomes of those whom they served. Having this information would have made for a more compelling case for the efficiency of the intervention and allowed comparison with other health interventions. The economic analysis considered only the perspective of the intervention funder or the health system and did not take into account the broader economic impacts on beneficiaries receiving care from the CHWs, such as changes in their out-of-pocket health spending. It is not clear whether inclusion of these amounts would have increased or decreased the cost-effectiveness result.

Despite these limitations, there has already been strong interest in incorporating findings from this study into local practice. The research team is working with the zonal health coordinator in the intervention district to include several of the study's indicators in routine supervisions of the CHWs. In addition, the National Department of Public Health (DNSP) is examining how to scale-up the community empowerment aspects of the community quality improvement collaborative.

Implications

The results of this operations research study shed a new light on a question which has remained elusive: how to motivate community health workers to remain committed to their work, and to reach and maintain strong performance. This study results demonstrate that in a low-resource setting a community-level quality improvement collaborative combined with financial incentives provided to the health works is a feasible and effective strategy to improve CHW performance as compared to financial incentives alone.in a low-resource setting.

Inherent in the use of the improvement collaborative process are several features which are critical for future program design and scale up of community health worker programs:

- Engaging the community in a way that ensures responsibility for their own health situation: The community-based improvement teams have proven to be an effective mechanism to do so as they manage their own data, develop solutions that are doable and provide support for the CHWs to achieve results.
- The support and engagement on the part of the communities is embedded within the very process of the collaborative- data review, finding their own solutions and ensuring that they are implemented. The population has discovered that they could make improvements that were within their reach, at low cost and that they could manage, pay for and continue implementing them.

There are several potential angles for future related operations research. Among these are:

- Community-based Quality Improvement Teams requires significant investment in time and additional resources. A follow-on strategy worth studying would be the use of existing community structures such as the Comité Villageois de Santé in Benin to assume similar roles and responsibilities as a Quality Improvement Team. As such structures already often exist and

have legal status, there is a higher chance that they will continue carrying out measurement and improvement activities.

- Incorporation of psychosocial measures for the CHWs such as on self-efficacy would allow researchers to better assess the mechanisms through which the intervention acts to improve performance.
- Testing additional modifications to the model used to reduce the number of learning sessions from once a quarter to twice a year. Each arrondissement can hold its own review of results during regular grouped supervision which would provide select lessons learned for the larger learning sessions. If similar performance improvements are observed, this modified intervention would be more cost-effective than the original.
- When calculating the cost-effectiveness of a CHW intervention, it would be valuable to be able to speak to the number of disability adjusted life years (DALYs) saved by high performance vs low performance of the CHW package of services. Further research in this area would provide important economic evidence to potentially allow for more effective advocacy for CHW programming.
- Testing the effects of the quality improvement collaborative as compared to a cadre of non-paid volunteer CHWs. While not possible in Benin where payment of CHWs is now mandated by the MOH, it would be interesting to measure the differences in the differences between performance and retention of non-paid CHWs when they receive the quality improvement collaborative intervention, and how that compares to the results seen here.

References

Alam, K., Tasneem, S., and Oliveras, E. (2012). Retention of female volunteer community health workers in Dhaka urban slums: a case-control study. Health Policy Plan. *27*, 477–486.

Banek, K., Nankabirwa, J., Maiteki-Sebuguzi, C., Diliberto, D., Taaka, L., Chandler, C.I., and Staedke, S.G. (2014). Community case management of malaria: exploring support, capacity and motivation of community medicine distributors in Uganda. Health Policy Plan.

Berman, P.A., Gwatkin, D.R., and Burger, S.E. (1987). Community-based health workers: head start or false start towards health for all? Soc. Sci. Med. 1982 *25*, 443–459.

Bhattacharyya K, Winch P, LeBan K, and Tien M (2001). Community Health Worker Incentives and Disincentives: How they Affect Motivation, Retention and Sustainability.

Catsambas T, Miller-Franco L, Guttman M, Knebel E, Hill P, and Lin Y (2008). Evaluating Health Care Collaboratives: The experience of the Quality Assurance Project (Bethesda, MD: University Research Co., LLC).

Colvin, CJ (2013). What motivates Community Health Workers? Designing programs that incentivize Community Health Worker performance and retention. In Developing and Strengthening Community Health Worker Programs at Scale, (Washington DC: Jhpiego),.

Freeman P, Deussom G, Glele Y, and Paraiso N (2012). USAID/Benin: Integrated Community Case Management (iCCM) Performance Evaluation.

George, A., Young, M., Nefdt, R., Basu, R., Sylla, M., Clarysse, G., Bannicq, M.Y., de Sousa, A., Binkin, N., and Diaz, T. (2012). Community health workers providing government community case management for child survival in sub-Saharan Africa: who are they and what are they expected to do? Am. J. Trop. Med. Hyg. *87*, 85–91.

Gray, DHH, and Ciroma J (19897). Attrition among Village Health Workers in Nigeria (Bethesda, MD: PRICOR/University Research Co.,LLC).

Greenspan, J.A., McMahon, S.A., Chebet, J.J., Mpunga, M., Urassa, D.P., and Winch, P.J. (2013). Sources of community health worker motivation: a qualitative study in Morogoro Region, Tanzania. Hum. Resour. Health *11*, 52.

Kaseje, D.C., Spencer, H.C., and Sempebwa, E.K. (1987). Characteristics and functions of community health workers in Saradidi, Kenya. Ann. Trop. Med. Parasitol. *81 Suppl 1*, 56–66.

Lehmann U, and Sanders D (2007). Community Health Workers: What do we know about them? (Geneva: WHO).

Ludwick, T., Brenner, J.L., Kyomuhangi, T., Wotton, K.A., and Kabakyenga, J.K. (2014). Poor retention does not have to be the rule: retention of volunteer community health workers in Uganda. Health Policy Plan. *29*, 388–395.

