

Brightening the Eyes of a Nation

How HelpMeSee and Madagascar’s Ministry of Public Health are working towards a 20-fold increase the number of cataract specialists working in rural areas

Oscelle Boye | 11/28/2023 | 8 min read | Discussion



With its ability to provide the feel of a human eye in training, HelpMeSee uses simulation-based training to help restore sight for people with cataract. Credit: Ymagoo Cinetyka. Image provided by HelpMeSee

How many ophthalmologists would you estimate are needed to serve a population of 29 million people? According to the American Academy of Ophthalmology (AAO) membership data (an estimated 92 percent of US-based practicing ophthalmologists are members), there were 2379 ophthalmologists serving California’s more than 29 million citizens in 2018 (1). In stark contrast, the entire island of Madagascar (a similar population size to California in 2021) has only 25 ophthalmologists who are trained to perform cataract surgery.

Twenty of these ophthalmologists live and practice in the capital, Antananarivo, or in other large towns, collectively taking care of an urban population of 11.5 million people. The remaining five, who live and practice in rural areas, look after the other 17.5 million. The result of this poor ratio? Only 370 cataract procedures are completed for every million needed across the country.

Statistics from HelpMeSee, which is a global nonprofit using simulation-based training to fight cataract blindness, indicate that over 100 million people in less economically developed countries across the globe are blind or visually impaired as a result of untreated cataract or a lack of access to care. According to a Rapid Assessment of Avoidable Blindness (RAAB) study conducted by Madagascar’s Ministry of Public Health, 200,000 people in the country are blind as a result of untreated bilateral cataract (2). With such a large and growing cataract burden, it is clear that more practitioners are needed – and fast. And that’s why HelpMeSee partnered with Madagascar’s Ministry of Public Health, and the Polyclinic d’Ilafy hospital in Antananarivo to launch the Mazava Project. With a name that means “bright” in Malagasy, the Mazava project is an initiative working to reduce the nation’s prevalence of cataracts by training more than 100 general practitioners to become competent cataract specialists by mid-2024.

Here, we take a closer look at the Mazava Project – and the people behind it – to find out what it takes to restore sight to a nation.



Building confidence, the HelpMeSee simulator allows for repetitive practice of each step of cataract surgery until it is mastered, then allows the trainee to move on to the next. Credit: Ymagoo Cinetyka. Image provided by HelpMeSee

The initial spark

According to Bonnie An Henderson, HelpMeSee’s President and CEO, to understand the origins of the Mazava Project, we should first understand the formation of HelpMeSee itself. Founded in 2010 by father and son, Al and Jim Ueltschi – Al also being a co-founder of the world’s first Flying Eye Hospital, Orbis International – HelpMeSee aimed to eradicate global blindness by improving surgical training through simulation. “Building on Al Ueltschi’s work in creating FlightSafety International, the first and most established flight simulation company, we worked to develop the best-in-class, high-fidelity manual small incision cataract surgery and phacoemulsification simulators, which we use to deliver training throughout the world,” says Bonnie An Henderson. “Since completion of the simulators, we have been able to train over 3,000 professionals across the globe.”

The motivation behind the Mazava Project then – and, in fact, all HelpMeSee projects in less economically developed countries – is simple: to increase worldwide access to eye care and thus reduce the prevalence and impact of preventable blindness. “Access to care for cataract – the leading cause of blindness – in many parts of the developing world is limited by several factors, including access to a competent cataract surgeon. Madagascar is one of those locations where there is a dire need for ophthalmologists,” says Bonnie An Henderson. “When a person is blind or severely visually impaired, this affects not only their life, but also that of their entire family. Often, a relative is required to stay home from school or work to care for the blind person. This has an economic effect on the family, community, and ultimately the country. Additionally, the person who remains home to be the caretaker is often the female child, which prevents girls from becoming educated, adding to the gender inequality in many countries.”



HelpMeSee is partnering with Madagascar’s Ministry of Public Health and the Polyclinic d’Ilafy in Antananarivo to increase access to care and help restore the gift of sight for people in Madagascar who suffer from cataract. Credit: Ymagoo Cinetyka. Image provided by HelpMeSee

From simulation to surgery

The Mazava Project certainly has the ambition and the technology to have an incredible impact on eye care infrastructure in Madagascar, but a big question remains: how exactly do you go about converting 100 GPs into cataract surgeons? Jean-Marie Andre, HelpMeSee’s Director of Business Development for Africa and Europe – and the Mazava Project’s lead and chief instructor, tells us that, to be included in the project, GPs must meet key criteria:

- Under 45
- Already established in the periphery (away from the capital)
- Able to pass the dexterity and psychomotor skill test on the HelpMeSee simulator
- Able to pass the ophthalmological knowledge test at the University of Antananarivo, under the supervision of Professor and Ophthalmologist, Léa Raobela.

