

RESEARCH NEWS

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Remote areas

Medical Care — Health Platform for Pickup Trucks

Around the world, there is a lack of comprehensive medical care for people living in remote areas. Researchers at the Fraunhofer Institute for Surface Engineering and Thin Films IST and the Fraunhofer Institute for Solar Energy Systems ISE have devised a solution for this in the PreCare project: a flexible, modular health platform that can be installed on the bed of a pickup truck. It is already in use in South Africa and Namibia. The team was presented with the Innovations for a Better Future award from the Fraunhofer-Zukunftsstiftung (Fraunhofer Future Foundation) for this development.

People living in remote, hard-to-access areas often receive little to no medical care. Aside from the difficulty of simply getting around, with underdeveloped road networks and lack of means of transportation, there is also a shortage of medical staff. Across many countries in Africa, it is not uncommon for there to be only one doctor for every 10,000 people. For comparison, there are an average of 44 physicians providing care for every 10,000 people in Germany. To help people in these regions get access to needed care, researchers have developed a rugged health platform that can be installed on the bed of all-terrain pickup trucks, offering all the infrastructure needed to perform health checks, packed into a tiny space. Even rough dirt or gravel roads are no longer an obstacle. “PreCare puts healthcare within reach for everyone, everywhere,” says Frank Neumann, Photo- and Electrochemical Environmental Technologies team leader at Fraunhofer IST and the project’s coordinator.

Basic medical equipment meets technological innovation

On the platform, electrical equipment like the built-in refrigeration system for medications, vaccines and blood samples is operated via an independent power supply that relies on solar panels and battery storage. There is even a water purification system on board. A system based on diamond-coated electrodes makes it possible to produce disinfectants from a simple sodium chloride solution while in the field. To compare treatment data and provide telemedicine services, a communication system that uses satellite or mobile networks can be incorporated. Diagnostic equipment such as portable X-ray, EKG and ultrasound units can be added as well.

Versatile design for individual needs

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“Our solution is flexible and modular. This lets even people in technologically underdeveloped regions participate in advances in medical care,” explains Joachim Koschikowski, manager of the Water Treatment and Separation group at Fraunhofer ISE. The mobile health platform is also low in cost, as it is installed in the bed of standard pickup trucks and can be operated effectively with as little as one driver and one healthcare professional. Ricarda-Laura Sack, who worked at Fraunhofer ISE while the first prototype was in development and is responsible for training and remote maintenance in South Africa, explains: “Ease of operation and low maintenance are really important to us. The goal is to get personnel ready to operate it on their own in just one training session. That’s a practical solution even for organizations with a limited budget.”

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Firmly rooted thanks to local network

The project has featured extensive collaboration with a wide range of local stakeholders. The first prototype was delivered to an NGO in South Africa in 2023. Funding from the Fraunhofer Future Foundation subsequently made it possible to develop a second prototype, which is now being operated by an NGO in Namibia. Local partners in healthcare, research, systems construction and logistics in sub-Saharan Africa were included from an early stage. S Mile Solutions (Pty) Ltd, which was founded during the project, is now handling the manufacturing, sales and maintenance. It is Fraunhofer’s first spin-off in South Africa. “Our aim is to make high tech available locally for the long term, with low barriers to entry — in Africa for Africa,” Neumann says.

Huge potential for further applications

To further develop the technology and incorporate it even more into people’s everyday lives, the team is continuing to rely on local collaboration. “The system is universal, and it has the potential to incorporate other kinds of technical equipment,” explains Simone Kondruweit-Reinema, head of marketing and communication at Fraunhofer IST, who is responsible for communication and marketing management for the project. Adaptation to areas such as disaster relief or veterinary care on wildlife reserves is also conceivable.

Innovations for a Better Future award from the Fraunhofer-Zukunftsstiftung (Fraunhofer Future Foundation)

In 2025, the Fraunhofer-Zukunftsstiftung (Fraunhofer Future Foundation) is presenting its Innovations for a Better Future award for the first time. This award recognizes the achievements of a Fraunhofer team that has succeeded in translating a technological solution into practice, thereby making a special contribution to sustainable development in line with the UN Sustainable Development Goals (SDGs). The prize, which is endowed with 50,000 euros, is made possible thanks to generous support from private donors. This earmarked funding supports the further development of the project.



Fig. 1 Frank Neumann, Ricarda-Laura Sack, Joachim Koschikowski and Simone Kondruweit-Reinema (from left) received the Innovations for a Better Future award from the Fraunhofer Future Foundation.

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Fig. 2 PreCare can be operated with as little as one driver and one healthcare professional.

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