**Measures included in the Stage 3 psychometric survey**

*Draft Hypo-RESOLVE QoL:* The draft PROM consisted of 40 items, split into three subdomains (psychological aspects, 20 items; social aspects, 6 items; physical aspects, 14 items). For each item, participants were asked to consider the overall impact of hypoglycaemia on that aspect of HRQoL during the past 4 weeks and respond on a 5-point scale (4=None of the time, 0=Most or all of the time). For three items in the physical domain (those involving work or sex life), an ‘N/A’ option was also provided based on the recommendations of the Hypo-RESOLVE Scientific Group. By reversing items as necessary and summing responses to items, a higher score in each domain was designed to represent a better HRQoL.

The following measures were administered alongside the draft Hypo-RESOLVE QoL to help describe the sample and facilitate psychometric analyses.

*DAWN2 Impact of Diabetes Profile (DIDP)*(1): The DIDP is a 6-item measure asking participants to indicate how diabetes impacts six areas of their lives (physical health, financial situation, relationships, leisure activities, work or studies, and emotional wellbeing). Participants provided an answer on a 7-point Likert scale (7=Very negative impact, 1=Very positive impact), with an N/A option also possible. A total score can be generated that is the average across all applicable items, with a higher score indicating a greater negative impact on the participant’s life. The DIDP asks participants how diabetes ‘currently’ impacts their lives, but to achieve comparability with the recall period adopted in the draft Hypo-RESOLVE QoL (above), a second version asking about ‘the past 4 weeks’ was also included in the study.

*EQ-5D-5L(2)*: The EQ-5D-5L is a widely used generic preference-based measure of HRQoL. It features five questions (or dimensions: mobility, self-care, usual activities, pain/discomfort, anxiety/depression). Participants respond on a 1 to 5 scale (1=no problems in that dimension, 5=extreme problems in that dimension) based on how they are feeling ‘today’. Accordingly, a profile score can be generated for each participant that involves 5 digits ranging from 11111 (no problems at all) to 55555 (extreme problems in all five dimensions). This profile score is converted into a utility score using an associated ‘value set’. While the EQ-5D-5L currently does not have a dedicated, accepted UK value set, there is an algorithm published by the NICE Decision Support Unit (DSU)(3) that can be used to score the measure. The EQ-5D-5L also features a 100-point Visual Analogue Scale (VAS), where participants are asked to rate their own health (0=worst health you can imagine, 100=best health you can imagine).

*Gold score(4):* The Gold Score is a single 1-7 item scale of hypoglycaemia awareness. Participants are asked whether they know when their hypos are commencing (1=Always aware, 7=Never aware). Scores of 1-2 are considered normal levels of awareness, 3-4 as moderate, and >4 as impaired awareness.

*HypoA-Q(5):* The HypoA-Q is a 33-item measure of awareness of hypoglycaemia (awake/asleep), and hypoglycaemia frequency, severity, and impact. The format and response options of the questionnaire differ depending on the question. Of note for this study is item 1, which asks how often participants have had any hypo in the past week (free-text response), and a 5-item subscale measuring impaired awareness (ranging from 5-25, with higher scores indicating more impaired awareness).

*Visual Analogue Scale (VAS) of hypoglycaemia-related QoL*: To help assess construct validity, two global VASs of hypoglycaemia-related QoL were generated. These scales asked participants ‘thinking about how hypos affect you, how would you rate your quality of life…’ with two different versions ‘…at the moment’ and ‘…during the past 4 weeks’. Participants responded on a 100-point scale (0=Worst imaginable quality of life, 100=Best imaginable quality of life).

**References**

1. Holmes-Truscott E, Skovlund SE, Hendrieckx C, Pouwer F, Peyrot M, Speight J. Assessing the perceived impact of diabetes on quality of life: Psychometric validation of the DAWN2 Impact of Diabetes Profile in the second Diabetes MILES - Australia (MILES-2) survey. Diabetes Res Clin Pract. 2019;150:253-63.

2. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Qual Life Res. 2011;20(10):1727-36.

3. Hernández Alava M PS, Wailoo A. Estimating the relationship between EQ-5D-5L and EQ-5D-3L: results from an English Population Study. EEPRU Policy Research Unit in Economic Methods of Evaluation in Health and Social Care Interventions; 2020 30th September 2020.

4. Gold AE, MacLeod KM, Frier BM. Frequency of severe hypoglycemia in patients with type I diabetes with impaired awareness of hypoglycemia. Diabetes Care. 1994;17(7):697-703.

5. Speight J, Barendse SM, Singh H, Little SA, Inkster B, Frier BM, et al. Characterizing problematic hypoglycaemia: iterative design and preliminary psychometric validation of the Hypoglycaemia Awareness Questionnaire (HypoA-Q). Diabet Med. 2016;33(3):376-85.

**SURVEY CONTENT**

Thank you for taking part in this survey on hypoglycaemia. Hypoglycaemia can also be known as low blood glucose, having a ‘hypo’ or going ‘low’.

