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“It’s almost like African medicine”: Engaging with Chinese “plant-based” pharmaceuticals in malaria elimination in the Comoros Union

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Abstract:

This paper uses the results of ethnographic fieldwork conducted in the Comoros Union to reflect upon some of the effects of the Chinese-led malaria elimination program implemented in the country from 2007-2015. The key research questions guiding this paper are: 1) How is the medication distributed by the program framed and understood? 2) What kind of alternative meanings and future does the Chinese approach to global health offer to individuals living within a post-colonial sub-Saharan African context? These questions are framed within salient perceptions about “natural” and “artificial” healing that were captured by this research.

Keywords: China, Comoros, malaria, artemisinin, mass drug distribution

When she puts the pill into her mouth, she is interacting with thousands of years of technology, of traditional Chinese medicine, negotiations with patents and farmers. She is the proof of where these relationships have led. Just as every person is a product of generations and generations of love (sex). Every pill is a product of fertile meetings of people and things.
Field journal, Comoros, 2015

In October 2015, China received its first Nobel Prize in medicine. This award recognized Tu Youyou’s contribution to the discovery of artemisinin to treat malaria. China’s pharmaceutical innovation changed the face of malaria treatment, especially in sub-Saharan Africa where most malaria-related deaths occur (Tang 2015). Developed based on a traditional cure for fever using the plant *Artemisia annua*, the extraction artemisinin is an essential ingredient in the combination therapy currently recommended by the World Health Organization as the first line treatment for uncomplicated malaria. Once only used in China and nearby malarial zones such as Vietnam and Cambodia, this medication is now produced by many international manufacturers and available throughout the world.

With its largescale transnational circulation, artemisinin combination therapy (ACT) has mostly lost the reputation it formerly carried as a “Chinese” medication. However, its use in one global health program implemented by the Chinese government in the Comoros Union renewed these perceptions and provoked ambivalent discussion about the value of a Chinese-plant based medication

The 2007-2015 Chinese-led FEMSE (Fast Elimination of Malaria by Source Eradication) intervention in the Comoros was lauded as a groundbreaking success by some (especially by the Chinese press), while being critiqued and countered by others (notably WHO and UN agencies). After eight years of the program’s implementation, the number of cases of malaria in the country was reduced from 100,000 to less than 1000 per year. However, in addition to impacting disease prevalence, the program also provoked discussion about the threat and benefit of Chinese public health work in Africa; and impacted the imaginary of China among people living in the Comoros.

This intervention in the Comoros engaged a strategy of mass distribution of Artequick, produced by Artepharm Pharmaceuticals headquartered in Guangzhou, China. This ACT, made from a combination of artemisinin and piperaquine, was developed in partnership with doctors from the Guangzhou University of Chinese Medicine Artemisinin Research Laboratory, one of the original facilities that contributed to the discovery of artemisinin in the 1970s. Since the discovery of artemisinin, doctors from this laboratory have been exploring different ways of using the drug, with the goal of eventual malaria eradication through eliminating the disease-causing parasite.

During FEMSE, most individuals living in the Comoros, as well as anyone entering the country by sea or by air, were treated at least twice with treatments that they were told were “natural and made from plants”. Highlighting the natural and “traditional” aspects of this medication helped the program gain much greater acceptance than similar contemporary European drug distribution programs.

This paper uses the results of ethnographic fieldwork to reflect upon the circulation of this medication and situate perceptions about the medication and FEMSE program within the broader context of Chinese development work in Africa.

China’s Role in African Healthcare

Biomedical treatments have become a part of the treatments of every society in the world, which is a relatively recent phenomenon. Large scale production of medication is something that really started to take off at the beginning of the 20th century, and the circulation of biomedicine is an excellent example of globalization.

By studying the actors involved with the circulation of physical objects such as medications, we gain insight to the dynamic social systems that are engaged in these flows. A “hybrid” medicine like artemisinin-based malaria treatment, based on a traditional Chinese recipe, becomes reinterpreted by Western biomedicine and then regulated and distributed simultaneously by different groups of transnational actors, offering a way to study some of the complex political and social relationships that distinguish our contemporary world.

