

Framework for a nutrition surveillance programme for the island of Ireland

Output from all-island planning group



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Foreword

Nutrition surveillance is a very important activity which provides the underpinning information necessary to enable governments to develop sound nutrition policies to protect public health.

safefood set up a planning group in February 2015 to develop a framework for a nutrition surveillance programme for the island of Ireland (IOI). The principal aim of this initiative was to take forward the recommendation of a report published in October 2012¹, and subsequently endorsed by the North-South Ministerial Council, that close co-operation on nutrition surveillance be developed on an all-island basis in order to ensure the collection of timely and robust data comparable throughout the island. I was asked to provide independent chairmanship of this group whose members were drawn from all the principal entities with a funding interest in both jurisdictions.

In drawing up a suitable framework, the planning group determined that it should be capable of providing data for both nutrition and chemical exposure purposes, that it should represent value for money by avoiding duplication of effort whilst meeting health, agriculture and food industry needs, that it should encourage the collection of data on a rolling basis rather than periodically so as to provide continuity and allow trends to be identified, serve the needs of the whole of IOI, and be capable of being phased in as resources and the timetables of existing surveillance programmes permitted.

This report sets out the approach which the group considers is necessary to be able to meet these criteria. In doing this it has taken account of a number of different approaches to nutrition surveillance, including the European Food Safety Authority's Guidance on EU Menu Methodology, and identified the factors that it considers to be the most relevant to the needs of the IOI.

The group believes that this framework has the potential to significantly strengthen the nutrition data collection processes currently in use in the IOI and I commend it to all those with an interest in achieving this. Its full implementation will, however, require the collaboration and resource input of all the key partners and Government Departments in the IOI. The group has therefore recommended that the Report now be forwarded by **safefood** to the Departments of Health in the two jurisdictions for consideration by them and other relevant departments.

¹ **safefood** (2012) Examining Nutrition Surveillance on the island of Ireland. Available from [http://www.safefood.eu/SafeFood/media/SafeFoodLibrary/Documents/Publications/Research%20Reports/Final-Nutrition-Surveillance-Report-report-Oct2012-\(2\).pdf](http://www.safefood.eu/SafeFood/media/SafeFoodLibrary/Documents/Publications/Research%20Reports/Final-Nutrition-Surveillance-Report-report-Oct2012-(2).pdf)

Finally, I would like to thank all the members of the planning group for their commitment to its work, and the staff of **safefood** who have provided such excellent support throughout.

Dr Jon Bell, Chair

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List of Abbreviations

cm	centimetre
EFSA	European Food Safety Authority
EU	European Union
FPO	food propensity questionnaire
g	gram
HHM	household measures
HSC	Health and Social Care
IOI	island of Ireland
IUNA	Irish Universities Nutrition Alliance
NANS	National Adult Nutrition Survey
NDNS	National Diet and Nutrition Survey
NI	Northern Ireland
NICE	National Institute for Health and Care Excellence
PA	physical activity
PSMA	portion size measuring aids
ROI	Republic of Ireland
UK	United Kingdom of Great Britain and Northern Ireland

1 Approach

A planning group was convened by **safefood** in February 2015 in order to progress the development of all-island nutrition surveillance programme (see Appendix 2 for details of the membership). The impetus for this group was the consideration by North-South Ministerial Council of the Report on Examining Nutrition Surveillance on the island of Ireland (IOI) (2012). In addition the importance of nutrition surveillance is clear from the number of high level strategy documents that advocate surveillance of the population's nutritional status as a key means of shaping policy and promoting health. Such strategy documents include the WHO Vienna Declaration on Nutrition and Noncommunicable Diseases in the Context of Health 2020²; the Northern Ireland Fitter Futures for All³; ROI Healthy Ireland Framework⁴ and the Department of Agriculture, Food and the Marine 'Sustainable Healthy Agri-Food Research Plan'⁵.

