

Reducing Child Mortality in Tanzania by Increasing Access to Pediatric Pneumonia Treatment: A Case for Increasing the Role of the Private Sector

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EXECUTIVE SUMMARY

Private-sector participation in increasing availability, affordability, and awareness of childhood pneumonia treatment, Amoxicillin Dispersible Tablets (Amox DT), is a critical step towards achieving the Government of Tanzania (GoT)'s goal of reducing childhood mortality by 80% by 2030. The GoT, in collaboration with Results for Development (R4D) and other partners, has made progress towards better understanding and addressing supply, demand, and regulatory barriers. Key actions to date include ensuring a well-enabled policy environment; developing a holistic pediatric amoxicillin market view which has been shared broadly with partners to increase transparency across the supply chain; and piloting the impact of ADDO (Accredited Drug Dispensing Outlet) sensitization efforts on improving knowledge, stocking, and dispensing behaviors.

These activities have resulted in an increase in the number of registered Amox DT suppliers from one to eight since 2014, and a 6-fold increase in import volumes of Amox DT from 2016-2020 in the private sector. However, there is room for additional progress as ADDO surveys conducted in 2017 and 2019 found ~0% availability of Amox DT at ADDOs and low demand for Amox DT is a common challenge noted at each level of the supply chain^{7,11}.

To address this challenge, a harmonized and systematic sensitization approach from the GoT and partners that is designed to increase awareness and generate demand across the private sector Amox DT supply chain is crucial. Further, it is suggested that additional monitoring, evaluation, and analysis are undertaken to understand the root causes of low demand for Amox DT among prescribers. This information can be leveraged to further enhance continued sensitization strategies that support the GoT in building a sustainable private sector market for Amox DT.



Drug dispenser helping a client at an Accredited Drug Dispensing Outlet (ADDO) in Dar es Salaam. © Results for Development

BACKGROUND & OVERVIEW

Preventing deaths in children under five (CU5) remains a global priority, and a critical goal for the Government of Tanzania (GoT). With a commitment to reduce childhood mortality by 80% by 2030, Tanzania has a continued focus on reducing childhood pneumonia, which is the leading cause of death in CU5 at 15%¹. Since 2014, the GoT, with the support of partners, has been working to enhance access to childhood pneumonia treatment by increasing availability, affordability, and awareness of Amoxicillin Dispersible Tablets (Amox DT), the first-line treatment for childhood pneumonia recommended by the GoT and the World Health Organization (WHO).

To achieve Tanzania's childhood mortality targets, focused efforts are required within the public and private health care sectors, given the critical role they both play within the Tanzanian healthcare landscape. A closer look at the public health sector, which accounts for 70%

of the health care system in Tanzania², demonstrates various efforts led by the GoT and supporting partners to increase access to Amox DT. In 2014, the GoT updated its clinical guidelines (i.e. Integrated Management of Childhood Illness Guidelines, Standard Treatment Guidelines, and Pediatric Standard Treatment Guidelines) and National Essential Medicines List to include Amox DT, encouraging various advancements in the public sector Amox DT market. An aligned regulatory environment enabled the sourcing and administration of catalytic financing to procure approximately 159.4 million tablets of Amox DT - equivalent to approximately 8.9 million full courses of treatment for childhood pneumonia. This catalytic financing has been complemented by disbursements from the GoT to support the full projected needs of the medicine over the past five years. Additionally, efforts to strengthen quantification and supply planning methods for Amox DT have led to an increase in the average monthly consumption from 1.3M tablets in 2015 to 3.2M tablets in 2020^{7,11}. This translates to a 140% increase in projected monthly demand over the past six years, which more accurately accounts for national demand while ensuring consistent access^{3,4}. Further, in developing a sustainable procurement strategy for Amox DT in Tanzania, ownership of procurement processes was also shifted from international procurers to the country's Medical Stores Department (MSD), who has been serving as the national procurement agency for Amox DT in the public sector since 2016.

