Exploring the knowledge, attitude, and practices of over-the-counter medical sellers in Ghana

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Abstract

Background. Rural areas in sub-Saharan Africa face a high prevalence and morbidity of skin disease while also lacking access to dermatologists. In Ghana, where approximately 25 licensed dermatologists are available for 25 million people, community pharmacies, called over-the-counter medical sellers (OTCMS), were established to respond to accessibility inequities, albeit without equitable training.

Objective. Our study evaluates the dermatologic knowledge, attitudes, and practices (KAP) of OTCMS in Ghana's Ashanti Region.

Methods. To assess dermatologic KAP, we created a standardized questionnaire and recorded 13 interviews with OTCMS in seven communities. Interviews were completed with help from Ghanaian translators and transcripts were transcribed verbatim, then analyzed qualitatively to determine common themes for analysis.

Results. This analysis identified six major themes: i) prescriber qualifications; ii) diagnostics; iii) therapeutics; iv) economics; v) health systems integration; vi) care-seeking behavior. Analysis of these themes outlined many cultural roles and challenges of OTCMS, including serving as the primary contact for dermatologic conditions in rural communities. While possibly necessary due to the lack of accessible dermatologists, this raises concerns for potential harm in diagnostic error and misuse of therapeutics due to the lack of formal dermatology training.

Conclusion. In rural parts of Ghana, the KAP of OTCMS play a pivotal role in assessing and treating skin disease for those who might otherwise lack access to adequate dermatologic management. Furthermore, although our study identifies potential issues related to the roles played by OTCMS, it also suggests strategies to improve the dermatologic health of many Ghanaians by enhancing education and healthcare delivery in rural areas.

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Informed consent: the consent for interviews was gathered orally. To protect the confidentiality of interview participants, personal identities, such as names, ages, genders, and names of the individual businesses, were not recorded.

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Introduction

People living in rural areas in sub-Saharan Africa have limited access to healthcare.[1] While current efforts attempt to overcome challenges in meeting the general healthcare needs of this population, little is mentioned regarding dermatologic conditions, which are the fourth leading cause of the non-fatal disease burden worldwide.[2]

To make more healthcare services available in rural Ghana, the Ministry of Health has established a branch of healthcare delivery through community pharmacies, called chemical shops. Chemical shops are owned and operated by local Ghanaians and are regulated by a division of the Ministry of Health called the Pharmacy Council. The required process of establishing one of these shops, beyond completing registration forms and paying licensing fees, includes completing secondary education.[3]

The sanctioned role of chemical shops, officially identified as over-the-counter medical sellers (OTCMS), within Ghana's healthcare system, is distinguishable from the traditional healthcare provider or pharmacist insofar as the medications they are approved to sell. Medical providers and pharmacists can prescribe medications generally considered a greater risk for harm (class A and B), but OTCMS are approved only to sell Class C, or over-the-counter (OTC) and other non-regulated medications (Table 1).[4,5]

Beyond their role in dispensing medications, OTCMS participate quarterly in regional continuing education courses, the focus of which is on treating and receiving general medical instruction on common diseases such as malaria. Importantly, OTCMS are not specifically sanctioned by the Pharmacy Council to assess and

treat medical conditions. The Ghanaian Ministry of Health has recognized the challenges of regulating these efforts as many prescription drugs are sold OTC, including the major challenges of misuse and the increasing risk of counterfeit or substandard drugs.[6,7] Additionally, recent literature has noted a growing trend of medical sellers acting as the primary medical contact for many diseases outside their intended scope, such as challenging dermatologic conditions.[8,9]

Dermatologic diseases have an estimated prevalence of as high as 51% in rural Ghana. One-third of skin disease is estimated to have at least a moderate impact on their lives as calculated by the dermatology life quality index.[10] Access to specialized dermatologic care in Ghana is limited by qualified provider availability, with an estimated 25 dermatologists available to a population of thirty million[11]. Rural areas, with even less access, have seen an evolutionary shift in the roles played by OTCMS, who now serve as the primary point of healthcare access to an ever-increasing array of available dermatologic therapies, including drug classes not approved for sale by OTCMS.

To further explore the impact of these differences in training and regulatory requirements between OTCMS and medical providers or pharmacists, as well as the potential benefits and risks of harm, we qualitatively studied the knowledge, attitudes, and practices of OTCMS in rural communities in the Ashanti region of central Ghana.

