

Results of a community-driven intervention in rural Zambia to reduce child mortality

As the global development agenda converges around the Sustainable Development Goals (SDGs) and aims for Universal Health Coverage (UHC), there is much emphasis on the need for an inclusive development approach. To achieve this, communities need to be at the centre of interventions and must have the knowledge and resources to drive their own development agenda according to their local needs. However, in rural Zambia, as in many other sub-Saharan African contexts, communities continue to face multiple barriers in accessing basic services. Underlying factors include geographical, financial and social constraints.

The MAMaZ Against Malaria at Scale (MAM@Scale) project is helping to overcome these barriers by bringing public health services closer to communities. Since 2017, alongside government health officials, the project team has piloted and subsequently begun scaling up an innovative pre-referral intervention to address severe malaria in young children. The project builds on earlier engagements in many of the same

communities over the past ten years that addressed barriers to accessing essential maternal and newborn health (MNH) services. Gender empowerment has been embedded within all the interventions and since April 2020, a COVID-19 response has also been integrated. The results achieved by MAM@Scale in a short time frame demonstrate the critical role that communities play in driving better health outcomes.

SUMMARY

- MAM@Scale achieved a 71% reduction (from 3.1% to 0.9%) in reported severe malaria case fatality rates in intervention sites and positive changes in gender empowerment.
- The project demonstrated the long-term impact of investing in community systems and their contribution to better health outcomes.
- Universal Health Coverage will not be achieved unless essential health services are brought closer to communities.



Background and context

MAM@Scale was implemented from December 2018 until November 2020 with funding from Grand Challenges Canada (GCC) and the Government of Canada, the Geneva-based Foundation Medicines for Malaria Venture (MMV) and UK development organisation Transaid. Originally an 18-month intervention, additional funding from FIA Foundation, GCC and a private donor extended the project timeframe by six months enabling MAM@Scale to integrate a COVID-19 component

and participate in Zambia's national COVID-19 response. The project built on three earlier initiatives, all focused around building strong community ownership with gender empowerment at their core.¹

Over 7,500 malaria deaths occurred in Zambia in 2018² and children under six are the most susceptible due to their lack of immunity. MAM@Scale empowered rural Zambian families to reduce their mortality risk from severe malaria by introducing artesunate rectal capsules (known locally as rectal artesunate or 'RAS'), a cutting-edge pre-referral intervention given at

community level to children aged six months to six years. The pilot project, MAMaZ Against Malaria (2017-2018), showed that RAS can help to drastically reduce child deaths from malaria: in intervention sites the reported case fatality rate from severe malaria fell from 8% to 0.25%.³ MAM@Scale supported the expansion of the initiative from the pilot phase in 45 sites in one district to wider coverage across five districts. GCC has committed funding for another phase of scaling up to run from December 2020 to November 2021. Coverage will be extended to a total of ten districts.

Strategy

The five MAM@Scale intervention districts have high malaria incidence rates and high malaria mortality. In two districts (Serenje and Chitambo) the coverage reached all priority communities. These districts operated as demonstration districts for the innovation. In three additional districts (Chama, Manyinga and Vubwi), the project collaborated with partners active in those locations.⁴ Community health volunteers (CHVs) were trained to administer RAS to children with severe malaria danger signs at community level and refer them to the health facility for further treatment. The intervention helps to stabilise the children until they can reach the facility. Capacity building of front-line health providers improved severe malaria case management and promoted the use of injectable artesunate as the optimal first-line treatment.

The CHVs were also trained to identify and refer other common child health emergencies, such as severe diarrhoea and pneumonia. Community-managed safety nets (e.g. food banks, emergency savings schemes and emergency transport systems) were established to tackle barriers and delays in the use of health services. Some communities already had such systems from the earlier MNH projects and were rapidly able to expand their operation to include child health emergencies. Bicycle ambulances were the mainstay of the emergency transport schemes (ETS). They are kept and maintained by the communities.