Lynn Miller-Franco, and Lani Marquez (2011). Effectiveness of collaborative improvement: evidence from 27 applications in 12 less-developed and middle-income countries. BMJ Qual. Saf. *20*, 658–665.

Mamadou A, and Anato M (2009). Collaborative approach to community-baed malaria prevention in Benin (Bethesda, MD: Plan USA).

Ministere de la Sante, Benin Annuaire des Statistiques Sanitaires 2013.

Olayo, R., Wafula, C., Aseyo, E., Loum, C., and Kaseje, D. (2014). A quasi-experimental assessment of the effectiveness of the Community Health Strategy on health outcomes in Kenya. BMC Health Serv. Res. *14 Suppl 1*, S3.

PISAF (2011). Rapport de l'atelier de partage des experiences sur la fonctionnalite des RC et la systeme de supervision. (Bohicon).

The World Bank Benin GDP per capita, World Bank 2014, Website – World Bank Data, http://data.worldbank.org/indicator/NY.GDP.PCAP.CD/countries/BJ?display=graph.

University Research Co., LLC (2012). PISAF Final Report (Bethesda, MD: URC).

Walt, G., Perera, M., and Heggenhougen, K. (1989). Are large-scale volunteer community health worker programmes feasible? The case of Sri Lanka. Soc. Sci. Med. 1982 *29*, 599–608.

Wubneh H (1999). Gumer Child Survival Project and the Horses: an alternative and sustainable approach to child survival programs. In Presented Papers: High Impact PVO Child Survival Programs, Volume 2, (Published for the PVO community and the US Agency for International Development by the Child Survival Collaboration and Resources Group (CORE) and Basic Support for Institutionalizing Child Survival Project (BASICS II)), pp. 124–133.

ANNEX XV. OPERATIONS RESEARCH BRIEF

To be sumbitted separately

ANNEX XVI. STAKEHOLDER DEBRIEF POWERPOINT PRESENTATION

Résultats préliminaires de l'évaluation finale de PRISE-C

Renée Fiorentino, Consultante

In-country debrief

11 août 2014

Preliminary results of the PRISE-C final evaluation

Termes de Références

- Examiner les documents et les ressources du projet pour comprendre le projet.
- Affiner les objectifs de l'évaluation et des questions clés sur la base des lignes directrices de CSHGP en coordination avec l'équipe du CHS et ses partenaires.
- .Basé sur les objectifs et les questions clés, élaborer un plan d'évaluation, y compris un calendrier d'évaluation sur le terrain et des outils d'évaluation.
- Faire la collecte, l'analyse et la synthèse des informations supplémentaires en ce qui concerne l'exécution du programme.
- Interpréter les résultats quantitatifs et qualitatifs et en tirer des conclusions, des leçons apprises et des recommandations concernant les résultats du projet.
- Mener une réunion de **débriefing** dans le pays avec des intervenants clés, avec un diaporama PowerPoint livrable, plus de 20 diapositives (avec l'USAID / Washington, DC, la participation à distance, comme mesure).
- Préparer un **projet de rapport** en ligne avec les directives de CSHGP et soumettre à la SCH sur ou avant le **1er Septembre**.
- Préparer et soumettre le **rapport final**, qui est due au bureau de l'USAID CSHGP GH / HIDN / NUT **au plus tard 90 jours après la fin du projet**.

Terms of Reference

-Review project documents and resources to understand the project.

-Refine the evaluation objectives and key questions based on the CSHGP guidelines in coordination with CHS team and its partners.

-Based on objectives and key questions, develop an evaluation plan including a field evaluation schedule and assessment tools.

-Complete the collection, analysis, and synthesis of supplemental information regarding the program performance.

-Interpret both quantitative and qualitative results and draw conclusions, lessons learned, and recommendations regarding project outcome.

-Lead an in-country debriefing meeting with key stakeholders, with a PowerPoint slideshow deliverable, no longer than 20 slides (with USAID/Washington, DC, participation remotely, as able).

-Prepare draft report in line with the CSHGP guidelines and submit to CHS on or before September 1.

-Prepare and submit the final report, which is due at the USAID CSHGP

GH/HIDN/NUT office on or before 90 days after the end of the project.

Questions de l'évaluation

1. Dans quelle mesure le projet a accompli et / ou contribué aux résultats (buts / objectifs) énoncés dans le Plan de le Mise en Œuvre Détaillé (PMOD)?
2. Quelles ont été les stratégies et les facteurs clés, y compris des questions de gestion, qui ont contribué à ce qui a fonctionné ou n'a pas fonctionné?
3. Quels éléments du projet ont été ou sont susceptibles d'être prolongée ou étendue par le Ministère de la Santé du Bénin (par exemple, à travers l'institutionnalisation ou politiques)?
4. Quelles sont les perspectives des intervenants sur la mise en œuvre de la recherche opérationnelle, et comment l'étude a affecté la capacité, les pratiques et la politique?

Evaluation Questions

-To what extent did the project accomplish and/or contribute to the results (goals/objectives) stated in the DIP?

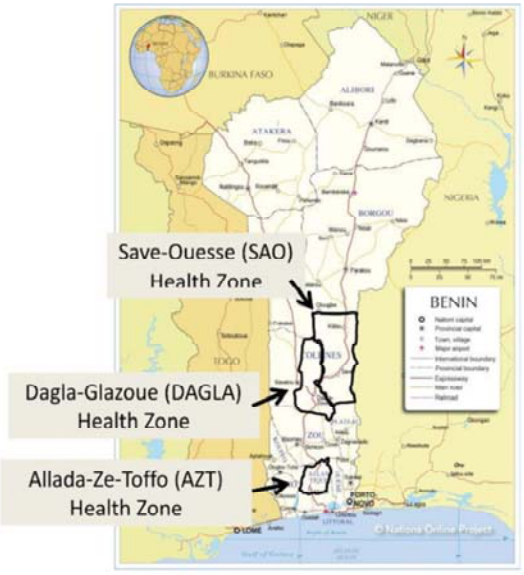
-What were the key strategies and factors, including management issues, that contributed to what worked or did not work?

