

Evaluation of a community case management project in rural eastern Cameroon

A 2012 evaluation of a three-year community case management project in rural eastern Cameroon found that high coverage of appropriate malaria and diarrhoea treatment was achieved and maintained in two intervention districts while remaining low in a comparison district. In addition, equitable access to treatment across socioeconomic groups was achieved and maintained over the three years, meaning that the poorest and least poor children had equal access to treatment. Unexpectedly, however, the study also found that under-five mortality fell in one intervention district but increased in the second while remaining unchanged in the comparison district.

BACKGROUND – CHILD MORTALITY

An estimated one in every nine children in sub-Saharan Africa dies before age five. Among the leading causes of death in young children globally are pneumonia (18%), diarrheal disease (11%) and malaria (7%).¹ Under-five mortality in Cameroon is 127 deaths/1,000 live births², and the health and socioeconomic status of Cameroon's East region has historically been among the poorest in the country.³

BACKGROUND – COMMUNITY CASE MANAGEMENT

Effective treatments are available for these diseases: oral rehydration salts and zinc for diarrheal disease, antibiotics for bacterial pneumonia and effective antimalarial drugs (artemisinin-based combination therapies or ACT) for malaria.

The challenge for increasing child survival is ensuring prompt access to these life-saving interventions in settings with poor access to health care. There is growing evidence to suggest that community case management (CCM) is an effective strategy to prevent child deaths where access to facility-based care is limited. CCM involves training, supervising and equipping community members to provide appropriate treatment for childhood illnesses.⁴



PROGRAM

The CCM program was funded by the Canadian International Development Agency (CIDA) and delivered by a PSI affiliate, the Cameroonian Association for Social Marketing (ACMS) (www.psi.org/cameroon), in collaboration with the Ministry of Health. More than 450 community health workers (CHWs) in the intervention districts of Nguemendouka and Doumé were trained to provide diagnosis and treatment for uncomplicated malaria (using artesunate-amodiaquine) and diarrhoea (using ORS+zinc), and to refer pneumonia and any severe illness to public health facilities.

EVALUATION METHODS

The evaluation used a quasi-experimental design to assess the impact of CCM on all-cause under-five mortality and other key health indicators. Two intervention districts, Nguemendouka and Doumé, received the CCM program for three years, while a comparison district, Abong-Mbang, received the current national standard of care for treatment of childhood illnesses (i.e., public facility-based care, with limited access typical in rural areas).

A twelve-year birth history among women of reproductive age (15-49 years) allowed for an examination of mortality trends preceding and during the intervention. A census of all households (18,177) was conducted in the three

¹ UN Inter-agency Group for Child Mortality Estimation, 2012. Levels and Trends in Child Mortality. New York: UNICEF.

² Ibid.

³ Institut National de la Statistique (INS) et ICF International, 2012. Enquête Démographique et de Santé et à Indicateurs Multiples du Cameroun 2011. Calverton, MD: INS et ICF International.

⁴ CORE Group, Save the Children, BASICS & MCHIP, 2010. Community case management essentials: Treating common childhood illnesses in the community. A guide for program managers. Washington, DC: CORE Group. Available at: <http://www.coregroup.org>

districts to collect birth histories and data on recent illness and treatment-seeking behaviour for children under five, and children's height and weight.

Kaplan-Meier estimates were used to assess cumulative probability of survival. Cox proportional hazards modelling was used to produce hazard ratios comparing risk of 1-59 months mortality during and prior to the intervention period. Chi-square tests of association were used to assess differences in treatment-seeking behaviour. Z-score standard deviations (NCHS/CDC/WHO international reference standard) were used to categorize severe and moderate stunting, wasting and underweight in children under five years of age.