The private sector in Tanzania is as critical as the public sector to driving health outcomes, and focused efforts to increase access to Amox DT in the private sector are needed simultaneously. The proportion of the population that seeks care in the private sector (i.e. ADDOs or private clinics), particularly in rural areas where most Tanzanians reside, can be as high as 80%^{5,6}. For acute illnesses, that proportion is still over half, at 52%. Further, for the remainder of patients that seek care at a public health facility, the private sector still plays an important role as a source of treatment in the event of stockouts – 90% of public health facility dispensers state that they would refer patients to ADDOs, when prescribed medicines are unavailable in their health facility⁷. To date, the GoT has made advancements to improve the private sector Amox DT market with a focus on regulatory and supply/demand generation activities, many of which are detailed in the *Interventions Summary* section below. While these activities have led to some significant gains, evidence suggests that progress in the private sector is lagging behind that of the public sector, and remains an area of significant opportunity for increasing access to Amox DT. Findings from surveys at the point of care within the public sector (at the health facility level in 2020) and private sector (at

the ADDO level in 2019) point to a sizable difference in Amox DT availability, with public health facility availability at >75% and ADDO availability at just 1%^{9,11}. It is clear that further intervention and effort is needed in the private sector to drive progress similar to what has been seen in the public sector in order to achieve the GoT's targets around child mortality reduction. In the following sections, this policy brief details activities to-date and proposes key areas for dedicated intervention.

INTERVENTIONS SUMMARY

To catalyze the scale-up of Amox DT availability in the private sector, the GoT in collaboration with R4D has sought to better understand and address supply, demand, and regulatory barriers. Programmatic interventions targeting these key market drivers have been implemented at various levels of the private sector supply chain starting from manufacturers down to private retail outlets such as ADDOs. These interventions are highlighted below.

- 1. Increasing market transparency amongst high-quality Amox DT manufacturers and their importers in Tanzania** by sharing information about Tanzania Medicines and Medical Devices Authority's (TMDA) registration processes, updates in Tanzania's regulatory and procurement landscapes, and the size of the public sector market as detailed in publicly available quantifications, to collectively demonstrate the business case around a growing Amox DT market in Tanzania. These efforts have been critical in encouraging the registration of high-quality Amox DT suppliers and establishing a secure supply base. Additional efforts here included hosting workshops in partnership with the GoT to sensitize importers on the value of Amox DT and its growing market given its classification as the recommended first-line treatment for childhood pneumonia.
- 2. Developing a holistic pediatric amoxicillin market* view across the private and public sectors and conducting trend analysis** through regular check-ins with existing pediatric amoxicillin importers. Check-ins cover topics such as successes, challenges, pricing information, and volumes of imports and sales, which are then aggregated with procurement and distribution data from MSD. This enables a continuous pulse-check of the Amox DT supply landscape and proactively flags supply-side issues requiring attention.

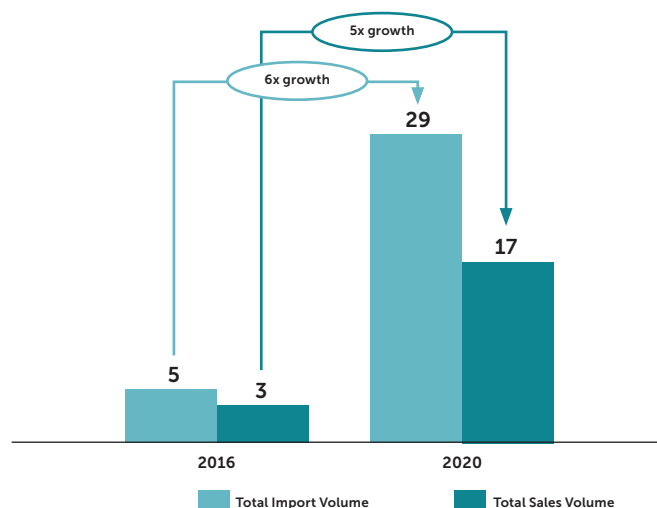
* Pediatric amoxicillin refers to the dispersible tablet and oral suspension formulations of amoxicillin.

