Nordic Council of Ministers

Nordic Working Paper

The Nordic Monitoring System

Basis for decision on 3rd data collection

Report prepared by
Fagt S, Andersen LF, Barbieri HE, Borodulin K, Thorgeirsdottir H, Trolle E, Matthiessen J

This working paper was funded by the Nordic Council of Ministers. However, the content does not necessarily reflect the Nordic Council of Ministers' views, opinions, attitudes or recommendations

NA2021:906
ISSN 2311-0562
http://dx.doi.org/10.6027/NA2021-906

Nordic Council of Ministers
Nordens Hus
Ved Stranden 18
DK-1061 Copenhagen
www.norden.org

Cite this report as:

Fagt S, Andersen LF, Barbieri HE, Borodulin K, Thorgeirsdottir H, Trolle E, Matthiessen J. The Nordic Monitoring System. Basis for decision on 3rd data collection. Nordic Working Paper. Nordic Council of Ministers, 2021

Preface

The governments in the Nordic countries have through *the Nordic Plan of Action on better health and quality of life through diet and physical activity* committed themselves nationally to address the issue of unhealthy diet, physical inactivity and overweight and enacted policies to promote a healthier lifestyle. The Nordic Council of Ministers has underlined these commitments by formulating common Nordic ambitions on combating unhealthy diet, physical inactivity, and overweight by drawing up the joint Nordic Plan of Action in 2006.

Common goals have been formulated to allow for comparisons between countries, whereby national actions taken in each of the Nordic countries can be assessed. Common public health goals and visions are a clear benefit when coupled with monitoring of the health behavior and overweight in the Nordic countries, an increased sharing of knowledge, a common effort to identify best practice, and increased scientific cooperation. In 2007, a Nordic working group was established with the aim to describe a future Nordic Monitoring System on diet, physical activity and overweight.

In 2008-2010, the monitoring system was developed and validated. In 2011, the first collection of data in the Nordic countries took place. In 2014, the second data collection was conducted. Several reports and documents of the project have been published, the last in 2016, presenting the results from the two data collections. In 2018-2019, the Nordic Monitoring Group has discussed future needs of the monitoring system before a possible 3rd data collection may be carried out. Parallel to this, results from the Nordic Monitoring System have been published in both scientific and grey papers as the results provide an important tool for stakeholders involved in promotion of public health in the Nordic countries. The major part of this report was finished in 2019, but the Nordic Monitoring Group has due to discussions with the Nordic Working Group for Diet, Food and Toxicology (NKMT) recently added sustainability as a future focus point. The Nordic Monitoring Group has started a discussion on to what extent sustainability can be incorporated in the future questionnaire or if existing indicators already are part of a sustainable lifestyle. The Monitoring Group will discuss sustainability more thoroughly in the future.

The current Nordic working paper sums up the deliveries from the Nordic Monitoring System and points forward to a new data collection.

Contents

Introduction

Development of the Nordic Monitoring System

Sisse Fagt, Ellen Trolle, Jeppe Matthiessen

As a result of *the Nordic Plan of Action on better health and quality of life through diet and physical activity* a Nordic working group was established in 2007 with the aim to describe a future Nordic Monitoring System on diet, physical activity and overweight.

The main objective of the Nordic Monitoring System (NORMO) is to provide status and temporal trend data of diet, physical activity and overweight among adults and children in the Nordic region. Furthermore, NORMO aims to compare results between the Nordic countries, evaluate results against recommendations on diet and physical activity, and to examine social inequality in diet, physical activity and overweight. Finally, the results from NORMO are evaluated against the goals and visions in the Nordic Plan of Action to indicate whether diet, physical activity and overweight change favorably or not.

In 2008-2010, the monitoring system was designed, methods developed and validated (Fagt et al, 2009; Fagt et al, 2012). The monitoring system was originally planned to be conducted in the age group from 7 to 65 y, but to limit costs only data in children 7-12 y and adults 18-65 y has been collected.

In 2011 and 2014, data in the Nordic countries has been collected and published in several reports, the latest in 2016 (Rasmussen et al, 2012; Matthiessen et al, 2016). Since the first data collection, development of the monitoring system has taken place. From 2014, the consumption of alcohol and smoking behaviour have been included in the data collection among adults, thus enabling comparison of these indicators within the Nordic region.

In 2018-2019, the Nordic Monitoring Group discussed future developments of the monitoring system based on experience from the first two data collections. It was clear that prior to a 3rd data collection the dietary indicator questions and the Nordic Physical Activity Questionnaire (NPAQ) need to be revised and some goals and visions need to be rephrased and updated, e.g. smoking and alcohol habits and evaluation of dietary index. The Nordic Monitoring Group has described how results from the monitoring have been communicated and used for several purposes. In appendices, an overview of selected output (including peer reviewed papers) is given.

