

A conversation with Cammie Lee and Kanika Bahl, June 23, 2017

Participants

- Cammie Lee – Country Director for Tanzania, Results for Development
- Kanika Bahl – Advisor, Results for Development
- Elie Hassenfeld – Co-Founder and Executive Director, GiveWell
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Note: These notes were compiled by GiveWell and give an overview of the major points made by Ms. Lee and Ms. Bahl.

Summary

GiveWell spoke with Ms. Lee and Ms. Bahl of Results for Development (R4D) to get an update on its pneumonia treatment program in Tanzania, which aims to increase access to amoxicillin dispersible tablets (amox DT) for childhood pneumonia. Conversation topics included the pediatric amoxicillin market, the program's monitoring and funding timeline, and findings from the Round 1 survey.

Tanzania's peds amox market

Types of pediatric amoxicillin

Pediatric amoxicillin formulations include amox DT, which is now the Tanzanian government's recommended first-line treatment for pneumonia in children, and oral solution (amox OS), which was recommended prior to the introduction of amox DT in 2015.

Public sector

Pediatric amoxicillin for the public sector is purchased from the manufacturer by the government's Medical Supplies Department (MSD) or by procurement agents, such as UNICEF's Supply Division, who send it to MSD for distribution. Public health facilities obtain their medicines from MSD, or from private wholesalers.

Distribution of amox OS to health facilities declined sharply in the third quarter of 2015. This was partly due to funding constraints at MSD, and partly in anticipation of the introduction of UNICEF-donated amox DT the following quarter. By the second half of 2016, amox OS was depleted in MSD warehouses and the last UNICEF-supported amox DT had arrived in Tanzania. As a result, there was also an overall decline in the pediatric amoxicillin market in 2016. No other entities were planning to fund amox DT, so it is highly likely that many health facilities stocked out of the drug by January 2017. That was one reason for R4D's decision to accelerate the procurement.

Data on the public sector side of the market are generally good quality because they all come from one source (the government itself) and include both volumes procured and volumes issued.

Private sector

In the private sector, importers and distributors buy pediatric amoxicillin from the manufacturer and sell it to wholesalers. The medicine is then purchased by both public and private health facilities (~9,000 accredited drug dispensing outlets [ADDOs] and ~1,300 pharmacies).

R4D estimates that nearly two thirds of all pediatric amoxicillin procurement and sales over the last three years have occurred in the private sector. After the drop in public sector deliveries of amox OS in the third quarter of 2015, there was a corresponding increase in the private sector, but since then, private sector sales have gradually declined.

R4D worked closely with all 16 pediatric amoxicillin wholesalers in the country to obtain data on all individual shipments received and distributed. In return, R4D provided each one with information about its market share and the size of the overall market. Data on the private sector are more difficult to check for quality as the companies want to keep them confidential, but they do not appear to have any incentive to fabricate information.

Monitoring and funding timeline

Overview of Round 1

The Round 1 survey was conducted in February and March 2017. The research team included representatives of the Tanzanian Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), the National Institute of Medical Research (NIMR), the Economic Development Initiative (EDI), and IDinsight, as well as R4D.

Data were collected from a nationally representative sample of 624 public health facilities (521 dispensaries, 50 health centers, and 53 hospitals) across all 26 mainland regions of Tanzania. In addition, 135 ADDOs were randomly sampled from the three sentinel regions (Kagera, Mtwara, and Pwani). Those regions were chosen because they are geographically spread out (and therefore broadly representative of the country as a whole), and because, unlike many regions, they had updated lists of ADDOs.

The purpose of the survey was to obtain data on:

- Availability and stocks of pediatric amoxicillin, both amox OS and amox DT.
- Availability and stocks of comparator medicines.
- Providers' knowledge and behavior with respect to the dispensing of amox DT and the diagnosis and treatment of pediatric pneumonia.

Further data collection

The Round 2 survey will begin this month, and results should be available before the end of 2017.

In addition, R4D will carry out a study later this year on diagnosis and provider behavior, using lung ultrasounds (which are comparable to gold-standard x-rays) and direct observation. The study will include an investigation of how much of the under- and over-diagnosis is due to providers' failure to comply with standard protocols. R4D also plans to do some testing of potentially cost-effective interventions for improving provider practices.

Funding

Around the end of March 2018, GiveWell and R4D plan to discuss the potential for Phase 2 of the program. By that time, three rounds of data should be available, plus the results of the misdiagnosis study and lean testing. After receiving all this information, GiveWell would like three months to decide whether to support Phase 2 and, if so, transfer the funds, although the process could perhaps be accelerated if necessary.

Round 1: amoxicillin supply

Logistics

Under the Integrated Logistics System (ILS) used for ordering and receiving medical supplies from MSD, public health facilities are divided into delivery groups A, B, and C. R4D is unsure how they were divided, but the geographical distribution suggests it was random. Each of the ten zonal stores delivers supplies to facilities in three cycles, beginning with group A and ending with group C on a quarterly basis. For each group, there is a period of delivery planning followed by distribution.