3. **Enhancing visibility, transparency, and relationships with wholesalers** by conducting a wholesaler landscape analysis. This has helped to clarify wholesaler process flows, identify motivating factors that drive wholesaler purchasing behaviours and define opportunities and challenges. Key learnings from these efforts can be used to activate wholesalers and leverage their critical roles in ensuring Amox DT flows through the supply chain from the importers to private-sector points of care (i.e. ADDOs and other private retailers).
4. **Piloting and assessing the impact of Amox DT sensitization workshops with ADDO personnel** to understand if such workshops can play a role in improving Amox DT knowledge levels and stocking and dispensing behaviours at ADDOs. The subsequent assessment provided helpful insights on the potential of Amox DT sensitization workshops to immediately change knowledge and behaviors. The assessment also demonstrated the longevity of this potential impact, highlighting the benefit of conducting such workshops at a national level, with the aim of increasing access to Amox DT at rural points of care.
5. **Assessing availability of Amox DT at ADDOs** to better understand and quantify the 'availability gap' in a critical part of the private sector. Prior to this assessment, there was limited evidence and understanding of Amox DT availability within ADDOs, making it difficult to identify the scope of the challenges and the root causes. To build collective knowledge, surveys were conducted in 2017 and 2019 to assess Amox DT availability, stock-on-hand levels, as well as Amox DT stocking and dispensing trends in the regions of Kagera, Mtwara, Pwani, and Dar-es-Salaam.
6. **Ensuring a well-enabled policy environment** in the private sector by successfully advocating for the inclusion of childhood pneumonia and Amox DT in ADDO training manuals. Further advocacy has centered on the inclusion of Amox DT on the ADDO medicine list, which is in the final approval stages.

KEY FINDINGS

1. **The number of Amox DT suppliers registered within Tanzania has increased since 2014.**
The number of Amox DT suppliers registered with the TMDA has increased from one to eight since 2014**. Three of these suppliers are certified as having Good Manufacturing Practices (GMP) as defined by the WHO (i.e. WHO-GMP certified)⁸. This increase in the number of suppliers has led to greater supply security and price competitiveness, amongst other aspects, resulting in a healthier market.
2. **Import and sales volumes of Amox DT in the private sector are increasing.**
Increases in imports and sales are important to ensure steady supply of Amox DT through all levels of supply chain. Landscape analysis shows that these volumes have increased five to six fold from 2016-2020 (see Figure 1), which suggests that there is increasing demand for Amox DT at the importer and wholesaler levels⁸.

FIGURE 1: Reported Annual Amox DT Sales and Import Volumes (10 x 10 Packs of 250 mg in '000)



3. **Wholesalers are key influencers of the private sector supply chain and their role should be significantly leveraged to increase availability of Amox DT.**
While wholesalers play a critical role in the private sector supply chain, awareness and availability of Amox DT amongst this group continues to be a challenge and poses a significant area of opportuni-

** Suppliers include Milan Laboratories, Medopharm, Sandoz, Laboratories and Allied, Sparsh Bio-tech, Kopran, Theon Pharmaceuticals, and IPCA Laboratories

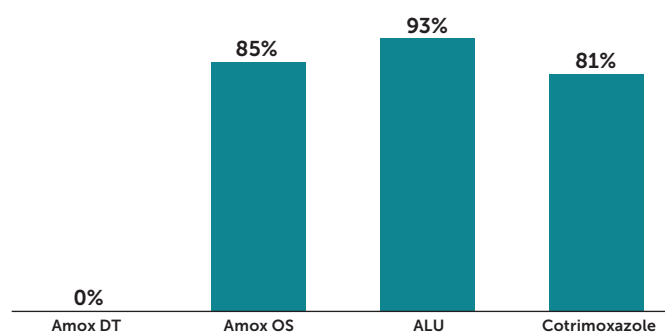
ty. 93% of ADDO personnel surveyed identify wholesalers as their primary source of information to learn about new medicines¹¹. However, preliminary analysis suggests that only four out of ten wholesalers have Amox DT in stock at any given point in time¹³. Furthermore, the 23% of ADDO personnel who report shortages within their outlets attribute wholesaler stockouts as a key reason¹¹. The top three reasons for low stocking levels amongst wholesalers include: (i) Low demand; (ii) Lack of awareness of Amox DT profit margins and (iii) Uncertainty about whether ADDOs are allowed to sell Amox DT¹³. Given their critical role within the private sector supply chain, further activation and sensitization of wholesalers on Amox DT is exceptionally warranted.

