

FREO2 Foundation

Q2 2021/22

Impact Report



EVERY BREATH IS

A CHANCE AT LIFE



About FREO2 Foundation

FREO2 Foundation (FREO2) is a global not-for-profit organisation that aims to reduce the number of deaths of babies and children suffering from pneumonia in low-and-middle-income countries.

We envision a world where every child can breathe, live and thrive. Our mission is to improve access to oxygen to save lives and reduce inequalities in health.

The FREO2 team is committed to saving lives by developing and deploying our novel medical oxygen technologies to improve access to oxygen and patient care at the under-resourced periphery of health services.

FREO2 oxygen innovations are affordable, developed specifically to be installed in the most remote parts of the world and can provide a constant supply of oxygen, even during a power outage.





A Note From Our Chief Executive Officer

Dear Supporter,

On behalf of the board and our entire global team, thank you for supporting FREO2 in 2021. Your support is the driving force behind our far-reaching programs in our tireless pursuit of health equity. Thanks to your generosity and collaboration, our team has worked tremendously this quarter to deliver medical oxygen where it is most needed.

The unexpected emergence of the Omicron COVID variant presented a new set of challenges for our production and installation programs. Despite many difficulties arising, we significantly advanced the delivery of our international programs and product development, while continuing our efforts in fundraising and advocacy. This highlights the strength, agility and adaptability of our fantastic team! We have been deeply saddened to see political unrest in the Solomon Islands and Uganda and our hearts go out to our teams on the ground. FREO2 continues to prioritise the safety of our staff and we are now more motivated than ever to increase access to oxygen at the under-resourced periphery of the health service.

A key highlight of this quarter has been finalising our contract with the Oxygen CoLab and the initiation of our expansion program across Tanzania. This program has a sharp focus on exploring the potential of providing 'Oxygen as a Service' rather than a product. This could be a game changer for LMICs. As we transition to scale, we are thrilled to welcome the support of a new partner, the Segal Family Foundation and look forward to working together as we support, strengthen and grow health programs in East Africa. We'd also like to congratulate our friends in the Adara Group on the opening of a state-of-the-art neonatal ward in Nakaseke Hospital, Uganda. We are delighted to support the ward with FREO2 oxygen.

Underpinning all of this activity has been the tireless efforts of our manufacturing partner Kröber. In the new world order of constant logistics and supply challenges, their amazing team has produced and delivered another 50 regulatory approved OxyLink systems to Uganda and Tanzania.

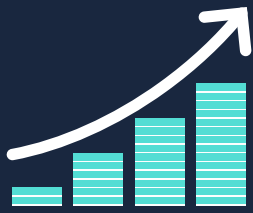


On the advocacy front, we have received fantastic coverage this quarter from PBS Newshour, who worked with our Uganda team to increase awareness of the oxygen access crises in Uganda. This World Pneumonia Day, FREO2 collaborated with the Australian International Development Network to produce a webinar to increase awareness and investment in oxygen. Working together with the Every Breath Counts Coalition, we received coverage from Australia's Radio National, calling Australia to act on the global oxygen shortage.

I would also like to take this opportunity to thank to our incredible team of interns and volunteers who have been the lifeblood of our organisation in the past few months: Monique Walsh, James Fox, Cathybert Ainembabazi, Graham Moore, Peter Rassool, Paul Main, Harriet Read, Aaron Western and Peter Cassemento.

As always FREO2 is enormously grateful to our donors and partners for their continued support. Your support can make our dream of a world where every child can live, breath and thrive, a reality.

With gratitude,
Roger Rassool, CEO of FREO2 Foundation.



Milestones achieved this quarter.

2,438 —————  ————— **4,600**
Children treated FY21/22 target

451 —————  ————— **552**
Health workers trained FY21/22 target

23 —————  ————— **40**
Health facilities where we work FY21/22 target



680,000

Catchment population for FREQ2 oxygen



11

Local FREQ2 staff employed

This data is collected by our data acquisition system (DAS). All our FREQ2 innovations have a built in DAS which collects and monitors live, key patient information such as oxygen flow rates, blackouts and cylinder consumption.

This allows us to address any system errors more quickly and accurately report on our impact!