-Which elements of the project have been or are likely to be sustained or expanded through the Beninese MOH (e.g., through institutionalization or policies)?

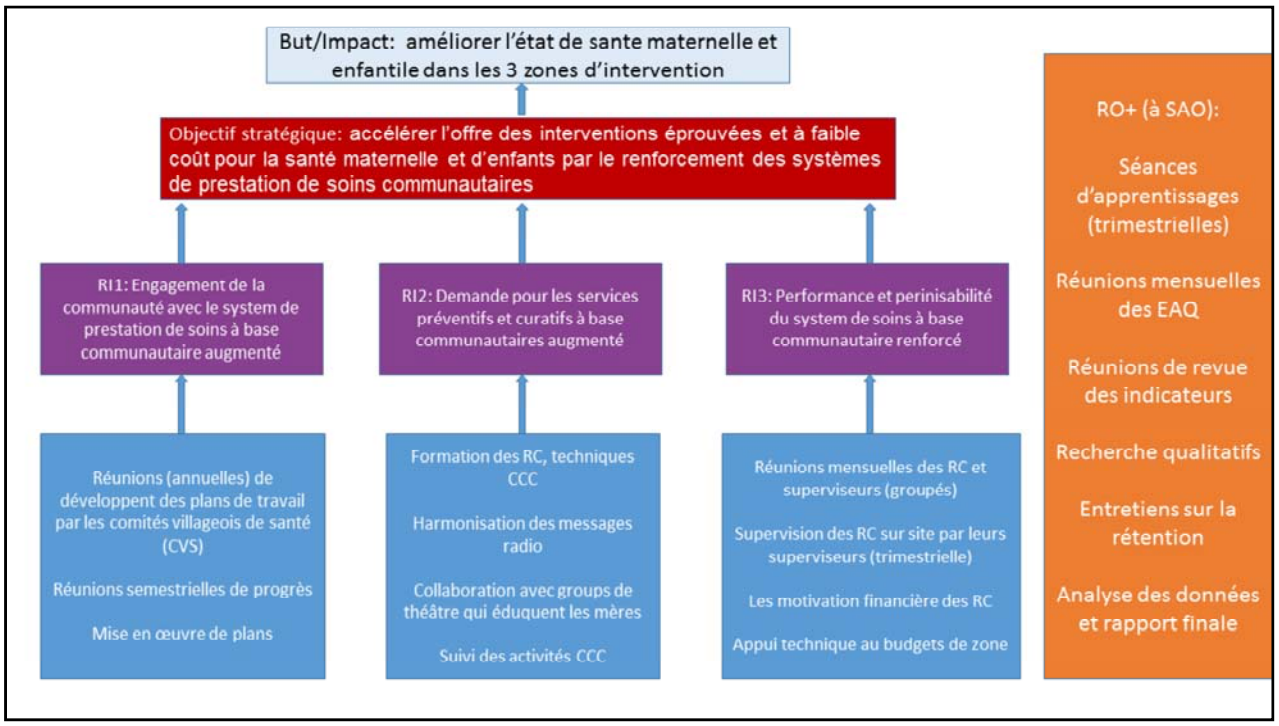
-What are stakeholder perspectives on the OR implementation, and how did the OR study affect capacity, practices, and policy?

Methods

- Analyse secondaire des données existantes
  - Indicateurs trimestrielle (routine)
    - ✓ De processus (plus intrants, e.g., formation et autre narrative)
    - ✓ De la qualité
    - ✓ De résultat
  - Supervision
  - Recherche Opérationnelle
    - ✓ Quant
    - ✓ Qual
  - Enquêtes pré/post auprès des ménages
  - Documents/lignes directrices ministérielles
- Collection de données qualitatives complémentaires
  - Visites des sites, entretiens avec des informants clés (individuel et en groupe)



Methods
-Secondary Analysis of existing data (Routine data on process, quality, and results, supervision, Operations Research data, both quantitative and qualitative) baseline and endline household survey data, review of MOH documents)
-Collection of complementary qualitative data (Sitve visits, interviews with key informants, both individual and groups)



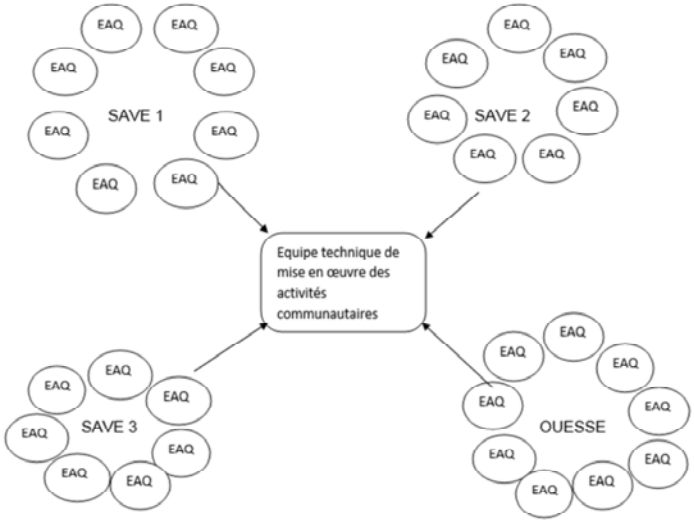
PRISE-C framework

Recherche Opérationnelle

Hypothèses:

La mise en œuvre d'une collaborative d'amélioration de la qualité peut augmenter la performance et la rétention des RC (par rapport aux motivations financiers et la structure de supervision standardisés et mandatés par la MS, pour les RC).