Healthcare in post-colonial Africa continues to be delivered by systems of care developed during the colonial period, expanded and financed largely by European and North American donors in partnership with local governments. With great financial and technical challenges related to the provision of preventative and curative services, transnational global health projects are at the heart of disease elimination programs in most sub-Saharan African countries. Since the wave of 1960s independence of most African states, European and North American government-funded NGOs, United Nations agencies, and other “Western” private and public donor agencies have supported these programs. On the sidelines, but gaining increasing importance, have been health programs financed and implemented by other countries, most notably Cuba and China.

China has also been involved with providing volunteer medical teams to Africa since the early 1970s and its role is becoming increasingly important through the state’s involvement in global health initiatives, donations of equipment and medication, construction of health facilities, and an increasing presence in the private market. Specifically addressing malaria, China pledged to build and supply 30 anti-malaria centers in sub-Saharan Africa, and donates

medications to many countries (Brautigam 2009). China's growing role in African health care coincides with its increased contribution to the international pharmaceutical industry through raw materials, new technologies, and finished products.

China's increasing influence on the African continent has provoked much discussion and research in recent years as the flows of people and products between China and Africa produce new social and political impacts. Mathews investigates "low-end globalization" by studying the micro-level interactions of traders from Africa and other parts of the world in Hong Kong and Southern China (Mathews 2011). He writes "China's movement into Africa represents a shift of global significance, as China increasingly replaces the West, and particularly Africa's earlier European colonial masters, as sub-Saharan Africa's major trading partner and patron" (2011:150). While Mathews describes the important scale of China's relationship with sub-Saharan Africa, it is also important to understand *how* this is occurring, and in what ways this shift is different from a simple substitution of European political and economic power.



Figure 1: A visiting student has her portrait drawn in Guangzhou, China

While circulation has been important for many years, there has been a major change of the scale of these flows during the second half of the 20th century. More than just a simple increase in the quantity and speed of circulation, we have seen societies become more interconnected, new relationships develop, and a reshaping of the socio-political imaginary. By studying the circulation of material objects, we can gain insight to the dynamic social systems that are engaged in these flows, and the exchanges that are beyond simply economic. As Appadurai and Kopytoff (1986) suggest, objects experience "social lives" as they are exchanged and circulate along with ideas and relationships. It is these micro-level interactions with objects involved in large-scale circulation that provide the most interesting view of how globalization is lived, interpreted, and negotiated. Applied by scholars to study the "social life" of medications (Whyte, et al. 2002), this approach has not yet been applied to understand how a "hybrid" medicine like artemisinin-based malaria treatment, based on a traditional

Chinese recipe, becomes reinterpreted by Western biomedicine and also acts as a vehicle representing China.

ACTs and the Discovery of Artemisinin

The Nobel Prize in Medicine delivered for the discovery of artemisinin (青蒿素) to Tu Youyou in October 2015 was remarkable in at least two ways: first, never before has a development emerging from traditional Chinese medicine been recognized with such an important award, and second, this was the first time any researcher working in China has been selected for this prize.



Figure 2: Farmer and his crop of *artemesia annua* in Chongqing, China

The first artemisinin extraction plant opened in Chongqing, China in 1985. However, artemisinin-based medications did not enter the global market until Western pharmaceutical companies and the World Health Organization (WHO) became involved. Since 2001, WHO has recommended artemisinin-based combination therapies (ACTs) for the treatment of *plasmodium falciparum* malaria. These therapies are formulated with artemisinin added to one other active malaria-fighting ingredient such as lumefantrine, amodiaquine or piperaquine. While most of the artemisinin used to produce these medications still comes from China, the majority of ACTs available in sub-Saharan Africa are now produced by European and Indian manufacturers

ACT has been referred to as an example of a “hybrid” medication: an industrial medication combining traditional Asian medicine and biomedical technology (Micollier 2013). When it first penetrated the antimalarial market in Africa, representations about this treatment centered on its “Chinese-ness”: a treatment that, while more expensive than alternative malaria treatments, was based on the natural harmony of plant-based medicines. Since that time, the identity of ACTs has been largely shaped by European and North American agencies involved in their dissemination and subsidization.