Materials and Methods

This qualitative study used a standardized questionnaire to assess: i) perceptions regarding the frequency and the context for which skin diseases presented locally; ii) the local availability of essential dermatologic medicines; and iii) the knowledge, attitudes/opinions of local OTCMS on diagnosing and managing skin disease(s) in the Ashanti Region north of Kumasi in Ghana, West Africa.

The questionnaire was designed to determine the local availability of topical and oral dermatology therapies considered essential medications by the World Health Organization, as well as the self-reported approach to advising and managing skin disease by OTCMS. Additionally, our questionnaire explored the training background of OTCMS and the frequency and nature of dermatologic conditions reported in their respective districts.

Inclusion criteria for participating in the study were: i) employment as purveyor of OCTMS services and products; ii) age of 18 years or older; iii) expressing verbal consent to participate after reviewing an informed consent document.

After pilot testing the interview tool, these interviews strictly followed this questionnaire and had translational assistance from local research assistants fluent in the local language to ensure minimal variability and error. The interviews were recorded with a small, hand-held recorder and, after completing all interviews, transcribed verbatim for qualitative evaluation.

One board-certified dermatologist, two co-investigators, and a neutral arbitrator qualitatively evaluated our interview data. After an initial in-depth review of the verbatim text, the review team first identified emerging themes. Subsequently, emergent themes and a short description/definition were established and assigned a unique color code for analysis. With the major themes acting as a guide, the review team then separately color-coded the entirety of the transcriptions according to their best interpretation of the topic. When completed, they met again and discussed the meaning and application of these themes until a unanimous decision was made regarding the specific themes assigned to each individual line.

Table 1. Drug classifications according to licensure.[5]

Drug Class	Classification	Licensure required	Examples
Class A	Prescription only medicine	Medical practitioners, pharmacists	Type I: amphetamines, antibiotics, antifungals, barbiturates, sulfonamides Type II: narcotics, opioids, steroids, Xanax
Class B	Pharmacist recommended	Medical Practitioners, Pharmacists	Ephedrine, stovarsol, etc
Class C	Over the counter drugs	OTCMS	Chlorhexidine, calamine, benzyl benzoate, etc
Exempted	Other	Any	Aspirin, sodium bicarbonate, etc

OTCMS, over-the-counter medical sellers.

Table 2. The six major themes of over-the-counter medical sellers knowledge, attitudes, and practices.

Theme category	Description
Health systems integration	Chemical shops often serve as a primary point of contact for clients and thus serve as a vital link to the health system, including referrals.
Economics	Chemical shops are private-sector business ventures that follow economic norms such as cost, supply, and demand. Both public and private face similar challenges common to other businesses, including competition, revenue generation, and some regulatory oversight.
Qualifications	Chemical shop workers report a wide variety of preparatory training and qualifications, including continuing education.
Diagnostics	Chemical shop workers incorporate a client's history and, sometimes, physical exam findings to diagnose dermatologic complaints of clients although there appears to be wide variability in diagnostic approaches. This also includes diagnostic uncertainty and questions regarding decision-making (algorithmic approaches and lack of knowledge).
Therapeutics	Chemical shop workers show an understanding of therapeutic indications for most dermatologic drug classifications, but narratives suggest that inappropriate use of such drugs is common. Attempting multiple empiric therapeutic trials until the skin condition resolves or clients seek alternative therapy is common. This category also includes diagnostic ordering tests and traditional medicines.
Care-seeking behavior	Care-seeking behavior among clients is driven by multiple factors, including cost, accessibility to or familiarity with a care provider (orthodox or traditional), and treatment outcome.

Ethical considerations

The University of Utah Institutional Review Board reviewed this study and determined it to qualify as exempt research: category E (IRB#122530). We pursued this exemption due to the lack of human subjects, including the overall qualitative and informative basis surrounding our objective of understanding the interplay of OTCMS within the Ghanaian healthcare system. The consent for interviews was gathered orally. To protect the confidentiality of interview participants, we did not record personal identities - such as names, ages, or genders - nor did we annotate the names of the individual businesses.

Results

We completed interviews with 13 distinct OTCMS across 7 communities in the Ashanti region of Ghana over two weeks and established 6 major themes outlining the structure of our analysis regarding the KAP of OTCMS (Table 2).

