



Dr. Birrer received her PharmD from Butler University in Indianapolis, IN and completed her PGY-1 pharmacy practice and PGY-2 critical care residencies at the University of Kentucky. Since completing her training, she has worked as a critical care pharmacist in trauma, general surgery, emergency medicine and neurocritical care. She currently works as a neurocritical care clinical pharmacist at Orlando Regional Medical Center (ORMC, Orlando Health, Orlando FL). She has been active in both state and national pharmacy organizations with several presentations and publications and also serves as a preceptor for pharmacy students and residents. Dr. Birrer joined the Samaritan's Purse Disaster Assistance Response Team in 2019 and has been deployed to Iraq (2019) and Haiti (2021). She is an active member of her local church, First Presbyterian Church of Orlando, including singing in the choir and hosting a small group. She also enjoys hiking trips and time with her family.



Dr. Poplavskiy graduated from Saint John Fisher College in Rochester, NY. He currently practices as a clinical pharmacist in a 300-bed community hospital, Rochester Regional Health. He's been on several medical mission trips to Haiti and Kenya. When he's not working as a clinical pharmacist, you can find him outside either cycling, mountain biking, or sailing on Lake Ontario. Dr. Poplavskiy joined the Samaritan's Purse Disaster Assistance Response Team in 2021.



Dr. Carlson is retired from over 30 years as a Director of Pharmacy at Pioneer Community Hospital in Stuart, Virginia. Over the course of his 40-plus years in pharmacy, he also practiced in community and long-term care. He currently works part-time in an independent pharmacy in Patrick Springs, Virginia. Dr. Carlson received his BS Degree in Pharmacy and his PharmD from Mercer University in Atlanta, GA. Prior to pharmacy school, he served in the US Army as a pharmacy technician which included serving a year in Viet Nam with the 24th Evacuation Hospital. He is currently Vice President of Christian Pharmacists Fellowship International. He serves the Lord at home as an active member and deacon of Grace Baptist Church. Dr. Carlson joined the Samaritan's Purse Disaster Assistance Response Team in 2019.

Rephaiah: Focus on Health and Hope for Neglected Populations

By Peter Kumpalume, Adwoa Nornoo, Joshua Nthakomwa, Agness Mpoto Bandazi, Precious Ngwalero Katundu, Baxter H Kachingwe, Hellen Chabunya, Harm Maarsingh and Sveinbjorn Gizurarson

Introduction

Every 3 minutes, two children die because of malaria in Sub-Saharan Africa.¹ Why do we still have an entire continent where thousands of children die every week? One reason is this: the active pharmaceutical ingredients are available to treat this disease, but unfortunately there is no manufactured dosage form for the pediatric population. According to the World Health Organization (WHO), the lack of pediatric formulations requires dividing adult tablets into smaller portions for these children.² However, if they are unconscious and/or unable to swallow a tablet, the only other option is to get to the nearest hospital – which could take hours or even days in some parts of the rural African areas (such as Malawi). In the meantime, the malaria parasite will continue to worsen their condition, ultimately killing them.

The disease with the next highest health burden after malaria is schistosomiasis (also called bilharzia or snail fever). Unfortunately, children under the age of five who suffer from schistosomiasis are usually not treated – although the drug (praziquantel) is available – because it is difficult to grind the

tablet and to give a fraction of the powder to an infant or a child.

Malaria is a life-threatening disease, and children who survive this illness are at a higher risk for developing multiple neurological problems, such as attention-deficit hyperactivity disorder (ADHD), and autism spectrum disorders with long-term impairments in academic performance. These complications lead to increased stress levels in the children's families, all caused by the parasite.³ Severe or cerebral malaria is not just a disease that is cured when the child has recovered – it often results in life-long neurological problems.⁴ It is also known that schistosomiasis inhibits cognitive growth, making children drop out of school due to poor memory and learning difficulties. Additionally, girls infected with schistosomiasis are four times more likely to become infected with HIV.⁵ Therefore, the best strategy to fight HIV in African infants and children (especially girls) is to treat them for schistosomiasis. Thus, it is crucial to have medications for malaria and schistosomiasis that are formulated specifically for infants and young

children in order to reduce childhood death and prevent complications for those who survive.

