Soft targets or partners in health? Retail pharmacies and their role in Tanzania's malaria control program

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ABSTRACT

The retail sector has been at the center of recent policy debates concerning its role in malaria control programs in Africa. This article closely examines the perspectives of owners and managers of retail pharmacies and drug shops in Dar es Salaam, toward the dominant public health discourse and practices surrounding the deployment of artemisinin-based combination therapy (ACT) as a way forward in malaria control. Drawing on fieldwork conducted between May–August 2007, and July–August 2009, involving in-depth interviews and participant observation in pharmacies and drug shops in Dar es Salaam, the article describes the social realities facing people who manage retail pharmacies, the nature of their interactions with customers, the kinds of antimalarials they sell, and their perspective on how the new malaria treatment guidelines have affected their business. Findings suggest that for most pharmacy owners and managers, it is 'business as usual' concerning the sale of conventional antimalarials, with a majority reporting that the introduction of ACT in public health facilities had not negatively affected their business. Implications of the research findings are examined in the context of proposed interventions to make pharmacy owners and managers more socially responsible and adhere to government health regulations. The article makes a case for actively involving pharmacy owners and managers in decision making processes surrounding the implementation of new treatment guidelines, and training programs that have an impact on their business, social responsibility, and community health. In considering regulatory interventions, health planners must explicitly address the concern that retail pharmacies fill an important role in the country's health care system, and that the complex nexus that drives the global pharmaceutical market often governs their operations at the local level.

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Introduction

There is renewed interest in retail pharmacies and the role they play in the rapidly expanding pharmaceutical market in developing countries (Brieger, Osamor, Salami, Oladepo, & Otusanya, 2004; Goel, Ross-Degnan, Berman, & Soumerai, 1996; Goodman, Brieger, et al., 2007; Goodman, Kachur, et al., 2007; Kamat & Nichter, 1998; Ongore & Nyabola, 1996; Smith, Jones, Meek, & Webster, 2009; Stenson, Syhakhang, Ericksson, & Thomson, 2001; van der Geest & Whyte, 1988; Whyte, van der Geest, & Hardon, 2002). In the domain of malaria control, reports of self-treatment with antimalarials bought over-the-counter from retail pharmacies, often in inappropriate dosages, have driven this interest, with researchers highlighting the central role retail pharmacies play in fostering home treatment of malaria (Hetzel et al., 2008; McCombie, 1996; Snow, Peshu, Forster, Mwenesi, & Marsh, 1992). Researchers dealing with the challenges of home treatment of malaria have acknowledged that they need to better understand the motivations and everyday practices of pharmacy personnel before taking steps to train, regulate and improve their dispensing practices (Granado, Obrist, Manderson, & Tanner, 2009; Marsh et al., 2004).

In much of this published literature, and underlying emerging policy decisions, is the image of pharmacists and drug shop managers in Africa as unqualified personnel who flout regulations, stock prescription-only drugs illegally and sell these in sub-therapeutic dosages (cf. Goodman, Kachur, Abdulla, Bloland, & Mills, 2007; Kachur, Black, Abdulla, & Goodman, 2006). Consequently, it has been argued that the African retail pharmacist needs to be trained and regulated in order to protect the interests of the larger community (Marsh et al., 1999). However, it is debatable whether profit maximization is the singular objective of those who own or manage retail pharmacies; therefore there is an urgent need to

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understand the perspectives of those who manage retail pharmacies before making generalizations about their attitudes and practices. This is especially significant in the Tanzanian context where the Tanzania Food and Drugs Authority (TFDA) has announced its intention to discontinue or upgrade many of the small drug shops (*maduka ya dawa baridi* or DLDBs) in the country with Accredited Drug Dispensing Outlets (ADDOs) or *Duka la Dawa Muhimu* (DLDM) (TFDA 2008),[1] and where plans to introduce greatly subsidized fixed-dose artemisinin combination therapies (ACTs) through retail pharmacies have been finalized (Sabot et al., 2009).

One of the main aims of accrediting retail pharmacies and subsidizing ACTs is to regulate antimalarial supply so that retailers only sell recommended treatments and dosages. The removal of ineffective antimalarials and artemisinin monotherapies from the market is seen as essential for populations to be treated with effective drugs. Researchers and health planners are concerned that resistance to ACT is likely to develop if malarial parasites continue to be exposed to monotherapies (Bosman & Mendis, 2007). In Tanzania, the Tanzania Ministry of Health and Social Welfare (TMHSW, 2006) formally implemented new malaria treatment guidelines in November 2006, requiring the large scale deployment of ACT, popularly known as ALu or *dawa mseto* in public health facilities, to treat uncomplicated malaria (Makundi, Mboera, Malebo, & Kitua, 2007). DLDBs were not included in the national implementation plan (Minzi & Haule, 2008). These new guidelines were implemented five years after the government decided to replace chloroquine (CQ) with sulfadoxine–pyrimethamine (SP) as the first-line treatment for uncomplicated malaria, even as retail pharmacies in the country continued to sell more than a dozen brands of antimalarials including ACT, artemisinin monotherapy and at least one of the other components of ACT (Kachur et al., 2006). The rationales for selling these discredited drugs are often presumed to be profit making. However, these have not been studied in the context of the shift in first-line treatment from SP to ACT.