across various dimensions, including knowledge of the medicine and its use (79%) as well as where to purchase it (26%)⁷. Low availability levels amongst ADDOs is also somewhat driven by misaligned policies – Amox DT is not clearly listed on the ADDO Medicine List which is responsible for indicating the medicines that ADDOs are able to stock and dispense (see Figure 3)⁷. These results indicate the need for increased awareness of Amox DT as the first-line treatment for childhood pneumonia and the need for more wholesalers that can supply this medicine to ADDOs.

4. Availability of Amox DT within ADDOs remains significantly low.

In 2017, zero out of 135 ADDOs across three Tanzanian regions had Amox DT stocked on the day they were surveyed. This is significantly lower than the number of ADDOs who stocked Amox OS (85%) and other essential commodities for childhood illnesses such as ALU for malaria (93%) or cotrimoxazole for other infections (81%) (see Figure 2)⁷. Similar results were seen in 2019, where only one out of 178 ADDOs had Amox DT in stock on the day of the survey¹¹. These findings suggest that a majority of children diagnosed with pneumonia in rural parts of Tanzania do not have access to Amox DT through these last-mile drug outlets, and they are likely receiving an alternative medicine and not the first-line treatment stipulated by the GoT and WHO.

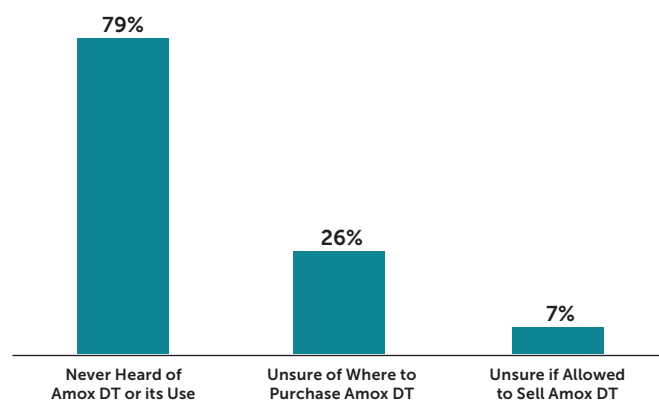
FIGURE 2: % of ADDOs who had Amox DT, Amox OS, ALU or Cotrimoxazole Available on the Day of Survey (n=135)



5. Lack of awareness is the primary contributing factor to low availability levels of Amox DT amongst ADDOs.

Further investigation on reasons for low availability of Amox DT at ADDOs indicates that the primary factor is a lack of awareness of Amox DT by key personnel

FIGURE 3: Primary reasons for not stocking Amox DT amongst ADDOs (n=135)



6. Awareness of Amox DT as the first-line treatment for childhood pneumonia, and knowledge of accurate dosing, can be strengthened and sustained amongst ADDO owners and dispensers through sensitization workshops.