Health systems integration and qualifications

Our interviews importantly identified perceptions regarding the commonality of skin conditions presenting to OTCMS within rural Ghana:

"Interviewer: OK so each week how would you say how many people come in the shop to be looked at or treated for a skin problem?

Shop owner: For a week umm, we see like umm… about 80 clients."

Specifically, 11 of the 13 interviewees reported seeing at least one patient per day presenting with a skin problem. Additionally, the OTCMS interviewed detailed a specific cultural expectation of their perceived role as a primary provider for dermatologic conditions, including the evaluation, diagnosis, and treatment dispenses for these conditions.

"Interviewer: So those that come before going to the hospital, do you examine them yourself and try to figure out what is wrong with them?

Shop owner A: Yes, normally I examine them, but I can say that sometimes they have to come so I can see the rashes that come onto their bodies and any other skin diseases.

Interviewer: Ok, so if you see it and you know what it is, you'll just give them the medication?

Shop owner A: Yes."

"Interviewer: What do you do for chickenpox? Well first of all, what do they look like or what do they come in with if they have it?

Shop owner B: Yeah chickenpox, this is a serious airborne disease; when a person appears maybe there are some people here, we need the person to wait outside, and we'll come to observe and see how it is. Then we will advise the person on why we left him outside, it can easily affect those who are inside here."

Through many examples such as these, the OTCMS we interviewed self-identified as essential contributors to the health system within their rural communities. The difficulty for local Ghanaians to be treated by a dermatologist was commented on in several interviews.

"Interviewer: And if you only have a few dermatologists how hard is it for them, to see a dermatologist?

Shop owner: It's… it can be a problem.

Interviewer: Very problematic?

Shop owner: Yes."

Furthermore, many of the interviewers mentioned this problem as partially being caused by the lack of medical centers in their cities, where only 1 of the 7 had a small medical center. In their own words, the OTCMS stated that they were the primary and sole providers for skin disease in their area.

With such an important role, it was important to outline their qualifications. However pivotal their integration into the Ghanaian healthcare system, the background education showed a wide variety of sources and training (Figure 1).

Additionally, no consensus was observed regarding the importance or regulation of continuing education offered by the Pharmacy Council, including regular attendance; 5 of 13 interviewees reported they had never attended courses at all, while one specifically received their primary education from the same:

"Interviewer: Where did you learn your pharmacologic knowledge?

Shop owner: From a council, we meet twice a year at a hotel and sometimes at a flat where we learn about all the diseases or sicknesses that come to our country then they will train us on the medicines that are used for treatment."

This is important because, although acting as dermatologic providers, those familiar with the courses stated that the continuing education courses were seldom specific to the management of skin disease. Instead, they reported that the common focus of these meetings included evaluating and managing common infectious diseases, such as upper respiratory infections or malaria.

Diagnostics and therapeutics

Through our 13 interviews, the most common skin conditions reported by OTCMS were dermatitis and fungal or viral infections. Conditions such as acne and cysts or scars were less common (Figure 2).

Additionally, we noted wide variations in approach to the dermatologic physical exam, including how interviewees interpreted and categorized information from patients. Discrepancies within this ability varied greatly, with some interviewees being candid in expressing a complete inability to diagnose certain common conditions:

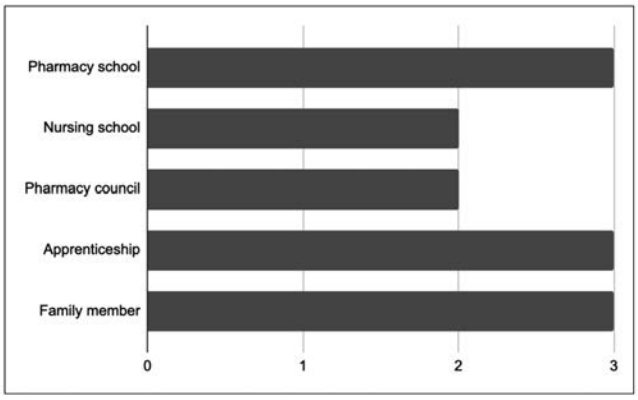


Figure 1. Training backgrounds of medical sellers.

"Interviewer: What do you give for bacterial skin problems?
Shop owner: We can look at the skin. If it's a bacterial infection, we can't tell.
Interviewer: You can't tell?
Shop owner: No. The person must go to the hospital."