While the dynamics surrounding the government's policy to replace CQ with SP in 2001 have been well documented (Mbuyazi & Gonzalez-Block, 2005), there is very little published data on the process of change from SP to ALu, following a number of *in vitro* and *in vivo* studies showing unacceptable levels of parasite resistance to SP, and the IMPACT-Tanzania studies which piloted the use of ACT in rural Tanzania (Kachur et al., 2004). Little is known about how the introduction of ACT in public health facilities, and the pressure to discontinue monotherapies has affected the local pharmaceutical market, in general, and the private pharmacies/drug shops, in particular, in terms of their business profitability, sales patterns and customer profiles. Examining the impact of Tanzania's new malaria treatment guidelines on the retail pharmacies is important given the significant role they play in malaria control (Hetzel et al., 2008). There is a need to find out whether pharmaceutical wholesalers and retail pharmacists welcome the policy change or are indifferent toward it, as was the case when CQ was replaced with SP (Williams, Durrheim, & Shretta, 2004).

Drawing on an empirical study, this article examines the everyday, on-the-ground situation and provides insights into how pharmacy owners and shop managers view Tanzania's current malaria scenario, and the government's decision to implement new malaria treatment guidelines. The article seeks to illustrate how owners and managers of retail pharmacies in Dar es Salaam in particular, interpret the dominant public health discourse and practices surrounding ACT as a way forward in malaria control in the context of the everyday realities of their business. By

highlighting the on-the-ground situation, this article calls for a greater appreciation of the challenges facing people who manage retail pharmacies as a first step toward including them in public health initiatives and making them more socially responsible and conforming with government regulations. The next section describes the research setting and methods, followed by research findings, discussion and conclusion.

Research setting and methods

Fieldwork was conducted in Dar es Salaam between May 2007 and August 2007 and July 2009 and August 2009. Dar es Salaam (population: 3.5 million), Tanzania's commercial capital, comprises three independently governed municipalities — Temeke, Ilala and Kinondoni. Temeke district (population: 886,529 in 2007), the largest of the three districts, with an area of 656 sq. km was chosen as the research site for this study because of its topography, infrastructure, population configuration, and the first author's previous ethnographic research in the district consolidated over several years. Of the three districts, Temeke represents a good mix of urban/rural population. While one-third of the district is "urban" and another one-third is peri-urban, the remaining larger section of the district is predominantly rural. Temeke also has a large underserved population, with the least developed health facilities, roads, water, power supply, and organizational infrastructure.

A list of 272 registered retail pharmacies or *maduka ya dawa* in Temeke district was obtained from the Drug Coordinator (municipal pharmacist) at the Temeke Municipal Council. This list formed the sampling frame from which 1/3rd of the retailers were randomly selected for the interview. Two research assistants verified the existence or absence thereof of the various shops on the list. Shops that were not on the list and potentially unregistered and difficult to trace were not included in the sample. Their omission was one of the sampling strategy's limitations. The Tanzania Drugs and Cosmetics Act recognizes two types of pharmacies—Part 1 and Part II. Part I pharmacies, which are generally well stocked with pharmaceuticals, must be run by a registered pharmacist, and can sell any drug registered in Tanzania. Part II pharmacies (DLDB), which are smaller than Part I pharmacies, can be run by anyone with a minimum of 4 years medical training (e.g., nurse, pharmacy assistant), and are legally permitted to stock only over-the-counter products such as painkillers and oral formulations of antimalarials such as SP and amodiaquine (AQ). They are not permitted to sell any antibiotics or injectables (Kachur, Schluden et al., 2006).

An interview guide comprising 25 open-ended questions in Kiswahili was pre-tested on a sample of six drug shop managers who were drawn from the original sampling frame. Their responses, which were not included in the final data analysis, were reviewed and the questions refined in light of the pre-test. Detailed interviews were then completed with 80 pharmacists/shop managers. Of these randomly selected pharmacies, 8% were Part I while the majority (92%) were Part II, or DLDB. Interviewees were asked about their training background, experience in managing a pharmacy, information about stocking and selling of antimalarials and antibiotics, and their observations regarding customers' medicine purchasing practices. The interview guide also included questions regarding their perspectives on the government's initiative to replace SP with ACT, their concerns regarding how the new policy has affected their business, and the problems and challenges they face in managing their shops.