Along with lowering the number of deaths from malaria worldwide, this Chinese invention can also be credited with the spawning the creation of a World Health Organization department to monitor pharmaceutical companies producing this treatment, NGOs aiming to identify counterfeit versions of the medication, agencies supporting the availability of artemisinin-based therapies in public and private African markets, and many, many, international meetings to discuss its “correct” use (World Health Organization 2015). Although factories in India, Europe, and elsewhere now produce artemisinin-based treatments, China remains the top agricultural producer of *Artemisia annua*, and continues to operate the largest artemisinin extraction plants in the world.

The WHO maintains a list of “Prequalified” ACTs, approved for quality and manufacturing practices. Only one Chinese brand (Arusomoon) appears on this list, although many of the prequalified ACTs are manufactured in China with Chinese-produced ingredients. Most health and development programs follow this WHO list and do not purchase ACTs that are not included. However, observation in both informal and formal pharmacies shows that, in many African countries, ACTs are entering the market through alternative channels. Artequick, the medication used in the FEMSE program, is not on WHO’s prequalified list, but is increasingly present throughout sub-Saharan Africa.

FEMSE

The FEMSE program began mass distribution of Artequick on one of the Comoros’ three islands, Moheli, in 2007, followed by Anjouan Island in 2012, and Grande Comore in 2013. The distribution of the ACT was done by village volunteers going from house-to-house, as well as medical staff conducting distribution at airports, seaports, and schools. 4000 Comorian staff and volunteers and 38 Chinese doctors and students were involved in the implementation of this mass drug administration program that distributed over two million treatment courses of Artequick to the country’s 800,000 residents and visitors (Institute of Science and Technology 2014). WHO estimates that over 75% of the country’s population received treatment with Artequick, and most with two rounds of treatment following the FEMSE strategy guidelines (World Health Organization 2015).

Unlike contemporary malaria elimination initiatives led by North American or European agencies that aim to eliminate malaria by stopping the bite of the mosquito with bed nets or insecticides, this project aimed to prevent malaria by eliminating the parasite that lives in the blood of infected populations. Professor Li Guoqiao, the director of the Guangzhou laboratory, explained that, in his opinion, most malaria-elimination programs have engaged the wrong strategy: trying to eliminate the mosquitos that transmit the parasites responsible for malaria, rather than the parasites themselves. He stated, “*you don’t need to kill the mosquito. That is too hard. You will never finish. It is quick and easy to kill the parasite that lives in the blood.*”

While the Chinese government lauded the success of this strategy, Western global health agencies have expressed their disapproval, and the World Health Organization has convoked meetings in an attempt to dissuade the Chinese government from continuing or expanding this initiative (Van Sant 2014).



Figure 3: Prof Li shows the results of the Comoros FEMSE program

From 2007 to 2015, the country saw a 95% reduction in cases of malaria. However, some scientists and public health experts critique the FEMSE program for contributing to artemisinin resistance, decreasing immunity to the disease, and for the inclusion of primaquine in the medication, an ingredient that may be fatal to individuals with a deficiency of the enzyme G6PD. An article published in the *Economist* cites the country's then Minister of Health, Fouad Mhadji, as dismissing these critiques as mainly “fueled by competition between Western and Chinese pharmaceutical companies” (*The Economist* 2014:4).