Summary

The Nordic Monitoring Group has analysed if the dietary indicator questions developed in 2010 are suitable for a future data collection by analyzing the dietary index data on basis of three national dietary surveys in Sweden and Iceland. The analyses show that the food groups included in the NORMO questionnaire is suited for estimating the proportion in the Nordic countries with an unhealthy diet. Thus, dietary indicator questions are suitable to be used in a 3rd round of NORMO.

However, the results show that the proportion that is classified in the healthy diet category (9-12 points) when using national dietary survey data is very small and lower than in NORMO. The results also show that the food questionnaire and thus the dietary index is more suitable for children and adults than for adolescents, which are in line with the initial validation study in 2009.

Questions on physical activity and screen-time are with minor modifications suitable to be used in a future data collection.

Improvements of participation rate may be possible with several non-costly initiatives in future data collections. We know from NORMO 2011 and 2014 that non-response is higher among low educated men, 18-44-y-olds. The Nordic Monitoring Group recommend that the market bureaus interviewing respondents also obtain key paradata[1] and use SMS-text messages as reminders as these initiatives may be useful to improve response rate, especially in the countries with the lowest rates. In NORMO 2014, Norstat collected data in the three Nordic countries with the lowest response rates (Finland, Sweden, Norway), whereas SFI-Survey and Maskina collected data in two countries with the highest response rates (Denmark, Iceland). These data indicate that choosing the right market bureau for collection of survey data may be important for the overall response rate. Closer collaboration between the market bureau and the national coordinator during the data collection process may be another important factor to consider in a 3rd data collection. This may secure better adherence to the survey protocol and close tracking of response rates in different population groups.

The Nordic Monitoring Group suggests revision of some of the vision and goals, e.g. on social inequality.

The costs of a future data collection will be higher than earlier data collections due to expected higher expenses to the market bureau carrying out the data collection. Cost will also increase because the questionnaire will be expanded with new questions on fish, on bread, alcohol consumption, use of e-cigarettes, sleep and indicator questions to assess the intake of a sustainable diet.

Through the years, the results from NORMO have been used in several research projects and the NORMO questions have been used in national projects. Also, different municipalities in e.g. Denmark has paid attention to especially the dietary questions, because indicator based health data on diet are valued in regional projects. This highlights the value of Nordic Monitoring System.

[1] The paradata of a survey are data about the process by which the data was collected. Paradata of a survey are usually "administrative data about the survey", such as the time of day interviews were conducted, the length of the interviews (in minutes), how many times there were contacts with each respondent or attempts to contact the respondent, the reluctance of the respondent etc.

Proposals for revising the Nordic Monitoring System

Jeppe Matthiessen, Sisse Fagt, Ellen Trolle

The Nordic Monitoring Group suggests revising, omitting and adding some items to the questionnaire to make the Nordic Monitoring System up-to-date. Still, only limited revisions are suggested due to reasons of comparison and because the length of the questionnaire should not be extended too much.

Data

Sociodemography

To account for non-representativeness, data is weighted using census data from each of the national statistical bureaus in the five Nordic countries. In order to construct weighing factors for children, age of the interviewed parent should be added to the NORMO-questionnaire.

Diet

Food is getting more attention on the climate change agenda than ever before (Nordic Council of Ministers, 2018; Willet et al, 2019). The EU has launched the Farm to Fork Strategy (European Commission, 2020), the United Nations has defined 17 Sustainable Development Goals for the year 2030 (United Nations, 2019). The Food and Agricultural Organization (FAO) of the United Nations and the World Health Organization (WHO) have published guiding principles for sustainable healthy diets (FAO, WHO 2019) and a summary report from the EAT-Lancet Commissions provides scientific targets for a healthy diet from a sustainable food production system and promotes a healthy and sustainable global reference diet (Willet et al, 2019).

Also, the Nordic Council of Ministers (NCM) has focus on sustainability and has launched a vision 2030: "to make the Nordic region the most sustainable and integrated region in the world" (Nordic Council of Ministers, 2019). Several reports from NCM support this focus (Nordic Council of Ministers, 2018; Nordic Council of Ministers, 2020) and there seems to be a huge potential for Nordic collaboration aiming at sustainable solutions (Wood et al, 2019; Meltzer et al, 2019). The Nordic Nutrition Recommendations 2012 (Nordic Council of Ministers, 2014) pointed at the overall changes to obtain a healthy and more sustainable diet, and both Sweden (Swedish Food Agency, 2015) and Denmark (Lassen et al, 2020; Danish Veterinary and Food Administration, 2021) have now Food Based Dietary Guidelines taken sustainability into account and focusing on climate impact. A healthy and sustainable diet consists of a variety of plant-based foods, with low amounts of animal-based foods, refined grains, highly processed foods, and added sugars, and with vegetable rather than animal-based fats. The ongoing revision of the Nordic Nutrition Recommendations (NNR 2022) aims at integrating environmental sustainability into the recommendations and guidelines. The Nordic Monitoring Group will follow this work and suggests adding new items on at least red meat, processed meat, pulses and nuts and seeds in order to assess status and temporal trends of a healthy and sustainable diet better in future monitoring rounds. It could also be considered to obtain better information on consumption of e.g. vegetables (not only frequencies of intake, but also amounts). Although the current consumption seems to be low, monitoring of intake of plant-based drinks and plant-based meat substitutes may be relevant also. If possible, validated indicators should be used. The suggested changes of the NORMO questionnaire are in line with NCM aim of encouraging all Nordic citizen to eat a healthy and sustainable diet (Nordic Council of Ministers, 2018). The working group will discuss if validated questions are available, as it will be too expensive to incorporate a full validation study on dietary indicators.