Awareness levels of Amox DT as a medicine amongst ADDO personnel that participated in a sensitization workshop jumped from 58% prior to the workshop to 93% two months after the workshop¹¹. These knowledge levels were sustained for as long as six months after the workshop was conducted. Similar trends were seen amongst ADDO personnel when assessed on their knowledge levels of Amox DT as the first-line treatment for childhood pneumonia (see Figure 4, next page)¹¹. Furthermore, knowledge levels of correct dosing of Amox DT amongst those that attended the sensitization workshop were three and a half times higher than those that did not attend the workshop. Similarly, knowledge levels of correct dosing frequency for Amox DT were almost two times higher amongst those ADDO personnel that attended the workshop (see Figure 5, next page)¹¹. These results indicate that sensitization workshops are valuable in creating improvements

in knowledge and awareness for medicines, such as Amox DT, where awareness lags policy changes.

FIGURE 4: Amox DT Awareness Levels of ADDO Personnel that Attended the Workshop and ADDO Personnel that Did Not Attend

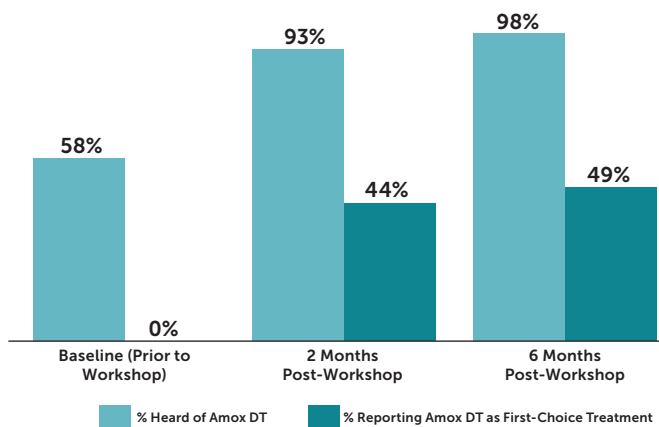
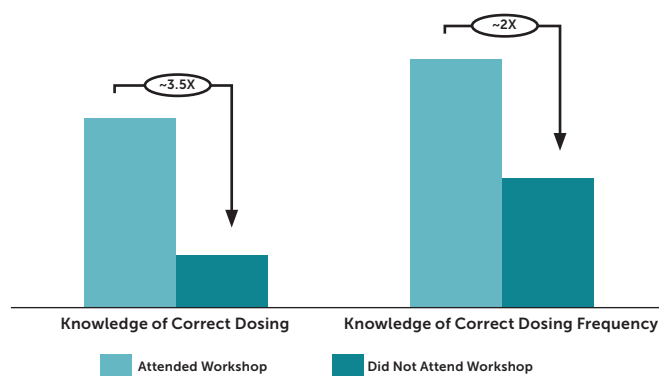


FIGURE 5: Knowledge Levels of Amox DT Medicine Amongst ADDOs Sensitized



7. Amox DT stocking and dispensing behaviours at the ADDO level are positively impacted by sensitization workshops.

Amox DT stocking behaviours, defined as the number of ADDOs who had Amox DT in stock on the day of survey, increased from 1% prior to the sensitization workshop to 51% two months after the workshop. The same trends were also seen when assessing Amox DT dispensing behaviours during the same period, with positive dispensing behaviours defined as those ADDOs that recorded Amox DT dispensed within their sales registers¹¹. The immediate impact of sensitization workshops on stocking and dispensing behaviours at the ADDO level further defines the value-add of these trainings when introducing new drugs into the private sector market.

8. Integrated follow-up and monitoring mechanisms are critical to ensure stocking and dispensing behaviours amongst ADDOs are sustained.

Although the immediate impact of sensitization workshops on Amox DT stocking and dispensing behaviours of ADDOs is positive, there remains an opportunity to ensure that these behaviours are sustained over time. For example, the number of ADDOs that had Amox DT in stock on the day of survey decreased by 10% (from 51% to 41%) when comparing survey results from two months and six months post-workshop. Key reasons for the reduced stocking rates include stockouts at the wholesale level, low demand, delays in receiving the medicine, and not ordering Amox DT on time¹¹. Moreover, the number of ADDOs that dispensed Amox DT reduced by 28% (from 51% to 23%) during the same comparative survey periods. The reasons cited by ADDOs for this reduction include stockouts at the ADDO level, consumer preference for Amox OS, and a higher level of incoming Amox OS prescriptions¹¹. Reasons contributing to the decrease of stocking and dispensing behaviour reinforce the challenge of low demand across the private sector supply chain, and also suggest the need for integrated periodic follow-up mechanisms – potentially twice a year – with ADDOs to ensure that the immediate improvements in stocking and dispensing Amox DT are sustained.