Methods

The findings presented here come from fieldwork conducted in 2014-2016 during several short trips (2-4 weeks) to the Comoros, China, and Geneva. Fieldwork included observation and interviews at:

- UN agencies and NGOs working in malaria control in the Comoros and Geneva
- Prof Li's FEMSE laboratory at the University of Traditional Medicine in Guangzhou
- An Artemisinin processing plant and with *Artemisia annua* farmers in Youyang County
- FEMSE sites in the Comoros
- Health facilities and pharmacies in the Comoros
- Community group and youth groups in the Comoros

Interviews were conducted in English or French and then translated to English during transcription. Data analysis began while interviews were ongoing using a grounded theory approach in order to identify categories and compare these categories with new data (Strauss & Corbin 1994). This paper is based on the theoretical memos developed based on the theoretical categories that emerged from these codes. I present writing from my field notes and interview quotes to contextualize and provide detail to these memos. In this paper I mainly focus on the data collected in the Comoros immediately following the end of the FEMSE program, contextualized by some of the findings from China and Geneva. All names

presented here, except for Prof. Li, are pseudonyms. Any translation from French to English I did myself.

“Natural and made from plants”

“I’d rather take medication from plants that I know is safe for my body. With chemical medicines, they can sometimes do more harm than good”

Siti, mother of 5, Grand Comore

During interviews, interlocutors described how individuals working for FEMSE framed the medication being distributed as plant-based and safe. *“When I said that I didn’t want to take any medicine...he told me that it was made from plants just like African medicine. This got me to agree to take it. Some medicines can make you weak, but with plants, they can cure the sickness and make your body strong too.”* Ali explained.

As shown in the poster below, many promotional materials distributed and displayed by the FEMSE program included photos of *artemisia annua* leaves surrounding images of individuals consuming the medication.



Figure 4 Poster used to Promote FEMSE

When individuals who had contact with FEMSE discussed the value of the program, the “natural” or “plant-made” aspects of the program’s medication were often highlighted.

Refusal

Refusal of the medication was often explained as being related to the forceful and opaque way that this medication was distributed. Alice, a French NGO worker described her experience as she traveled to the Comoros in 2008,

As soon as we arrived at the airport, we were asked to take a pill. We asked for information about the origin of the product, and the only response that we were given was that it was a Chinese product to fight against malaria. We were accompanied by two expatriates from Sauve une Vie who had been in the Comoros for over a month and were taking Malarone as prophylaxis. They refused to take the pill they were given at the airport, saying that they were taking prophylaxis. However, the agent in charge of the medication distribution did not allow them to enter the country and they were required to leave on the next plane. Taking this pill was a condition to enter the territory of Moheli. We were not able to see where these pills were manufactured nor their composition. We only knew that it was a Chinese product...

The way that the medication was distributed by FEMSE with such little explanation allowed for the creation of diverse representations of the medication's and the program's purpose. Some individuals interpreted the strategy as China testing potentially dangerous new drugs on a vulnerable population or as a new method of birth control. To counter these interpretations, local health care providers and officials held public meetings or made announcements. One local doctor in Grand Comore is described as encouraging his community to take the medication by shouting through a megaphone, *"This drug is safe and effective. You are not being used as Guinea pigs."* (The Economist 2014:3).

During interviews with people who reported to have avoided consuming Artequick during the mass distribution, reasons for not wanting to take the drug focused around the potential for unknown side effects or often the origin of the medication. *"I didn't take it because I'm not used to those kinds of medicines"* the wife of one of the Comorian FEMSE staff who had refused the medication told me. Upon prodding, she explained what she meant by *"those"* kinds of medicines: *"Medicines from China. They are not made for us. They may work there, but we don't know what they will do to our people."*



Figure 5: Notes from a focus group discussion in Moroni about FEMSE and China-Africa relations

Geopolitical Skepticism/The Hope of China in a Pill

Interlocutors also highlighted the different approach of the FEMSE program. While many admitted being shocked at first by the program's mass distribution method, which was described as, at times, quite forceful, there was a consensus that, like the medication, the Chinese approach was something that one could "get used to". However, the ambivalence felt toward Chinese initiatives in the Comoros was quite clear. On one hand, China, an official partner of the Comoros since the day of the country's independence, over forty years ago, offers an alternative way of doing things. This is often contrasted with what has been historically proposed by France. Yet, on the other hand, the exact alternative being offered is not clear. Sometimes China was seen as a new colonial power, and a producer of low quality potentially dangerous goods, but other times China was seen proposing a model of development that was adapted and empowering for Comorians, even if it took some time to become accustomed to.