All interviews were conducted in Kiswahili with the help of a research assistant who had substantial training and experience in conducting ethnographic interviews. Oral informed consent was obtained from all interviewees. Copies of letters of introduction and research permit were given to the interviewees to reassure them

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[1] A national rollout of the ADDO initiative is currently under way.

that the data were being collected for research purposes and that confidentiality would be maintained at all stages of the research. Upon completing the in-depth interviews, each lasting 40–50 min, two research assistants gathered additional data on the antimalarials that were in stock. A checklist of 30 brand names of antimalarials was used. Photographs of different antimalarials and antimalarial brands were shown to the interviewees as cues to elicit drugs-related data. All interviews were recorded on a digital audio-recorder, transcribed verbatim in Kiswahili and then translated into English by the second author.

In addition, the first author engaged in three weeks of participant observation, with four to 5 h spent in each of the six purposively selected pharmacies: two Part I and four Part II. Two were near the Temeke District Hospital; two were in Mbagala, a large town located ten miles from the district hospital; and two were in a mid-sized village located in Chamazi ward on the outskirts of Temeke District. The flow of customers in and out of each of the pharmacies was monitored in the six pharmacies for three consecutive days. Managers were also asked to provide information on the number of customers they served during an average week. The first author made detailed notes on the pharmacist–customer interactions and engaged in informal conversations with both the pharmacy personnel and customers, inquiring about the patients' illnesses and views on the availability of the wide range of antimalarials in the last few years. Additional research led by the second author was undertaken in July 2009 and August 2009 to monitor changes in the malaria drugs market, and to do follow-up interviews with some of the pharmacy owners and pharmacists initially interviewed in 2007. While most of the data presented in this article are from phase I of the study, information gathered during phase II of the study have been incorporated into the text. Quantitative data were entered into a spreadsheet and processed using Microsoft Excel. "Text" data were first entered into MS Word and initially processed using ATLAS.ti 6.0 program. The authors reviewed all the interview transcripts line-by-line, and extracted segments and passages that called for a closer analysis, which were then manually encoded and analyzed for cultural meanings that underlie the discourse.

Results

Background characteristics

In Dar es Salaam, women who are in their early 20s, and dressed in ordinary, everyday attire, manage most of the retail pharmacies, especially DLDBs. Owing to a high turnover among those who manage the shops, 48% of the interviewees either did not know or were unsure about the year in which their shop was established. Nine percent reported that their shop was established between 1994 and 1999; 27% said theirs was established between 2000 and 2005; and another 16% said that their shop was established between 2006 and 2007. Clearly, retail pharmacies in Tanzania are a relatively new phenomenon because they were proscribed during the socialist-ujamaa era (Mujinja, Mpembeni, & Lake, 2003). Absentee investors (matajiri or wamiliki) own many of the Part I pharmacies and DLDBs. They commonly operate Part 1 pharmacies through a registered pharmacist ("advisor") who gets a small commission for his services. Many of the shop owners work as doctors or pharmacists at public hospitals in Dar es Salaam and elsewhere in Tanzania. While most of them see the pharmacy as an additional source of income, one well-qualified pharmacist owned four DLDBs at a busy intersection. DLDBs have low capital investment, ranging between US$600 and US$1000 per shop, excluding the cost of the furniture needed to stock and display the pharmaceuticals. Clerks, who usually work alone and describe themselves

as muajiliwa (lit. a hired person) or muuzaji (lit. seller) managed 94% of the shops, having infrequent contact with the shop owners. Significantly, only five owners in the study sample managed their pharmacies on a full time basis, and women employees managed 92% of the shops. At least 2/3rd of them did not have the stipulated four years of training; instead, the majority had completed a one-year training program in general nursing, followed by some practical experience in a public hospital or private dispensary. About 10% of the managers had worked in pharmacies elsewhere before working in the present shop. A small number of them had trained as nurse-midwives with several years of experience working in a public or a private hospital/dispensary before taking up their current job.