MAIN FINDINGS – COMPARABILITY OF STUDY DISTRICTS ON KEY INDICATORS

- **ITN ownership & use:** 9 out of 10 households with a child under the age of five owned at least one insecticide-treated net (ITN), though significantly more had slept under a net the night before the survey in the intervention district of Doumé (75%) than the intervention district of Nguemendouka (72%) or the comparison district of Abong-Mbang (68%).
- **Socioeconomic conditions:** No district had a disproportionate fraction of the population living in the lowest socioeconomic category, although Nguemendouka had the lowest proportion of the population living in the highest socioeconomic category (30%) compared to the others (both 35%).
- **Water & sanitation:** Access to improved water and sanitation was poor in all districts: only 1 in 10 households had access to both improved water and sanitation in any district, though access to improved water was significantly lower in Nguemendouka (20%) than Doumé (29%) or Abong-Mbang (30%).
- **Vaccination coverage:** In the two intervention districts, close to half of children aged 12-23 months had all basic vaccinations compared to 41.2% in the comparison district of Abong-Mbang.
- **Undernutrition** is a substantial problem in all three districts, particularly chronic undernutrition. Half of children in the intervention districts were stunted (low height for age) – 50% in Doumé and 52% in Nguemendouka – versus 45% in the comparison district. The prevalence of acute undernutrition based on wasting (low weight for height) was comparable across all three districts: 4% in Doumé, 3% in Nguemendouka, 4% in Abong-Mbang.

MAIN FINDINGS – APPROPRIATE DIARRHEA & FEVER TREATMENT

Table 1: Proportion of children under 5 years appropriately treated for diarrhoea

| | Children with diarrhoea in the previous two weeks treated with oral rehydration salts (ORS) | | | | Children with diarrhoea in the previous two weeks treated with ORS+zinc | | |
|------|---|-------|-------------|------|---|-------|-------------|
| | Intervention | | Comparison | | Intervention | | Comparison |
| | Doumé | N'ka | Abong-Mbang | | Doumé | N'ka | Abong-Mbang |
| 2010 | 61.1% | 61.8% | 7.2% | 2010 | 40.5% | 50.4% | 0.3% |
| 2012 | 38.6% | 56.9% | 7.4% | 2012 | 20.1% | 36.7% | 0.3% |

Table 2: Proportion of children under 5 years appropriately treated for fever

| | Children with fever in the previous two weeks treated with any antimalarial | | | | Children with fever in the previous two weeks treated with ACT | | |
|------|---|-------|-------------|------|--|-------|-------------|
| | Intervention | | Comparison | | Intervention | | Comparison |
| | Doumé | N'ka | Abong-Mbang | | Doumé | N'ka | Abong-Mbang |
| 2010 | 58.5% | 55.5% | 24.1% | 2010 | 41.0% | 46.0% | 4.8% |
| 2012 | 45.8% | 60.5% | 22.6% | 2012 | 32.4% | 50.6% | 3.6% |

- The two intervention districts achieved high levels of appropriate treatment for diarrhoea (ORS+zinc) and fever (ACT) and maintained significantly higher levels than the comparison district during the three years of the project (see Tables 1 and 2 above).
- While intervention districts Doumé and Nguemendouka maintained significantly higher levels of coverage than comparison district Abong-Mbang, coverage in Doumé dropped somewhat in all areas from 2010-2012 while Nguemendouka maintained or increased coverage over time in most (Tables 1 and 2).

MAIN FINDINGS – ALL-CAUSE UNDER-FIVE MORTALITY

- Looking at three-year averages (see Figure 2 below), all-cause child mortality dropped in one intervention district, Ngelemendouka, from 2009 to 2012 but rose in Doumé, the other intervention district, during the same time period. Mortality remained stable in the comparison district.
- Annual averages (see Figure 1 below) show more variation, including a drop in under-five mortality in the two intervention districts in the last year. Taken as a whole, however, the results show possible program impact in Ngelemendouka but not in Doumé.
- Given the smaller spike in mortality in Ngelemendouka and the larger spike in Doumé from 2010 to 2011, it is possible that confounding factors influenced both intervention coverage and child mortality during this time. Such factors could include climate events, such as heavy rains or flooding, which could influence both the feasibility of intervention delivery as well as disease transmission.
- In all three districts, risk of death in under-fives was significantly higher among births occurring in the poorest households compared with those occurring in the least poor households.
- Hazard ratio trends suggest a protective effect of insecticide-treated net ownership and drinking water treatment for child mortality.