La recherche se prononcera également sur le cout efficacité de cette approche de collaboratif.



Operations Research

Hypothesis: The implementation of a quality improvement collaborative in addition to the financial incentives will improve the performance and retention of CHWs as compared to financial incentives alone.

The research also has a cost-effectiveness component.

Visites des sites, entretiens/discussions avec parties prenantes et la communauté: 28 juillet- 7 août

- Coordonnateurs de zone (3, 1 par zone)
- Directeurs Départementale de Sante (2, 1 par Département)
- Points focaux de la sante Communautaire (3, 1 par zone)- celle de AZT en voyage d'étude
- Responsable du projet à la mairie (échantillon de 3)- seulement SG mairie d'Allada
- Superviseurs de RC (échantillon d'au moins 1 par zone)
- Relais Communautaires (échantillon d'au moins 2 par zone)- 1 seule à Igboyoko
- Membres de les équipes de l'amélioration de la qualité/comites villageois de la sante (au moins 2 par zone)
- Directrice de la Direction de la Sante Mère-Enfant (DSME)
- Point focale de la sante communautaire (DSME)
- Chef service de la sante communautaire (Direction Nationale de la Sante Publique)
- Mamans dans les 3 zones (Bénéficiaires du projet)
- USAID

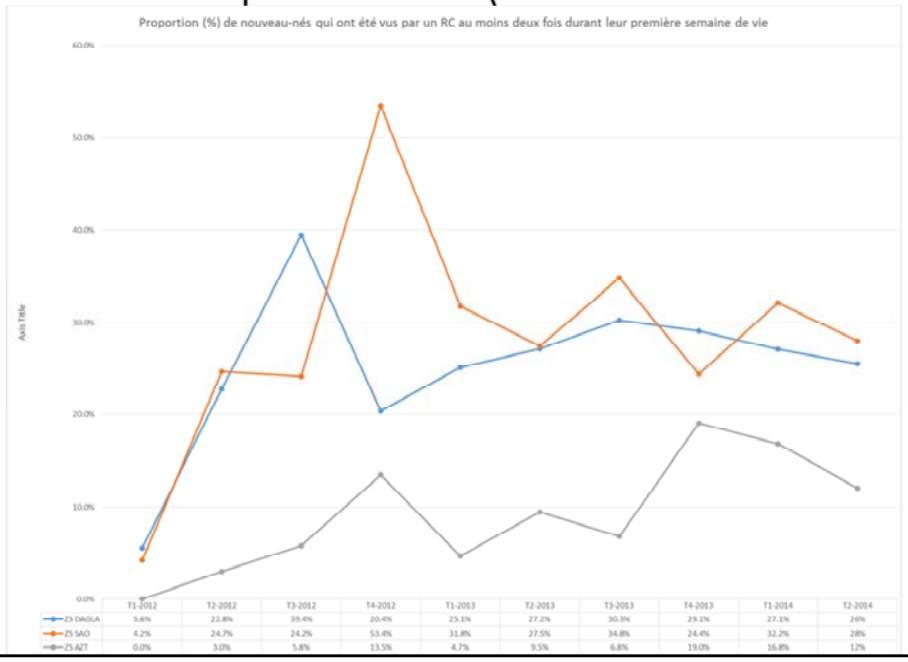
Site visits/interviews and discussions July 28- August 7
-Zonal coordinators
-Departemental Directors
-Focal points for Community Health
-Person responsible for the project at the mairie
-CHW supervisors
-CHWs
-Members of the quality improvement teams and village health committees
-Director of Maternal-Child Health Department
-Focal point for community health at Maternal-Child Health Department
-Chief of community health at National Public Health Directorate
-Mothers of children in the 3 zones
-USAID

Résultats- les succès du projet (des entretiens)

- Résultat:
  - ↓ maladies enfantiles
- Processus:
  - Sélection des RCs par le population- approche participatifs
  - EAQ- vrai facilitation de diffusion d'innovation y compris les petites actions simples de prévention
  - *« J'ai maintenant une autre vision de ce que c'est d' être Major… sortir, circuler dans la communauté. Faute de moyens on ne le faisait pas avant. L' idée était là dans la stratégie avancée, mais maintenant on stimule la demande au même temps qui est mieux, = vrai intégration » -Point Focal, SAO*
  - *« Par définition les choses simples sont plus durables, la manière dont ils ont visualisé les indicateurs (arbres de logiques)…était pratique » - Chef Service, Service Communautaire, national*

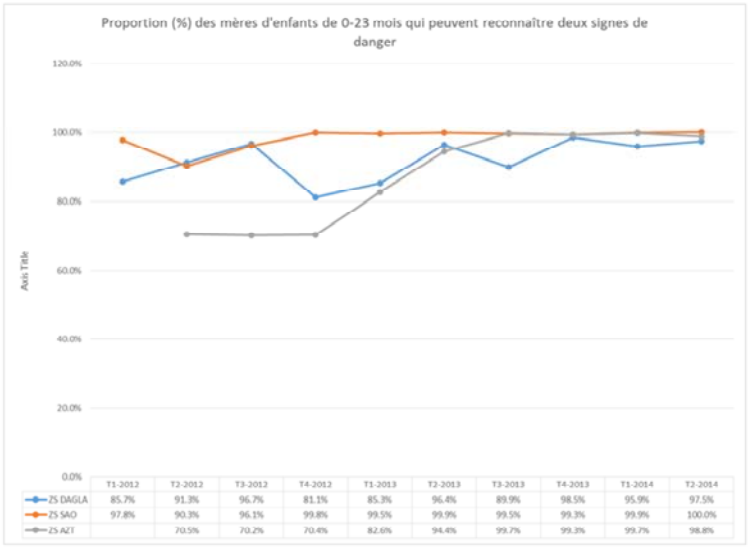
Results
-Reduced childhood illness
Process
-Selection of CHWs by the community (participative approach)
-Quality Improvement Teams-true facilitation of diffusion of innovation including small simple actions for prevention of disease

