How a simple scan helped children suffering with hidden heart diseases in South Africa

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A simple heart scan can save the lives of children suffering with conditions such as rheumatic heart disease. Credit: Shidlovski/Shutterstock

The polite, well-behaved ten-year-old girl lying patiently in the makeshift clinic in her school in Cape Town, South Africa, is exactly

like all her friends—active and smiley. Also like her friends, she's under strict instructions from her teachers to put "jokes in your pockets, smiles on your faces". But the ultrasound waves bouncing back from her heart during an echocardiography scan show that she is different: she has congenital heart disease, which means her heart did not develop properly in the womb, and it makes each heart beat less efficient.

This birth defect can lead to abnormal heart rhythms, shortness of breath, fatigue and an increased risk of cardiovascular disease in later life. A child with the same heart condition in the UK would have received treatment when they were a baby and would be closely monitored throughout their life. However, though the girl has had an operation to treat her heart abnormality, her parents have been too worried about medical costs to bring her in for further follow up. Without this, the surgery she had hasn't entirely fixed the problem with her heart. She desperately needs further care.

This is just one of the hidden heart conditions spotted by a team of ten echocardiographers from around the globe, during a five-day trip to Cape Town in September 2019. The group was a mix of cardiac physiologists, who use echocardiography to diagnose patients with heart conditions, consultant doctors, and university researchers. Our group came together as part of a humanitarian project that aimed to screen for hidden heart conditions in South Africa—especially rheumatic heart disease.

This condition might be uncommon in most parts of the developed world, such as the US and the UK. However, it's the single biggest cause of heart-related death in children and young people in the developing world. An estimated 250,000 people, most of them under 35 years old die of rheumatic heart disease each year across the world. In South Africa, two out of every 100 children are affected by the disease. But most have no idea that they're affected, let alone receive treatment for

the condition.

Rheumatic heart disease is an unfortunate side effect of rheumatic fever. Rheumatic fever is a rare complication that may develop after a bacterial throat infection, such as strep throat and scarlet fever, and causes inflammation in the heart, joints, skin, and brain.

The inflammation characteristic of rheumatic fever sometimes infiltrates the heart, where it can damage the heart valves – meaning that some blood may flow in the wrong direction through the valves, rather than being pumped around the body properly. The disease can ultimately cause disability because of heart failure, and lead to patients dying young.

Luckily, this kind of heart damage can be visible to trained eyes. Our team of echocardiographers—which are in short supply in South Africa—use hand-held echocardiographic devices to spot the disease. Caught early enough, the disease is easily treated with antibiotics.

We were trained by a cardiologist from Cape Town, before heading to three primary schools in the area where we provided free heart scans to over 1,000 children, aged eight to 15.

At the first primary school we visited, we found a boy with a serious heart condition. Two of the cusps—the flaps of tissue that form heart valves—had fused together, meaning his aortic valve consists of two cusps, rather than the normal three. He had no idea that he was living with this condition. While this disease is not rheumatic, this sort of bicuspid heart valve can mean that he could potentially develop trouble breathing, chest pain, and fatigue later in life—and these could be life threatening, especially as he gets older. This child will now be monitored closely and get the surgery he needs if required.

On the same day, we find the smiling girl who turns out to have a congenital heart defect that has been "lost to follow up" after her surgery. We learn from Dr. Luke Hunter, a cardiologist from Cape Town who trained our volunteer group, that this is a common problem because many families fear how medical costs may cripple their family. Finding out that this child needs further medical follow up might mean that she lives a longer, healthier life with follow up.

The next day, we travel to the less developed area of Grabouw and find the first confirmed case of rheumatic heart disease in another primary schoolgirl. The team find a few more borderline cases of rheumatic heart disease too, finding a total of 16 cases that week alone—plus another case of congenital heart disease, taking the total to three. All of these findings are life-changing for the children and the families affected.

Our work found fewer cases of rheumatic heart disease in the area than the previous year, which might mean that the disease is declining in the area. However, continued work in Cape Town will help continue to detect silent heart disease in the area, which is tragically shortening the lives of young people in Africa.

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