The group comprised the key funding agencies that have historically supported nutrition surveillance on the island. The group met 6 times and used a number of information and guidance sources, including the European Food Safety Authority (EFSA) Guidance on the EU Menu Methodology⁶, the UK National

² World Health Organization (2013) Vienna declaration on nutrition and noncommunicable diseases in the context of health 2020. Available from http://www.euro.who.int/__data/assets/pdf_file/0005/193253/CONSENSUS-Vienna-Declaration-5-July-2013.pdf

³ Department of Health, Social Services and Public Safety (2012) A fitter future for all. Framework for Preventing and Addressing Overweight and Obesity in Northern Ireland 2012-2022. Available from <http://www.dhsspsni.gov.uk/framework-preventing-addressing-overweight-obesity-ni-2012-2022.pdf>

⁴ Department of Health (2013) A framework for improved health and wellbeing 2013 – 2025. Available from <http://www.hse.ie/eng/services/publications/corporate/hieng.pdf>

⁵ Department of Agriculture, Food and the Marine (2015) Sustainable Healthy Agri-Food Research Plan. Available from <https://www.agriculture.gov.ie/media/migration/research/whatsnew/SustainableHealthyAgriFoodResearchPlan300315.pdf>

⁶ European Food Safety Authority (2014) Guidance on the EU Menu methodology. EFSA Journal 2014;12(12):3944

Diet and Nutrition Survey methodology⁷ and the Irish Universities Nutrition Alliance methodology⁸ in order to draw up a suitable framework for the programme. The recommendations of the group are contained in the following sections.

⁷ Public Health England (2014) National Diet and Nutrition Survey. Results from Years 1-4 (combined) of the Rolling Programme (2008/2009 – 2011/12). Available from <https://www.gov.uk/government/statistics/national-diet-and-nutrition-survey-results-from-years-1-to-4-combined-of-the-rolling-programme-for-2008-and-2009-to-2011-and-2012>

⁸ Irish Universities Nutrition Alliance. National Adult Nutrition Survey (NANS) methodology. Available from <http://www.iuna.net/wp-content/uploads/2011/04/methods.pdf>

2 Framework

Study organisation and planning

The surveillance programme should be subject to the appropriate ethical consideration and approval.

Target Population

The planning group agreed that the greatest benefit for the IOI from a nutrition surveillance programme was most likely to be achieved if it was to be established on a rolling basis with a target population consisting of the following indicative age groups:

- All children⁹ and adults aged from 1.5 years¹⁰ on IOI, broken down as follows:
 - Pre-school children: 1.5-4 years
 - Primary school children: 5-10 years
 - Post-primary children: 11-14 years
 - Post-primary children: 15-17 years
 - Adults: 18–64 years
 - Older adults: over 65 years

The following groups can be included in an additional boosted sample as and when required

- Infants: 3-17 months;
- Pregnant and breastfeeding women;
- Special groups if over 5% of the population; if they have particular health service needs; or if they experience health-related inequalities¹¹.
- Other population groups should be considered if they also constitute at least 5% of the total population and fall into the category of special diet groups e.g. vegetarian, ethnic diets; or are

⁹ Four age groups for children are proposed but it is also an option to amalgamate two of the groups into one group where that is considered appropriate and provided that the overall number of children participating does not reduce below 520 per year.

¹⁰ The ages of the target population should be their ages at the time of the survey

¹¹ Presumption in favour of including special groups in sufficient numbers to be able to analyse the data per group to an adequate level of accuracy would require a further 130 participants to be added for each (see section 2.6).

institutionalised participants e.g. boarding schools or nursing homes based on institutionalised sub-groups at a population level¹².

Sampling frame

The sampling frame should comprise a list of units (e.g. persons or households) from which the sample should be drawn.

Based on previous experience postal codes are recommended as the preferred option for this, rather than population registers given that the latter do not necessarily provide information on where people are living now. A postal code system has been in existence in Northern Ireland (NI) for many years and was launched in Republic of Ireland (ROI) in 2015; see www.eircode.ie . A list of alternative sampling frames that could be considered for IOI, including those that have been previously used, is given below:

Potential Alternative Sampling frames on the IOI:

Population registers do exist in ROI and NI for births, marriages and deaths and information is collected at a local level but they do not indicate where people are living now.