The National Food Administration in Denmark request a better coverage of the fish intake in future data collections. The Nordic Monitoring Group suggests adding an item on fish used on bread as the current item only covers fish as main course, which is only half of the fish intake in Denmark. The working group needs to consider how a new question on fish should be incorporated in the dietary index.

Because it is not possible to monitor salt intake in the Nordic countries with the present NORMO-questionnaire, estimates from national surveys are needed to evaluate status and temporal trends of the salt intake in the Nordic region.

Physical activity and screen-time

A revised and slightly modified version of the Nordic Physical Activity Questionnaire (NPAQ) will be used in the future data collection of *the Danish National Survey of Diet and Physical Activity*. In the Danish Version of NPAQ, estimation to the nearest half hour has been omitted from the items to the interviewer comments and filters have been added to items on MVPA, VPA and screen time to secure better data quality. Due to the fast development of screen devices and screen behaviour, items have been updated with relevant examples of screen devices and screen behaviour today. In addition, 'sitting' has been added to the item of computer time so similar wordings are used for TV and computer time. The main purpose of these items is to measure sedentary screen time. The modified Danish version of NPAQ may be used as starting point for the English master questionnaire in a 3rd data collection

The Nordic Monitoring Group suggest to omit items measuring the overall level of occupational (adults) and leisure-time physical activity (children and adults) because these items have only been used to a limited extent when reporting key data of physical activity.

Overall, the Nordic Monitoring Group believe that with minor modifications NPAQ is suitable to be used in a 3rd round of NORMO.

Alcohol

The Nordic Monitoring Group suggest to add an item measuring units of alcohol consumed during the last week as this will make it possible to examine status and temporal trends in the proportion of adults exceeding the maximum alcohol intake level. The maximum alcohol intake level is justified to lower the risk of alcohol-related mortality and morbidity such as cancer and is in accordance with the Nordic Nutrition Recommendations (Nordic Council of Ministers, 2014).

E-cigarettes, snuff and sleep

The Nordic Monitoring Group suggests to add new items on e-cigarettes, snuff and nicotine pouches to NORMO as usage is increasing in the Nordic countries (Danish Cancer Society, 2021).

We suggest also to add new items on sleep length (sleep on weekdays and weekend days) and maybe sleep quality as sufficient sleep is an important part of a healthy lifestyle (Jennum et al, 2015). When incorporating new questions, the working group will aim at using validated questions.

Goals and visions

Years of goals and visions in Nordic Plan of Action need to be up-dated before a 3rd data collection is started as they are no longer valid. Further, items on smoking and alcohol have been included in NORMO since 2014, why goals and visions for these health behaviours also need to be added. This will also be the case for sleep behaviour if items on sleep are added to NORMO. The Nordic Monitoring group may suggest text for the goals and visions but will discuss this further with NKMT.

Diet

In the Nordic Plan of Action, goals and visions have been formulated on food groups and macronutrients for the diet. However, other indicators of health behaviour and health status, such as physical activity and overweight are evaluated using only one or two overall indicators. Therefore, the Nordic Monitoring Groups suggests to replace goals and visions for food groups and macronutrients with an overall indicator of the diet

quality because the overall diet[2] is more important for public health and climate changes than single food groups and macronutrients. However, if actions should be taken, knowledge on food groups is important for policy planning and health education. One indicator of the overall diet (the dietary index) will be easier to evaluate and interpret than several indicators of single food groups and macronutrients and will align with other health behaviors in the Nordic Plan of Action. Proposals for revised goals and visions for the overall diet are shown below.

Revised Goal	Revised Vision
The current trend, where an increasing proportion of adults eats a diet that is not healthy and sustainable, has been brought to a halt and at best reversed	At least X%* of the adult population eats a healthy and sustainable diet
The current trend, where a high proportion of children eats a diet that is not healthy and sustainable, has been reversed	At least X%* of the child population eats a healthy and sustainable diet

*to be decided and agreed within NKMT

The working group will discuss if and how aspects of sustainability can be incorporated into existing indicators and if a sustainability index should be developed.

Social inequality

The Nordic Monitoring Group suggests revising goals and visions on social inequality because the way these have been fulfilled when reporting data previously were not always beneficial from a public health perspective. Fulfillment of the goals and visions occurred sometimes through deteriorated health behaviour and health status in the high education group.