Rephaiah

In 2016 a project was born, called Rephaiah, a biblical name that means “God heals” or “Medicines from the Lord.” The goal of Rephaiah is to establish a not-for-profit pharmaceutical manufacturing company in Malawi to manufacture neglected drugs to treat neglected diseases in neglected populations: infants and children under the age of 5 years. The drugs need to be affordable for families living under the poverty line (less than \$1.00/day). In the US, the cheapest antimalarial drug containing artemether and lumefantrine costs about \$129.37 per treatment (in January 2021). Since the average monthly salary in Malawi is about \$32.00/month, that requires about 4 months of salary to treat just one child! Obviously, there is a clear need to make this treatment available and affordable for every child in Africa, thereby saving their lives. To make this possible, it is important to equip Malawians to manufacture these drugs themselves.

In John 10:10 (NIV), our Lord Jesus teaches us: *“The thief comes only to steal and kill and destroy; I have come that they may have life, and have it to the full.”*

That is what Rephaiah is all about. We want the opportunity to give these African children health and hope in Jesus’ name by manufacturing affordable medications that can be administered to infants and young children. After visiting Malawi multiple times since 2018, visiting and having regular meetings with WHO, and collaborating with Palm Beach Atlantic University, the pharmaceutical company Rephaiah has now been registered in Malawi.

Pharmacy Education in Malawi

The vision of Rephaiah is not only to manufacture affordable medications for Malawi and other African countries, thereby reducing childhood diseases and deaths, but also to do this in a sustainable way that promotes the local economy by hiring Malawians in all levels of the organization. This will create jobs for pharmacists in areas such as drug formulation, research and development, and regulatory affairs. In Malawi, the undergraduate program in pharmacy was initiated in 2006 at the College of Medicine, University of Malawi, now renamed the Kamuzu University of Health Sciences (KUHeS). In 2021, the first students entered the graduate program in pharmacy. The university has an exciting vision and are currently in the initial phase of training Malawian pharmacists to make their own drugs and to conduct their own research and development projects. These are all highly skilled pharmacists with vision, but they need equipment and opportunities to flourish.

Kamuzu University of Health Sciences and the Ministry of Health of Malawi (MoH)

At a Pharma Expo in Malawi in July 2022, the Minister of Health of Malawi, Honorable Ms. Khumbize Kandodo Chiponda (who is a pharmacist herself) addressed the conference and spoke about the urgent need for a

pharmaceutical manufacturing unit located in Malawi that can respond to the crisis and manufacture life-saving drugs for the country. Dr. Charles Mwansambo, Primary Secretary for MoH, likewise emphasized the importance of having such capabilities in Malawi. Two days before the Expo, Rephaiah and KUHeS had agreed to join forces and work together. Although Rephaiah is focusing on manufacturing life-saving drugs for children under the age of 5 years while KUHeS is focusing on manufacturing drugs that are lacking in the country, we see a strong synergy. We believe that by working together we can establish a Rephaiah plant near Blantyre, Malawi where we can manufacture life-saving, life enhancing, and lacking drugs, improving lives in Malawi and Sub-Saharan Africa. By doing so, we will be setting up a Center of Excellence in Drug Development and Manufacturing for this part of the world.

Next Steps and the Need

It has been a long and a bumpy road to finally get to this point. There has already been made conceptual drawings of the building, consulted with experts in architecture and engineering in the US and with architects in Malawi, and we are hoping to start the construction in Q1 2023.

First and foremost, we truly need and appreciate your prayers. Looking back, every step since 2016 has been guided by the Lord through prayer; so in order for this project to be successful, we need further prayer support. We praise God because we see His hand in this project every step of the way, and we continue to seek His guidance, and direction as we move forward.

We also need your prayers for wisdom to make the right decisions with regard to our funding needs, as well as our needs for equipment, technical support, and training support for our employees. Although we have reached a major milestone, the forthcoming steps will require great focus. There will be temptations to accept offers or advice that might lead us astray, so please join us in prayer that we stay on the right track to complete what God has initiated, and that He will bring us partners who are followers of Christ.

A sad fact is that today about 30% of the drug budget in many low-income countries (including Malawi) is lost through theft, and 35% of private clinics are selling donor-supplied drugs (including antimalaria drugs). Please pray for guidance and direction as to how Rephaiah can keep high ethical standards and build a healthy, focused environment where this type of behavior will not be tolerated.