Census data – Central Statistics Office (ROI) and Northern Ireland Statistics and Research Agency (NI) holds census data collected in 2011.

List of pre-schools – available but not updated regularly.

List of Schools – available from respective departments of education.

List of GPs – available from the Health Service Executive the Royal College of General Practitioners and the Irish College of General Practitioners and the NI Health and Social Care Trusts.

Pointer – An address database for NI which is maintained by Land and Property Services with input from local councils and Royal Mail.

Previous/Current survey sampling frames used on the IOI:

National Diet and Nutrition Survey (NDNS): UK postcode address files are accessed, addresses clustered into primary sampling units (PSU), small geographical areas based on postcode sectors, randomly selected from across the UK. 27 addresses from each PSU were randomly selected.

¹² Interviews with institutional participants may not be so important for nutritional survey purposes as menus for these are usually determined centrally

National Adult Nutrition Survey (NANS): Sample of adults was randomly selected from an ad-hoc database held by data Ireland (An Post).

National Teens Food Survey: Schools were selected from a database of secondary schools available from department of education and science.

National Children's Food Survey: Schools selected from database of primary schools available from department of education and science.

National Preschool Nutrition Survey: Used a database of names and addresses compiled by 'eumom' – Irish parenting resource or from randomly chosen childcare facilities in selected locations.

Sampling method and design

A probability sampling method at the individual level needs to be used in order to provide an acceptable selection of the different relevant population groups. If a sampling frame at the household level (e.g. postal codes) is used, not more than two individuals per household should be sampled. In the NI sampling for the NDNS, not more than one adult and one child, or one adult or one child, per household are sampled.

A final decision regarding the exact number of individuals (either 1 or 2) to be sampled per household will be dependent on costings and the size of the survey budget available.

The sample should be stratified by age, gender, region of residence (NI and ROI), urban and rural area, socio economic group, and household size.

Ethnic groups also need to be considered in respect of overall sampling population if they form greater than 5% of population as per census data.

Multi-stage sampling may be the most favourable sampling design for logistical reasons i.e. sampling at the household or school level and then at the individual level. Such sampling should be planned carefully, and the sampling design should be taken into account when performing data analyses. In the case of a multi-stage sampling, the response rate should be calculated at each level (i.e. at household/school level and then at individual level).

Timing

All days of the week (weekdays and weekend days) need to be adequately represented during data collection.

Inter-seasonal variability is an issue to be considered although it may not be very important in ROI and NI where much food which was once seasonal is now produced or imported all year round.

Holiday periods should also be included where feasible.

Sample size

It is recommended that for each of the age groups surveyed (see section 2.2.) at least 260 participants (130 males and 130 females) be recruited per year, per jurisdiction over a four year period. This approach should yield a sample of 2080 participants on the island of Ireland over a 4 year period or 1040 per jurisdiction per age group (Table 1). This will ensure a statistically significant level of 1% at the 95 percentile level for each age group. A larger sample size may be considered depending on cost and logistical factors but in order to provide a statistically robust sample the minimum number of participants per age group should be 1040 in each jurisdiction, across a 4 year period. This approach should yield an adequate data set after a 2 year period and a full data set after 4 years per age group per jurisdiction.

Table 1 Breakdown of the sample size per age group*

Age group (years)	NI Male per year	NI Female per year	Total male + female NI per year	ROI Male per year	ROI Female per year	Total male + female ROI per year	lol Total per year	lol Total after 4 years
1.5-4	130	130	260	130	130	260	520	2080
5-10	130	130	260	130	130	260	520	2080
11-14	130	130	260	130	130	260	520	2080
15-17	130	130	260	130	130	260	520	2080
18-64	130	130	260	130	130	260	520	2080
>65	130	130	260	130	130	260	520	2080
Total	780	780	1040	780	780	1040	3120	12480

*The number of age groups is considered in section 2.2

To adequately cover pregnant and breastfeeding women and other discrete groups requires an additional 130 participants per age group to be considered.