We propose revising the goals and visions regarding social inequality as described below:

Goal 2011	Proposed Goal	Vision 2021	Proposed Vision
Existing differences between different social groups with regard to overweight, obesity, unhealthy diet, and physical inactivity have not deepened further and at best have been reduced.	Existing differences between different social groups with regard to overweight, obesity, unhealthy diet, and physical inactivity have not deepened further and at best have been reduced *without deteriorating health behavior and health status in any social group.*	The difference between different social groups on meeting the defined objectives with regard to diet, physical activity, and overweight/obesity has decreased and is at most 20% between groups.	The difference between different social groups on meeting the defined objectives with regard to diet, physical activity, and overweight/obesity has decreased and is at most 20% between groups *without deteriorating health behavior and health status in any social group.*

[2] Using the dietary index score as indicator of the overall dietary quality

Evaluation of the dietary index using national surveys in Sweden and Iceland

Heléne Enghardt Barbieri, Eva Warensjö Lemming, Hólmfríður Þorgeirsdóttir, Jón Óskar Guðlaugsson

Background

NORMO measures health-related risk behaviour concerning diet by a validated questionnaire, including eleven questions regarding the consumption of different food groups, which are used to form a dietary index (DI). By categorizing and grading the answers of the questions, the index was designed to measure the quality of the diet regarding the intakes of saturated fat, added sugars and dietary fibre (Sepp et al, 2004).

Data from national dietary surveys, conducted in Sweden and Iceland, has been used to calculate the dietary index to evaluate whether the index is able to rank study participants as intended – from those having an unhealthy diet to those having a healthy diet. We further evaluated the correlation between individual components of the DI and the intake of selected macronutrients and fruits and vegetables (F&V).

Method and subjects

We calculated the dietary index by using data from three national dietary surveys conducted in Sweden and Iceland; *Riksmaten adults 2010-11* (Amcoff et al, 2012) and *Riksmaten adolescents 2016-17* (Lemming et al, 2018) from Sweden and the *National dietary survey in Iceland 2010-11* (Thorgeirsdottir et al, 2011). As the national dietary surveys were not originally intended to evaluate the NORMO questions, all questions on the different food groups in the NORMO questions were not included in the survey questionnaires. For those food groups that were missing in the food frequency questionnaires used in the national surveys, data from the diet registration/recall were used to estimate the consumption frequency instead, as described below.

In the dietary survey *Riksmaten adults 2010-2011*, the participants, all together 1797 (participation rate 36%) women and men between 18-80 years, reported everything they ate and drank during four consecutive days in a web-based food diary. They also filled out a questionnaire, which included eight of the eleven questions on frequency of consumption (per month, week or day) of the food groups used for calculation of the overall dietary quality score in NORMO (table 1). For cheese and sausages, the 4-days record was used to estimate the frequencies of consumption by counting the number of meals per day containing full fat cheese and sausages, divided by number of recorded days. For bread (wholemeal, rye, hard), the number of slices per day was calculated (grams of bread/mean weight of slices) from the food record instead.

In the *National dietary survey in Iceland 2010-2011,* a random sample of 2000 people, 18-80 years of age, was drawn from the national population register. Net participation rate was 68.6% and all participants were included in the analyses. The method used was 2 x 24 hr recalls interview by telephone, with questions on frequency of consumption of certain foods and food groups (Food Frequency Questionnaire (FFQ)). In the FFQ the participants answered six of the eleven questions (table 1) used in NORMO. There were no questions regarding frequency consumption of cakes, French fries, full fat cheese, sausages or slices of bread. Instead, frequencies from the 2 x 24 hr recalls were used to estimate the corresponding frequency for respective questions. For bread (wholemeal, rye, hard) the mean number of slices per day were calculated (grams of bread/mean weight of slices) and then the mean number of slices for the two days gave slices per day. For cakes, French fries and full fat cheese the frequency was estimated as 0 times/month if consumed neither of the two days, 15 times/month if consumed one of the two days and 30 times/month if consumed both of the two days. Those who consumed sausages one or both of the two days were assumed to consume it more often than once a week and if sausages were not consumed the frequency was estimated as once per week or more seldom.

The dietary survey, *Riksmaten adolescents 2016-2017*, was carried out class-wise in the grades 5, 8 and 11 (mean ages 12, 15 and 18). In total, 3099 (participation rate 60%) students participated. Information on food consumption was collected with a newly developed web-based method called RiksmatenFlex. RiksmatenFlex was developed based on the 24-hr recall methodology. RiksmatenFlex also contained a questionnaire that covered episodic foods. Nine of the eleven questions used in the NORMO study were covered in the questionnaire in RiksmatenFlex. For cheese and sausages the RiksmatenFlex were used to estimate the frequencies, using the same method as in Iceland. Table 1 shows the method used to estimate the dietary index score in each country.