Managing a DLDB is a low paying job. Shop managers are typically paid between Tsh 40,000 ($30) and Tsh 50,000 ($40) a month as salary, even as the government has recently introduced a bill that stipulates Tsh 80,000 ($60) as the minimum monthly wage. They work for 10 h a day on average, and often seven days a week. Not surprisingly, for many employees, there is little incentive to remain at their job, resulting in a high turnover among them. Thus, during phase II of the research, only about 20% of the 80 managers/dispensers interviewed during phase I of the study could be traced. New employees had replaced them. Due to the low customer flow into these DLDBs, managers spend much of their time simply waiting for customers. By contrast, managers of Part I pharmacies located near a public health facility are busy, attending to a steady flow of customers. Thirty-five percent of the managers had been working in their pharmacy for less than a year; half of them for less than three months. Twenty-seven percent of them had been working for between 1 and 2 years; 18% between 3 and 5 years; 12% between 6 and 10 years; and the remaining 8% had worked for between 11 and 12 years. As such, the people who manage Part I pharmacies and DLDBs comprise a diverse group in terms of their training background, experience and knowledge of managing a drug shop.

Customer flow and interactions

The daily or weekly number of customers who come to purchase medicines from DLDBs is relatively low because of the small range of pharmaceuticals they have to offer to potential customers. During a typical week, on average, 25% of the shops received 10 customers or less a day; 46% received between 11 and 20 customers; 16% received between 21 and 40 customers; and the remaining 13% (most of them Part I pharmacies) received between 41 and 80 customers. Leah,[2] a nurse-midwife in her late thirties, who has been managing a DLDB since 1998, explained why she believes the number of customers who patronize her shop is low:

> Now there are many new pharmacies in Dar es Salaam, so I cannot say for sure that I'll receive 30 customers today or even 10 because customers have many more shops to choose from. And not everyone who comes to my shop wants to buy medicines; many people just come to me for advice. Others come with their prescription to find out how much it would cost them. And there are those who come to find out the cost of the medicine and exclaim, "Oh! Your medicines are so expensive!"(Lo! bei yako ipo juu!), and leave.

The above quotation suggests that the proliferation of drug shops encourages people to shop around more for a suitable medicine at an affordable price. The shop's location is critical in terms of the business turnover. Shops located near a hospital or a municipal dispensary receive many more customers per day than

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[2] All names in this article are pseudonyms.

those away from a large health facility such as the district hospital, and away from the main road or a densely populated locality. Thus, pharmacy owners compete with each other and with other businesses for building or renting a shop in key locations, particularly at major road intersections or near health facilities.

Interviewees estimated that at least half of their customers come with a prescription, and that about 30% request a medication either by specifying its name or showing the packaging of a previously used drug. The remaining 20% report symptoms and request the pharmacy manager to suggest an appropriate medication. In most cases, pharmacy managers acquiesce to a client's demands because they operate in a competitive health care arena. They also give their customers some advice, however perfunctory, as a means to insure their patronage. Most of the provider–customer interactions which were monitored lasted less than 3 min. These interactions typically involved questions from customers about the availability of a particular drug, the prescription's cost, and the dosage. Customers only occasionally sought a diagnosis. In one case, the pharmacy assistant at a Part I pharmacy spent 15 min with a young woman customer, explaining in detail the dosage, schedule and potential dangers of quinine injections that the doctor had prescribed. In another case, the pharmacist at a busy Part I pharmacy, spent several minutes giving first aid to a young man who had been robbed and badly beaten up by thieves.

Malaria customers

Interviewees provided approximate numbers to indicate the percentage of their customers who come to purchase antimalarials. Thirty percent reported that between 5% and 25% of their customers come with a written prescription for antimalarials or present their symptoms and state that they have *homa* (fever) or *homa ya malaria*. Fifty-five percent said that between 30% and 50% of their customers are malaria patients, and the remaining 15% said that as many as 66%–85% of their customers are malaria patients. Sada, a 28-year-old woman, who has been managing a DLDB since 2003, gave an example of how she has to patiently negotiate with some of her malaria customers:

> There are some customers who know exactly what malaria medicine they want and there are others who are clueless. Yesterday, for example, I had a customer who said that he had tried some antimalarial, which he did not find helpful. The customer said, "Oh! I finished swallowing all six tablets, but my fever is still there." But he could not tell me what tablets he had consumed. So I showed him one box of antimalarial after another and then he pointed to one of the boxes and said, "yes, yes, this one."

Interactions between pharmacy personnel and their customers are mostly cordial. In some cases, however, managers have to deal with customers they describe as *korofi* (quarrelsome). Flora, a 35-year-old woman who has been managing a DLDB for two years, explained:

> For the past few years, people have got used to paying Tsh 300 or Tsh 400 (US$ 0.25–0.30) for antimalarials. Now with all the new brands of antimalarials in the market which are very expensive, people are concerned. Customers complain to me saying, "Why have these medicines become so expensive?!" I try to explain to them that it's because of government taxes, but customers don't believe me. They say I'm being greedy and start quarreling with me.