9. There are some efforts to increase access to Amox DT in the private sector, but partners strategies are fragmented.

Multiple partners in Tanzania are supporting the GoT on increasing access to and awareness of childhood pneumonia treatment and Amox DT in the private sector. While this is a good starting point with some gains made, there lacks a holistic and coordinated strategy for Amox DT in the private sector that partners can align with and anchor their support on. Without the development of a coordinated strategy, efforts amongst partners are fragmented and imbalanced with some regions receiving more support to increase access to Amox DT over other regions. For example, only two key partners are working in eight regions while 23 regions lack dedicated support, raising concerns about equity across the nation, and fundamentally, progress piloted in certain contexts are not scaled, representing significant missed opportunities for broad-based impact¹⁴.

RECOMMENDATIONS

As outlined in this policy brief, efforts to scale up access to Amox DT in the private sector by the GoT and supporting partners have led to some gains. Despite this progress, there remains significant opportunity to ensure that this life-saving drug is equally accessible to all children, regardless of where their care is sought. Findings related to the implementation of the interventions described above have uncovered additional areas of action that are needed in the private sector. The following actions are recommended for government and non-government partners alike to build on the aforementioned efforts and support increased access to Amox DT in the private sector.

1. Continue to monitor the pediatric amoxicillin market and encourage registration of additional high-quality Amox DT suppliers to ensure a healthier and competitive Amox DT market.

Increased market transparency efforts that have taken place over the last four years have led to success in ensuring a secure supply base for Amox DT in the private sector through the registration of Amox DT suppliers. Continued efforts in this area are encouraged in order to add a few more high-quality Amox DT suppliers to the Tanzania market to reach a critical mass that should ensure a sustained, competitive, and healthy market for Amox DT. More importantly, continuous monitoring of the holistic pediatric amoxicillin market is encouraged to ensure a consistent understanding of market trends and proactively identify supply-side issues.

2. Plan and implement a systematic approach to increasing demand generation and awareness of Amox DT amongst wholesalers.

Wholesaler activation is an integral part of a demand generation strategy, given the trusted role that wholesalers play within the private sector supply chain – particularly amongst ADDOs – as a source of key information about new medicines. A systematic approach to wholesaler activation that builds on existing platforms like the Prime Vendor System or existing work being conducted by key partners is recommended. Key considerations for this approach should include: (i) Harmonization of regulatory guidelines (e.g. ADDO Medicine List, Prime Vendor Medicine List) and systematic dissemination of these updates (ii) A sensitization strategy that ensures wholesalers are armed with information and materials that make them confident about sharing Amox DT information with their customers, including dispelling myths related to

Amox DT profit margins; (iii) An upstream linkage strategy where wholesalers are aware of, and connected to, Amox DT importers/distributors within their region to purchase the medicine; and (iv) A downstream linkage strategy where wholesalers are aware of, and connected to, ADDOs within their region to ensure medicines can reach these last-mile drug outlets. To enable these linkage strategies, transparency around updated regional- and district-level private sector supply networks should be made available in order to increase visibility of the landscape of players within the supply chain.

3. Expand Amox DT sensitization workshops for ADDOs nationally across Tanzania to improve knowledge levels and stocking and dispensing behaviours.

Expansion of the pilot ADDO sensitization workshops to more regions across Tanzania is highly recommended, given the positive impact of such activities on Amox DT knowledge levels and stocking and dispensing behaviours of ADDO dispensers and owners. Using existing structures, such as the relationships between regional and district pharmacists and the ADDOs, can be leveraged to optimize reach and efficiency. A prioritization approach, focusing on high-burden regions, is also recommended. Sensitization efforts for this group can be further augmented through the timely dissemination of updated ADDO training manuals that now include childhood pneumonia and Amox DT information. A similar sensitization approach for private pharmacies is also recommended, given their similar role as a source of treatment for patients in urban areas.