The stores' schedule in early 2017 was as follows:

Group	Planning and distribution
A	January – March
B	February - April
C	March - May

Amox DT procured by R4D using funding from Good Ventures was delivered to zonal stores around January 15. This was earlier than expected and before groups B and C had begun planning, so their deliveries included the drugs. It is very likely that round 1 findings reflected the impact of the first amox DT shipment on data collected, and therefore should not be considered a traditional "baseline." However, group A deliveries did not include amox DT because planning for group A deliveries began before the amox DT had arrived, so it is unlikely the plans would have included the new stocks. By comparing findings from health facilities in group A versus groups B and C, it seemed like it would still be possible to gain an overall impression of the program's impact.

Findings

As R4D had expected, supplies of pediatric amoxicillin at health facilities had been significantly depleted by the time the survey started:

- A majority of health facilities reported having experienced stockouts of amox DT and amox OS in the last 90 and 30 days, respectively.
- On the day of the survey, more than half of health facilities had at least one form of peds amox available (where availability is defined as having at least one tablet or bottle of solution on the premises), most of which was driven by amox DT.

On the same day, many more facilities had Coartem or another brand of artemether/lumefantrine (ALU), an anti-malarial, in stock, as well as cotrimoxazole, which is used to treat a variety of infections. Malaria tends to receive more political and donor support, so cotrimoxazole availability is probably a better indication of what could be expected for amox DT in future rounds.

Because the survey occurred during the ongoing distribution of donated amox DT, a clear counterfactual cannot be determined. However, at least three pieces of evidence suggest the donated drugs were reaching the health facilities and improving stocking levels:

- Groups B and C showed ~60% higher levels of availability and ~80% higher total stocks than group A. This most likely underestimates the impact of the program, as the B and C deliveries had not been completed. It is also possible that some stocks from B or C were transferred to group A facilities informally.
- The total stocks in group B were ~40% higher than in group C. Deliveries to both B and C were ongoing at the time of the survey, but deliveries to group facilities in group C began later than those in B.
- Fewer facilities in groups B and C had amox OS available than in group A. It is therefore unlikely that the higher stocks of amox DT were due to better general supply chains in B and C.

Of the ADDOs:

- None had ever stocked amox DT, even though a vast majority had ever stocked amox OS and had it available on the day of the survey.
- Similarly, a vast majority had cotrimoxazole and Coartem/ALU available.

Round 1: providers' knowledge and behavior

Diagnosis

Less than half of surveyed providers reported that pneumonia should be assessed by looking for chest indrawing and counting the child's breaths. Knowledge was somewhat stronger in hospitals than in health centers and dispensaries. About half of all providers identified at least one of the two symptoms. These figures represent

an important opportunity for improvement, but it is possible that providers' behavior in practice differs from what they tell surveyors they would do.

Providers were also given a patient scenario adapted from a task developed in partnership with the World Health Organization (WHO) and used by other groups. It was done before the questions on diagnostic criteria to avoid priming. However, many providers had difficulty switching from answering regular survey questions to engaging in the role play, so the results do not warrant firm conclusions about the know-do gap. Much better data on these issues will be available by early 2018.

Treatment

About three quarters of surveyed providers cited pediatric amoxicillin as the first choice pneumonia treatment, with knowledge slightly stronger in hospitals and health centers than in dispensaries. Of those who answered correctly, about two-thirds said they would give that treatment to a child who had the two main symptoms and did not have malaria or diarrhea in the patient scenario. It is possible that the figures can be partly explained by providers switching to other treatments due to stockouts of pediatric amoxicillin, in which case improving stock levels may improve treatment practices.

Encouragingly, providers who had been trained in the Integrated Management of Childhood Illness (IMCI) in the past three years and had amox DT available on the day of the survey were more than twice as likely to identify amox DT as the first line treatment.

Patient register data are of mixed quality. Of all cases where pneumonia was the diagnosis, the child was under 5, and the information was written down, more than half were prescribed amoxicillin or other penicillin medication.

Again, more reliable methods will be used to gather data later this year, including direct observation of prescription practices.

Dispensing

R4D investigated various ways of determining how much of the amox DT reached patients. As expected, the dispensing register data were not of high enough quality: pediatric and adult formulations were not always differentiated, and the units of measurement used in records were not consistent across health facilities, so it was unclear whether the figures referred to bottles, tablets, capsules, or dispersible tablets. One bottle of amox OS is equivalent to one course of treatment, whereas 20 tablets are required for one course, so the data were not considered useful enough to be worth collecting in Round 2.

However, R4D discovered that every facility keeps a store ledger, which details the amount of stock that moves from the facility's store into the dispensary area, and this differentiates between formulations (tablets, capsules, etc.). The figures in the ledger will be used to estimate dispensing levels: the quantity of amox DT available in the dispensing area in Round 2 will be subtracted from the quantity in that area in Round 1 plus the quantity recorded in the ledger in the intervening period. These

figures will not tell R4D whether it was the right treatment for the patients' condition, or even allow firm conclusions about how much actually reached patients; some may be lost to theft, disposal (e.g. due to expiry), or other leakage. However, it is the best proxy R4D could find at this time.

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