These comments suggest that there is considerable consternation, especially among the poor, regarding the significant increase in the retail price of medicines, in general, and the availability of various types of antimalarials ranging from Tsh 500 to Tsh 12,000 in the retail market. The available data on the cost of various antimalarials in Tanzania's retail market reveal that ACTs are at least 20 times more expensive than SP.

Data gathered through participant observation in the pharmacies revealed that polypharmacy is commonly practiced, but on a modest scale. Customers who purchased SP, were normally recommended Panadol, aspirin or diclofenac as a companion drug to reduce the fever and muscle pain. During a typical antimalarial drug transaction monitored in six different pharmacies, the customer spent an average of Tsh 700 (range 300–1200). An average transaction involving Ekelfin (SP) made in Kenya plus diclofenac cost the customer Tsh 1200.

Popular antimalarials

All drug shops sold antimalarials—adult and pediatric formulations. Some shops stocked as few as three brands of antimalarials, while others stocked as many as twenty-one different brands. The average number of antimalarial products in stock at the shops at the time of the interview was seven. None of the interviewees reported stocking chloroquine. Few shops had vials of injectable quinine in stock, but these were not prominently displayed. The most popular antimalarial sold in the pharmacies was SP marketed under different brand names. Among the different brand names of SP, Metakelfin was most popular. Metakelfin made in Italy sold for Tsh 2000,[3] and Ekelfin made in Kenya sold for Tsh 800. Twenty-five percent of the interviewees mentioned unspecified Metakelfin as the most popular brand; 17% specifically mentioned Metakelfin that was made in Italy; 14% mentioned Ekelfin made in Kenya, and another 15% mentioned Orodar made in Kenya as the most popular brand. The remaining 29% mentioned numerous other brands of SP/anti-folates (sulfadoxine/pyrimethamine and sulfamethoxazole/pyrimethamine), including Malafin, Tankelfin, and Laefin. Different brands of SP, which were of foreign manufacture were relatively more popular, despite their higher cost, mainly because people considered them to be of better quality and hence more effective than those manufactured in Tanzania. However, this "allure of the distant" was limited to SP and not ACTs which were several times more expensive than "imported" SP.

Interviewees explained that although the government has introduced ALu in public health facilities, SP is still popular among malaria customers because of their familiarity with the drug and the relative low cost. Jennifer, a 31-year-old nurse who has been managing a DLDB since 2002, explained:

> You know, not everyone likes ALu. I know of customers who say that after taking ALu they get heart palpitations (*zinapandisha mapigo ya moyo*), they feel dizzy, they feel all the more sick, so there are many people who prefer SP because they feel that these medicines work better for them. They say that ALu does not suit them, so they buy SP.

The above comments regarding medicine compatibility suggest that despite SP's reputation as a drug that is largely ineffective against drug resistant malaria, one that also occasionally produces severe side effects such as the Stevens–Johnson syndrome, the drug is still popular among adult patients, especially if the particular brand is of foreign manufacture. In other words, even as the Tanzanian government has deployed ACT in public health facilities, there is a parallel market for "older" conventional antimalarials (see also Minzi & Haule, 2008).

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[3] Effective April 2008, the TFDA imposed a ban on this antimalarial brand.

A large majority (80%) of the interviewees averred that the plethora of brand name antimalarials currently available in the market neither confused them nor their customers. One retailer put it curtly: "We live with these medicines, so we know what they are!" Only a small number said that occasionally some customers did get confused. For example, Mama Simon, a nurse-midwife with ten years of experience managing a Part I pharmacy, explained:

> Yes, Orodar is a brand name, but many customers do not know that Orodar is the same as SP. They say, "The doctor has written Metakelfin so why are you giving me Orodar?" I try to explain to them that both Orodar and Metakelfin are SP, that Orodar is cheaper than Metakelfin, that the medicine is the same, only the brand name is different. Some of my customers accept what I say, others don't, so I have to sell them what they want.

The potential for confusion among customers with regard to the different brand names of the same antimalarial and subsequent overdosing in some cases, cannot be overlooked. However, Mama Simon's comments, and the data gathered through participant observation, underscore the fact that pharmacist–customer transactions are often customer-driven, and pharmacy managers routinely acquiesce to customers' demands.

From SP to ALu

At the time of the interviews, 85% of the shops did not stock or sell ACTs, but carried at least one brand of artemisinin derivative/monotherapy – an antimalarial that was a component/partner drug for ACT. The remaining 15% had at least one antimalarial that was a combination therapy, either Coartem or Co-Arinate. Artemisinin-based monotherapies (artesunate, artemether and dihydroartemisinin) were several times more expensive than SP. Antimalarials manufactured in Europe were priced higher than those regionally manufactured in Africa. For example, per dose, Arinate made in Belgium sold for Tsh 7000, whereas a brand from Kenya of the same drug sold for Tsh 5000, and one made in Tanzania sold for Tsh 3000.