*Have you had a hypo in the past year?*

□ Yes (if answer yes, proceeds to rest of survey)

□ No (if answer no, does not proceed with survey. “Thank you for your interest, but you are not eligible to take part”).

*What age are you?*

□ Free text box (if answer <18 yrs, does not proceed with survey. “Thank you for your interest, but you are not eligible to take part”).

Do you live in the United Kingdom (UK)?

□ Yes (if answer yes, proceeds to rest of survey)

□ No (if answer no, does not proceed with survey. “Thank you for your interest, but you are not eligible to take part”).

We expect the survey to take around 10 minutes to complete.

The survey includes several types of questions. The first set of questions ask about you.

1. **What is your name?**

□ Free text box

1. **What sex were you assigned at birth?**

□ Male

□ Female

□ Prefer not to say

1. **Is your gender different to the sex you were assigned at birth?**

□ Yes - if yes, then show Q4

□ No

□ Prefer not to say

1. **How would you describe your gender?**

□ Male (including transgender men)

□ Female (including transgender women)

□ Prefer to self describe as \_\_\_\_\_\_\_\_\_\_\_\_ (non-binary, gender-fluid, agender, please specify)

□ Prefer not to say

1. **Which best describes your ethnicity?**

□ White

□ Mixed or multiple ethnic groups

□ Asian or Asian British

□ Black

□ African Caribbean or Black British

□ Other ethnic group

□ Prefer not to say

1. **Is English your first language?**

□ Yes

□ No

1. **What is the highest educational or school qualification you have completed?**

□ PhD or equivalent doctoral level qualification

□ Masters or equivalent higher degree level qualification

□ Bachelors or equivalent first degree level qualification

□ A-level or equivalent post-secondary level qualification

□ GCSE or equivalent secondary school qualification

□ None of the above

1. **Which best describes your current employment status?**

□ Student/in training

□ Employed (including full-time, part-time, self-employed, voluntary or on a temporary leave of absence, such as maternity or sickness leave)

□ Unemployed (job-seeking)

□ Unemployed (due to disability or sickness)

□ Unemployed (not seeking work)

□ Retired

□ Other (please specify)

Thanks. Now we are going to ask you some questions about you and living with diabetes.

1. **What type of diabetes do you have?**

□ Type 1 diabetes

□ Type 2 diabetes

□ Gestational diabetes

□ Other

1. **How long have you lived with diabetes? (Please answer to the nearest year)**

\_\_\_\_ years (free text)

1. **What is your current medication for diabetes? Please tick all that apply.**

□ Insulin (if participant selects insulin these Qs are displayed….)

□ Background or long-acting insulin only

□ Mixed insulin

□ Multiple daily insulin injections

□ Insulin pump therapy (Continuous subcutaneous insulin infusion)

□ Non-insulin injectables (injectables other than insulin)

□ Glucose lowering tablets (oral medications for diabetes)

□ None of the above

[if participant selects insulin, then the following question will be displayed]

1. **How long have you been managing your diabetes with insulin? (Please answer to the nearest year)**

\_\_\_\_ years (free text)

1. **What is your current type of glucose monitoring (please tick all that apply):**

□ Finger prick blood glucose monitor

□ Freestyle Libre (a sensor is inserted on the body and a separate device is used to scan instantaneous and trending glucose levels)

□ Freestyle Libre-2 (A sensor is inserted on the body and a separate device is used to scan instantaneous and trending glucose levels; this version has optional real-time glucose alarms)

□ Continuous glucose monitoring (CGM), other than Freestyle Libre (a wearable device that measures glucose levels throughout the day and night, such as Medtronic or Dexcom)

□ Urine monitor

□ Other (please specify)

□ I don’t monitor my glucose levels

1. **During the last month, how often did you deliberately run your blood glucose ‘high’ to avoid having a hypo (or ‘going low’)?**

□ Never

□ Rarely

□ Sometimes

□ Often

□ Almost always

1. **Do you have any of these health conditions? Please tick all that apply.**

□ Other endocrine diseases (e.g., thyroid disease, Addison’s disease, polycystic ovary syndrome)

□ Heart disease

□ Kidney problems

□ Liver problems

□ Peripheral neuropathy (e.g., damage to nerves in feet)

Thank you. The next set of questions ask about how often you experience hypos (low glucose levels) and your awareness of them.

[INSERT GOLD SCORE]

[INSERT HypoA-Q]

[INSERT VAS of hypoglycaemia-related QoL]

[INSERT Draft Hypo-RESOLVE QoL questions]

[INSERT EQ-5D-5L]

As a small ‘thank you’ for taking part in this study we are offering people the chance to enter a prize draw for £50 shopping vouchers.

□ Yes, I would like to be entered into the prize draw

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (please enter email address)

□ No, I do not want to be entered into the prize draw

**Thank you. This is the end of the survey.**