Two approaches were used – high intensity and low intensity. High intensity sites had a minimum of five CHVs trained to administer RAS and up to 12 additional CHVs who were



trained to mobilise the community. In low intensity sites a single CHV was trained in RAS administration and CHV to population ratios were much higher (usually between 1:500 to 1:1,000 compared to 1:250 in the high intensity sites). In the high intensity sites CHVs were actively supported to establish community systems such as food banks and selected sites operated emergency transport systems. In the low intensity sites CHVs learnt about community systems but received less coaching and mentoring support to help establish them. In both cases CHVs were supervised by local health facility staff.

At national level, MAM@Scale worked with the National Malaria Elimination Centre (NMEC) and the Ministry of Health (MOH) to prepare the ground for wider national scale-up of RAS administration. A major thrust of the scaling up approach is to support the government in embedding the innovation in the national integrated Community Case Management (iCCM) programme which is being rolled out across the country.

Project results have been tracked through various complementary means: a baseline and midline survey (February 2019 and July 2020 respectively), a community monitoring system (CMS) established by the project, a qualitative study on gender empowerment, and regular monitoring visits. The CMS gathered data on health facility and population coverage, and 17 community level indicators (Box 1). The timeline showing when each district began operations and started to generate data is shown in Figure 1.

¹ Mobilising Access to Maternal Health Services in Zambia (MAMaZ, 2014-2016), funded by UK Department for International Development, MORE MAMaZ (2016-2018), funded by Comic Relief, and MAMaZ Against Malaria (MAM, 2017-2018), funded by MMV and Transaid.

² World Health Organization, 2019, **World Malaria Report 2019**. Geneva: WHO.

³ Green, C. Quigley, P. Kureya, T. *et al*, 2019, "Use of rectal artesunate for severe malaria at the community level, Zambia", **Bulletin of the World Health Organisation** 97, 810-817.

⁴ In Chama MAM@Scale worked in partnership with the USAID Program for Advancement of Malaria Outcomes and in Vubwi and Manyinga, the Churches Health Association of Zambia.

BOX 1: COMMUNITY MONITORING SYSTEM INDICATORS

1. Simple malaria cases
2. Suspected severe malaria cases
3. Suspected severe malaria cases tested with a rapid diagnostic test (RDT) for malaria
4. Positive RDTs
5. Rectal artesunate suppository (RAS) recipients
6. RAS recipients given a referral note by CHVs
7. RAS recipients receiving a counter-referral form from the health facility
8. RAS recipients who were followed up by CHVs on their return from the health facility
9. Children with severe malaria supported by emergency transport system
10. Children with severe malaria supported by food banks
11. Children with severe malaria supported by savings schemes
12. Children with suspected severe malaria who died
13. Children referred to the health facility with severe diarrhoea
14. Children referred to the health facility with pneumonia
15. Children with severe diarrhoea or pneumonia supported by emergency transport system
16. Discussion group sessions held in the community
17. Door to door visits undertaken by CHVs

Results

The **CMS tracking** shows that project targets were exceeded in many areas:

- The intended population coverage was exceeded by 178% @ 320,000 versus 115,000 planned.
- The number of intervention communities reached was exceeded by 192% @ 351 versus 120 planned.
- The number of health workers trained to give injectable artesunate was exceeded by 138% @ 238 versus 100 planned.

Other **key results** include⁵:

- Almost 46,000 door-to-door visits were conducted by CHVs for general awareness-raising on severe malaria and other childhood illnesses and 17,000 childhood illness discussion group sessions were held.
- Almost 123,000 suspected simple malaria cases were seen by CHVs.
- 4,050 children with severe malaria danger signs were identified by CHVs, 97% of them received RAS and 92% had a positive rapid diagnostic test.
- Around 1,200 children with suspected severe malaria were transferred to the health facility by ETS and another 1,800 were transferred for other child health emergencies.
- 85% of RAS recipients were followed up by CHVs at least once.

Comparing results of **high-intensity versus low-intensity sites**, it was noted that⁶:

- Low intensity sites do not do as well as high intensity sites, even if CHVs work as hard as those in high intensity sites. This is because CHVs are fewer in number and volunteers cannot reach the entire population. It is likely that severe malaria cases are missed in these areas.

- In the absence of an adequate level of on-going coaching and mentoring support, low intensity sites perform poorly compared to high intensity sites in establishing community systems and far fewer people in low intensity intervention sites benefit from these schemes.