Table 1. Method used to calculate the consumption frequencies of the different food groups among adults (in Sweden and Iceland) and adolescents (in Sweden)

	Adults (Sweden)		Adults (Iceland)		Adolescents (Sweden)	
	FFQ	4 days record	FFQ	2 x 24-hour recall	FFQ	2 days record
Fruit and berries	X		X		X	
Vegetables, pulses, root fruit	X		X		X	
Fish or shellfish as main course	X		X		X	
Type of fat on bread	X		X		X	
Bread (wholemeal, rye, hard)		X		X	X	
Chocolate and/or candy	X		X		X	
Cake, biscuits etc.	X			X	X	
Soft drinks, cordial etc.	X		X		X	
French fries, roasted/ fried potatoes	X			X	X	
Cheese, full fat		X		X		X
Sausage as main course		X		X		X

Calculation of the dietary index

The different consumption frequencies for every food group, except bread and fat on bread, were converted to times per month by using 7 days a week and 30 days per month. The times per months for the Candy, cakes, soft drinks and French fries groups were added together to form one of the components of the DI. The times per month were further converted to times per day or week for the calculation of the different components of the index as depicted in Table 2. Participants were given 0, 1 or 2 points for each component depending on the consumption of respective item as shown in Table 2.

Table 2.The categorisation of the consumption that provides the Dietary index

	Unit	0 p	1 p	2 p
Fruits and vegetables	Times per day	< 3	3-4	≥ 5
Bread (wholemeal, rye, hard)	Slices per day	< 1	1-2	≥ 3
Fish and seafood	Times per week	< 1	1	≥ 2
Candy, cakes, soft drinks, French fries	Times per week	≥ 7	3-6	< 3
Fat on bread	Type	≥ 60% fat	≤ 40% or no spread	-
Cheese	Times per week	≥ 4	1-3	≤ 1
Sausages	Times per week	> 1	≤ 1	-

For Fruits and vegetables, Bread, Fish and seafood a high consumption gave a high score, while for Candy, cakes, soft drinks and French fries, Cheese and Sausages a high consumption gave a low score. For fat on bread, a fat content ≤ 40% or no spread gave one point while a fat content ≥ 60% fat gave 0 point. The overall DI was calculated by summing up the points from each component generating an index that take on any point between 0 and 12 points. The index was then categorized in three consumption groups as

previously employed in the NORMO: scores 1–4 indicates an unhealthy diet, scores 5–8 indicates a medium healthy diet whereas scores 9–12 indicate a healthy diet, but only 12 indicate an optimal diet.

The index was designed to measure the quality of the diet regarding the intakes of saturated fat, added sugar and fibre. To be a good indicator, the overall index as well as the different components of the index should correlate with the intake of the macronutrient, which was investigated in the present project. We also want to know if the index was a good indicator of the intake of wholegrains and the consumption of fruit and vegetables, why these were included in the calculations. There should also be a dose-response relationship between the three categories of the DI and the intake of macronutrients and of fruit and vegetables.

The selected variables were the intakes per day for saturated fatty acids (SFA, E%), added sugar (E%), fibre (g/10 MJ), wholegrain (g/10 MJ) and F&V (g). The measuring unit varies, as the recommendation for fruit and vegetables is in gram and in E% and g/10 MJ for the others.

Statistical analysis

For analysis of correlation between the food groups of and the overall DI on the one hand and macronutrients and fruit and vegetables on the other we used Pearson's r. For the dose-response analysis investigating the mean intake of macronutrients and F&V in three categories of the DI, we used Anova to test for the overall difference. Pairwise comparisons between the categories of the DI, for the means of macronutrients and of fruit and vegetables, were done with oneway anova adjusting p-values with the Sidak's procedure.

Results and discussion

Adults

In Table 3, the proportions of participants in the different DI categories from the two NORMO surveys and from the national dietary surveys in Sweden and Iceland are shown. In Sweden, the intake of the food groups Candy, cake, soft drinks and French fries was lower than in NORMO (Table 4). In Iceland, there were larger differences between the proportions in NORMO and the dietary survey, which may be due to an overestimation of the intake of cakes, French fries and cheese by using only two days of 24 hr recalls, which may not represent habitual consumption. For the same reason, there can be an underestimation of the bread intake (Table 5).