While this comment shows that the shop owner had good insight into their diagnostic limitations, and funneled patients to higher levels of care when needed, this was not universal across all interviewees. Furthermore, all OTCMS interviewees specifically noted the lack of any diagnostic tool, such as microscopy, stains, biopsies, or microbiologic cultures, and instead relied exclusively on the heuristics derived from their training.

Knowledge of dermatologic therapies and their clinical applications also greatly varied among OTCMS regarding medications dispensed (*e.g.*, topical or oral treatments) for skin diseases reported, including some specific therapeutic errors:

"Interviewer: For dermatitis, do you know what they commonly prescribed for something like that?
Shop owner D: For dermatitis they normally prescribe Flucloxacillin antibiotics."

"Interviewer: Yeah, okay. So how are you trained to tell the difference between ring worm and eczema?
Shop owner E: For eczema I give Griseofulvin, it depends on the age or weight of the person."

"Interviewer: Do you see eczema?
Shop owner F: I treat it with funbact-A (triple cream) that one is very effective. About 90% of people say it works for them."

Common practices included providing antibacterial, antifungal, or antiviral medications interchangeably for conditions that were evaluated and assigned the same diagnosis, while also dispensing antibacterial therapies for perceived fungal and/or viral conditions, and vice versa. Lastly, many conditions that were considered infectious were treated empirically with triple-combination creams, which included a variety of anti-bacterial, anti-fungal, and corticosteroid components.

Care-seeking behavior and economics

OTCMS reported financial or economic challenges faced within traditional business atmospheres, such as problems due to distribution, monetary influences on consumer decision-making, and challenges brought on by industry regulations.

In the Ashanti region, the general lack of convenient access to transportation, when combined with the vast distances seen in these communities (the seven communities ranged from 16.1 to 30.1 km away from the region's nearest hospital, with an average distance of 21.9 km), was a major influence over business transactions. This was commented on throughout our interviews as both an impact on supply chain management, often due to distribution channels for medications that faced logistical problems with local road and commuter infrastructure.

Economic concerns from the consumer purchasing decision perspective created pressures surrounding the decisions to turn away potential clientele because of medicine shortages or lack of alternative treatment options:

"Interviewer: What are the challenges you face as a chemical shop owner in this community?
Shop owner: The challenges are based on money. People can't afford the medications they need. As chemical shops we are not supposed to sell antibiotics, but people need them for wounds."

Others mentioned challenges with insurance:

"Interviewer: What about bacterial skin infections?
Shop owner: Bacterial skin infections do come. When you're dealing with insurance you cannot say bacterial skin infection. They won't pay it, they have given it a name dermatitis. When they see dermatitis, they think it is a bacterial skin infection or a fungal skin infection."

While several even mentioned varying offering medications that were not specifically indicated to stay competitive within their markets as the standard regulation protocols appear to be poorly controlled:

"Interviewer: So, it sounds like sometimes they do sell that when they shouldn't?
Shop owner: Yes, sometimes they do because of the laws are not being enforced as they're supposed to. With the Ghanaian market even when they come in like if you want to find out why the few… I mean they have the money and they're supposed to be served. Whatever they walk in for… there is a limited number of those that are expensive. Telling the pharmacist or whoever is here the reason for the drug and some of them they just hear it. Maybe from the radio, maybe through a conversation and then others from a recommendation from friends who had this condition. And they went to the hospital that was getting this drug. If they present with similar conditions, then they just go on buy this and then they think they want this. If you want to out why you are asking too much. So, we have a lot of challenges in our practice in Ghana because of the regulations."

Many of these business decisions surrounded what was described as care-seeking behavior, with some businesses choosing to focus on the business aspect of the practice over medical concerns due to the ever-present market pressures:

"Interviewer: So, if I said I wanted isotretinoin and you didn't give it to me I could walk on the street and get someone to give it to me?