Résultats- processus (données routines)



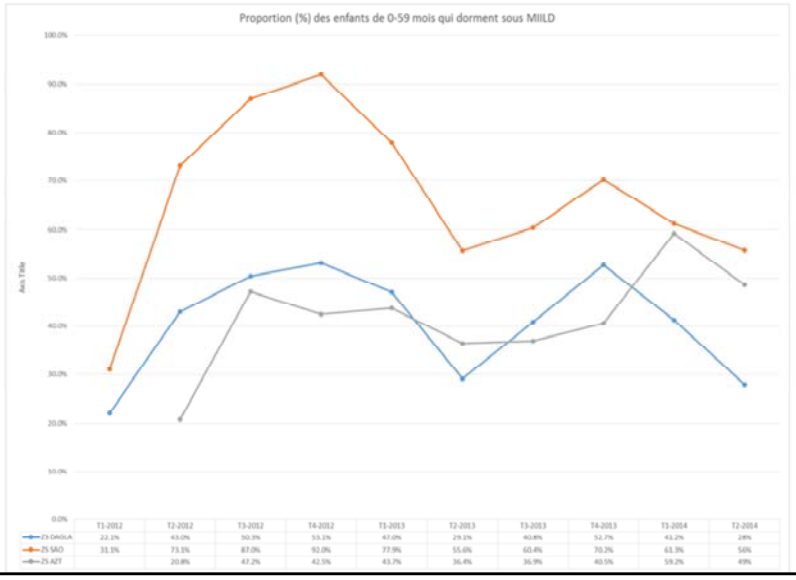
One indicator of process….proportion of newborns seen by a CHW at least twice during their first week of life.

Résultats- qualité (données routines)



Proportion of mothers who can name 2 danger signs

Résultats- résultat (données routines)



Proportion of children sleeping under LLIN

Résultats- les défis auxquels le projet à fait face (des entretiens)

- La gratuité des services
- La pérennisation des activités du projet
- « *L'approche est un peu top-down* »
- Le nombre des acteurs dans une zone et le non-respect des normes ministérielles en matière de motivation
- Les affectations des personnels

Results: the challenges the project faced (According to the interviews)
-Free services
-Sustainability of the activities of the project
- The approach is a little top-down
-The number of actors in a zone and the lack of some actors to follow the MOH norms of CHW motivation
-Affectation of staff

Résultats- genre

Relais Communautaires désagrégés par sexe: 64 M, 47 F

« le projet a attiré l'attention sur ce qui était auparavant un problème des femmes- les enfants malades; avoir désigné un homme n'est pas un problème »

Results: Gender
CHWs by sex: 64 M, 47 F

Les innovations (source= PV réunion sur les bonnes pratiques à SAO T1 2014)

- Redistribution des MILDs en surplus aux ménages qui en ont besoin
- Responsabilisation des membres des EAQ pour le suivi d'utilisation des MILDs/system d'amende pour non utilisation (200CFA-5000CFA)
- Utilisation des bidons pour approvisionnement en eau (bassine 40CFA/bidon25CFA)
- Construction des latrines publiques avec dispositif de lavage de main
- Dispositif de lavage de main a l'entrée des coins d'aisance
- Dépistage de la malnutrition de masse
- Création de caisse pour la prise en charge immédiate des références

Innovations:
-Redistribution of LLINs from households which had too many to those who needed them
-Engaging the members of the quality improvement teams to follow-up on utilization of LLINs with a "tax" for non utilization
-Utilization of water cannisters for hand washing stations
-Construction of public latrines with images of hand washing
-Posting of images of hand washing near public defection locations
-Mass malnutrition assessments
-Creation of a fund for urgent referrals

Tegbo, AZT

« Elle prend $ de la caisse s'il faut, et on l'a rembourse après, elle nous parle de l'hygiène, qu'il faut garder à chaud l'enfant, les messages la plus appréciée sont: l'hygiène corporelle, dormir sous MILD (prévention palu), enterrer l'ordure, lavage des mains »

"She takes the money from the fund if necessary and we reimburse her afterward. She teaches us about hygiene, that we need to keep our children warm. The messages the most appreciated are: bodily hygiene, sleeping under a bednet, burying waste, and washing hands."

Igboyoko, SAO

- *« l'EAQ aide le RC à cerner l'utilisation des moustiquaires »*
- *« …messages du projet complimentent ce que les élèves apprennent a l' école…et l' église est la troisième pilier du stand»*
- Apprécient surtout le ↓ des dépenses pour les maladies

The quality improvement team helps the CHW to educate on the utilization of bednets

The messages of the project compliment what the students are learning at school, and the church also passes the messages.