Table 3. The proportion (%) of adult participants divided by the Dietary index categories in Sweden and Iceland. Figures in brackets are results when using the weighing factor

DI categories	NORMO 2011 18-65 year	NORMO 2014 18-65 year	National dietary survey 2010-2011 18-80 year
Sweden	n=1860	n=1732	n=1534
0-4 p	22 (23)	23 (28)	27
5-8 p	69 (69)	69 (66)	69
9-12 p	9 (8)	8 (6)	4
Iceland	n=2006	n=1962	n=1312
0-4 p	18 (19)	24 (24)	46
5-8 p	71 (70)	70 (69)	51
9-12 p	11 (11)	6 (6)	3

Table 4. Percentage distribution for each food group in the different categories in NORMO and in the national dietary survey Riksmaten adults 2010-11, in Sweden

	Unit	Categorisation	Points	NORMO 2011 n=1886	NORMO 2014 n=1789	Riksmaten 2010-2011 n=1667
Fruits and vegetables	Times per day	< 3	0	53	46	64
		3-4	1	34	38	30
		≥ 5	2	13	15	6
Bread (wholemeal, rye, hard)*	Slices per day	< 1	0	17	21	25
		1-2	1	45	46	41
		≥ 3	2	38	33	34
Fish and seafood	Times per week	< 1	0	21	20	29
		1	1	42	39	43
		≥ 2	2	38	41	28
Candy, cakes, soft drinks, French fries	Times per week	≥ 7	0	28	26	9
		3-6	1	36	38	28
		< 3	2	36	36	63
Fat on bread	Type	≥ 60%	0	62	71	60
		≤ 40%	1	38	29	40
Cheese*	Times per week	≥ 4	0	53	57	57
		1-3	1	29	29	26
		≤ 1	2	18	14	17
Sausages*	Times per week	> 1	0	14	13	55
		≤ 1	1	86	87	45

*estimated from food record, n=1797.

Table 5. Percentage distribution for each food group in the different categories in NORMO and in the national dietary survey, in Iceland

	Unit	Categorisation	Points	NORMO 2011	NORMO 2014	National survey 2010-2011
				n=2011	n=2012	n=1312
Fruits and vegetables	Times per day	< 3	0	63	65	81
		3-4	1	29	27	14
		≥ 5	2	8	7	5
Bread (wholemeal, rye, hard)*	Slices per day	< 1	0	19	26	60
		1-2	1	50	46	30
		≥ 3	2	31	27	9
Fish and seafood	Times per week	< 1	0	11	13	9
		1	1	23	22	18
		≥ 2	2	66	65	72
Candy, cakes*, soft drinks, French fries *	Times per week	≥ 7	0	44	42	65
		3-6	1	35	35	21
		< 3	2	22	23	14
Fat on bread	Type	≥ 60%	0	65	76	62
		≤ 40%	1	34	24	38
Cheese*	Times per week	≥ 4	0	40	44	68
		1-3	1	27	29	-
		≤ 1	2	33	26	32
Sausages*	Times per week	> 1	0	6	4	9
		≤ 1	1	94	96	91

*estimated from 24 hr recall

The correlations between the individual components of the DI and macronutrients and fruit and vegetables are shown in Tables 6 and 7. The results show that the food groups included in the DI are able to indicate the intakes of saturated fat (SFA), added sugars and fibre, as intended. The components also indicate the intake of wholegrain and fruit and vegetables, i.e. a positive correlation indicate a higher intake, and a negative correlation a lower intake. For all food groups the correlation was in the "right direction", both in Sweden and Iceland, although the strengths of the correlation differed between the countries. The lowest correlations were found when no relation between food group and nutrient is expected.

Table 6. Correlation (Pearson) between dietary index per food group and intake of saturated fat (SFA), added sugars, fibre, wholegrain, and fruit and vegetables, in the national dietary survey Riksmaten adults 2010-2011, in Sweden

Food	SFA	Added sugars	Fibre	Wholegrain	Fruit & Vegetables
	E%	E%	g/10 MJ	g/10 MJ	g/day
Fruits and vegetables	-0.110**	-0.084**	0.346**	0.160**	0.465**
Bread (wholemeal, rye, hard)	0.016	-0.092**	0.299**	0.415**	0.183**
Fish and seafood	-0.072*	-0.132**	0.203**	0.125**	0.274**
Candy, cakes, soft drinks, French fries	-0.032	-0.286**	0.154**	0.131**	0.077*
Fat on bread	-0.227**	0.031	0.055*	0.049*	0.004
Cheese	-0.241**	0.029	-0.054	-0.061*	-0.106**
Sausages	0.104**	0.055*	-0.155**	-0.083**	-0.092**

*p<0.05 **p<0.001

Table 7. Correlation (Pearson) between dietary index per food group and intake of saturated fat (SFA), added sugars, fibre and fruit and vegetables, in the national dietary survey 2010-2011, in Iceland

Food	SFA	Added sugars	Fibre	Fruit & Vegetables
	E%	E%	g/10MJ	g/day
Fruits and vegetables	-0.156**	-0.090**	0.331**	0.360**
Bread (wholemeal, rye, hard)	0.042	-0.186**	0.278**	0.158**
Fish and seafood	0.070*	-0.186**	0.049	0.065*
Candy, cakes, soft drinks, French fries	-0.071*	-0.402**	0.276**	0.128**
Fat on bread	-0.183**	-0.083*	0.179**	0.081*
Cheese (fat cheese from recall)	-0.160**	-0.049	0.101**	0.032
Sausages	-0.178**	-0.005	0.082*	0.069*

*p<0.05 **p<0.001

Table 8 shows the correlations between the overall DI and the macronutrients and fruit and vegetables. The higher DI score the lower intake of saturated fat and added sugars and the higher intake of fibre, wholegrain and fruit and vegetables.