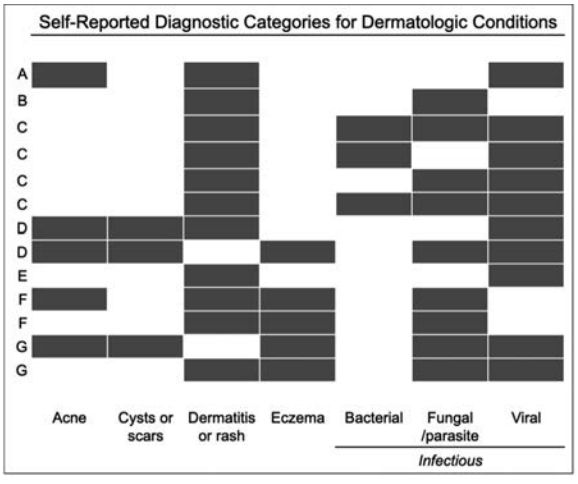


Figure 2. Specific disease categories cited by each over-the-counter medical sellers, organized by the furthest city from Kumasi (A) to the closest (G).

Shop owner: Yes, that is what I'm saying. So sometimes you want to look at the business aspect you may not do the right thing but at the end of the day, it's a practice. It is a professional body and then there's a whole lot of implications attached to whatever you were doing. I have to ensure that it's the right thing is done."

The balance of business practices in contrast with patient goals was mentioned by many of those interviewed. Other OTCMS also noted a similar issue that applied to other drugs not currently allowed within the OTCMS regulations as outlined by the Pharmacy Council:

"Interviewer: Let's say I wanted to have some of your antibiotic, an oral antibiotic?

Shop owner: OK for an antibiotic it's classified as class B. That's a pharmacy drug. When it's a pharmacy drug it can't be recommended by a pharmacist so once you come in then you want to buy… there are a few questions we ask. We want to find out why you want it, whether it's a continuation of a prescription drug that you're already taking or maybe the recommendation from a friend. Maybe you have information from somewhere and you want to know is what is actually happening. Probably, what you are looking for may not be the best choice for you. So, we interview and find out if that is actually what you need then we can give it to you and if not, we can make a recommendation for you."

This care-seeking behavior was described specifically as a cultural component seen within this region, that included a wide availability of normally highly regulated medications in unregulated markets:

"Interviewer: They're decided on something that may not be the right medication.

Shop owner: Exactly, exactly, and if you want it's business oriented. Apart from the fact that you are providing medications to customers. There is a business aspect attached to the whole thing so if I'm here and I don't serve they can walk 400 m and somebody will serve. I don't know if you found this in terms of… but you also need money to keep business."

Of note, non-approved class A pharmaceuticals were commonly found in these shops, and some of those the field team saw included ampicillin, cefuroxime, ciprofloxacin, doxycycline, flucloxacillin, griseofulvin, and metronidazole. Additionally, the same care-seeking behavior for specific medications was mentioned by shop owners to be seen regarding seeking herbal medicines normally offered by traditional healers. Table 3 shows examples of traditional medicines.

"Interviewer: So, what about people that come using traditional healers instead of the pharmacy?

Shop owner: Mmm. They do."

Thus, the general population's deep cultural roots in traditional medicines combined with easy direct access to unregulated drugs were routinely mentioned to influence the ability of OTCMS to maintain sound business practices while still providing reasonable healthcare to customers.

Discussion

Through the initial qualitative assessment of dermatologic knowledge, attitudes, and practices of over-the-counter medical sellers, our interviews identify the frequency of OTCMS serving as the initial, and often only, point of contact for dermatologic care for many rural Ghanaians. These interviews also outline certain limitations in the ability of these providers to fulfill their community goals effectively and according to the statutes allowed within current regulations. Furthermore, the discrepancy between the education and training provided and the duties fulfilled by these OTCMS raises concern for potential harm. Given the high prevalence of skin disease in rural Ghana, it is important that accurate diagnoses are made, and appropriate treatments recommended.

Increasing the roles of over-the-counter medical sellers in rural areas

Importantly, we noted from our interviews that most individuals presenting to OTCMS with skin disease seek care for common and relatively easy-to-treat conditions. This was seen recently in a report from the same region, where 80% of the conditions seen were estimated to be treatable with topical medications, many of which are already available to OTCMS.[12-14]

We believe that the implementation of a dermatologic-specific curriculum, overseen and executed as part of the existing Pharmacy Council regional meetings, could vastly improve the ability of these local providers to appropriately identify and diagnose skin conditions while reducing the harm caused by inaccurate diagnosis and treatment.

