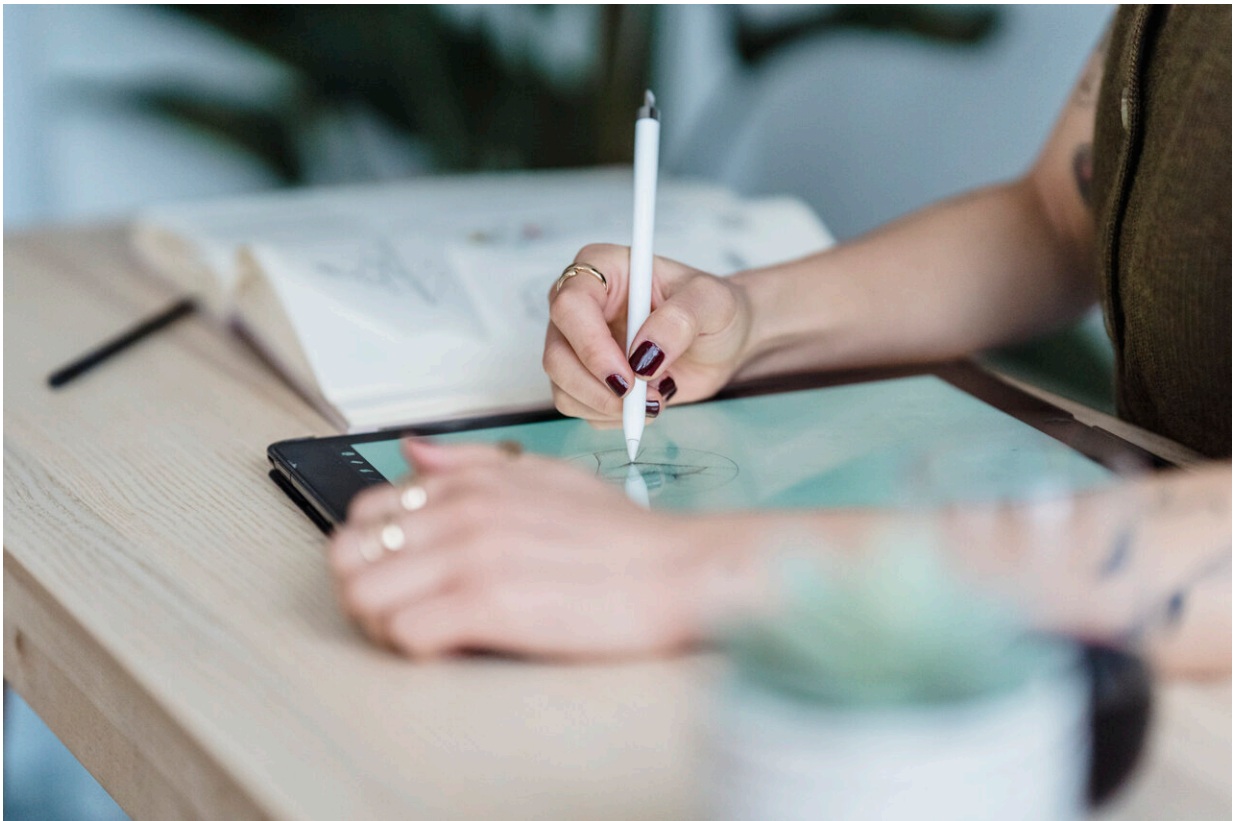


Diabetes prediction tool overestimates risk and creates unnecessary anxiety

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Credit: Michael Burrows from Pexels

The FINDRISC questionnaire has been used extensively to predict a person's degree of risk for getting type 2 diabetes, but new findings show that it does not adequately identify the most vulnerable individuals.

Type 2 [diabetes](#) is caused by lifestyle and genes. People who don't exercise, or who are overweight or obese, are among those at increased risk.

The Finnish Diabetes Risk Score, or [FINDRISC](#), is a recommended tool for checking how at risk a person may be for developing type 2 diabetes. The questionnaire asks patients about their lifestyle, body measurements, and their own and their family's medical history.

"The results are far less useful for predicting whether someone will develop diabetes over the next ten years than we thought," says Anne Jølle, a specialist in general medicine at NTNU's Department of Social Medicine and Nursing.

The diabetes tool overestimates risk, making it more difficult to screen for the individuals who actually need help. It can also create unnecessary anxiety.

Jølle is the first author of a new study published in *Open Diabetes Research & Care*.

The new research shows that FINDRISC results cannot be relied on as they are currently used. Today's practices are based on a study from the 1990s. Research from NTNU and St. Olavs hospital shows that as the tool is used now, it is not working properly.

Overestimates and poor screening

"We're finding that the actual risk of developing diabetes among people with elevated FINDRISC scores is only half as high as we thought. The tool is also poorly suited for identifying the individuals at highest risk," says Jølle.

She says that previously, on a scale of 0-26, it was thought that people who scored 15 or higher had at least a 30 percent risk of developing type 2 diabetes over the next 10 years.

"But our findings show that the risk of developing type 2 diabetes over the next 10 years is only about 15 percent, or half of what we thought, for people with that score," says Jølle.