Table 8. Correlation (Pearson) between Dietary Index score (0-12 p) and intake of saturated fat (SFA), added sugars, fibre, wholegrain, and fruit and vegetables in adults in Sweden and Iceland

	SFA E%	Added sugars E%	Fibre g/10 MJ	Wholegrain g/10MJ	Fruit & vegetables g/day
Sweden	-0.216**	-0.203**	0.344**	0.297**	0.317**
Iceland	-0.185**	-0.367**	0.432**	-	0.280**

**p<0.001

The mean intake from added sugars (E%), saturated fatty acids (SFA, E%), wholegrain (g/10 MJ), fibre (g/10 MJ) and fruit and vegetables (g) stratified by the three DI categories differed significantly between all groups except for the intake of added sugars between the middle (5-8 p) and high (9-12 p) categories in the Swedish population (Table 9).

Table 9. Mean intake of saturated fat (SFA), added sugars, fibre, wholegrain, and fruit and vegetables in the different DI categories in the Swedish Riksmaten 2010-2011

DI	N	SFA	Added sugars	Fibre	Wholegrain	Fruit & Vegetables
		E %	E%	g/10MJ	g/10MJ	g/day
0-4	414	13.9	10.9	21.5	37.3	238
5-8	1061	12.8	9.2	25.7	56.6	324
9-12	59	11.5	8.5	32.1	75.8	463

Table 10. Mean intake of saturated fat (SFA), added sugars, fibre and fruit and vegetables in the different DI categories. The Icelandic national dietary survey 2010-2011

DI	n	SFA	Added sugars	Fibre	Fruit & Vegetables
		E%	E%	g/10 MJ	g/day
0-4	606	15.0	10.9	17.7	203
5-8	665	14.2	7.4	22.0	260
9-12	41	11.3	3.8	32.7	419

The dose-response relationship between the three categories of the DI and the selected macronutrients and fruit and vegetables are shown in figures 1 and 2. Even though the differences are small, the graph is leaning in the right directions.

