Irish Section Conference 2022, 15–17 June 2022, Impact of nutrition science to human health: past perspectives and future directions

Development of a mapping and merging framework to address data fragmentation in nutritional research: FNS Cloud project

G. Bennett[1,2], LA. Bardon[1,2], C. McAteer[1,2] and ER. Gibney[1,2]

[1]*Institute of Food and Health, University College Dublin, Dublin, Ireland and*
[2]*School of Agriculture and Food Science, University College Dublin, Dublin, Ireland.*

There is a wealth of dietary data collected globally, however a lack of data harmonisation has meant data collected is often not reused after its initial purpose. Instead of considering data singularly, similar data could be combined (i.e., mapped and merged) to maximise the scope of existing data and address research gaps. However, approaches for reusing and merging data need to be further developed and validated. FNS-Cloud will facilitate the accessibility and reuse of dietary data, allowing researchers to answer novel research questions with existing data[1]. Food Frequency Questionnaires (FFQs) are often not reused outside the population they have been developed for as predefined food lists make them population specific. The concept of mapping and merging FFQs would allow researchers to incorporate multiple datasets collected from different FFQs in their analysis. A comparison exercise using Food4Me (pan-European FFQ) and NHANES (American FFQ) was completed to test the impact of a FFQ mapping approach on dietary data outputs[2, 3].

Guidelines to map food items, frequency of consumption and portion sizes were created and a subset of Food4Me data (n = 210 participants from 7 countries) was re-entered into the mapped FFQ. Mean food group and nutrient intakes were then calculated based on n = 29 aggregated food groups. Analysis included paired sample t-tests to compare mean intakes and Pearson correlation coefficients to assess associations between intakes across both FFQ versions. Analysis has compared original Food4Me FFQ data to Food4Me data that was re-entered into the mapped and merged FFQ. Mean food group and nutrient intakes have been calculated on a population level examining intakes overall as well as by country and sex. Strong correlations in food group intakes across both FFQ versions were noted. "Fish and Fish Products" had a lower correlation than other groups (0.87), with higher mean intakes of this food group reported in the Food4Me FFQ than the mapped FFQ. This is due to the number of fish items dropped during the mapping process (e.g., white fish intake was assessed in Food4Me but not NHANES). Energy and nutrient intakes were also highly correlated. Sugar (174.24 *g* vs. 135.86g) and saturated fat intake (46.42 *g* vs. 30.98g) were higher in Food4Me compared to the re-entered Food4Me data, again this is due to several Food4Me food items being dropped during the mapping process. Future analysis will consider the impact this mapping process has on individual food group and nutrient intake. Although preliminary analysis has shown that the mapping and merging of two distinct FFQs does not significantly impact many foods group and nutrient intakes of an overall population, refinement of the mapping process is required as certain key food group and nutrient intakes are affected by the FFQ mapping.

References
1. EUH (2020) *Food Nutrition Security Cloud.* [Available at: https://www.fns-cloud.eu/].
2. Forster H, Fallaize R, *et al.* (2014) *J Med Internet Res* **16**(6), e150.
3. National Centre for Health Statistics (2021) *National Health and Nutrition Examination Survey* (NHANES) [Available at: https://www.cdc.gov/nchs/nhanes/about_nhanes.htm].