Quarterly Update



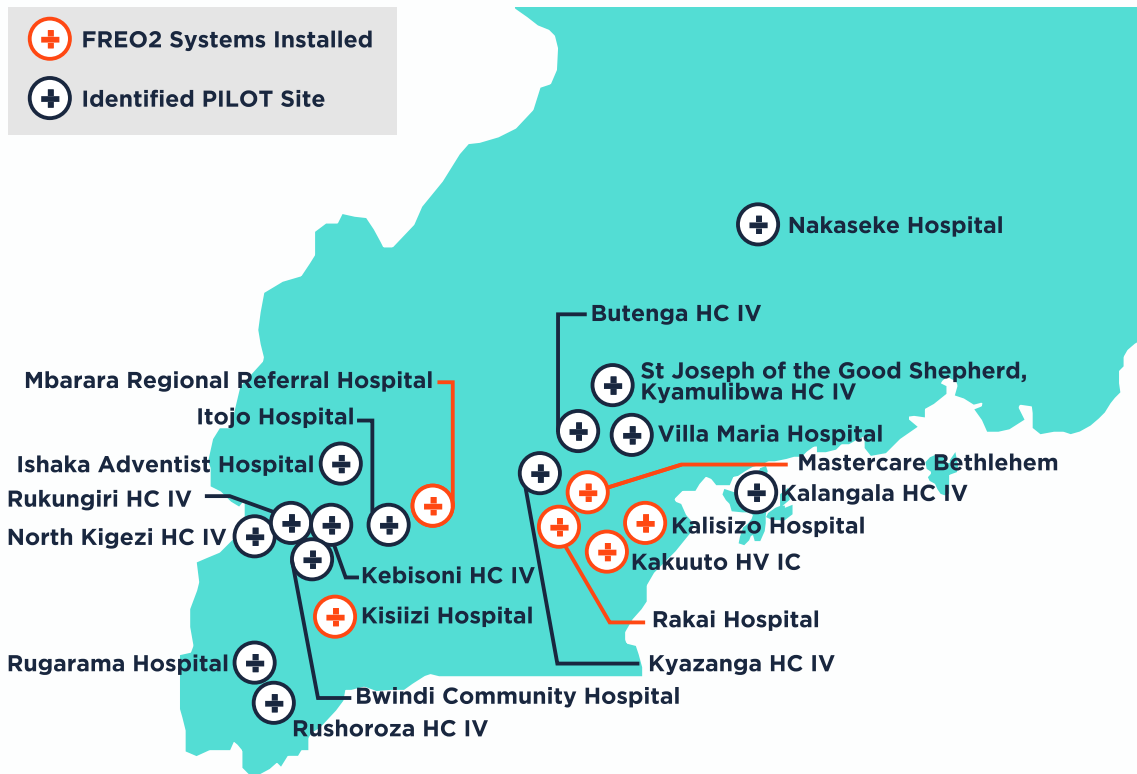
Successes

- Completed our contract negotiations with the Oxygen CoLab team and initiated the Tanzanian expansion program.
- Delivered 6 new FREO2 systems for installations across Uganda.
- First batch of 50 OxyLink-5 units from Kröber shipped to Africa.
- Embarked on a new partnership with the SEGAL Family Foundation.
- Received fantastic coverage from PBS newshour, who collaborated with our FREO2 Uganda team to increase awareness of the pneumonia crises and the oxygen access gap, [watch here](#).
- Continued our oxygen advocacy work this World Pneumonia Day (12 November) facilitating and speaking at the Australian International Development Network's World Pneumonia Day Webinar, which received coverage on Australia's radio network Radio National, [listen here](#).
- Adara Group opened a neonatal ward in Nakaseke Hospital equipped with FREO2 systems to keep the oxygen flowing for babies and children, [read more here](#).
- Launched our first ever Christmas donation fundraising campaign.

Challenges

- Ongoing demonstrations and violent riots in the Solomon Islands, which began on 24 November 2021, [learn more here](#). The impact of this unrest has significantly impacted the development of our work on the ground and the lives of our partners in the Pacific. Our thoughts are with our friends in the Solomon Islands and we have never been more motivated to pilot so that oxygen is available for those who need it most.
- Bombings in Uganda's capital, Kampala, have caused continued unrest in the region, [learn more here](#). FREO2 continues to prioritise the safety of our team in Uganda as we scale our oxygen delivery across the country.
- The continued impact of the COVID-19 pandemic and the new uncertainty of the Omicron variant.
- Freight costs continue to increase as a result of COVID-19. FREO2 is currently investigating preferential freight costs with partners.
- Supply chain disruption caused by the pandemic, we have particularly been affected by the microchip shortages. Microchips are an essential component of our Data Acquisition Systems. Fortunately, despite delays, we have procured enough microchips to deliver our planned installations of DAS for this year.
- COVID uncertainty in Melbourne has impacted our work in the office. We are tremendously grateful and proud of our engineering team who have worked tirelessly despite the restrictions to produce FREO2 systems for delivery in Uganda and Tanzania.

