Saving lives in poor countries is about adapting to what's already working there

May 4 2017, by Hamish Graham, Patrick Walker And Trevor Duke

Each year, 5.9 million children under the age of five die, mostly from preventable causes. That's more than 16,000 children every day – and more than 8,000 of these are deaths that could have been prevented with simple, affordable interventions.

So why aren't these interventions available to the children who need them? And what can we do to bridge the gap?

These are the questions we have been tackling with colleagues in Nigeria, where we are attempting to make oxygen therapy available for every child who needs it.

A very basic therapy

In concept, there are few medical therapies more basic than oxygen.

Oxygen is all around us; it is in the air we breathe. Oxygen is the foundation of life, and every cell in our body needs it to survive and do its job.

But some illnesses can cause our blood oxygen levels to drop dangerously low – a condition called hypoxaemia. And hypoxaemia puts our vital organs, and our lives, at risk.

Hypoxaemia is a common complication of some very run-of-the-mill

conditions. Global estimates suggest one in six children admitted to hospital with pneumonia, malaria, or meningitis, and one in five sick newborns, have hypoxaemia on admission.

Hypoxaemia also kills. For children with pneumonia (which kills more children than any other single disease), hypoxaemia increases risk of death up to fourfold.

The good news is many of these deaths can be prevented by providing concentrated oxygen. Our colleagues in Papua New Guinea show that providing oxygen as part of a basic package of health care could reduce childhood pneumonia deaths by 35%. And the intervention was very affordable – at US$1,673 per life saved.

This and other projects used small machines that concentrate oxygen from the air around us; by removing the nitrogen it's possible to isolate about 95% oxygen. This makes oxygen affordable and available at the point of care. And it doesn't need to be transported in large gas cylinders – which is costly, dangerous and unreliable.

The bad news is that despite oxygen being used for more than 100 years, it is still not available to most sick children in resource-limited settings.

At its simplest, an effective oxygen system requires two things: (1) a reliable source of capturing and delivering oxygen, and (2) staff who can use it well.

But how do we ensure there is a reliable oxygen source in remote, under-resourced hospitals that often don't have a reliable power supply? And how do we equip and motivate staff to use it well? How do we make sure the right children get oxygen at the right time? And what do we do when the equipment breaks down?

Such questions show that oxygen therapy may be simple in concept, but actually getting it to children who need it is incredibly challenging.

Bridging the gap

A recent review of 20 oxygen projects from 15 countries uncovered some practical lessons about how we can more effectively get oxygen to children – even in very difficult environments. And we are now using this evidence in Nigeria to make oxygen available to every child who needs it.

Here are some examples.

In Nigeria, existing oxygen equipment is often of poor quality and not suitable for hot, humid, dusty environments. And even when there is working equipment, the power supply is very unreliable.

We recently tested oxygen concentrators being used in 12 Nigerian hospitals, and found that hardly any were producing medical-grade oxygen. Most were just blowing out the air they'd drawn in. Using experiences from The Gambia and Papua New Guinea, we are now using better equipment, building a robust maintenance system, and using solar energy to ensure 24/7 power supply.

Like many countries, Nigeria has a user-pays health system, and oxygen therapy is very expensive – often as much as all other hospital costs combined. With inspiration from Laos, we are trialling a financing scheme to make oxygen more affordable.

Nigerian hospitals also struggle to maintain a skilled and motivated workforce. By adapting methods used in other oxygen projects, we have developed an education and supervision program that involved local staff training and supporting each other in a way that could be self-sustaining,

even with high staff turnover.

There are many misconceptions about oxygen in the country, including the fear that oxygen kills. These ideas can be dangerous, causing sick children to miss out on oxygen therapy even when it is available. But by understanding local perceptions about oxygen, we have been able to give nurses tools to make it easier to know who needs oxygen, assess whether oxygen is helping, and communicate this with parents.

Building on success

So often we hear talk about problems and solutions. Yet oxygen therapy is a good example of how the most effective solutions start not with problems, but with current successes.

Nigerian hospitals, like hospitals everywhere, are already doing so much right. Of course, they have problems – we all do. But to build an effective oxygen system, we need to start with what is working.

Nurses in Nigeria may not know the specifics of oxygen use, but they are incredibly good at caring for their patients in other ways. If we can find ways to integrate oxygen therapy into their existing routines and practices, we will have much greater chance of success than if we just give them more work.

Oxygen therapy serves as a powerful reminder of the disturbing discrepancies in health care that exist between and within countries. But it's also a reminder of the extraordinary opportunity we have to improve and make progress.

Oxygen is something that people in developed countries take for granted, but it remains unavailable for millions of sick children and babies whose lives depend on it. In this, it's not dissimilar to other basic health

interventions that are out of reach of those who need them most.

All these therapies are simple in concept, but complex when implemented in real life. But this complexity does not mean they should end up in the too-hard basket.

By welcoming the challenge, and really committing ourselves to understanding how interventions work on the ground, we have the opportunity to save the millions of children who die unnecessarily each and every year.

The solutions already exist: we just have to put them into practice.

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