All interviewees said that they received customers who asked for ALu. Enock, a senior pharmacist who owns and manages a mid-size DLDB, said:

> Yes, I do get customers who ask for ALu. Some of them have heard about ALu over the radio, and some have previously been treated with ALu at Temeke hospital or they have heard about it from a relative who had recovered from malaria after being treated with ALu. So I get customers who bring a packaging of ALu and say they want the same medicine. They are disappointed when I tell them that they can get ALu only at the hospital.

Majority of the interviewees asserted that the range of artemisinin products available in their shops did not confuse their customers. Although many people are aware of ALu, only a few are aware of the other new antimalarials in the retail market. Most commonly, customers who purchase an expensive ACT are usually those who have been prescribed the drug at a private health facility. The over-the-counter sale of artemisinin-based therapies is uncommon because of the high price of the drugs. At a time when the daily wage in Tanzania averages around Tsh 2000 a day, and the price of a kilo of regular rice is Tsh 800, the new antimalarials sold through private pharmacies are expensive and beyond the reach of the poor and marginalized people, who need them most.

Perceived impact of new treatment guidelines

Interviewees were specifically asked about the impact of the new treatment guidelines on their business. An overwhelming majority (86%) of the interviewees said that they had not noticed any difference in their business following the introduction of ALu in public health facilities. They responded by saying "No, it has not affected the business in a negative way" ("*hapana, sio kwamba imeshaathiri*") or, "No, it has not affected the business in a negative way at all" ("*hapana, haijaathirika kabisa*"). Many of them, including owners and pharmacists interviewed during phase II of the study responded on a positive note, stating that the government had in fact done the right thing by introducing ACT in the country. Only a small number of interviewees mentioned that the new malaria treatment guidelines had negatively affected their business. Andrew, a pharmaceutical technician who has been managing a Part I pharmacy for the past 12 years, had this to say:

> Yes, the government's decision to introduce ALu has definitely affected my business. Until recently, I used to get many patients with a prescription for SP or even AQ. Now because of ALu, the market for both SP and AQ has died (*soko imekufa*), and I don't sell ALu. Many Tanzanians know about ALu, but they don't know about Coartem, so if I tell them that Coartem is the same as ALu, they don't understand, and even if they understand, they will not buy Coartem because it is very expensive.

In Andrew's case, the deployment of ALu in public health facilities had negatively affected his business because his pharmacy is sited near the district hospital, where patients who are diagnosed with malaria are treated with ALu; they are no longer prescribed SP or AQ.

Discussion

In an era of highly subsidized ACT as a way forward in malaria control, this case study has revealed that in Dar es Salaam, for the majority of the pharmacy managers, it is "business as usual" with regard to the sale of conventional antimalarials, especially SP. This finding has important implications for the scaling up of new strategies such as ADDOs, and especially Affordable Medicines Facility − malaria (AMFm), which intends to introduce highly subsidized ACTs in the retail market as a strategy aimed at crowding out monotherapies. While several changes to the private sector are under way in Tanzania, leading to a reconsideration of retail pharmacies and their role in malaria control, this study has revealed that those who manage retail pharmacies and DLDBs are ordinary people trying to make a living in a very challenging economic environment where job opportunities are limited and cash income ever more scarce. Shop managers come from diverse backgrounds, with varied training experience. They have different opinions about their customers and their role in community health and malaria control. Further, those who manage retail pharmacies often have very limited training. Many of the pharmacy owners do not closely supervise their employees, who in turn are subject to customers' preferences and demands. Each of these aspects, including the high turnover among those who manage DLDBs, must be considered in conjunction with current efforts aimed at improving or standardizing the quality of pharmacists' dispensing and communication practices (cf. Brieger et al., 2004; TFDA, 2008).

In the current economic environment, it is unrealistic to expect people to undergo several months of formal training before they become eligible to manage a retail pharmacy, when both the training infrastructure and the reward system in terms of remuneration are meager. Owing to the fact that the owners of many retail pharmacies and DLDBs are medical professionals who are not involved in the day-to-day management of their shops, interventions designed to involve retail pharmacies in malaria control must

be simultaneously directed toward pharmacy owners and managers.[4] Examining their understanding of government rules and regulations, especially those pertaining to the sale of SP and other discredited monotherapies, would be crucial in the context of the AMFm initiative.