Expected participation rates need to be taken into account to ensure sample size targets are met. This can be based on participation rates experienced in other surveys that have taken place recently on IOI.

Recruitment and participation rates

Planned substitution and selection of an additional sample, or stratified oversampling, should be considered where necessary in order to obtain the required number of participants. High participation rates are key to avoiding sampling bias.

The non-response rate and the reasons for this should be monitored on an ongoing basis in the different age and sex strata (see section 2.16.2). The data analysis can be weighted based on the likelihood of inclusion in order to reduce bias.

Information collected on participants

This should include:

- Age; gender; whether rural/urban; household size; socio economic group; education;
- Socio economic information (see 2.16.1): In ROI this should be informed by the standard set of questions used in the context of the Healthy Ireland survey (unpublished – available from Department of Health). In NI postcodes can provide further details re Health and Social Care Trusts and Deprivation quintiles.
- Compliance with data protection legislation such as the ROI Data Protection Act 1988 amended by the Data Protection (Amendment) Act 2003¹³ and the UK Data Protection Act 1998¹⁴ is a requirement.
- Compliance with equality legislation such as section 75 of the Northern Ireland Act 1998 should be considered in the context of the information asked of participants.

Overall dietary assessment method

The preferred assessment method for all participants on the IOI is a four-day diary. This is based on the extensive use historically of this method by both NDNS and IUNA teams on IOI, thus providing comparability with existing historical data, and also on the known effectiveness of this method in providing estimates of both nutritional intake and chemical exposure. The value of weighing food should be carefully considered in order to avoid placing an undue burden on participants. The method

¹³ Available at <https://dataprotection.ie/viewdoc.asp?DocID=1467&ad=1>

¹⁴ Available at <http://www.legislation.gov.uk/ukpga/1998/29/contents>

of dietary assessment chosen should be reviewed from time to time in the light of the results of further research on assessment methodology and the needs of the users of the data.

This method is best administered using face-to-face interviews with each participant (or in the case of young child, their parent or guardian). The day of the week for the first data collection should, as far as possible, be randomly assigned.

For all age groups, except infants and toddlers, information should also be gathered on the frequency of consumption of some less frequently eaten foods and food supplements (vitamins etc.). This can be achieved by using an additional modified food propensity questionnaire (FPQ) covering all seasons of the year –for an example see www.efsa.europa.eu/en/datexwgs/docs/3944A-5-3-5.pdf

Dietary software

Any dietary software package used for the surveillance programme should have been validated, tested and be available at a reasonable cost.

Administration of the interview

Well-trained interviewers should conduct the dietary interview. Training of staff as well as monitoring and evaluation is of key importance. The current NDNS/NANS protocols or a blend of these can be used. As part of this the interviewers should make three contacts with the participants, an introductory contact, a review 24-36 hours into the recording period to review the diary and a final contact to check for completeness and collect the diary. A home visit is the preferred location for these interviews because of access to foods and household measures.

Describing foods and portions consumed – the food list

A food list is a core element which influences the information captured and the process of the data entry interview. It is recommended that the food list should:

- Include country-specific foods
- Be structured and well organised
- Be open-ended and allow for regular updating
- Have all the foods classified in accordance with the EU system for describing and classifying foods known as the FoodEx2 classification system¹⁵

¹⁵ EFSA (2015) The food classification and description system FoodEx2 (revision 2). Available from <http://www.efsa.europa.eu/en/supporting/doc/804e.pdf>

- Where possible, be connected with the national energy content database on the foods to facilitate the quality control of the interview based on checks of the daily energy intakes.

Ideally there should be one food list for the IOI surveillance programme even though different food lists have been used in ROI and NI in the past. Specifically the food list needs to provide the level of detail required to allow for analysis for both dietary information and exposure data purposes.