The **baseline and midline survey findings** showed that many positive changes had taken place in just over one year. Some of the key highlights include the following:

- CHVs were significantly more knowledgeable about the causes of malaria and the danger signs of severe malaria.
- More CHVs indicated that they had managed cases of severe malaria and referred cases on to health facilities at midline compared to baseline and there was a significant improvement in the number of CHVs confident to administer RAS.
- Drug availability improved generally at health facility level although there were intermittent shortages of injectable artesunate, partly due to COVID-19-related supply challenges.
- 10 deaths were reported in the surveyed health facilities in the midline survey out of 1,134 cases of severe malaria in children under six years, giving a case fatality rate of 0.9% compared to 3.1% at baseline, a 71% reduction.
- The proportion of simple malaria cases progressing to severe malaria decreased from 2.2% at baseline to 1.1% at midline.

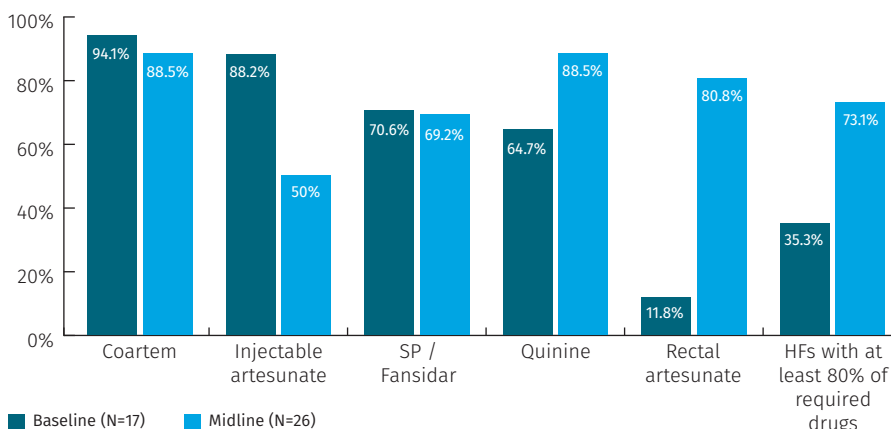
A qualitative study on **gender empowerment** complemented the positive findings from the surveys that showed a high level of confidence among female CHVs. The gender empowerment results are presented in a separate evidence brief.

^{5,6} Source: Community monitoring system data, February 2019 to October 2020.

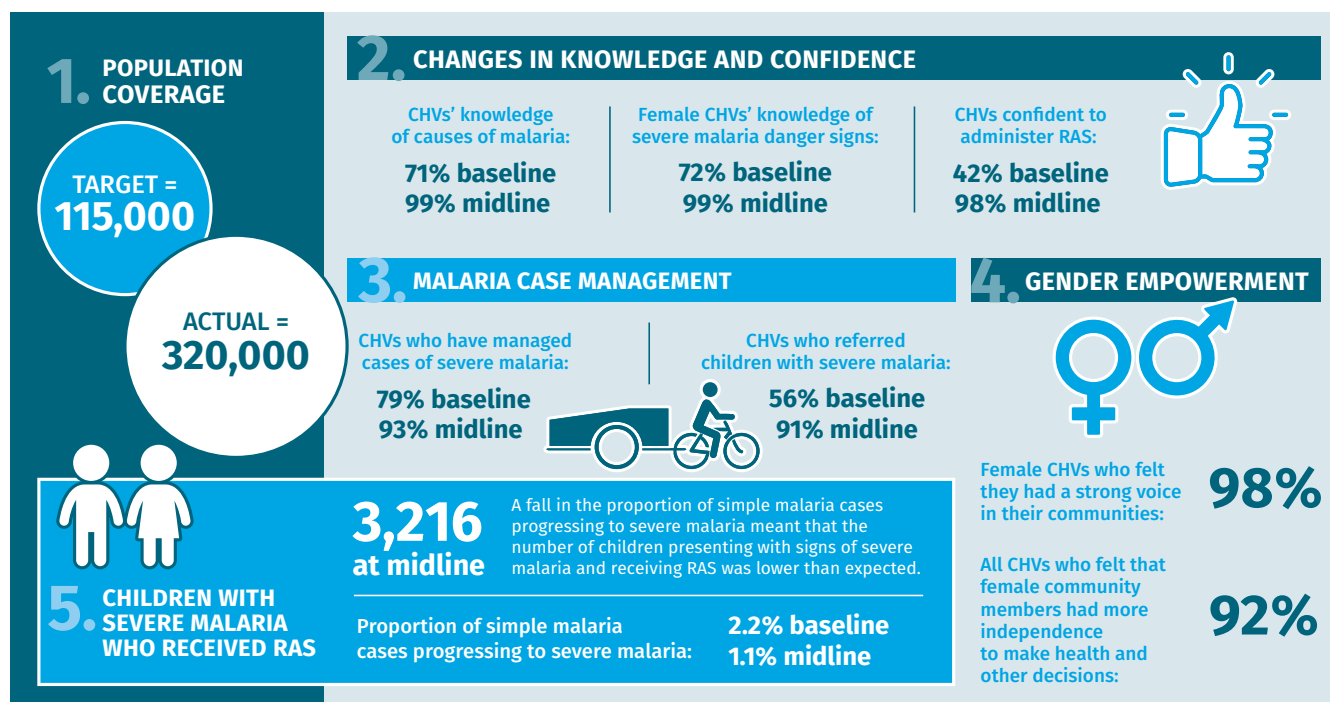
Figure 1: Intervention District Start Dates

