



# WISEPILL

AERIS HELPS WISEPILL USE IoT TO IMPROVE TB TREATMENT OUTCOMES

“Tuberculosis, particularly drug-resistant TB, affects patients around the world, primarily in under-served communities. The Wisepill approach, using IoT technology to improve medication adherence, has shown marked success wherever it has been adopted. Our partnership with Aeris, and its global connectivity service, enables us to provide the same patient experience from urban Kiev in Ukraine to rural Uganda, and to address the challenge of TB treatment with a creative and cost-effective solution.”

Lloyd Marshall, CEO and Founder, Wisepill Technologies

## The Global Tuberculosis and HIV/AIDs Problem

In much of the developed world, tuberculosis is a disease rarely seen; when seen, it typically is treated quickly, effectively, and relatively inexpensively. But TB is one of the top 10 causes of death worldwide and a major global health problem. It is the most prevalent communicable disease, contracted by more than 10 million people annually. In 2016, 1.7 million people died from TB (including 250,000 children), more than 95% of whom lived in low- and middle-income countries. TB also is a leading cause of death for people with HIV/AIDS, causing 40% of the 1.2 million deaths from HIV/AIDS in 2016.

Both TB and HIV/AIDS can be treated, with well-defined drug regimens leading to positive patient outcomes. However, the standard drug used to treat TB must be taken for at least six months. A patient who fails to complete the full course of medication risks a recurrence of the disease, in a more virulent drug-resistant form. The World Health Organization (WHO) estimates that in 2016 there were 600,000 new cases of TB resistant to the primary drug treatment—with nearly half a million of those cases being resistant to multiple drug treatments. The remedy for multi-drug-resistant TB (MDR-TB) has a treatment course lasting substantially longer, often more than year, and is substantially more expensive. Long hospital stays typically are required.

Drug-resistant TB accounted for 32% of South Africa’s \$218 million national budget for TB in 2011, though it represented only 2% of all TB cases.

Set against this backdrop is the UN’s Sustainable Development Goal #3 (“To ensure healthy lives and promote well-being for all at all ages.”), which includes ending global epidemics in TB and HIV/AIDs by 2030. Necessary drug treatments to accomplish this goal exist, and thanks to international agencies and NGOs, as well as major donors, funds exist to ensure these drugs are available to patients in the poorest countries. But funding and available drugs don’t help if a patient fails to adhere to the full course of prescribed medication.

According to studies by the WHO, nearly 50% of patients fail to complete a prescribed TB drug regimen, a problem known as “non-adherence”. The reasons for this include lack of access, communication barriers, and simply forgetfulness. Many of these patients live at or below the global poverty line of \$2.00 per day of income, often in rural areas, far from even the most basic medical facilities, so are unable to be checked regularly by health professionals. The vast majority of these patients, however, live in areas covered by cellular carriers, and many of even the poorest patients have mobile phones and can receive text messages.





## Wisepill's Connected Pillbox to Improve Medication Adherence

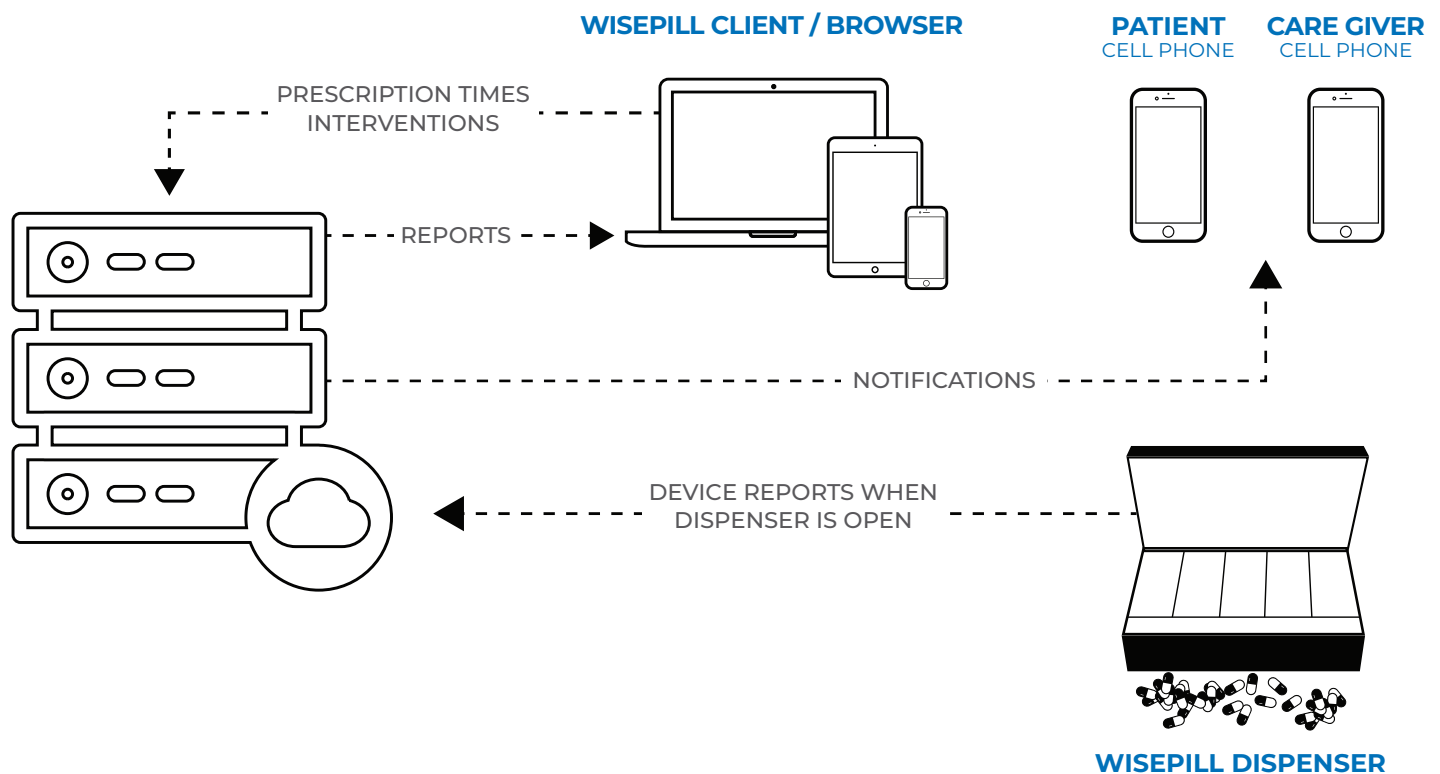
To tackle the challenge of patient medication non-adherence, the team at Wisepill used Internet of Things (IoT) technology to create a simple but extremely effective way to determine which patients stop taking their medication during the course of treatment, and to cost-effectively reach out to those patients to try to get them back on course. Wisepill created a pillbox that provides real-time medication management solutions. The Wisepill electronic pillbox uses cellular and internet technologies to automatically record each time the dispenser is opened and to forward that information to Wisepill's cloud servers. The server associates a dispenser with a patient and securely stores all related device and patient intake data. The pillbox, designed to