Most of the interviewees in this study reported that the sales volume of artemisinin-based therapies in their shops is negligible compared to SP and AQ because of the high cost of these drugs. An immediate concern that needs to be addressed is the continuing sale of SP over-the-counter at retail drug shops, even as researchers have questioned its therapeutic efficacy. Despite the large-scale deployment of ALu, people buy SP from retail pharmacies because of its availability, low cost and perceived efficacy. People also rely on DLDBs to buy these drugs because of the inconveniences and failures of access to medicines through government facilities, or conversely, because of greater convenience and access to service in shops. Limited government control and the high price of ACTs in the retail market also enables wholesalers and pharmaceutical sales agents to continue to promote the sale of antimalarials that are of questionable therapeutic efficacy.

The continuing popularity of SP in the context of large scale deployment of ACT indicates that what is regarded as the best first-line drug from a biomedical perspective may not be consistent with the cultural expectations or cultural reinterpretation of the antimalarials that people consider efficacious. Medical anthropologists have consistently demonstrated that once a drug has been used for many years and is trusted, perceptions of efficacy remain strong, even in the face of declining biological efficacy (van der Geest, Hardon, & Whyte, 1990). Thus, after the Tanzanian government banned the sale of chloroquine in the country starting August 2001 and made SP the first-line drug, Tanzanians did not take to SP easily. They complained about the drug's various side effects and its inefficacy. They also made nostalgic statements about CQ, which reflected their desire to revert to a medication that is accorded cultural significance, and to an era when people had access to an antimalarial that was cheap and readily available (cf. Kamat, 2009; Nsimba, 2006; Tarimo, Minjas, & Bygbjerg, 2001). Following the transition from SP to ACT, a similar pattern is evident, especially among adult patients who believe that SP is more compatible with their bodily constitution and their pocket than ACT. In other words, people determine the suitability of particular types of antimalarials both in terms of cost and their perceptions of body sensitivity and medicine strength (Nichter, 2008). However, additional ethnographic and policy research is needed to ascertain people's expectations of medicines and the contingencies that influence their medicine purchasing and consumption behavior in various contexts.

The abundance of antimalarials sold in Tanzania under different brand names, is also a cause for concern because of the potential for counterfeit or substandard drugs, which can go undetected in a market that is not efficiently regulated. Concomitantly, it is argued that in a free market economy, the availability of a large number of different antimalarial brands will offer more "choice" to the general public. Moreover, it is believed that the increased competition in a larger and secure market will automatically drive down the prices; the market forces will ultimately work in the public's favor. In the year 2007, there were more than 125 antimalarial products registered in Tanzania. Many of these drugs were imported from more than two dozen countries. The flooding of Tanzania's pharmaceutical market with antimalarials has not

occurred in a political and social vacuum; the global pharmaceutical industry has created and responded to the demands of a competitive marketplace. Amid growing criticism against the manufacture and sale of monotherapies, for example, Arinate (artesunate) is reformulated and sold as co-Arinate with sulfamethoxypyrazine/pyrimethamine as the companion drug, while Cotecxin (dihydroartemisinin) is reformulated and sold as Duo-Cotecxin with piperaquine phosphate as a companion drug. While the replacement of monotherapies with ACTs is an encouraging development, as of July 2009, the retail price of both these drugs was Tsh 12,000 (US $9) – far beyond the purchasing capacity of most Tanzanians. Local pharmaceutical companies have also entered the market by aggressively promoting combination therapies such as Co-Malafin with SP and artesunate as the component drugs, and sold at a retail price of Tsh 5500 (US $4). It remains to be seen what the public health consequences of the numerous brands of antimalarials in the market might be, especially in relation to global malaria control initiatives, changing national treatment guidelines, and the national rollout of ACT subsidized at the top of the private sector supply chain and routed through accredited retail pharmacies (Sabot et al., 2009).

Antimalarials priced at Tsh 12,000 ($US9), and displayed prominently in retail pharmacies/DLDBs in Tanzania where most people live on $1 or $2 a day, is a recent phenomenon. The current price structure of ACTs in the retail market is not in the interest of the poor who bear the largest economic and social burden of malaria. These highly effective but expensive antimalarials require increasing out-of-pocket health expenditures, draining away precious resources from people who purchase these drugs out of desperation. Given the high retail price of ACTs that are commonly sold alongside relatively cheap and less effective monotherapies including SP, it may be argued that "new social distinctions are being made based on the individual's ability to pay" (Petryna, Lakoff, & Kleinman, 2006: 7).