Figure 1: Average under-five mortality (deaths per 1,000 live births) at one-year intervals from 2004-2012 (intervention period: Oct. 2009-2012)

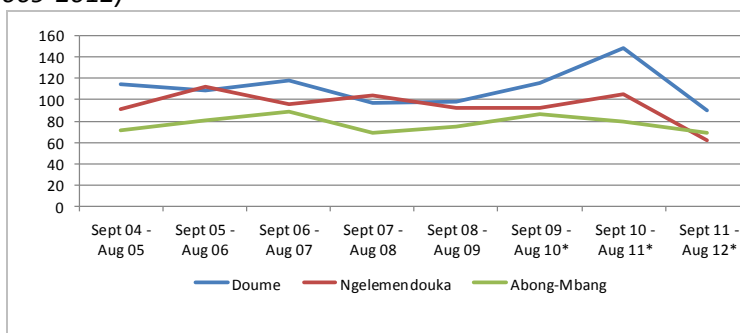
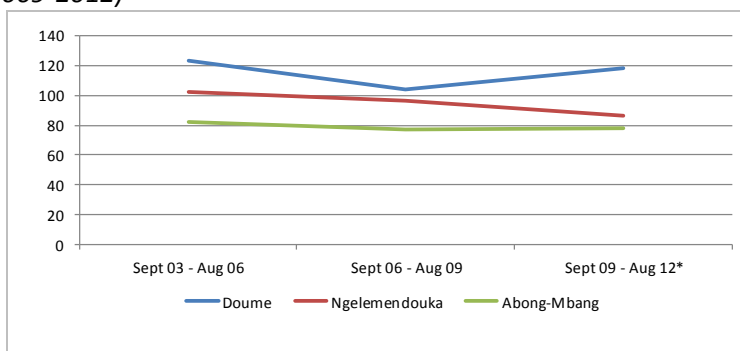


Figure 2: Average under-five mortality (deaths per 1,000 live births) at three-year intervals from 2003-2012 (intervention period: Oct. 2009-2012)



MAIN FINDINGS – EQUITY OF ACCESS TO APPROPRIATE TREATMENT

- Care from community health workers (CHWs) was more commonly accessed by children living in the poorest households (52% of those with fever and 50% of those with diarrhea) compared to those in the least poor households (35% of those with fever and 44% with diarrhea).
- The presence of CHWs was associated with equity of access to care and appropriate treatment for both fever and diarrhea. Among children under five years with fever in the previous two weeks, 45% in the lowest socioeconomic category received an ACT compared to 33% in the highest. Among children with diarrhea in the previous two weeks, equally 46% in both the highest and lowest socioeconomic categories received ORS.



CONCLUSIONS & RECOMMENDATIONS

Trained and supervised CHWs equipped with quality-assured treatments for children can bring about equitable and sustained gains in coverage of appropriate case management for malaria and diarrhea.

CHWs are an extension of the public health system. Given the access that CHWs successfully brought to the poorest children, this intervention demonstrably increased access to public health care overall and levelled the inequities in access to care seen in the comparison district. Scale-up of this model could improve equitable coverage, contributing to achievement of global targets such as Millennium Development Goal 4 (to reduce child mortality by two-thirds).

Contextual factors may influence the extent to which iCCM intervention coverage levels are maintained over time. While both intervention districts in this study achieved similar and high coverage levels at midterm and at endline, coverage levels dropped somewhat in one of the districts, though remaining significantly higher than the comparison district. Further research is needed to better understand the factors that influence the successful maintenance of iCCM coverage over time. The literature suggests that factors may include CHW retention and motivation, supervision, and health district and community engagement, as well as environmental factors.

This study provided partial evidence for the effectiveness of iCCM to reduce all-cause child mortality, as important gains in child survival were made in one of the two intervention districts. While every effort was made to gather contextual information to understand factors influencing child health in the study areas, the reasons for the lack of impact in the other district were unclear.

While supporting iCCM in areas that otherwise have no or limited access to health care provides important access to life-saving treatment for common, life-threatening childhood illness, chronic underlying factors such as poor nutrition and lack of access to improved water and sanitation undermine treatment efforts by reducing immunity and perpetuating disease risk.

A full copy of “Cameroon CCM Endline Evaluation 2012: Outcomes & Impact in Doumé and Nguemendouka Districts after Three Years of Program Implementation” is available upon request. For further information, please contact Jane Miller at jmiller@psi.org or Julie Archer at jarcher@psi.org.