DISTRICT	Feb 19	Mar 19	Apr 19	Oct 19	Dec 19	Jan 20
Serenje	●	●				
Chitambo		●	●			
Chama				●		
Manyinga					●	
Vubwi						●

Figure 2: Malaria Drug Availability at Health Facilities, Demonstration Districts



Source: MAM@Scale baseline survey (Feb 2019) and midline survey (July 2020)



Lessons Learned and Policy Implications

Maximising existing resources: MAM@Scale worked with different cadres of CHV and showed that they can be successfully trained to administer RAS and mobilise communities around a child health agenda. Training a variety of CHVs present in communities builds on existing structures, increases coverage, promotes equity of access to severe malaria and other essential services, and is low-cost. It is recommended that the MOH follows this approach and incorporates good practice from MAM@Scale's RAS training approach into iCCM and other CHV training manuals, including the use of innovative participatory training tools (e.g. communication body tools).

Ensuring universal coverage: Training a small number of CHVs (i.e. 1-2 per community) in severe malaria case management is unlikely to substantially increase communities' access to RAS and severe malaria treatment. Distances within communities are large and the reach of individual CHVs is small. It is recommended that the MOH considers moving towards 1 CHV: 250 population to increase coverage, a ratio that MAM@Scale and NMEC have found to be very effective.

Bridging the gap between communities and the health system: Community managed ETS can significantly reduce travel times to the health facility and be a positive factor in encouraging prompt referral of very sick children. This is despite the often long distances and poor terrain that they must navigate. ETS will be an important part of the RAS intervention as it is scaled up across Zambia. It is recommended that the MOH and districts budget for replacement ETS vehicles after four or five years, and support ETS riders via routine supervisory processes.

Gender empowerment and social inclusion: Whole community approaches are needed to change social norms in favour of improved child health care seeking. Having more female CHVs with a stronger voice in their communities is an enabling factor for the ultimate achievement of the project and national goals and opens up other development opportunities for women. This is further complemented by more women being able to make health-related decisions at household level. It is crucial that CHVs are trained to promote male involvement in health and to promote social inclusion. Reaching the least-supported women in the community is essential since they and their children usually carry the highest burden of ill-health.



Reducing mortality: Effective case management of severe malaria in young children requires access to RAS, injectable artesunate, and commodities such as RDTs and disposable gloves. It is important to ensure an uninterrupted supply of these essential drugs and commodities as community RAS is scaled up in Zambia. The lower number of deaths due to severe cases of malaria in the MAM@Scale intervention sites in the demonstration districts (where there was much higher coverage and longer engagement) is likely to be attributable to the positive changes brought about by CHVs trained by the project. Investing in community health promotes sustainability and provides a strong basis for further development gains.



For more information: info@transaid.org, GH_UKinfo@dai.com, info@developmentdata.info, disacaretrust@gmail.com or info@MMV.org

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