Although the Tanzanian government has deployed ACT through public health facilities, many people continue to seek mainly non-ACT antimalarials from retail pharmacies (see also Hetzel et al., 2008). They do this because pharmacies are often conveniently located and operate at convenient times; the waiting time is a few minutes compared to 3 to 5 h at a municipal dispensary or the district hospital; they can "choose" from a wide array of antimalarials and other pharmaceuticals available at pharmacies, and buy the drugs over-the-counter; they can buy antimalarials in proxy on behalf of a family member or a friend; they prefer the welcoming and mostly cordial nature of their social relationships with the pharmacists, and finally, some adult customers believe that the more expensive the drug, the more efficacious it will be, and that inexpensive antimalarials issued through government health facilities are not as effective as the medicines available in the private sector (see also Nichter, 2008). Not surprisingly, many adult patients would rather spend Tsh 2000 on SP that is of foreign manufacture, than wait at a public health facility for several hours before being prescribed ALu at a subsidized price. At the same time, they are unlikely to readily pay Tsh 12,000 for an ACT available at a retail pharmacy. A combination of perceived efficacy and economic reasoning is behind people's choice of drugs, albeit this observation may apply mainly to adult patients and not child patients. Thus, the local context of treatment seeking for malaria in urban Tanzania must be acknowledged and the public health implications of this pattern continuously monitored in a rapidly changing pharmaceutical environment.

As long as the price of ACTs in the retail market remains high, pharmacists will continue to sell conventional antimalarials at a steady pace. The current situation not only contravenes the national malaria treatment guidelines, it may also result in a higher

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[4] TFDA in collaboration with Management Sciences for Health (MSH) currently offers a one-week training course for shop owners and a six-week training course for shop managers or dispensers.

incidence of severe malaria and recrudescence among the general public, given the widely acknowledged SP-related treatment failures (White, 2004). At a time when the implementation of initiatives such as ADDOs and AMFm is well advanced, cooperation from pharmacy owners, managers, and customers will determine the success or failure of these bold initiatives.

Conclusion

The proliferation of retail pharmacies, especially DLDBs in Tanzania's rapidly changing health and social environment mirrors the limitations of the existing public health system to meet the health needs of the community at large. Rather than characterizing those who own and/or manage retail pharmacies and DLDBs as people who break rules without compunction, a more productive strategy would be to reach out to them, and involve them as 'partners in health,' in the decision making process surrounding the implementation of new treatment guidelines, training pharmacy personnel and upgrading existing DLDBs into ADDOs; initiatives that have a direct bearing on their business, social responsibility, and community health (see also Minzi & Haule, 2008). Tanzania's decision to expand the ADDOs and AMFm initiative represents an important step toward appreciating the key role retail pharmacies play in malaria control.

As calls to engage with retail pharmacists and tap into their value and goodwill to avoid wide-scale unregulated use of antimalarial monotherapies are getting increasingly louder, it is important to clearly delineate how this goal might be achieved within the existing legal framework (cf. Hetzel et al., 2008; Kachur et al., 2006; Sabot et al., 2009). Health economists in particular have demonstrated that regulatory interventions tend to be very expensive, and that they often have a limited impact (Mujinja et al., 2003). In considering interventions such as pharmaceutical training, accreditation, consumer education, the pre-packaging of drugs, and the strengthening of regulatory systems to improve the retail sector (Mills, Brugha, Hanson, & McPhake, 2002), health planners must explicitly acknowledge the fact that retail pharmacies have diverse configurations and in many cases their operations are ephemeral in nature as evidenced by the frequent closure of shops and the high turnover among shop employees. While pilot training programs designed to contribute to behavior change among pharmacy managers have been shown to produce encouraging results, programs designed on scale will have to be tailored to suit the background characteristics of the retailers, the duration of their formal training, their work experience, and their motivation to continue with the present job given the overall poor wages they earn. Programs aimed at training retail pharmacists/shop attendants to sell drugs in line with national malaria treatment guidelines, and to serve the best interests of the larger community, however well-intentioned, must take into consideration the fact that retail pharmacies operate at the lower end of a complex "pharmaceutical nexus" that drives the global pharmaceutical market (cf. Petryna et al., 2006; van der Geest, 2006; Whyte et al., 2002).

To that end, additional research is needed to better understand the factors that have led to the overreliance on pharmaceuticals to deal with a global health problem that has its roots in poverty, social and economic inequalities, and malnutrition (Jones & Williams, 2004; Packard, 2007; Sachs & Malaney, 2002; Stratton, O'Neil, Kruk, & Bell, 2008). There is a need to critically examine the relationship between the strategic business interests of the global pharmaceutical companies; the shifting national drug policies; the production, distribution and marketing of pharmaceuticals at national and regional levels; and the patterns of medicine transaction, consumption and interpretations at the local level.

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