Tracked 47,804 people for 10 years

The research group at NTNU followed 47,804 people who had no diabetes diagnosis at the outset of the study.

The participants were all age 20 or older when they participated in the large HUNT3 study from 2006 to 2008. HUNT (The Nord-Trøndelag Health Study) has collected [health information](#) about people in Trøndelag county since the 1980s, and their data are now widely used in longitudinal studies.

The researchers compared the health data used from the HUNT database with information from the Norwegian Prescription Database to see if participants had received medication to lower their blood glucose levels over a 10-year period. If they had, they were considered to have type 2 diabetes.

No practical screening

"We could have chosen to say instead that everyone with a FINDRISC score of 11 or higher had an increased risk of developing type 2 diabetes in the next 10 years," says last author and Professor Bjørn Olav Åsvold of HUNT.

That approach might have allowed researchers to capture as many as three out of four people who would develop diabetes over the next ten years. However, one out of every three Norwegians would have then potentially ended up in a group interpreted to be at increased risk, and only one in 10 in this group would actually develop diabetes over the next ten years.

This is not a particularly practical screening method to identify high-risk individuals. Nor is it helpful for accurately identifying who should be advised to participate in prevention programs.

No point without preventive measures

"The point of calculating type 2 diabetes risk is to identify the individuals who are at highest risk, so that they can be invited to take effective preventive measures," says Åsvold.

The Norwegian Directorate for Health and Social Affairs recommends "structured intensive lifestyle intervention" measures. This means varied, interdisciplinary treatment that should be preventive. It usually consists of physical activity, exercise, dietary changes and behavioral therapy.

"Monitoring people at high risk of developing diabetes is challenging. It requires personnel and time that the primary health service can't provide the way it's organized today. What we recommend is follow-up with patients for longer than six months, several times a week," says Jølle.

The recommendation is based on establishing local group-based, low-threshold services in communities. The GP should refer patients to these groups, which currently go by the name Frisklivssentraler (Healthy Life Centres), but they can also consist of other types of group programs. Several studies show that the onset and progression of type 2 diabetes can be delayed with this type of intervention. This is exactly what is

recommended in Norway.

Unnecessary worry and improper selection

"Two problems in that the way FINDRISC is used today are that it overestimates risk, causing anxiety for lots of people who aren't really at risk, and it identifies the wrong individuals. What this means is that most of the people who need follow-up don't get it, making the screening completely pointless," says Jølle.

So far, there has been little research to see if FINDRISC does what it promised. Maybe it's been taken for granted that you could trust it.

"What looks intuitively correct needs to also be documented with research results if measures are to be implemented as part of knowledge-based practice. In my opinion, the Norwegian Directorate for Health's guidelines regarding screening for type 2 diabetes should be changed," says Jølle.

Better tools needed

"This is an important study that puts risk assessment and prevention of type 2 diabetes on the agenda," says Kåre I. Birkeland, a professor in the Institute of Clinical Medicine at the University of Oslo.

Birkeland also heads the Medical Council for the Norwegian Diabetes Association.

"The study calls attention to interesting new aspects. It points out the need for better tools than FINDRISC to identify at-risk individuals for type 2 diabetes who require special preventive measures," he says.

Birkeland doesn't find it surprising that the study results are different in a cohort identified in Norway from 2006 to 2008 that were followed for 10 years after that, as compared to conditions in Finland 10 to 15 years earlier.

"We know that the incidence of diabetes has risen sharply in that period, and the way we diagnose diabetes today is completely different. As the authors also comment in the article, the use of HbA1c test has made diagnosis much easier for general practitioners, and has also changed the population being diagnosed," he says.

Given this background, Birkeland finds it somewhat surprising that this study did not show a higher 10-year incidence of diabetes than was found in Finland 10-15 years earlier.

The treatment of diabetes today is also very different, since the number and types of available medication have increased significantly. This factor also affects the findings, as the incidence of diabetes was assessed based on who used diabetes medication.

"I hope the findings will stimulate researchers to develop new and better models for finding high-risk individuals for type 2 diabetes, as well as identifying protective factors. Maybe based on the results from the HUNT4 study?" says Birkeland.

Health policy

Turid G. Spilling, Head of Communications in the Diabetes Association, agrees. "This is an important HUNT study on a tool we've been using for almost 20 years," she says.

Spilling points out that both national and historical differences mean that FINDRISC may not have the same ability to predict diabetes in Norway

in the 2000s as in Finland in the 1980s.

The results from HUNT also show the importance of major epidemiological studies that can capture changes important to our health. In this context it would be particularly useful to have a national diabetes register.

"Now it's important to get the results from HUNT put on the health policy agenda, so that we have better tools for detecting type 2 diabetes early. That way, more people can get help sooner, and we can prevent having a lot of people develop serious complications later," says Spilling.

More information: Anne Jølle et al. Validity of the FINDRISC as a prediction tool for diabetes in a contemporary Norwegian population: a 10-year follow-up of the HUNT study, *BMJ Open Diabetes Research & Care* (2019). [DOI: 10.1136/bmjdr-2019-000769](https://doi.org/10.1136/bmjdr-2019-000769)

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