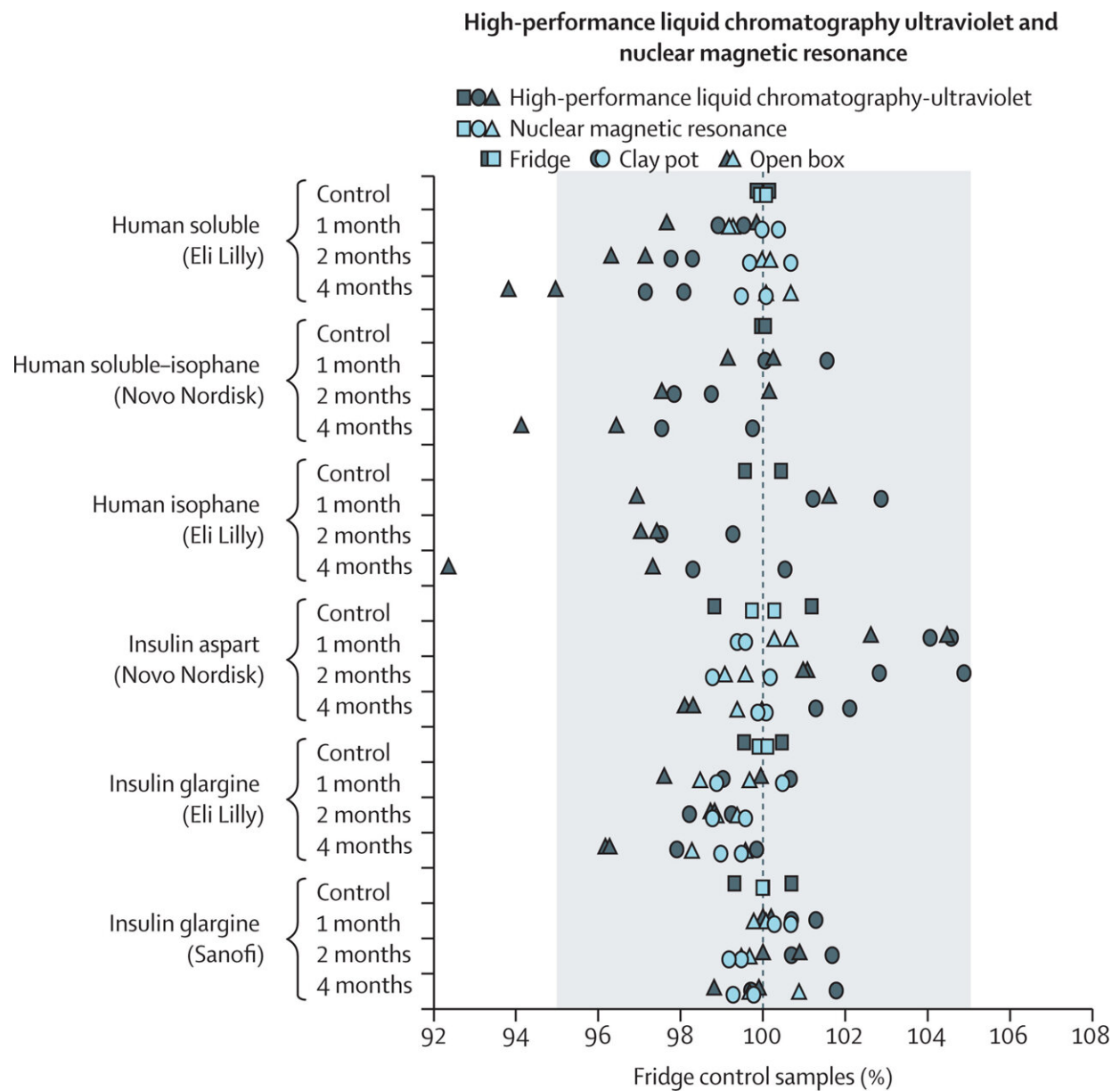


Longer shelf life for insulin has major bearing on global health

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Relative potency and total concentration of insulins at each timepoint Relative potency measured by high-performance liquid chromatography-ultraviolet (shaded in black), and relative concentration measured by nuclear magnetic resonance (shaded in blue), of the control insulins after storage in refrigerator (squares), and insulins stored in clay pots (circles) or boxes (triangles) for 1, 2, or 4 months. Nuclear magnetic resonance analysis was done at the University of Gothenburg and liquid chromatography-ultraviolet analysis at the University of Florida. Credit: *The Lancet Diabetes & Endocrinology* (2023). DOI: 10.1016/S2213-8587(23)00028-1

An international study shows that it is likely that insulin can be stored at room temperature, and for considerably longer than drug companies have counted on to date. Access to this vital medicine can thereby be significantly improved for the world's poorest inhabitants. Researchers at the University of Gothenburg are among the scientists presenting these results.

In type 1 diabetes, the [insulin](#)-producing beta cells in the pancreas are destroyed. Insulin must be given by injection, daily, for the rest of one's life. Inadequate insulin treatment impairs metabolism, which can lead to eye damage, [kidney failure](#), or other complications in the long term. In many developing countries, insulin is in short supply and often highly expensive. Globally, millions of people have died prematurely due to unequal access to diabetes care.

Since insulin is temperature-sensitive, it should be refrigerated (at 2°C–8°C) for long-term storage; but families in many developing countries lack refrigerator access. At [room temperature](#) (up to 30°C), insulin is usually thought to keep for some four weeks, after which discarding it is recommended.

Quadrupled storage period

For the present study, a University of Gothenburg research team contributed analyses of six types of insulin. Six different families in Nagpur, India, stored the insulin for a period ranging from one to four months in the summer. It was stored either in a box in the coolest room in the home or in clay pots designed to serve as simple cooling systems, with evaporation of water keeping the contents cool.

One of the authors behind the study is Gun Forsander, researcher in pediatrics at Sahlgrenska Academy, University of Gothenburg, and pediatrician at Sahlgrenska University Hospital.

"This study shows that insulin probably has a considerably longer shelf life at room temperature—up to four times as long as was previously believed. The study also showed that the simple solution, with cooling clay pots, can be helpful when the weather's at its hottest," Forsander says.

Increased insulin access

Another research team, at the University of Florida in Gainesville, performed concentration determination of insulin according to standard procedure ([liquid chromatography](#)) after room-temperature storage in the Indian households.

The results are published in *The Lancet Diabetes & Endocrinology*. The study was led by Dr. Graham D Ogle, director of the "Life for a Child" organization and adjunct professor at the University of Sydney, Australia.

"If our results can be confirmed in larger studies, it may drive a change in the requirement to discard insulin kept outside a fridge after one month. The period when insulin may still be used can potentially, in that case, be extended to three or perhaps even four months. That would have

a major bearing on the resource-weak families' access to insulin," Ogle says.

More information: Sanket Pendsey et al, Insulin thermostability in a real-world setting, *The Lancet Diabetes & Endocrinology* (2023). [DOI: 10.1016/S2213-8587\(23\)00028-1](https://doi.org/10.1016/S2213-8587(23)00028-1)

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