Appendix M
The spot urine sample: collection and processing for urinary iodine measurement

M.1 Introduction

This appendix provides an overview of the spot (single) urine sample collection and processing methodology for 2019 to 2023 (years 12 to 15). The COVID-19 pandemic necessitated some changes to the protocol throughout the fieldwork period as outlined below.

Spot urine samples were collected from participants aged 4 years and over during or following a face-to-face visit, for measurement of urinary iodine concentration in order to estimate population iodine status.

Iodine concentration in a single spot urine sample contributes to an estimate of population median concentration and is used to estimate population iodine status by comparison against population thresholds defined by the World Health Organization (WHO, 2007). It does not provide information about an individual's iodine status because iodine concentration fluctuates widely depending on urine volume, dilution, recent iodine intake and other metabolic and physiological factors. As such, the proportion of the population with insufficient iodine intake cannot be determined from this data.

An overview of the methods of analysis and the associated quality control and quality assessment procedures for urinary iodine measurement are provided in appendix Q.

M.2 Consent

Eligible participants aged 16 years and over were asked to give written consent. For children aged under 16 years, written consent was sought from a parent or legal guardian, with written assent from the child participant where possible.

Information leaflets were provided for participants, including an appropriate version for children. The most recent versions used during the fieldwork period covered by this report are included in appendix C. Any earlier versions, for example, as adapted for use during the COVID-19 pandemic, are available on request.

M.3 Exclusion from participation in providing a spot urine sample

Participants were asked a series of screening questions to assess their eligibility for providing a spot urine sample. Participants aged under 4 years, those using a urinary catheter, and those who were incontinent were excluded and not asked to provide a spot urine sample. If participants could not provide a sample at the interviewer visit then the interviewer could, at their discretion, leave a home collection kit so that they could post back the sample at their convenience.

Prior to year 12 participants were requested not to provide a urine sample when they were menstruating, however this restriction was lifted from year 12 and participants could provide a sample if they felt comfortable doing so.

M.4 Changes as a result of the COVID-19 pandemic

Fieldwork was suspended in March 2020 due to the COVID-19 pandemic. Interviewers were able to restart fieldwork in October 2020 with remote fieldwork protocols. The interviewer stage used a telephone interview and spot urine samples were not collected. Participants who were subsequently visited by a biomedical fieldworker were asked if they were willing to provide a spot urine sample, and if so a home collection kit and pre-addressed, pre-paid postal package was left with them to complete and post back the sample at their convenience.

In April 2021, a flexible approach, whereby face-to-face or telephone interviews could be conducted was employed. Where participants were visited face-to-face they were asked to provide a spot urine sample (either during the visit or by posting back a home collection kit). If their interview was over the telephone then they were asked to provide a sample (using a home collection kit) at the biomedical fieldworker visit. Due to the differences in the fieldwork mode over the 4 survey years, the gap between dietary data collection and spot urine collection was up to 22 months.

M.5 Interviewer training, procedures and instructions

Information about the recruitment and training of interviewers is provided in appendix B, and detailed protocols are included in appendix L. The instructions provided to interviewers were:

- check the participant's eligibility for providing a spot urine sample. If the participant did not meet the eligibility criteria they were not asked to provide a sample
- ensure that the participant understood the spot urine collection procedures
- confirm and obtain the appropriate written consents
- label the universal tube with the participant's serial ID, date of birth, sex and barcode label
- ask the participant to pass urine (not from the first urine pass after waking) directly into a labelled 30 mL "universal" tube without touching the inside surface with their fingers or hands. Participants were also asked to avoid using sources of iodine contamination such as antiseptic sprays and wipes
- record the details of the sample collection in the Computer Assisted Personal Interview (CAPI) program
- leave the £5 spot urine sample gift card with the participant.

Immediately after the visit the interviewers were instructed to send the universal tube (encased in rigid outer packaging) to MRC Epidemiology Biorepository in the pre-addressed postal pack by first class post at ambient temperature and to post the associated consent form to NatCen.

If participants were unable to provide a sample during the interviewer visit, or if they had a telephone interview and a biomedical visit, they were offered the option of collecting and

posting their own spot urine sample independently. Where this was the case, the fieldworker assigned labels to the tube, respective dispatch note and consent form and collected participant's written consent. They then left the spot urine home leaflet, spot urine kit, the dispatch note and a pre-paid envelope with the participant, asking them to post the sample within 24 hours (if possible) along with the completed dispatch note. The participant was then given a £5 gift card at the end of the visit.

M.6 Sample tracking, reception and storage

Upon receipt at MRC Epidemiology Biorepository, the samples were imported into a laboratory information management system (LIMS) (LabVantage Solutions Limited, High Wycombe, UK). Samples were cross-checked in the study database to ensure correct labelling and verify identification. Samples were aliquoted and frozen (at –70°C) on the day of receipt.

References

World Health Organization (2007) Assessment of iodine deficiency disorders and monitoring their elimination: a guide for programme managers, 3rd ed (who.int)