From there, successful GPs enter the training process. “The training is comparable to a concentrated ophthalmology residency program focusing solely on manual cataract surgery training,” Bonnie An Henderson tells us. The program starts off with three weeks of simulated training. “Every cataract surgeon faces potential complications. But HelpMeSee’s simulation-based training allows trainees to experience complications without risk to the human eye,” explains Andre. “Training in these modules is mandatory before a trainee proceeds to surgery on a human, which is focused on increasing patient safety.”

In addition to safety, the surgical simulation-based training offers other benefits, in particular, allowing trainees to focus on, repeat, and ultimately master each step of the multistep cataract surgery. The incorporation of surgical simulation into training regimens is something that Andre believes will become a mainstay of surgical education. “With its ability to provide the feel of a human eye in training, we believe that cataract surgery will be taught using the innovations of simulation-based training worldwide. What we are doing here in Madagascar is a result of the government recognizing the impact that this innovative technology can have on people waiting to have their sight restored.”

After passing an exam on the simulator, the trainees proceed to live surgery, which is

supervised by Raobela and her team. Once the student is deemed competent and autonomous in cataract surgery, they are then presented with a Cataract Surgeon’s Diploma. The freshly graduated cataract surgeons are then sent to operating rooms (ORs) across the country. Mazava operators from the first year will work within already established ORs that do not have cataract surgeons, whereas those from the second and third years will be positioned in new ORs that will be created by the Ministry of Public Health at strategic locations.

What the doctor ordered?

As of writing, 14 GPs have received their Cataract Surgeon’s Diploma, six of whom are practicing routinely with excellent results. Rico Ludovic Mpanasoa, one of the trainees who has successfully attained his Cataract Surgeon’s Diploma and now serves as a Cataract Operator at the Institut de la Vision, tells us of his personal experience of training through the Mazava Project.

Why did you choose to undergo this training?

I initially chose to enter into the Mazava Project because, as a GP, I was encountering a large number of patients from my local region who were coming to my practice presenting with blindness as a result of cataract. Having always been drawn to learning surgery, and wanting to do something to help my patient population, this was really an opportunity I could not miss.

How was the experience of undergoing the year-long cataract surgery training?

Learning to perform cataract surgery was a process that I found incredibly exciting; however, that’s not to say that it didn’t come without its challenges as I was still continuing to serve at my private practice over the course of my training.

How did the training you received translate to the experience of performing cataract surgery within your patient population?

For me, the training has translated well. Moving from the surgical simulator to working on actual patients’ eyes was a smooth transition. I was well supported and mentored on-site by senior surgeons initially, and gradually gained my autonomy in performing the procedure. Everything happens naturally.

What impact is your Cataract Surgery Diploma having on your community?

At the moment, I perform around five of these procedures each week – and we are seeing good results. For my patients, they both understand and appreciate the fact that I am now a cataract surgeon and are really grateful to have the option to receive this treatment locally, which, for many, is the only way to access the treatment at all.

More Doctors, More Projects

The project has already made significant progress but, as Patrice Zafindrianomply, Director of Non-Transmissible Disease within the Ministry of Health, informs us, this is only the beginning. “At last measurement, the cataract surgical rate (CSR) – the number of cataract operations performed per million people over the course of one year – in Madagascar was 370, which is extremely low. Our focus for the Mazava project is achieving a CSR of 2,000 surgeries every year for the next ten years, as recommended by the World Health Organization (WHO).” Certainly, by increasing the number of cataract surgeons practicing in rural regions of Madagascar by 20 times what they were before it began, the Mazava project

has the capability to seriously improve the majority of Malagasy people’s access to cataract surgery and dramatically lower the nation’s rates of preventable blindness.



At the onset of this initiative, the entire island of Madagascar had only 25 ophthalmologists who are trained to do cataract surgery for 29 million people. Through a unique partnership, 100 new cataract surgeons are being trained who can restore the gift of sight. Credit: Ymagoo Cinetyka. Image provided by HelpMeSee

Though bolstering an entire nation’s eye care infrastructure is no mean feat, there are many other regions with the same dire need for ophthalmologists. And that’s why HelpMeSee hopes the Mazava Project will serve as a successful blueprint that can be applied to other countries. “We believe this sustainable approach will help address the gaps in care that exist for 100 million people around the world who are blind or visually impaired as a result of cataract and are unable to access surgery,” says Jean-Marie Andre. “Once the results of this project are complete via a scientific study we are conducting in parallel, our intention is to replicate this model in other developing countries.”

It will take time before the data prove the exact impact of the project but, looking at what has been achieved in just a few months, the future of eye care access for the Malagasy people certainly seems bright – or, as they would put it, mazava.

References

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I have always been fascinated by stories. During my biomedical sciences degree, though I enjoyed wet lab sessions, I was truly in my element when sitting down to write up my results and find the stories within the data. Working at Texere gives me the opportunity to delve into a plethora of interesting stories, sharing them with a wide audience as I go.

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