The public above all appreciate the reduction in spending on illnesses

% contribution aux numérateurs de couverture-arrondissement d'Agbanou, commune d'Allada (AZT)

Niveau de prise en charge	Nbre de cas d'octobre 2013- mars2014 chez les enfants de < 5ans			
	Paludisme	Diarrhée	IRA	Total
Formation Sanitaire	150	4	81	235
Communautaire	260	2	1	263
Total	410	6	82	498
Contribution des RC (%)	**63%**	**33%**	**1%**	**53%**

Percent contribution to coverage numerators, arrondissement of Agbanou, commune of Allada

Gestion

- PMP révisé en 2011, raffinement des indicateurs
- Pendant les supervisions trimestrielles- l'utilisation de l'outil de la MdlS sur les qualités des données
- Annuellement- processus de DQA (au niveau du projet)
- *« Je tire sur le fibre patriotique »*

Management
-PMP revised in 2011 to include more precise indicators
-Use of Ministry tools to assess quality of data during quarterly supervisions
-Annual data quality assessments by the project

Conclusions preliminaries

- Appréciation profonde de la PeC de proximité
- Haut % contribution aux numérateurs de couverture
- Collaboratifs d'amélioration de qualité semblent avoir conduit à la diffusion réelle de l'innovation dans la zone d'intervention de SAO (intervention +)
- Appropriation profonde de l'approche par les responsables sanitaires de la zone d'intervention +

Preliminary conclusions
-deep appreciation of community case management
-high contribution to coverage numerators
-Quality improvement collaboratives seem to have guided real diffusion of innovation in SAO
-Appropriation of the OR intervention approach (quality improvement collaborative) by zonal health officials.

Questions restantes/prochaines étapes

- Est-ce que le choix de DAGLA en tant que zone témoin était idéal? Est-ce que c'est possible d'avoir contribué à leur résultats restreints?
- Comment maintenir un accent sur la prévention tout en créant la demande pour la PeC au niveau communautaire, e.g., Gbedavo?
- Nettoyage des données enquêtes pré-post auprès des ménages
- Finalisation des analyses RO
- Compléter les calculs sur la contribution aux numérateurs de la couverture
- Rapport de l'évaluation- draft, fin aout; finale, avant 90 jours après la fin du projet

Remaining questions/next steps

-Was the choice of Dagla as the control zone ideal? Could it have contributed to their limited improvement results?

-How to maintain an emphasis on prevention while at the same time creating demand for community case management?

-Data cleaning for the household survey data

-Finalizing the OR analysis

-Completing the calculations on the contribution to the coverage numerators

-Evaluation Report-Draft by the end of august, Final version submitted 90 days after the end of the project.

ANNEX XVII. PROJECT DATA FORM

12/22/2014 Form Summary - Benin - CHS - FY2010 - CSHGP Project Data Form

USAID FROM THE AMERICAN PEOPLE | MCHIP Maternal and Child Health Integrated Program | PVO NGO Support

Welcome, Center for Human Services PVO Account
Contact Us | Change Password | Logout

Project Reporting Home | Project Data Form | Reports

Project: Benin - CHS - FY2010 (2010-2014) Innovation

Form Summary | Project Information | Partners | Project Details | Locations & Sub-Areas | Target Beneficiaries | Rapid CATCH...

Form Summary - CSHGP Project Data
The CSHGP project data form is used to capture critical project information to make CSHGP reporting easier at both the project and portfolio levels.

Form Completion Status

- ✓ Project Information
- ✓ Partners
- ✓ Project Details
  - ✓ Strategies
  - ✓ Capacity Building
  - ✓ Interventions & Components
  - ✓ Operational Plan Indicators
- ✓ Locations/Sub-Areas
- ✓ Target Beneficiaries
- ✓ Rapid CATCH Indicators
  - ✓ DIP Submission
  - ☐ Mid-term (Optional)
  - ✓ Final Evaluation

LEGEND
☐ = Please Complete ⚠ = Please Review
✓ = OK ✖ = Please Correct

Enter the project location or sub-areas on the Locations/Sub-Areas tab in order to enter "Target Beneficiaries" and "Rapid CATCH Indicators" data.

You may print the data entered for this project or download it as a PDF file. *(Note: PDF files require the free Adobe Reader for viewing.)*

ANNEX XVIII. PRISE-C PERFORMANCE MONITORING PLAN

Annex 1 – M&E Table
CHS Benin – DIP M&E Plan Revised June 2011

Objective / Result	No.	Indicators	Rapid Catch Indicator	Numerator	Denominator	Source / Measurement Method	Frequency	Data Collection by	Baseline Value	Endline Value	Comments
1. Increased community engagement with community health delivery system	1	Number of villages with a complete (3 member) village health development committee	NO	NA	NA	Health Center Annual Workplan	Annual	Health Center	0	89	
	2	Number of villages with a health workplan	NO	NA	NA	Health Center Annual Workplan	Annual	Health Center	0	89	
	3	% of villages with community representation at at least 75% of monthly CHW meetings	NO	Number of villages which are represented by a member of the VHDC at at least 75% of monthly CHW supervision meetings	Total number of villages with a PRISE-C CHW	CHW Supervisor Reports	Quarterly	CHW Supervisor	0%	100%	