Figure 6: A former driver from the FEMSE program wearing a shirt with the logo of the flags of China and the Comoros

Rachid, a pharmacist in Anjouan, explained to me, *“The Comoros was French until 1975. Before that it was English, and Portuguese, and Arab. Maybe we will become Chinese next, who knows? No, I’m kidding. But really, the Chinese ambassador in Comoros has a strong weight. Before, it used to be the French embassy, but you can see that it is changing. Comorians are tired of the French way of doing things. The Chinese have built buildings, hospitals. They are able to do deep sea fishing, which Comorians don’t have the technology to do. However, among educated Comorians, there is still a distrust of Chinese medications. Even if it’s not politically correct, they will look for medicines made in France. It’s true that a lot of the counterfeit medications come from China. But the Chinese “respect internal affairs”. They have done so many things: built roads, palais de peuple, the water system in Moroni, most recently they have eliminated malaria.”*

The growing demand for Mandarin language classes, traditional medicine services, and collaborations with Chinese cultural offerings shows this growing interest in the future that China has to offer. While I was conducting fieldwork in the Comoros, I attended two Mandarin Chinese classes. These classes, led by university professors from Northern China who had been sent to work in the Comoros for two years, were filled with students. After the classes I spoke with these students, many of them also attending university classes, about their reasons for studying Chinese. They often claimed that China presented a unique potential opportunity that they were open to discovering. *“We’ve already had our experience with the French”* Siti, a 23 year old student who was also studying engineering at the university told me, *“We want something new.”*

A lot of resentment and blame is put on France for the Comoros’ current state of development. Siti continued, *“All countries that were colonized by France are now underdeveloped. These are the countries that are in war, that have problems with security. For example, other countries, like those colonized by the British, they got out of it okay. The Seychelles, Mauritius...”* These feelings about the country’s past colonial history influenced the context for Chinese initiatives such as the FEMSE program.

French influence was also given as a reason for some individuals to refuse the medication distributed by the FEMSE program. Only 74% of individuals on the island of Grand Comoros accepted the medication, compared with 95% on the other two islands. This was explained to me by Hassan, an employee of the Ministry of Health Malaria Program, as partially being motivated by the close ties that Grand Comoros has with France, *“The French didn’t like this project at all. Even when the FEMSE team came to l’école française of Moroni, they were turned away. Not like the other schools, who welcomed them. I think the French don’t like to see the Chinese succeeding where they have failed. They tried many things in this country, but the Chinese achieved something that they couldn’t.”*

China is seen to offer a development model that is very different from European (post-) colonialism. Instead of wanting to control places outside of their own country, interlocutors told me during interviews, the Chinese have other specific objectives. *“China has had too much experience with foreign invasion. It does not colonialize. The Chinese started going into the Indian Ocean on ships a long time ago, but they did not colonize. It was to do business and trade, and then to go back home.”*

The FEMSE program, implemented by the Comorian Ministry of Health in collaboration with Chinese partners, was seen as a remarkable concrete example of how China may contribute to the Comoros. Unlike other public health programs, where program activities may become more important than program identities, FEMSE and Artequick were always analyzed in terms of being Chinese. Both positive and negative perspectives of the program and medication were positioned in terms of cultural identity. The medication and strategy of the program were often critiqued and these fears were positioned in terms of the potential motivations of the Chinese government as well as the ingredients and quality of the medication.

