

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

M.1 Introduction

This appendix provides an overview of the spot urine collection and processing methodology for Year 10 (2017/18) and Year 11 (2018/19) of the NDNS RP. The methodology outlined in this appendix is consistent with Year 9 (2016/17) unless stated otherwise. Detail of the methodology for Year 9 can be found in appendix M of the Years 1 to 9 report.¹

Spot urine samples were collected from participants aged 4 years and over for measurement of urinary iodine concentration in order to estimate population iodine status.

Iodine concentration in a single spot urine sample provides an estimate of population median concentration and is used as an estimate of population iodine status for which thresholds for interpretation have been defined by the World Health Organization.² It does not provide any information about the individual's iodine intake because iodine concentration fluctuates widely depending on liquid intake and, therefore, how dilute the urine is, as well as being influenced by the individual's recent iodine intake. As such, the proportion of the population with insufficient iodine intake cannot be determined from these 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 Ethical approval

As described in appendix B, ethical approval was granted by a Multi-Centre Research Ethics Committee (MREC)ⁱ for all aspects of the survey protocol, including collection of the spot urine sample, measurement of iodine in the spot sample and for storing spot urine sample residues for potential use in future analyses related to nutrition and health (where consent has been obtained).

ⁱ Ethical approval for Years 6 to 11 was obtained from Cambridge South NRES Committee (Ref. No. 13/EE/0016).

M.3 Consent

Information leaflets were provided for participants, including an appropriate version for children. 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.

M.4 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 under the age of 4 years, those using a urinary catheter, and those who were incontinent were not asked to provide a spot urine sample. Women and girls were requested not to provide a urine sample when they were menstruating. If participants could not provide a sample at the first interviewer visit then they were asked again at the subsequent visit if appropriate.

M.5 Interviewer training, procedures and instructions

Information about the recruitment and training of interviewers is provided in appendix B. At the first interviewer visit,ⁱⁱ interviewers were instructed to:

- 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 collection date (in Year 9 and 10) or with the barcode label (in Year 11)
- 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 collection in the Computer Assisted Personal Interview (CAPI) program
- leave the £5 spot urine sample promissory note (Year 9) or gift card (Years 10 and 11) with the participant

ⁱⁱ If the urine sample could not be collected at the first visit, interviewers re-established eligibility and sought consent at visit 3 (see appendix B for more information on interviewer visits).

Immediately after the visit the interviewers were instructed to send the universal tube (encased in rigid outer packaging) to the laboratory (the Medical Research Council Elsie Widdowson Laboratory (MRC EWL) for Years 9 and 10 and the MRC Epidemiology Biorepository for Year 11) in the pre-addressed postal pack by first class post at ambient temperature and to post the associated consent form to NatCen.

M.6 Sample tracking, reception and storage

For Years 9 and 10, on receipt of samples at MRC EWL, associated details (serial ID, date of birth and sample collection date) were recorded and cross checked with the database, to confirm the correct data. Urine samples were refrigerated at 5-8°C for up to 2 weeks before being aliquoted (after reaching room temperature) into 3 x 1.7 mL aliquots of urine (in 2 mL microtubes); aliquot amounts were modified if the spot urine sample was smaller than 5 mL. Information about the aliquots was then entered into a computerised sample tracking system (ItemTracker (International) Ltd, Birkenhead, UK) and aliquots were stored frozen at -20°C.

For Year 11 samples were aliquoted and frozen (at -70°C) on the day of receipt at MRC Epidemiology Biorepository. Samples were recorded in the laboratory information management system (LIMS) (LabVantage Solutions Limited, High Wycombe, UK) and were cross-checked against the list of expected samples and CAPI data to ensure that all samples were received and correctly labelled.

Information on urinary iodine analysis and quality control procedures can be found in appendix Q, section Q.3.20.

References

¹ National Diet and Nutrition Survey Years 1 to 9 of the Rolling Programme (2008/2009 – 2016/2017): Time trend and income analyses <https://www.gov.uk/government/statistics/ndns-time-trend-and-income-analyses-for-years-1-to-9>.

² World Health Organization (WHO), Assessment of iodine deficiency disorders and monitoring their elimination. [Internet]. Available from: http://whqlibdoc.who.int/publications/2007/9789241595827_eng.pdf.