Additionally, recent studies have documented a significant economic burden related to treating conditions with medications that are not indicated.[15] This may be partly due to care-seeking behavior and culturally popular medications. As OTCMS outnumber pharmacies in rural areas ten-to-one,[16] roughly 80% of all medications dispensed in these regions of Ghana are dispensed by OTCMS;[17] it is likely that they contribute to a significant portion of harm from the inappropriate treatment of skin disease. Thus, increasing the ability of OTCMS to dispense medications of higher classes, especially those recently labeled as key access antibiotics,[17] could reduce the harm of improper therapeutic applications while also improving outcomes.

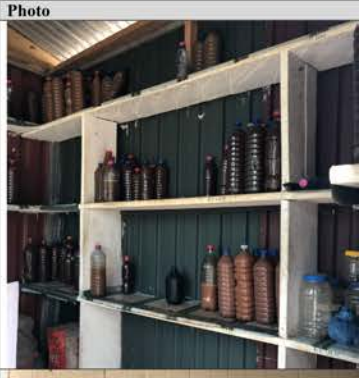
Health and economic benefits

Recent studies describe dermatologic conditions as the fourth leading cause of morbidity worldwide,[18] with a significant impact on both quality of life, and socioeconomic costs.[19-23] In Ghana, specialized OTCMS programs recently showed increased efficacy in managing novel medical applications in rural Ghana, exemplified in programs for contraception, and malaria.[24,25] These exceptions have shown improved healthcare metrics both in public health and economic impact and, if similarly applied to dermatologic disease, might theoretically equally improve the management of skin conditions in rural Ghana, including the ability of OTCMS to manage these pathologies in areas with little-to-no dermatologists.

Limitations

Our study explores the KAP of 13 OTCMS in the Ashanti region of Ghana and may not be representative of rural dermatologic KAP across the country. Additionally, the information gathered for this study was primarily overseen by two research assistants, one US-based and one Ghanaian, and thus it is potentially biased by both foundational knowledge and translational discrepancies. Furthermore, although complementary information gathering included a meeting with the local pharmacy council and teaching hospital, complete information regarding their policies and local regulations within the region was not easily obtainable and is also currently evolving within Ghana's Ministry of Health. Future

Table 3. Photographic examples of traditional medicines and creams.

Description	Photo
Tonics from a traditional healer. Notable labels include: *weak, presure (sic), diabetes, fever, blood tonic.*	
Herbal tonics on the shelf of an OTCMS Notable indications include constipation, menstrual pains	
Traditional medicines and supplements being sold by a street vendor	
Chimek Aloe Vera Cream Indication: Stubborn pimples, Ringworm, dandruff, skin disease, stretch marks, heat rashes, toilet infection, black spots, eczema, age spots Ingredients: Unknown	
Joy Ointment Indication: Candidiasis, Skin rashes, Boils, Eczema, Ringworm, Foot rot, Body odor, Anal sores Ingredients: Cassia alata, Gossyplum arboretum, Daucus carota, Carica papaya, Petroleum jelly	
Angel Cream Indication: Shingles, Ringworm, Candidiasis, Eczema Ingredients: Cassla alata, Funtumia clascia, Petroleum jelly, Perfume	
Samocid PKI Indication: Fungi of skin (Candida) / fungicide Ingredients: Sophora flavescens ait, Cortex dictamni, Fructus Cridii, Rhizoma Smilacis Glabrae, Hydrocarpus anthelmintica	

studies will be required to further evaluate the policies and practices of the local Pharmacy Council, including the regulation, content, and instructional efficacy of regional meetings for OTCMS.

Conclusions

By exploring the KAP of over-the-counter medical sellers in the Ashanti region, this qualitative study sought to evaluate the main providers for dermatologic conditions seen among rural Ghanaians and their perceived efficacy in diagnosing and managing skin disease. While this evaluation revealed potential harms caused by inaccurate diagnosis and subsequent inappropriate treatment, we believe the high burden of disease for certain dermatologic conditions shows substantial room for public health improvement. Training in recognizing and treating highly prevalent skin conditions provided for OTCMS by the Council of Ghana could significantly improve skin disease-related morbidity. Thus, we hope to showcase, with the addition of special provisions for improved access to skin-appropriate medications, a public health intervention that will directly impact many rural Ghanaians who suffer from the severe morbidity caused by skin disease and a lack of access to dermatologic care.

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