It is our prayer that God will use the work of Rephaiah to improve the life and health of the people of Malawi and surrounding countries, and that the people will come to realize that He is both Jehovah Rapha (the Lord Who heals) and Jehovah Jireh (the Lord Who provides).

We truly hope you will join our mission to end preventable childhood deaths and to empower the people of Malawi. Would you prayerfully consider what your role could be in

this endeavor? We would love to connect with anyone who is interested in assisting Rephaiah in any way! Kindly contact us through Sveinbjorn Gizurarson at sg@rephaiah.org or WhatsApp at: +354 898 0318, or Adwoa Nornoo at adwoa_nornoo@pba.edu. We also encourage you to visit our preliminary website www.rephaiah.org for more information.

References

1. World Health Organization. *Malaria Report 2021*, World Health Organization, 2021.
2. Olumese PE (Ed.). *Guidelines for the Treatment of Malaria*, 3rd Edition. World Health Organization, 2015.
3. Idro R, Kakooza-Mwesige A, Balyejjussa S, Mirembe G, Mugasha C, Tugumisirize J, Byarugaba J. Severe neurological sequelae and behaviour problems after cerebral malaria in Ugandan children. *BMC research notes*, 3(1), 104, 2010.
4. Gizurarson S, Katundu PN, Mwachunga E, Sveinbjornsdottir GM, Njardvik U, Dzowela T, Dodoli W, Ragnarsdottir KL. A Case Study: How the Rephaiah project combats malaria in young children. In: *Bio-mathematics, Statistics and Nano-Technologies: Mosquito Control Strategies*: Editor: Dr Peyman Ghaffari, Taylor & Francis Group, In press 2022.

5. Hotez PE. *Forgotten people forgotten diseases. The neglected tropical diseases and their impact on global health and development*. 2nd Edition. ASM Press Washington DC, 2013.



The Minister of Health of Malawi, Honorable Ms. Khumbize Kandodo Chiponda and Dr. Sveinbjorn Gizurarson, after presenting a lecture on: the role of pharmaceutical businesses and companies in ensuring availability and accessibility of quality medicines in Malawi, in Lilongwe, the capital of Malawi, July 30th, 2022



Peter Kumpalume

Drug development specialist at BioProducts Laboratory, Cobra Biologics and GlaxoSmithKline and senior lecturer at KUHeS; research interests are developing new drugs for diseases that particularly affect the developing world. He has also served as Malawi's Minister of Health.



Adwoa Nornoo

Department of Pharmaceutical Sciences, Lloyd L. Gregory School of Pharmacy, Palm Beach Atlantic University, West Palm Beach, FL



Joshua Nthakomwa

Director of Investment Promotion and Facilitation with the Malawi Investment and Trade Center (MITC). Joshua is a board member at Rephaiah.



Agness Mpoto Bandazi

Rephaiah Human Resource Manager. Social scientist with experience in Project implementation in International and Non-Governmental Organizations in Malawi.



Precious Ngwalero Katundu

Chief Executive for Rephaiah. Serves as pharmacist and lecturer at KUHeS and is completing her PhD in Clinical pharmacology at the University of Cape Town, South-Africa.



Baxter H. Kachingwe

Chief Scientific Officer and Chief Operations Officer for Rephaiah. Lecturer in Pharmaceutics and Biopharmaceutics at the Pharmacy department of KUHeS.



Hellen Chabunya

She has 14 years professional experience in various countries working with international organizations, Governments, privately owned firms, and Non-Governmental Organizations. Hellen is a board member at Rephaiah.



Harm Maarsingh

Department of Pharmaceutical Sciences, Lloyd L. Gregory School of Pharmacy, Palm Beach Atlantic University, West Palm Beach, Florida, USA



Sveinbjorn Gizurarson

Professor in clinical pharmacokinetics and toxicology at the University of Iceland, he is also an Honorary lecturer at KUHeS. He has regularly visited PBA and provided lectures and research discussions. Sveinbjorn has one drug on market, Nayzilam, that took 20 years to develop and 12 years through phase I-III.

'...Truly I tell you, whatever you did for one of the least of these brothers and sisters of mine, you did for me.' Matthew 25:40b