	Household knowledge and practice										
4	% of children age 0-5 months who were exclusively breastfed during the last 24 hours	YES	Number of children 0-5 months who drank breastmilk in the previous 24 hours AND did not drink any other liquids in the previous 24 hours AND were not given any other foods or liquids in the previoius 24 hours	Total number of children 0-5 months in the survey	HH Survey	Baseline/Endline	PRISE-C	24%	43%	Weighted average over 3 zones
5	% of infants from 0-6 months who are exclusively breastfed	NO	Number of infants from 0-6 months exclusively breast-fed	Number of infants from 0-6 months visited by the CHW	CHW Performance Reports	Quarterly	CHW Supervisor	20%	96%	
6	% of mothers ages 0-23 months who can name two danger signs (pregnancy, newborn or post-partum)	NO	Number of mothers/ guardians of children who know at least 2 danger signs	Number of mothers/ guardians of children interviewed by the health agent	CHW Performance Reports	Quarterly	CHW Supervisor	20%	99%	
7	% of newborns seen by a health worker at least 2 times in their first week of life (1-3 days and 3-7 days)	NO	Number of newborns who were seen by a health worker at least 2 times in the first week of life (between the 1st and 3rd and the 3rd and 7th days)	Number of newborns estimated in the period	CHW Performance Reports	Quarterly	CHW Supervisor	20%	21%	
8	% of children 6-59 months monitored for acute malnutrition	NO	Number of children 6-59 months monitored for acute malnutrition	Number of children 6-59 months identified to have acute malnutrition	CHW Performance Reports	Quarterly	CHW Supervisor	0%	100%	Over 80% receives highest performance incentive for this indicator
9	% of children ages 0-23 months with diarrhea in the last two weeks who were treated with ORS	YES	Number of children 0-23 months with diarrhea in the last 2 weeks AND who received ORS	Total number of children aged 0-23 months who had diarrhea in the last 2 weeks	HH Survey	Baseline/Endline	PRISE-C	34%	40%	Weighted average over 3 zones
10	% of children ages 0-23 months with diarrhea in the last two weeks who were treated with ORS and zinc supplements	NO	Number of children 0-23 months with diarrhea in the last 2 weeks AND who received zinc supplements	Total number of children aged 0-23 months who had diarrhea in the last 2 weeks	HH Survey	Baseline/Endline	PRISE-C	39%	40%	
11	% of mothers of children 0-23 months who live in a household with soap or a locally appropriate cleanser at a hand washing station	YES	Number of mothers with children 0-23 months who live in households with soap at the place for washing hands	Total number of mothers of children age 0-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	12%	25%	Weighted average over 3 zones

	12	% of children from 0-59 months who live in a household with a handwashing station at/near the latrine	NO	Number of children ages 0-59 months who live in a household with a handwashing station at/near the latrine	Number of children from 0-59 months in the CHW catchment area	CHW Performance Reports	Quarterly	CHW Supervisor	0%	20%	
	13a	% of children ages 0-59 months who live in a household who drink water from a pump or who treat their drinking water with Aquatabs	NO	Number of children ages 0-59 months who live in households without access to potable water who drink water from a pump or who treat their drinking water with Aquatabs	Number of children from 0-59 months in the CHW catchment area	CHW Performance Reports	Quarterly	CHW Supervisor	47%	38%	
	14	% of children aged 0-23 months who present with symptoms of pneumonia in the past 2 weeks and who received a front-line antibiotic (CTX) from a health worker or CHW	NO	Number of children aged 0-23 months who present with symptoms of pneumonia in the past 2 weeks and who received a front-line antibiotic (CTX) from a health worker or CHW	Number of children aged 0-23 months who present with symptoms of pneumonia in the past 2 weeks	HH Survey	Baseline/Endline	PRISE-C	45%	44%	
	15	% of children age 0-23 who slept under a treated mosquito net the night before survey	YES	Number of children aged 0-23 months who slept under an insecticide-treated bednet the previous night	Total number of children age 0-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	78%	77%	Weighted average over 3 zones
	16	% of children in the catchment area from 0-59 months who sleep under an LLIN	NO	Number of children from 0- 59 months who sleep under an LLIN	Number of children from 0-59 months in the CHW catchment area	CHW Performance Reports	Quarterly	CHW Supervisor	45%	42%	
2. Increased demand for high impact community preventive and curative services	17	% of children ages 0-23 with fever in the past two weeks who received ACT within 24 hours of onset of fever	YES	Number of children age 0-23 months with a febrile episode in the last 2 weeks AND whose mother/caretaker sought treatment for the child within 24 hours AND who were treated with an appropriate anti-malarial drug	Total number of children age 0-23 months with a febrile episode in the last 2 weeks	HH Survey	Baseline/Endline	PRISE-C	35%	24%	Weighted average over 3 zones
	18	% of children who received VitA in the last 6 months	YES	Number of children age 6-23 months who received a dose of Vitamin A in the last 6 months (mothers recall or card verified)	Total number of children age 6-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	82%	86%	Weighted average over 3 zones
	19	% of mothers of children ages 0-23 who had at least 4 ANC visits when they were pregnant with their youngest child	YES	Number of mothers with children age 0-23 months who had at least 4 antenatal visits while pregnant with their youngest child	Total number of mothers of children age0-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	43%	42%	Weighted average over 3 zones

20	% of mothers of children ages 0-23 months who had at least 2 VAT before the birth of their youngest child	YES	Number of mothers with children age 0-23 months who received at least 2 tetanus toxoid vaccinations before the birth of their youngest child	Total number of mothers of children age 0-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	78%	69%	Weighted average over 3 zones
22	% of children ages 0-23 months whose births were attended by a skilled health worker	YES	Number of children age 0-23 months whose birth was attended by a doctor, nurse, midwife, auxiliary midwife, or other personnel with midwifery skills	Total number of children age 0-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	66%	67%	Weighted average over 3 zones
23	% of mothers of children ages 0-23 months who have discussed family planning with their husband	NO	Number of mothers of children 0-23 months who have discussed family planning with their husband	Total number of mothers of children age 0-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	29%	32%	
24	% of children aged 12-23 months who received DTP1 according to the vaccination card or mother's recall by the time of the survey	YES	Number of children age 12-23 months who received a DTP1 at the time of the survey according to the vaccination card/child health booklet or mothers recall	Total number of children age 12-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	72%	58%	Weighted average over 3 zones
25	% of children age 12-23 months who received DTP3 according to the vaccination card or mother's recall by the time of the survey	YES	Number of children age 12-23 months who received DPT3 at the time of the survey according to the vaccination card/childhealth booklet or mothers recall	Total number of children age 12-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	67%	52%	Weighted average over 3 zones
26	% of children aged 12-23 months who received measles vaccine according to the vaccination card or mother's recall by the time of the survey	YES	Number of children age 12-23 months who received a measles vaccination by the time of the interview as seen on the card or recalled by the mother	Total number of children age 12-23 months in the survey	HH Survey	Baseline/Endline	PRISE-C	62%	50%	Weighted average over 3 zones
28	% of children less than 1 year old who were vaccinated during outreach activities conducted according to the workplan in villages more than 5 km from a health center	NO	Number of children less than 1 year old who were vaccinated during outreach activities conducted according to the workplan in villages more than 5 km from a health center	Number of infants less than 1 year estimated in the workplan	CHW Performance Reports	Quarterly	CHW Supervisor	30%	92%	Over 80% receives highest performance incentive for this indicator
	BCC Activities									
29	# of health education talks given by the CHW	NO	NA	NA	CHW activity form	Quarterly	CHW Supervisor	223	4249	
30	% of health education talks held	NO	Number of health education sessions held	Number of health education sessions planned	CHW Performance Reports	Quarterly	CHW Supervisor	59%	58%	Over 80% receives highest performance incentive for this indicator
31	% of children under 5 who had a home visit from a CHW in the quarter	NO	Number of children under 5 who had a home visit from a CHW in the quarter	Number of children under 5 in the catchment area of the CHW	CHW Performance Reports	Quarterly	CHW Supervisor	43%	41%	Over 80% receives highest performance incentive for this indicator
32	% of mothers who know the CHW in their village	NO	Number of mother who know the CHW in their village	Number of mothers interviewed in the survey	HH Survey	Baseline/Endline	PRISE-C	31%	82%	
33	% of mothers who participated in the CHWs activities	NO	Number of mothers who participated in the CHWs activities	Number of mother who know the CHW in their village	HH Survey	Baseline/Endline	PRISE-C	41%	70%	

