



The effects of extreme temperatures on people living with type 1 and type 2 diabetes

Isabel Clark, Working with People and Communities Lead, Health Innovation Kent Surrey Sussex; Dr Harriet Daultrey, University Hospitals Sussex NHS Foundation

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Executive Summary

People living with diabetes have been identified as responding differently to hot and cold weather compared to people without diabetes. Existing research indicates an increased risk of hospital admissions, GP visits, and mortality during periods of extreme temperatures; however, there is currently limited understanding of why this occurs and who is most at risk.

In May 2026, Health Innovation Kent Surrey Sussex (KSS HIN) worked with Dr Harriet Daultrey (University Hospitals Sussex NHS Foundation Trust) to capture the lived experiences of people with type 1 and type 2 diabetes. Two focus groups were held to explore how temperature extremes affect day-to-day management, health and wellbeing, and to inform future research and service design.

The activity was funded by My Charity University Hospitals Sussex.

Key Insight

Hot and cold weather were consistently identified as making blood glucose management more difficult. However, this was not experienced uniformly. There are differences of experiences between people living with type 1 and type 2 diabetes.

Weather affected glucose levels

Hot and cold weather affected glucose management for people with type 1 and type 2 diabetes. People with type 1 diabetes experienced rapidly falling glucose levels during the hotter weather whereas people with type 2 diabetes described less predictable changes.

Multiple interacting factors shape risk

Weather impacts are compounded by activity, routine, occupation, hormones, and environment, creating a complex and highly individualised system that makes glucose management difficult to predict or control.

Diabetes technology supports self-management but has limitations

People with type 1 diabetes valued continued glucose monitoring but reported reduced reliability during extreme heat and cold, including sensors detaching in hot weather, creating additional uncertainty.

Health and wellbeing are directly affected

Extreme weather affects both physical health and emotional wellbeing. People with type 1 diabetes reported rapid onset of low glucose and concerns about keeping glucose levels safe, whereas people with type 2 diabetes described more gradual effects including fatigue and disruption to daily routines.

Lack of guidance increases burden

Limited clinical guidance on managing diabetes during extreme hot and cold weather leaves people relying on trial and error, increasing uncertainty and the burden of self-management.

Conclusion

Managing diabetes in hot and cold weather is not solely a physiological challenge. It reflects the interaction between biological responses to temperature, behavioural and lifestyle adaptations and reliability of glucose monitoring technologies.

This creates multiple layers of uncertainty, experienced differently by people living with type 1 and type 2 diabetes.

This report highlights a need for:

- More personalised and practical guidance.
- Greater integration of weather considerations (in particular hot weather) into clinical care.
- Further research to understand risk mechanisms and support targeted interventions.

The effects of extreme temperatures on people living with type 1 and type 2 diabetes

Context and Background

[People living with diabetes](#) have been identified as being at high risk of becoming unwell during hot and cold weather compared to people without diabetes.¹

Some [research studies](#) have shown that people living with diabetes experience a higher risk of hospital admission, and GP visits during very hot and very cold weather, and a higher risk of death during hot weather.² There is currently no clear explanation for why this is happening, and who is at most risk.

In May 2026, Health Innovation Kent Surrey Sussex (KSS HIN) was commissioned by Dr Harriet Daultrey, Clinical Academic Researcher at Brighton and Sussex Medical School to seek the views, experiences and needs of people living with type 1 and type 2 diabetes. The aim was to:

- Understand how extreme temperatures of heat and cold impact on people living with type 1 and type 2 diabetes.
- Shape future research to ensure it reflects the real experiences of people living with diabetes.
- Improve the health and care outcomes of people living with type 1 and type 2 diabetes during periods of warm and cold weather.

The insight captured has fed directly into a research application to the National Institute for Health and Care Research (NIHR).

Methodology

Two 90-minute focus groups were held on 6th May 2026, and 13th May 2026, comprised of 5 participants in each group.

Participants were recruited by developing accessible and inclusive communications which were shared through:

- Voluntary, Community and Social Enterprise organisations.
- NHS patient stakeholder bulletins.

¹ UK Health Security Agency. *Beat the Heat: Staying Safe in Hot Weather*. GOV.UK. Updated 20 May 2026. Available at: <https://www.gov.uk/government/publications/beat-the-heat-hot-weather-advice/beat-the-heat-staying-safe-in-hot-weather> (Accessed: 3 July 2026).

² Thompson R, Kovats S, Hajat S, O'Connell E. *Individual level risk factors associated with episodes of heat as recorded within primary care records: a time-stratified case-cross over study*. *European Journal of Public Health*. 2024;34(Suppl 3):ckae144.214. doi:10.1093/eurpub/ckae144.214. PMID: PMC11516440. Available at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC11516440/> (Accessed: 3 July 2026).

- Direct invitations at diabetes clinics.