4. Strengthen the role of existing pharmaceutical professional organizations to support ADDO owners and dispensers.

There are multiple existing professional bodies; for example, Pharmaceutical Society of Tanzania (PST), and Pharmacy Council, among others; that are well positioned to support ADDO owners and dispensers in the areas of regulatory supervision, advocacy leadership, and capacity building, amongst others. Strengthening the ability of these organizations to build capacity at ADDOs across the nation is highly recommended in order to increase awareness of new commodities, such as Amox DT. These groups can be further leveraged to identify bottlenecks, such as lack availability at the wholesaler level, in commodity procurement across regions. Through informed discussions with owners and dispensers, they are well positioned to identify potential solutions (i.e. pooled procurement mechanisms, coordinated demand generation efforts within the region, etc.) to address these challenges.

5. Conduct analysis to understand the root causes of low demand of Amox DT amongst prescribers and use this information in the development of appropriate sensitization and demand-generation strategies.

Low demand amongst prescribers is often cited as a key challenge, with many prescribers still prescribing Amox OS for the treatment of childhood pneumonia, despite GoT guidelines indicating Amox DT¹¹. Further exploration in partnership with relevant professional bodies on the root causes of this prescribing behaviour is recommended to better understand the inhibited uptake of Amox DT amongst this group. Identification of these root causes can subsequently inform the development of appropriate sensitization materials and strategies which can then be disseminated by leveraging group associations, CME workshops, and written materials (i.e., handouts, posters. etc.).

6. Focused efforts on integrating monitoring and evaluation activities into existing data systems and implementing larger-scale evidence-generation activities can provide further transparency and clarity on the progress of Amox DT availability in the private sector.

Reinforcement activities after sensitization:

As highlighted above, the ADDO sensitization training, while improving stocking and dispensing behaviours in the immediate term, did not lead to high levels of sustained results in this area. This suggests the need for continuous reinforcement post-sensitization, keeping in mind the need to balance costs. Common methods for the reinforcement of learnings gained through sensitization activities include follow-up site visits, mobile messages, and scheduled reminders.

Comprehensive data monitoring systems:

Current data monitoring systems that track availability of commodities at the private sector level, including within ADDOs, are limited. To ensure that the GoT and regulatory partners have continuous visibility of medicine availability at the ADDO level, it is highly recommended that public-sector monitoring systems be expanded to ADDOs, which would require ADDO dispensers to log, track, and submit data on stocking and dispensing volumes. Leveraging and integrating existing data monitoring systems – such as the GoT Hospital Management Information System (HoMIS) – into ADDOs can serve as a foundational platform from which to create a holistic view of Amox DT trends in the

health system and track medicine availability within the private sector.

Private-sector landscape analysis: The 2017 private-sector landscape analysis conducted by R4D in partnership with the GoT and key private-sector players helped to identify challenges, which led to specific interventions being implemented in the private sector. While a comprehensive data monitoring system in the private sector is being developed, an updated landscape and mapping analysis of key market players and regional partners is highly recommended in order to understand the progression of Amox DT import, sales, and availability trends across various regions as well as success and challenges faced. For example, there are multiple partners leveraging various mechanisms to collect real-time data on Amox DT usage and availability. Aggregating this information will be beneficial in building out a more robust data monitoring system and in developing an evidence-based and comprehensive strategy going forward. Strong GoT leadership during the strategy development phase is important to build on the Amox DT successes seen in the public sector, leading to equitable access for children with pneumonia nationwide.

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Pharmacy Council



Tanzania Medicines and Medical Devices Authority's (TMDA)



Pharmaceutical Society of Tanzania (PST)



National Institute for Medical Research (NIMR)



Apotheker