

PRESS RELEASE

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Biomedical research made in Luxembourg - Digital data and AI to improve the lives of people with diabetes.

A new research project aimed at significantly raising the quality of life of people with diabetes (PWD) launches today in Luxembourg: CoLive Diabetes. In this international project led by the Luxembourg Institute of Health (LIH), scientists will study over several years how digital data can be used for better management of diabetes and for the prevention of diabetes-related complications. By making deep analyses of data, among other things using artificial intelligence (AI), the researchers want to generate so-called digital twins of the respective patients – a kind of mirror image of each person on the computer. This should enable medical professionals to predict the course of diabetes more accurately and to develop better, personalised treatment strategies for PWDs.

Until now, medical doctors have used biomarkers to determine the health status of PWDs. These markers measure the blood glucose level or glycated haemoglobin. As such, they cannot predict exactly how the disease will progress over months, let alone years. *“We want to change that,”* says DrGuy Fagherazzi, Research Leader of the Digital Epidemiology and E-health hub at LIH’s Department of Population Health: *“We want to find digital markers that will allow an individual, long-term prognosis for PWDs.”*

The core element of the project is a specially developed smartphone app. In this app, named CoLive, study volunteers record information regarding their lifestyle or their physical and mental wellbeing. This includes geolocation data, social media usage, selfies or voice recordings. The scientists plan to identify signatures in the volunteers’ voices – so-called vocal markers. These are associated with emotions and psychological factors such as fear, anger, stress, anxiety levels or even an episode of hypoglycaemia.

For generating the digital twins, the researchers will use an infrastructure called the Digital Health Data Lake – where a large pool of health-related innovative digital data types such as speech and pictures will be collected for research purposes. The CoLive team wants to combine these data with the data collected using the CoLive app. Dr Fagherazzi explains: *“Collecting all this digital data will help us to better characterise and understand, in real life, how psychological factors impact, for instance, the glycaemic variability, the risk of having hypoglycaemia or future diabetes-related complications. It will also help to give advice to healthcare professionals on how to better detect and treat psychological factors and mental health in PWDs.”*

To implement this, the scientists aim to develop a special tool for the smartphones of PWDs. This tool will give an alert if it detects a potential risk and provide suggestions on how people can optimally manage their diabetes. *“These digital tools and just-in-time interventions will help PWDs to optimise their daily diabetes management when they need it,”* says Prof Laetitia Huiart, Director of LIH’s Department of Population Health. She also expresses her delight at the start of CoLive Diabetes: *“Luxembourg will gain even more visibility in health research through this international project. CoLive Diabetes provides the opportunity to use the potential of real digital data and AI to significantly improve PWDs’ quality of life. In CoLive Diabetes, we are investigating what really matters to those who live with diabetes.”*

Information for potential volunteers

PWDs are the most connected group of chronic patients and the most active in self-monitoring their disease: The LIH researchers and their colleagues anticipate 50,000 volunteers with type 1 and type 2 diabetes will participate worldwide in CoLive Diabetes. Digital analyses assisted by AI offer a chance to gain genuinely new insights, especially for the large volumes of data required from such a huge number of volunteers. For the CoLive team, privacy is a top priority of the study: all data are treated in such a way that they cannot be traced back to an individual person.

CoLive Diabetes is an open and participatory research project. The volunteers, nicknamed “CoLivers”, will be involved at the different stages of the research, such as the conception of the smartphone app, the validation of existing research questions and the identification of new innovative research questions relevant to their day-to-day diabetes management. The CoLivers will even have the opportunity to lead research projects based on CoLive data along with professional researchers.

More information on CoLive Diabetes: www.colive-diabetes.org

About Luxembourg Institute of Health: Research dedicated to life

The Luxembourg Institute of Health (LIH) is a public research organisation at the forefront of biomedical sciences. With its strong expertise in population health, oncology, infection and immunity as well as storage and handling of biological samples, its research activities impact on people’s health. At LIH, devoted scientists investigate disease mechanisms to develop new diagnostics, innovative therapies and effective tools to implement personalised medicine. The institution is the first supplier of public health information in Luxembourg, a strong cooperation partner in local and international projects and an attractive training place for ambitious early-stage researchers.

Scientific contact

Dr Guy Fagherazzi

Department of Population Health

Luxembourg Institute of Health

E-mail: guy.fagherazzi@lih.lu

More info : www.colive-diabetes.org

Twitter: [@CoLiveDiabetes](https://twitter.com/CoLiveDiabetes)

Facebook : [@colivediabetes](https://www.facebook.com/colivediabetes)

Press Relations

Juliette Pertuy

Deputy Head of Marketing and Communication

Luxembourg Institute of Health

Tel: +352 26 970 893

E-mail: juliette.pertuy@lih.lu