

Innovations that save lives: Munich Re and Fraunhofer grant awards for ideas for treatment of Covid-19

- Ideas competition to support development of equipment for the local treatment of Covid-19 patients in regions particularly severely affected
- Awards and implementation budget totalling €1m
- Blueprints and training app provided free of charge to partners in countries most in need



„The coronavirus has reached every country in the world, but medical assistance for patients is far from being available everywhere. Munich Re would like to make its competence and resources available to promote new solutions for the treatment of patients. Innovation is the motor of society and the economy – and initiatives like the Give a Breath Challenge drive it ahead. Those who took part have demonstrated that with creativity, commitment and tenacity, possibilities for helping save people’s lives can be created quickly. I would like to say a big thank you to them!”

Torsten Jeworrek, Member of the Board of Management

Medical technology for rapid local production

Against the background of the Covid-19 pandemic, Munich Re and the Fraunhofer-Gesellschaft launched the Give a Breath Challenge in March of this year. They aim to promote innovative ideas that can help people who have contracted the new coronavirus, contributing their own expertise and networks, and funding totalling €1m.

The challenge was split into three categories. The first category was for designs for non-invasive lung ventilators and oxygen concentrators, the second for the development of non-invasive respirator masks, and the third for the provision of information on the use of the equipment developed and basic knowledge on Covid-19 for additional support staff needed. With these three components, a complete respirator system can be set up. It has to be possible to produce the equipment anywhere in the world using 3D printing or other fast manufacturing processes.

The primary aim is to create the technological basis for the rapid local supply of ventilators to cope with imminent shortages in the local emergency treatment of Covid-19 patients and mitigate the impact of the pandemic for people affected worldwide.



„Events like the current Covid-19 pandemic challenge us to search for solutions together and implement them quickly and efficiently. I am therefore particularly pleased with the good partnership and cooperation with Munich Re and all others involved, whose commitment and ideas within the framework of the Give a Breath Challenge have made it possible to take a major step forward in overcoming the medical crisis.”

Prof. Ralf B. Wehrspohn, Director for Technology Marketing and Business Models at the Fraunhofer-Gesellschaft

The winners' equipment: versatile, inexpensive, multi-purpose

Over 150 project designs were submitted worldwide. Seven teams were selected for the final in April and received support for the manufacture of prototypes. In mid-July, the prototypes were examined by experts at the ETH Zürich (Swiss Federal Institute of Technology Zurich) and by Professor Dr. Dieter Köhler, the former president of the German Society for Pneumology (DGP), who applied internationally recognised testing methodologies. The jury determined the winners on the basis of their findings.

Two winners shared the award in the category for non-invasive ventilators. The **SmartCPAP** team developed a non-invasive ventilator that can be produced inexpensively anywhere and used in a wide range of conditions. The machine has some special features that make it particularly suitable for Covid-19 patients. For example, it assists patients' spontaneous inhalation and exhalation in a very flexible way, thereby providing support for as long as possible without intubation so that intensive-care beds can be kept free for more serious cases. The SmartCPAP can work with oxygen from various different sources and also has features that save oxygen – an important aspect in a crisis in which oxygen is a rare commodity.

The **Vivid Breath** team also received an award in this category. Vivid Breath developed an exceptionally inexpensive respirator system comprising an O₂ concentrator and a ventilator. It offers various possibilities for ventilation and other purposes in addition to its current use for Covid-19 patients. The O₂ concentrator can supply up to six patients with oxygen at the same time. The materials and components required can be procured easily or manufactured locally using a 3D printer.

The **Soteria** team was the winner in the respiratory mask category. A 3D printer is also all that is needed to produce a Soteria mask. Due to its innovative internal honeycomb structure, it can be adapted flexibly to different shapes and sizes of face, enabling it to be sealed very effectively. It can also be used for many different types of ventilator. Assembly instructions with illustrations and a video tutorial help ensure that it can be quickly introduced.

The **Virus Fighter's Handbook** was the winner in the training material category. A team from the Project Group for Automation in Medicine and Biotechnology (PAMB) at the Fraunhofer Institute for Manufacturing, Engineering and Automation (IPA) worked with experts from Festo SE & Co. KG and doctors from a number of clinics to develop the design of a digital manual based on an existing app. Registered users receive information via the app on the use and maintenance of the newly developed equipment, with specific information provided on treating Covid-19 patients.

Equipment to be piloted in South Africa

The digital blueprints for the ventilators and masks, including information on their manufacture, assembly and use, are to be made available to governments and partners throughout the world to enable them to be produced and used locally. The digital handbook for the treatment of Covid-19 patients will also be globally accessible via an app. This approach will enable severely affected regions to receive support more quickly and independently of international supply chains.

A plan for working with Stellenbosch University in South Africa to pilot the equipment designed has already been developed. Discussions on piloting are currently taking place with the Faculty of Medicine and Health Sciences at Stellenbosch University, the Tygerberg Hospital in Cape Town, the Centre for Rapid Prototyping and Manufacturing in Bloemfontein and the Fraunhofer Innovation Platform (FIP) at Stellenbosch University. Over the next few weeks, the necessary clinical studies and functional tests are to be carried out to enable the equipment to be approved by the South African authorities.

Support group from industry and science

Munich Re and the Fraunhofer-Gesellschaft would like to thank not only those taking part in the Challenge, but also the experts from industry and science who contributed their expertise on the jury and in various consultations, and agreed to further assistance being provided via the knowledge and networks at their companies.

In addition to Munich Re board members Dr. Torsten Jeworrek and Dr. Thomas Blunck, and Fraunhofer directors Professor Ralf B. Wehrspohn and Professor Alexander Kurz, the jury included the following experts:

- Prof. Oscar-W. Reif, Chief Technology Officer Corporate Research, Sartorius Stedim

Biotech GmbH

- Peter Schardt, Chief Technology Officer, Siemens Healthineers
- Prof. Johann Weidringer, Chairman of the DIN Advisory Boards NARK and NAMED
- Dr. Dr. Karsten Hiltawsky, Head of Technology and IP, Drägerwerk AG & Co. KGaA
- Dirk Hilgenberg, Senior Vice President Production Systems, BMW Group
- Dr. Marco Nock, Director Innovation Management, EOS GmbH

Münchener Rückversicherungs-Gesellschaft

Aktiengesellschaft in München
Group Media Relations
Koeniginstrasse 107, 80802 Munich, Germany

www.munichre.com
LinkedIn: <https://de.linkedin.com/company/munich-re>
Twitter: @MunichRe

For Media inquiries please contact

Strategic Communications & PR

Florian Amberg

Tel.: +49 89 3891 2299
Mobile: +49 170 712 97 84
flamberg@munichre.com

Group Media Relations

Stefan Straub

Tel.: +49 89 3891 9896
Mobile: +49 151 64 93 30 48
sstraub@munichre.com

Group Media Relations

Irmgard Joas

Tel.: +49 89 3891 6188
Mobile: +49 151 52 81 70 24
ijoas@munichre.com

Media Relations Asia-Pacific

Faith Thoms

Tel.: +65 63180762
Mobile: +65 83390125
fthoms@munichre.com

Media Relations North America

Jodi Dorman

Tel.: +1 609 243 4533
Mobile: +1 908 391 2427
jdorman@munichreamerica.com

London Insurance Market

Lillian Ng

Tel.: +44 207 8863952
Mobile: +44 7809 495299
lillianng@munichre.com

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