Although the Chinese offer what are seen as promising opportunities, many things about these opportunities are unclear. The FEMSE program was seen as something difficult to understand, but possibly very positive, there was a lot of misunderstanding of other Chinese initiatives in the country. This was seen in the discourse surrounding the donation of diverse Chinese-produced medications to health facilities, or the hopeful confusion with which the Chinese medicine clinics in the country were met. Hali, who sells cloth at a market stand located directly across from a Chinese medicine clinic compared Chinese initiatives like FEMSE with Chinese traditional medicine, *“We were not sure it would work. The machines and medicines are strange with their medicine, but you try, and maybe it will be better than what you’ve tried before, or maybe it won’t do anything at all. We tried, and this one worked.”*

During interviews, many individuals described a new type of colonialization that was being launched by the Chinese in Africa. Charlie, a French-trained Comorian pharmacist reflected, *The Comoros was French until 1975. Before that it was English, and Portuguese, and Arab. Maybe we will become Chinese next, who knows? No, I’m kidding.*

Some individuals, especially those working in public health, expressed the idea that Chinese drug donations were a way to get rid of expired or unsellable drugs. *“The Chinese just ask the manufacturers in their own country. Take drugs that they couldn’t sell. For them it’s a way of supporting their own industry”* stated Peter, a doctor working with a UN organization.

However, at the same time that skepticism about Chinese activity in Africa was expressed, many Comorians interviewed also described China as offering a new future for the country and a “way out” from relying on European connections and support. For a population still concerned with obtaining freedom from the French, with the island of Mayotte still under French control, this potential seemed to produce an important optimism for what could be offered by China. In any case, many respondents stated, *“at least it’s not France”*

France ruled our country for a long time, and you see how things are now. All the countries that were colonized by France are under-developed. All the countries that were colonized by France are in war, they have insecurity. For example, countries colonized by others, like the English ones, they came out okay. The Seychelles, Mauritius....(Cidi, nurse in Anjouan)

Although the Comoros has been independent since 1975, there is still a strong French presence and connections, with many Comorians traveling between the two countries or migrating permanently to France. The greatest resistance against the FEMSE program was seen on the island of Grand Comores. Interviews revealed that many people saw this resistance to be related to a French competitive jealousy. The refusal of the French School to

let the program enter to treat its students was frequently cited as an example. David, a pharmacist in Moroni, stated,

I think the French don't like to see the Chinese succeeding where they have failed. They tried many things in this country, but the Chinese have achieved something that they couldn't.

Conclusion and discussion

The FEMSE program highlighted the natural and “traditional” aspects of Artequick, the medication that they distributed as a part of their malaria elimination program. Acceptance of the medication was influenced by perceptions of the product’s ability to strengthen the body and similarity to plant-based African treatments.

Refusal of the medication was often framed by a perceived lack of transparency on the part of the FEMSE program. This lack of transparency was also noted in descriptions that compared this Chinese-led global health program with programs run by European or North American actors. The FEMSE program and the distribution of Artequick, were understood and positioned within a context that had ambivalent but strong perceptions about China. On one hand, China was seen as offering a promising alternative to post-colonial French and British approaches to development, and Chinese medicine embraced as offering a “natural”, possibly effective, alternative to biomedicine. However, on the other hand, Chinese products are often seen as inferior, and Chinese-produced counterfeit medications have received recent attention as an African public health threat (Sambira 2013).

Artemisinin-based medication, as a “hybrid” biomedicine, lies at the crossroads of Traditional Chinese Medicine and “Western” Biomedicine. When European-produced ACTs circulate, the Chinese aspect of their identity becomes minimized in favor of a biomedical aspect. The FEMSE program, seen as being unique in its “Chinese-ness”, highlighted the Chinese aspect of the ACT Artequick, and the mass distribution strategy for malaria elimination. Feelings about Chinese-Comorian partnerships were ambivalent. The alternative approach to public health offered by the Chinese carried along with it negative perceptions and hesitation about the quality and motivation of China, but also great hope in a new approach to eliminating disease and improving life in the Comoros. For most people interviewed, China represented an interesting alternative partner in public health.

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