	34	% of Mothers who have interacted with the CHW in the past 2 months	NO	Number of mothers who have interacted with the CHW in the past 2 months	Number of mother who know the CHW in their village	HH Survey	Baseline/Endline	PRISE-C	14%	33%	
	CHW Case Load										
	35	# of ORS packets distributed by the CHWs in the quarter	NO	NA	NA	CHW Case Register	Quarterly	CHW Supervisor	70	259	
	36	# of ACTs distributed by the CHWs in the quarter	NO	NA	NA	CHW Case Register	Quarterly	CHW Supervisor	4130	1339	
	37	# of LLINs distributed by the CHWs in the quarter	NO	NA	NA	CHW Case Register	Quarterly	CHW Supervisor	215	NA	
	38	# of cases seen by the CHW	NO	NA	NA	CHW Case Register	Quarterly	CHW Supervisor	1155	26944	
	Mutuelles										
	39	# of joint education talks with RAS/PROMUSAF/Mutuelle Network Partner	NO	NA	NA	CHW activity form	Quarterly	PRISE-C	0	NA	
	40	% uptake in mutuelles	NO	Number of households enrolled in mutuelles in the project area	Total number of households in the project area	RAS/PROMUSAF reports	Annual	RAS/PROMUSAF	0%	NA	
3. Strengthened performance and sustainability of the community health delivery system	**Knowledge and Skills**										
	41	# of CHW supervisors trained in supervision techniques	NO	NA	NA	PRISE-C Training Records	Quarterly	PRISE-C	0	38	
	42	# of CHW trained in IMCI-C	NO	NA	NA	PRISE-C Training Records	Quarterly	PRISE-C	117	118	
	CHW Performance										
	46	Proportion (%) of children 6-59 months correctly treated for malaria according to national guidelines	NO	Number of cases of malaria in children 6-59 months correctly treated	Number of cases of malaria received in children 6-59 months of age	CHW Performance Reports	Quarterly	CHW Supervisor	100%	97%	Over 80% receives highest performance incentive for this indicator
	47	Proportion (%) of children 2-59 months correctly treated for diarrhea according to national guidelines	NO	Number of cases of diarrhea in children 2-59 months correctly treated	Number of cases of diarrhea received in children 2-59 months of age	CHW Performance Reports	Quarterly	CHW Supervisor	100%	98%	Over 80% receives highest performance incentive for this indicator
	48	Proportion (%) of children 2-59 months correctly treated for ARIs according to national guidelines	NO	Number of cases of ARIs in children 2-59 months correctly treated	Number of cases of ARIs received in children 2-59 months of age	CHW Performance Reports	Quarterly	CHW Supervisor	99%	97%	Over 80% receives highest performance incentive for this indicator
	49	Proportion (%) of referrals for malaria, diarrhea, ARI and malnutrition in children 2-59 months which were justified	NO	Number of cases of malaria, diarrhea, ARI, and malnutrition in children 2-59 months	Number of cases of malaria, diarrhea, ARI, and malnutrition in children 2-59 months referred by the CHW and who were subsequently seen by a	CHW Performance Reports	Quarterly	CHW Supervisor	100%	100%	Over 80% receives highest performance incentive for this indicator
	Supervision										
	50	# of MOH supervision visits received by CHW in the quarter	NO	NA	NA	CHW Register	Quarterly	CHW Supervisor	99	0	
	51	# of monthly CHW meetings held	NO	NA	NA	Health Center Records	Quarterly	CHW Supervisor	99	90	
	52	# of PRISE-C coaching visits to CHWs by zone	NO	NA	NA	PRISE-C Activity logs	Quarterly	PRISE-C	0	10	
	53	# of PRISE-C coaching visits to CHW supervisors by zone	NO	NA	NA	PRISE-C Activity logs	Quarterly	PRISE-C	0	10	
	Sustainabilit										
	54	# of health zones with community health advisory board in place (at least 3 members)	NO	NA	NA	PRISE-C Records	Annual	PRISE-C	0	3	
	55	# of CHWs leaving their post (Retention)	NO	NA	NA	CHW activity form	Monthly	CHW Supervisor	0	5	

U.S. Agency for International Development

1300 Pennsylvania Avenue NW

Washington, DC 20523