News from Uganda



Product:

This quarter, FREO2 Uganda has now reached the point where we have consistency in the supply and arrival of product directly from Australia and Kröber in Germany, with regular batches of FREO2 product arriving on a monthly basis.

Installation:

Our Uganda team has delivered the greatest number of FREO2 installations ever achieved this quarter (finishing at 10 new sites)!

The team was also proud to host our Tanzania team recently, to share knowledge and installation advice.

Clinical:

Over the last quarter, the team has completed 8 training programs, with 5 training programs focused on pulse oximetry and hypoxemia detection and 3 training programs focused on oxygen delivery, FREO2 equipment use and system maintenance. A total of 159 health workers were trained this quarter (94 female and 65 male).

Business:

This quarter, we've had a focus on engaging and driving local sales of FREO2 products and services. The team has had promising meetings with key distribution and delivery partners.

The Uganda team has also engaged with new stakeholders for partnership and funding opportunities and presented at the Uganda National Oxygen Stakeholders Forum in December.

Key Learnings:

- On the technical end, we are still learning how staff at different health facilities are interacting with FREO2 systems and the impact they are having.
- A vital lesson in our work is the importance of maintaining spares and responding faster in cases where there may be challenges with the equipment.

News from Tanzania



Product:

This quarter we've had multiple products arrive from all corners of the world. Our Oxylink concentrators, oxygen distribution systems and Protect power management systems have all arrived in Tanzania in preparation for our rollout.

Installation:

Our Tanzania team has successfully conducted baseline assessments across 18 sites this quarter. It has been an excellent opportunity to help us prioritise our first 12 installations.

The team has also completed a video installation guide for FREO2 systems to support the installation process.

Clinical:

This quarter, pulse oximeters and oxygen cylinders have been delivered to Dongobesh and are now ready for training.

Our clinical team has also been working hard on oxygen therapy and pulse oximetry training.

Business:

This quarter we completed our Service Agreement for health facilities and have been focusing on an impact and scaling strategy.

The Tanzania team have also identified and are currently negotiating with a key hire to manage customers and partners.

Key Learnings:

- The Tanzanian government has very strict employment laws; a number of NGOs have stressed the importance of strong legal advisors throughout the process.
- There is an installation methodology and specified requirements, however the team should always adopt the "expect the unexpected" mindset.
- Opportunity to leverage Uganda team's procurement experience to expedite local procurement of equipment for the Tanzania program of work.

News from the Pacific



Pilot Program Update

- We are proud to announce that Dr. Divi Ogaoga has agreed to act as our program lead for our pilot. Dr. Divi is a paediatrician and was previously Director of the RCH Division at the Ministry of Health and Medical Services.
- Dr. Divi is leading and managing the team on the ground in assessing the oxygen situation and planning for installation. Dr. Divi will also lead the team in monitoring and evaluation, as well as on-going technical support to the two hospitals we have identified as pilot sites.
- As the program progresses, Dr. Divi will be engaging with the Ministry of Health and Medical Supplies for the expansion of FREQ2 systems into other healthcare sites.
- We have identified two pilot sites for FREQ2 oxygen installation, the Helena Goldie Hospital and the Good Samaritan Hospital. These two sites encounter significant financial and logistical restrictions with oxygen procurement.



Dr. Divi answers our questions about oxygen access in the Pacific.

What is your plan for working with FREQ2?

Ultimately, to contribute to quality care for sick children admitted with pneumonia and hopefully decrease their chance of dying. To achieve this, I need to assist in this demonstration program and in the future help with the rollout of FREQ2 systems.

What is the future that you see for FREQ2 in the Solomon Islands or more broadly in the Pacific?

The future looks good. I look forward to the expansion and having oxygen more readily available for immediate use for sick children.

What are some of the key learnings you have had so far with working with FREQ2?

Team work, effective communication, good preparation before installation and training of end users. We also need to be patient because it takes time for these things to happen.

Have you identified any potential risks that may impact FREQ2's work in the Pacific?