Describing foods and portions consumed – food description

It is recommended that:

1. All foods, including beverages and food supplements consumed during a 24-hour period, should be recorded per consumption occasion and quantified and described as eaten e.g. method of cooking. The place and time (for meals) of consumption should also be recorded for each eating occasion.
2. Food descriptors should be in accordance with the FoodEx2 food classification system as described above. This system allows for 26 different types of descriptors (known as facet descriptors) e.g. cooking method, packaging material facet, fortification-agent facet.
3. All self-made composite dishes should be disaggregated and described.
4. Information should be collected on the facet descriptors of the food or ingredient.
5. Every effort should be made to collect general information on brand and product name for manufactured and packaged foods.
6. Information that is difficult for participants to report, i.e. fat content, sugar presence/sweetening agent or fortification of processed foods, should be added to the survey database by national experts after the data collection phase and before data cleaning.

It is also recommended that all future all-island nutrition surveillance programmes utilise and develop validated and robust tools and protocols for describing foods and portions consumed.

The group noted that the NDNS¹⁶ has made use of a hard copy diary in which participants are asked to record estimated portion sizes (unweighed) with the assistance of images, household measures and packet information. In contrast, in ROI, the adult NANS participants have weighed foods where possible and used reference tools such as food atlas, portion size publications and estimation of portion sizes. Where it is thought potentially beneficial to weigh foods this should be balanced against the burden to participants and the risks to the delivery of the surveillance programme.

¹⁶ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216486/dh_128546.pdf

Describing foods and portions consumed – determination of portion sizes

For specific foods (e.g. fruits, rolls and sauces), it is recommended that validated portion size measuring aids (PSMAs) other than portion size picture books be used, i.e. country-specific household measures (HHMs), standard units, abstract shapes and food photographs of standard portions. The food portions measured with these tools should be tested by weighing prior to the survey to obtain accurate portion estimates. Atlases developed for previous surveys on IOI could also be appropriate here.

Describing foods and portions consumed – food supplements

For food supplements, information should be collected on the supplement name/type, the brand, the concentration (or strength) and the amount consumed per unit of weight or strength. The unit weight and, where appropriate, strength, of the supplements should be recorded and included in the dietary supplement composition database.

For all age groups, except infants, information on the frequency of consumption of various classes of food supplements should be collected using an additional modified FPQ covering the past year, covering whether or not food supplements are used and, if used, whether or not the consumption is/has been occasional or regular. If supplement use has a seasonal pattern, the consumption frequency should be recorded by season.

In the case of infants, the reference period to be used is recommended to be one month. Data on the food supplement type and level, based on the FoodEx2 system, should be included in the FPQ.

Non-dietary information to be collected - socio-demographic and other background information related to food consumption patterns

Participants

Background information for each participant should be collected using a self-administered questionnaire, or by the interviewer. Some information, such as sex, age and geographical location, may be readily available from the sampling frame. The answers should ideally be entered in an electronic format (either at the face-to-face meeting, or with the assistance of an electronic questionnaire entry tool). The minimum set of questions should elicit the following information:

data collection date; who provided the answers (if the participant is a child or cannot answer personally); who checked the data at site; any special circumstances affecting the data collection; sex; date of birth; age; size of household; region, area or city of residence—the recommended vocabulary

should be based on the nomenclature of territorial units for statistics classification; education level (in the case of children, the education level of the parents) (see 2.7); employment status (in the case of children, the employment status of the parents)(see 2.7); professional category (in case of children, the professional category of the respondent (see 2.7)); ethnicity (self-defined) (see 2.7); special conditions (e.g. lactating, pregnant, chronic/long-term disease,); and special diet pattern (e.g. normal diet, vegetarian diet, slimming diet, diet related to health conditions (e.g. coeliac disease, diabetes).

Non-participants

The minimum information recorded on the non-respondents should be age and sex. If possible, additional information should be collected by a brief questionnaire including region, education (using the sampling frame) and reason for not answering and possibly, an indicator question about food habits¹⁷.

Non-dietary information to be collected - body weight and height

- For adults aged >17 years: weight and height information should preferably be measured during the interview. A precision of 1 cm for height and 1 kg for weight is sufficient. However, the precision of the instrument should be taken into account to avoid rounding errors in reading the measures.
- For children aged 1.5-17 years the weight and height information should be measured. Height should be reported in centimetres and the reading taken to the last completed 1 mm. The body weight should preferably be measured in kilograms and recorded to the nearest 100g.
- Consideration should be given to the collection and analysis of bio-fluids where this would be beneficial.