work in challenging environments, has a rechargeable, extended-life battery, which allows the device to be used for as long as six months without the need for an external power source. The device also is designed to work in places where cellphone network coverage is poor or unreliable.

Using secure cloud servers to store client data, Wisepill ensures that data are not lost if a device goes missing or is damaged. Furthermore, the data are available to create in-depth reports and notifications via a web browser or mobile apps. In particular, text message notifications can be sent directly to patients as reminders to take their pills, and to care providers so they can check on patients and encourage them to resume treatment. These messages are sent automatically by the application, eliminating the time gaps, sometimes weeks, to receive this feedback.

Wisepill Technologies seeks to provide a truly global data solution to its clients in every corner of the globe. For instance, Wisepill devices are being used in China, India, Eastern Europe, and parts of Africa to manage TB medication adherence. Wisepill dispensers have been used by patients with TB, HIV/AIDS, epilepsy, osteoporosis, chronic heart conditions, diabetes, leukemia, asthma, attention deficit hyperactive disorder (ADHD), and hepatitis C in more than 20 countries.

The Wisepill system also has been used by research organizations and universities to monitor medicinal intake data for research purposes. For example, Wisepill worked with Massachusetts General Hospital and the Harvard Initiative for Global Health to adapt the technology to work well in rural environments where cellular networks are not always reliable.



## Aeris and Wisepill—Working Together to Solve Global Health Challenges

To make medical adherence programs work, one of the key elements required is a connectivity solution that holds up under difficult situations, such as rural, hard-to-reach locales. With the Aeris Connectivity Platform (ACP), companies can install the Aeris global subscriber identity module (SIM) at the point of manufacture, reducing both supply chain costs and deployment time, as well as overcoming any local, regional, or national compliance requirements. By utilizing Aeris' single global access point name (APN), a system was deployed on a simple plug-and-play basis, without the need to reconfigure to local network settings. The ACP enables Wisepill to have real-time access to medical adherence data, along with alert management functionality, thereby improving medical intake for patients. Added to this are Aeris' exceptional customer support, including a willingness to go beyond the standard product offerings to address unique challenges, and the ability to tailor specific solution pricing to support this vital social impact mission.

Wisepill has developed a creative approach to a global challenge, looking at medication adherence through a novel IoT lens. Aeris is using its expertise and leadership to help Wisepill reduce cost and improve service. Aeris is proud to be working with Wisepill to support its mission and all of those involved in the global "Stop TB" community (<http://www.stoptb.org>). By cultivating an international IoT approach to medicinal intake solutions, the vision of collective healthcare accessibility can come to fruition.



## ABOUT WISEPILL TECHNOLOGIES:

Wisepill is a pioneer and leader in the field of medication adherence, providing scalable real-time adherence management solutions worldwide.

Visit [www.wisepill.com](http://www.wisepill.com) or follow them on Twitter @wisepill to see their progress and get in touch with them.

Contact them at  
[info@wisepill.com](mailto:info@wisepill.com)  
or +27 82 8551388.

## ABOUT AERIS:

Aeris is a technology partner with a proven history of helping companies unlock value through IoT. For more than a decade, we've powered critical projects for some of the most demanding customers of IoT services today. We strive to fundamentally improve their businesses by dramatically reducing costs, accelerating time-to-market, and enabling new revenue streams. Built from the ground up for IoT and road tested at scale, Aeris IoT Services are based on the broadest technology stack in the industry, spanning connectivity up to vertical solutions. As veterans of the industry, we know that implementing an IoT solution can be complex, and we pride ourselves on making it simpler.

Visit [www.aeris.com/india](http://www.aeris.com/india) or follow us on Twitter @AerisM2M to learn how we can inspire you to create new business models and to participate in the revolution of the Internet of Things.

United States Contact:  
[info@aeris.net](mailto:info@aeris.net)  
or +1 408 557 1993

Europe Contact:  
[EU\\_info@aeris.net](mailto:EU_info@aeris.net)  
or +44 118 315 0614

India Contact:  
[india\\_info@aeris.net](mailto:india_info@aeris.net)  
or +91 01206156100

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