Natural disasters can affect what is prioritised, we need to convince decision makers and influential individuals that oxygen access is critical.



A conversation with Dr. Barigye on oxygen provision and how FREO2 can keep the oxygen flowing.



In the Western Region of Uganda lies the Mbarara Regional Referral Hospital (MRRH), home of some of the best health professionals and educators in the region and referral hospital for the districts of Mbarara, Bushenyi, Ntungamo, Kiruhura, Ibanda, and Isingiro. Despite being located in the second largest city in Uganda, when the FREO2 team arrived at MRRH in 2016, the hospital was grappling with a low supply of an essential medicine: oxygen.

It was here that the FREO2 team were unexpectedly reunited with an alumnus of the University of Melbourne (UoM), Dr. Celestine Barigye. Dr. Barigye is the Director of MRRH and was previously the Personal Assistant to the Honorable Minister of Health in Uganda, Dr. Ruhakana Rugunda. Before receiving a scholarship to undertake a Masters in Public Health at the UoM, he practised as a doctor for over a decade, working on the frontlines of Uganda's health system in emergency care.

FREO2 Uganda intern Cathybert Ainembabazi recently sat down with Dr. Barigye to discuss the oxygen access crises in Uganda, the impact of the COVID-19 pandemic and how FREO2 foundation can help...

Dr. Barigye, can you tell us about some of the challenges you have observed in oxygen provision in Uganda?

Oxygen provision is one of the biggest challenges in Uganda. When I first arrived here at MRRH, we were only using oxygen cylinders which we had to ration to those patients we thought really needed it. It was so sad because many would go without oxygen because the oxygen cylinders would often run out. Then in 2015 there was a report from a medical ward which showed that many people were dying of single organ failure, due to a lack of oxygen.

In response I enquired with the Ministry of Health, and MRRH became the first hospital in Uganda to get an oxygen plant in 2016. During its installation, a team from Australia called FREO2 came to learn about the oxygen situation at MRRH. I told them about the key challenge with the oxygen plant, it required constant energy supply, so when the national grid turned off, we would lose oxygen which is vital for the survival of many patients.

To my surprise, the FREO2 team said they had come up with a solution! That's how I learned that FREO2 systems reduce oxygen cylinder use by running off a concentrator while the power is on and when the power shuts out it uses the cylinders, so that the children can survive during a power outage.

In your opinion, why is access to oxygen so essential for pediatric health?

Children are so vulnerable when they are not able to have their lungs functioning. When they are born you really need to support them to help their lungs get acclimated to higher levels of oxygen, so they can breathe. Still in Uganda we have too high rates of neonatal deaths. Many children die before the age of 28 days. For many of these babies it is because they have an infection in the chest and they need medical oxygen treatment which is hard to find.

According to the Ministry of Health, pneumonia accounts for 10% of deaths in children under 5 in Uganda, with at least 25 Ugandan children losing their lives to pneumonia every day. How have you personally seen pneumonia impact the lives of Ugandans?

Pneumonia used to be so bad here in Uganda, but over the years we have had some interventions including vaccines and better access to oxygen. Measles also was causing pneumonia-like symptoms which required oxygen, and vaccines have reduced this burden. Other illnesses that can cause a patient to be immunocompromised like HIV or malnourishment have also improved over the years.

Critical care generally has not been a big priority because generally public health focuses on prevention efforts like vaccination. I think for us COVID was a wake up call – what do we do for illnesses that cannot be prevented? We need better human resources, infrastructure and treatment. Slowly at MRRH we hope to be there soon.

How has the COVID-19 pandemic impacted your work at MRRH?

The pandemic has impacted us both positively and negatively. Positively we are more at work, therefore the doctors have been really focused on improving care and seeing patient needs holistically. We have also improved our resources to include rapid diagnostic tests and PCR, and of course the new investment in oxygen has been really positive. Negatively, of course the impact on our economy and the loss of so many lives. We have lost two doctors at MRRH, one resident and one specialist. Since the pandemic started, we have lost about 256 lives which is still much less than I've seen in other countries and regions.

As you know, FREO2 works to improve access to oxygen at the under-resourced periphery of health services to keep the oxygen flowing, even when the power goes out. What has been the impact of having FREO2 systems in MRRH?