Quality assurance

A quality assurance plan should be prepared to cover

- overall management of the surveillance programme,
- compliance of the surveillance procedures,

¹⁷ See the PANCAKE non-response questionnaire. Available from <http://www.agripressworld.com/start/artikel/484454/en>

- organisation and content of training,
- piloting,
- quality control of the dietary surveillance and
- evaluation of the achieved quality.

Quality assurance should be a separate stand-alone protocol, covering all the areas identified above and supported by a set of protocols relating to the quality control of the data.

IUNA studies and NDNS have existing quality assurance protocols that can be adapted where necessary.

Misreporting of energy intake in dietary surveys

As a measure of quality, it is recommended that an assessment of the prevalence of under-reporting and over-reporting of dietary intakes should be performed, both at group level and at individual level, using the Goldberg cut-off method updated by Black¹⁸, taking into account the physical activity (PA) of the participants (low, moderate or vigorous physical activity). If no information is available on these specific physical activity categories, age-specific average physical activity may be used for the evaluation. Misreports (i.e. under- and over-reporters) should be identified, and not excluded from the dataset. IUNA and NDNS approaches can be utilised for this. The approach that has been used in ROI in the past is described by McGowan et al¹⁹, based on Black and Goldberg cut offs.

Intellectual property rights, data ownership and data transfer

The raw data and final reports should be available so as that they can be used to inform and evaluate public policy in a timely manner. As the surveillance will be publically funded all aspects of the work should, in keeping with current best practice internationally, be accessible to all relevant stakeholders. The establishment of a central repository, with agreed access protocols is strongly recommended. Multidisciplinary data mining and research should be facilitated to maximise use of the surveillance

¹⁸ Black AE. Critical evaluation of energy intake using the Goldberg cut-off for energy intake: basal metabolic rate: a practical guide to its calculation, use and limitations. *Int J Obes Relat Metab Disord.* 2000; 24(9):1119-1130.

¹⁹ McGowan MJ, Harrington KE, Kiely M, Robson PJ, Livingstone, MBE and Gibney MJ, 2001. An evaluation of energy intakes and the ratio of energy intake to estimated basal metabolic rate (EI/BMR_{est}) in the North/South Ireland Food Consumption Survey. *Public Health Nutrition*, 4, 1043-1050.

data. It is recommended that intellectual property rights protocol for the surveillance programme data be in line with both the ROI²⁰ and UK²¹ protocols for publically funded data.

Reporting

The data should be analysed and made available in a format that satisfies the reporting requirements of the commissioning parties and, wherever possible, international bodies such as WHO, EU and EFSA. When reporting data internationally it is recommended that a basic set of information is always provided (see <http://www.efsa.europa.eu/en/efsajournal/doc/3944.pdf> pages 63 and 64).

In the analysis of data and reporting the following needs be addressed:

- the sampling design used should be clearly described including the representativeness of the sample and any potential bias.
- it should be possible to limit bias by calculating the inclusion probability for each participating individual by considering the response rate in each age, sex, education level or regional category.
- field substitution and weighting factors should be used to improve the representativeness of the study population wherever appropriate.
- field substitutions for a non-responding sample unit, or statistical methods that are applied to adjust for non-response bias after data collection has finished, should be described at the country level.

²⁰ Department of Jobs, Enterprise and Innovation (2012) Putting public research to work for Ireland. Policies and procedure to help industry make good use of Ireland's public research institutions.

²¹ UK Public Data Principles. Available from http://data.gov.uk/sites/default/files/Public%20Data%20Principles_For%20Data.Gov%20%281%29_10.pdf ; Data Access Policy. Available from http://ukdataservice.ac.uk/media/455247/dataaccesspolicypublic_2_00.pdf

Appendix 1: Members of the all-island nutrition surveillance planning group

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