Accessible and inclusive methods were used to ensure all participants were able to be meaningfully involved. A stimulus pack was shared in advance of the session. Clear ground rules, and value behaviours were set at the beginning of each focus group. All participants were treated as equal partners, and received a £27.50 per hour as a result of their involvement.

Demographic details of participants

The demographic questions were optional.

Of the data captured:

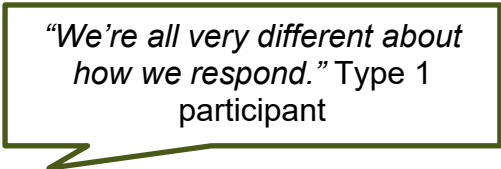
- 30% of participants identified as “female”.
- Participants were aged between 36-71 years.
- 70% of participants identified as “English, Welsh, Scottish, Northern Irish, British”.

Insight from people and communities

Do hot or cold weather make managing blood glucose more difficult?

Insight identified that both hot and cold weather can make managing blood glucose more difficult for people living with type 1 and type 2 diabetes.

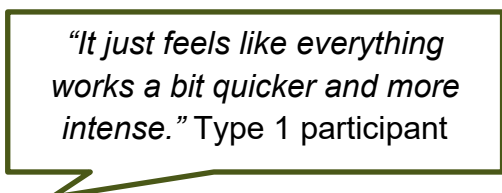
However, this was not experienced uniformly and there were differences between people living with type 1 and type 2 diabetes. These nuisances were seen in relation to how quickly changes occur, the monitoring technologies used, and lifestyle factors.



“We’re all very different about how we respond.” Type 1 participant

The speed and intensity of changing glucose levels due to extreme weathers

- All the participants reported that weather was a disrupting factor on maintaining stable glucose management, but the impact differed from person to person, regardless of the type of diabetes.
- For participants living with type 1 diabetes, weather - particularly heat - was experienced as a direct physiological process, producing rapid and often severe glucose changes. The significant challenge was the speed of which participants experienced symptoms, reporting that the change was immediate and time-sensitive requiring rapid recognition and intervention.



“It just feels like everything works a bit quicker and more intense.” Type 1 participant

- Whilst participants living with type 2 diabetes still experienced weather-related challenges, these were felt in a more gradual way where changes were harder to detect. There was a lack of certainty on the impact of weather changes on glucose levels, participants living with type 2 diabetes reported a greater level of ambiguity.

"It's hard to figure which of the two things is the problem... is it the weather or is it what I'm doing?" Type 2 participant

Impact of socio-economic factors

- Participants highlighted that the impact of weather was shaped by structural and socioeconomic factors, including the nature of their work, financial access to equipment, and ability to avoid exposure to extreme weather.

"I can't just stop... we don't get paid if we stop." Type 1 participant

- Those in physically demanding or outdoor roles across participants living with type 1 and type 2 diabetes reported greater challenges in managing their glucose levels due to limited ability to adjust activity or pause work.

Impact of activity levels and lifestyle factors on glucose levels

- All of the participants living with type 1 and type 2 diabetes emphasised that weather rarely acts in isolation. Instead, the impact of weather interacts with activity levels, routines, and broader lifestyle factors, which complicates the ability to assess and understand the cause of glucose changes.
- Participants living with type 2 diabetes reported uncertainty about their changing glucose levels, and whether this was due to the hotter weather, increased physical activity or other lifestyle factors.
- In contrast, participants with type 1 diabetes noted that increased activity combined with heat could rapidly accelerate glucose decline.
- Hormonal changes were also identified as adding an additional layer impacting on glucose levels, compounded with activity levels and lifestyle factors. Participants living with type 1 experienced complex and sometimes unpredictable responses due to the combination of insulin, temperature, activity, and hormone changes during the menstrual cycle. There was a greater uncertainty on whether timing of the menstrual cycle and heat caused an increase impact on glucose levels for participants living with type 2 diabetes. There was a recognition that overlapping layers likely had an influence.

"You are doubling the effects of weather due to hormone changes. It is two times harder". Type 1 participant

Impact of extreme weather on the monitoring glucose levels

- All participants reported that cold weather disrupted the reliability of continuous glucose monitoring. In these cases, challenges did not arise from changes in glucose levels themselves, but from an inability to access information about those levels due to inaccuracies with the technology.
- Participants reported that the glucose sensors could fall off during hot weather due to sweating. This resulted in loss of real time glucose readings. Participants described adopting precautionary strategies based on perceived risk rather than confirmed glucose levels.
- The impact of cold weather on glucose monitoring was less reported amongst participants living with type 2 diabetes when they felt their glucose levels were more stable.