FREO2 systems are currently installed in our pediatric wards at MRRH and the impact is great! We have had lots of survival. The real benefit of FREO2 systems is that golden time when the electricity goes off and the system continues the flow of oxygen, to me that is the most important. I really think the impact has been so great that I can see FREO2 systems installed in every ICU bed at MRRH, which would significantly reduce mortality.

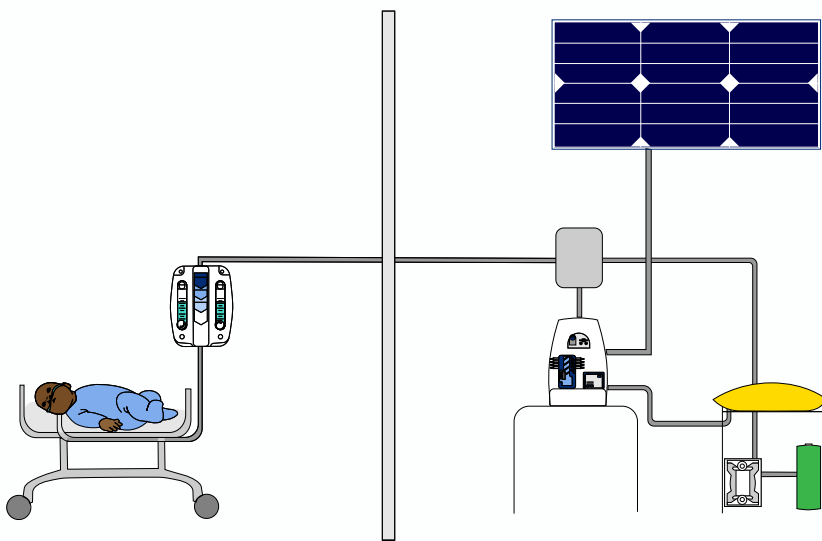
What is your dream for the future of MRRH and what role does oxygen play in this future?

The dream is to create centres of excellence. We have 24 specialised areas across our centres and our big dream is to handle critical care. We'd like to become the national referral hospital. Oxygen is so important to this dream, if we can have more FREO2 systems to bridge that gap when the power goes out. To sustain life at MRRH, we need to be prepared for these emergencies. FREO2 can continue to help us raise the bar for survival rates, because every life matters.



FREO2 SOLAR could reduce oxygen costs by 86% for communities without electricity.

By Dr. David Peake



Graphic Design by Harriet Read

The COVID-19 pandemic has brought the world's attention to the blight of respiratory infections and the global pneumonia crisis. As the leading infectious killer worldwide, pneumonia is considered the "forgotten killer", responsible for 2.6 million deaths in 2017. Medical oxygen is a proven and extremely cost-effective intervention, demonstrating a 35% reduction in mortality for patients with pneumonia and has been shown to be twice as cost effective as vaccination.

Many communities living in low-resource settings face the challenge of oxygen shortages, due to having very poor or no energy supply. Groups around the world have investigated the use of 'traditional' solar installations for oxygen delivery - using large solar panels to produce excess power which is stored in large lead-acid battery banks for use during periods of low solar insolation. Although this is an effective strategy, it also requires a significant capital investment in solar panels, charging circuits, power inverters and environmentally damaging lead-acid batteries. The cost of a system such as this can range between \$12,000 and \$30,000 USD to power a single oxygen concentrator.

FREO2's SOLAR is a novel approach to solar powered oxygen. Leveraging existing FREO2 technologies, it uses DC power directly from photovoltaic panels to power a custom oxygen concentrator where the AC compressor has been replaced with a BLDC compressor. Excess oxygen produced during periods of high solar insolation is then stored in low-pressure oxygen storage, removing the need for an inverter and large battery banks which correspond to a significant portion of the cost and causes of failure in traditional solar systems. FREO2 SOLAR is targeting smaller health facilities, which may have more sporadic oxygen demands and where a larger SOLAR installation would be overkill.

Although SOLAR is in the early prototype phase, we are aiming for an installation cost of around \$4000 USD. This system would be well suited for stabilising oxygen availability at rural and geographically distant healthcare centres without access to grid electricity, allowing healthcare workers to provide oxygen in areas with the highest pneumonia burden. Over this quarter, our focus has been on increasing SOLAR's oxygen production capacity and ruggedising the system for shipment to Uganda for technical testing with our in-country partners.

[Click here to watch a video guide on how our FREO2 SOLAR innovation works!](#)



A Big Thank You to Our Supporters!