"The sensor is too cold... I can't then see my levels. It doesn't necessarily impact my levels, but it makes me cautious because I can't then see my levels." Type 1 participant

"Within 10 minutes my glucose patch had fallen off", Type 1 participant

Impact of travel and environmental changes

- Participants highlighted additional challenges when travelling to hotter climates or being in unfamiliar environments. These situations were associated with increased uncertainty due to changes in routine, activity, and exposure to higher temperatures.
- For participants living with type 1 diabetes, there were specific concerns around managing insulin and equipment in these conditions, including how to keep insulin within safe temperature ranges and ensure reliable access to monitoring.
- Travel was therefore experienced as requiring a period of experimentation and adjustment, adding to the overall burden of managing glucose levels in extreme weather.

What changes have people noticed to their health and wellbeing in hot and cold weather, and how do these vary across diabetes type?

Participants living with type 1 and type 2 diabetes described clear changes to their physical health, emotional wellbeing, and day-to-day functioning in response to hot and cold weather. However, these changes differed in their intensity, reflecting different lived experiences.

Physiological changes and impact on health and wellbeing

- Participants in both groups reported that weather influenced how their bodies responded, but the nature of these changes varied.

- Participants living with type 1 diabetes described rapid falls in glucose during hot weather that could quickly lead to hypoglycaemia. These episodes were experienced as more urgent and severe than in normal temperatures.

"I'm spinning out here... I need something immediate." Type 1 participant

- In contrast, participants living with type 2 diabetes described changes in a more gradual and less clearly defined way, often relating to broader experiences such as fatigue, changes in routine, or feeling "off", rather than acute physiological events. These changes appeared to be less directly attributed to glucose fluctuations, and more embedded within overall wellbeing.

Impact of hot and cold weather on self-management of diabetes

- Across both participants living with type 1 and type 2 diabetes, participants described an increase in the mental effort required to manage diabetes in changing weather conditions, though this burden manifested differently.

"It's a 24-7 job. You're kind of just figuring it out as you go." Type 1 participant

- Changes in emotional wellbeing were also reported across type 1 and type 2 participants, with weather exacerbating stress, worry, and a reduced sense of control, but with variances.
- In contrast, participants living with type 2 diabetes had greater cognitive burden caused by uncertainty over glucose changes with the challenge of trying to retrospectively understand patterns over time. This resulted in frustration and anxiety.

Impact on daily activities and functioning

- Outdoor temperature changes affected participants' ability to carry out daily activities, though there were variances amongst type 1 and type 2 participants.
- Participants with type 1 diabetes described having to actively adjust or interrupt day-to-day activities during hotter weather due to rapid glucose changes, particularly during physical work or exercise. There were reports of this impacting on work performance, physical safety and ability to maintain routines.
- In contrast, participants with type 2 diabetes described impacts that were more likely to blend into broader lifestyle adjustments, such as changes in activity levels, energy, or routine, rather than requiring immediate interruption.

"There are 40 plus things that affect your blood sugar." Type 2 participant

What are the key concerns people have about managing blood glucose in hot and cold weather, and how do these concerns differ between type 1 and type 2 diabetes?

A range of concerns about managing blood glucose in hot and cold weather were experienced by participants living with type 1 and type 2 diabetes. While there was a shared sense that weather introduces additional risk and uncertainty, the nature of these concerns differed.

"It's the drop that gets you... it's how quick you get there." Type 1 participant

Risk of rapid hypoglycaemia versus hidden deterioration

- A major difference between the participants living with type 1 and type 2 diabetes was the type of health risk participants were most concerned about.

"It can change so quickly... you don't have time to react." Type 1 participant

- Concerns reported by participants living with type 2 diabetes were less focused on acute events.

Lack of guidance on the impact of extreme weathers on people living with diabetes

- Participants with type 2 diabetes were unaware that diabetes increased their vulnerability during periods of extreme heat and cold and had not considered weather as a factor influencing their health.

"No one has ever spoken to me about weather", Type 2 participant

- The lack of guidance was highlighted by both groups, participants expressed concern about the extent to which managing these challenges falls on the individual with limited formal support or guidance.
- This lack of guidance for participants with type 1 diabetes was reported as intensified due to the need to make frequent and rapid decisions as a result of unstable glucose levels.
- For participants living with type 2 diabetes, the lack of guidance resulted in a focus on identifying patterns, understanding causes of glucose changes and knowing how to self-manage and respond.
- This lack of guidance for all participants contributed to a sense that people must *"figure it out themselves"*, increasing the burden of self-management.

Recommendations

- **Recognise type 1 and type 2 diabetes as separate conditions.** Future research and guidance should distinguish between the different experiences and self-management needs of people living with T1DM and T2DM.
- **Raise awareness of temperature-related risks.** Temperature should be discussed as part of routine diabetes education and clinical care, as many participants reported little awareness of its impact.
- **Identify who is most at risk.** Further research is needed to understand which clinical, environmental and socioeconomic factors increase vulnerability during periods of extreme heat and cold.
- **Improve support and guidance for using diabetes technology in extreme weather.** Including practical support when sensors detach in the heat.