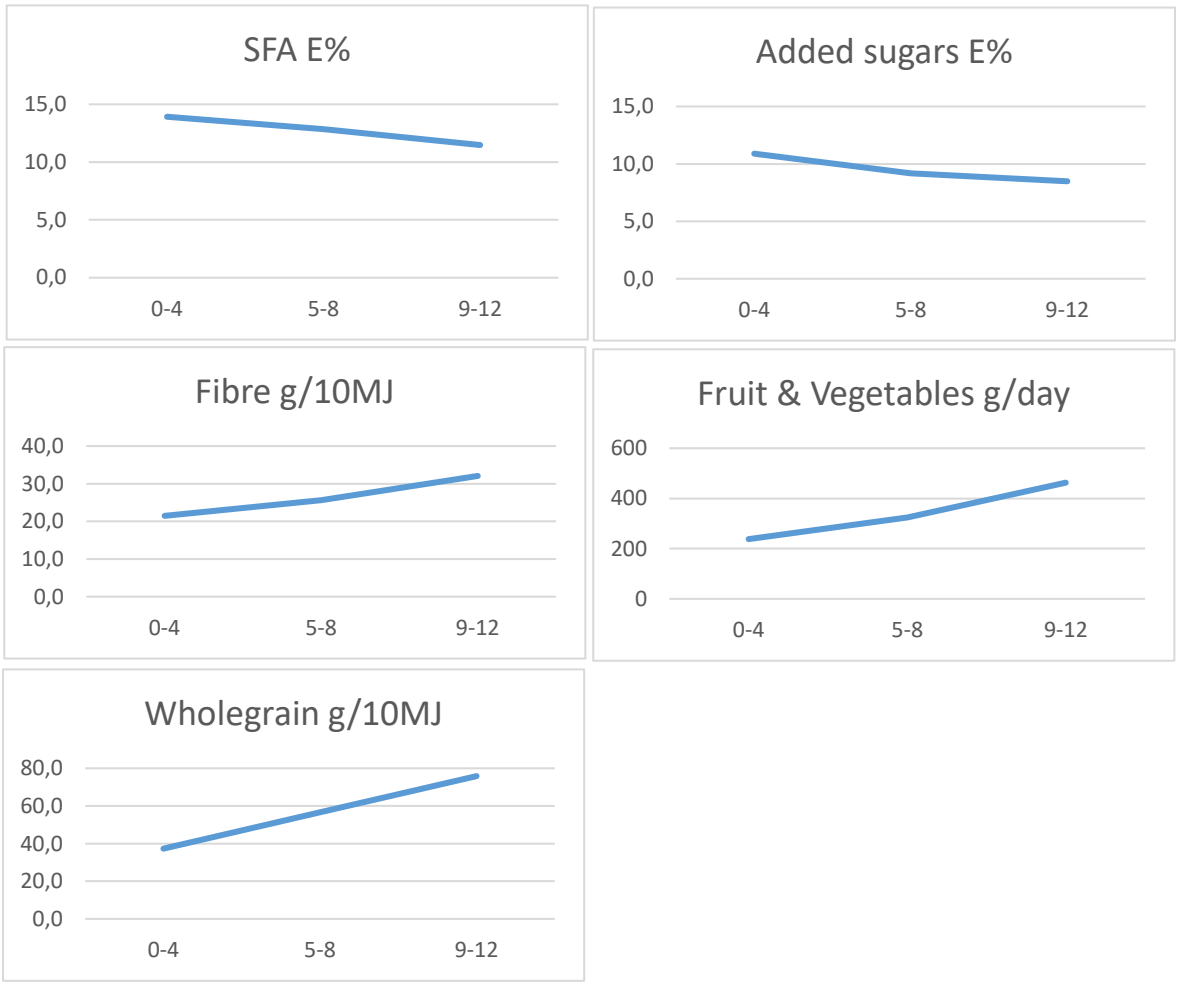


Figure 1. The mean intake of saturated fat (SFA) (E %), added sugars (E %), fibre (g/10 MJ), fruit and vegetables (g/day) and wholegrain (g/10 MJ) in the three dietary index categories in adults in Sweden.

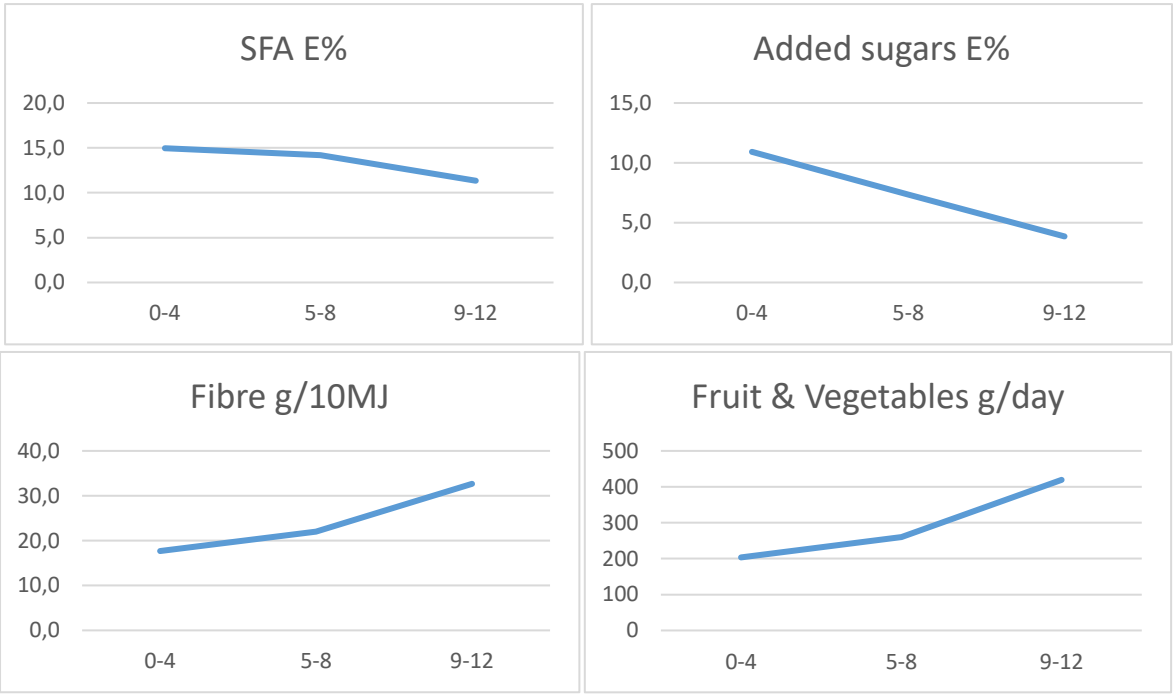


Figure 2. The mean intake of saturated fat (SFA) (E %), added sugars (E %), fibre (g/10 MJ) and fruit and vegetables (g/day) in the three dietary index categories in adults in Iceland.

Adolescents

In Table 11, the proportions of participants in the different DI categories from the two NORMO surveys and from the national dietary survey *Riksmaten adolescents 2016-2017* are shown, both in total and in the 5th grade. In NORMO, the children were in age 7-12 year.

Table 11. Percentage distribution in the Dietary index categories in Sweden. Figures in brackets is results when using the weighing factor

DI categories	NORMO 2011	NORMO 2014	Riksmaten adolescents 2016-2017	
	7-12 year	7-12 year	Grade 5 (11-12 year)	Total (grade 5, 8 and 11)
Sweden	n=497	n=487	n=731	n=2373
0-4 p	21 (20)	19 (22)	31	35
5-8 p	72 (74)	74 (72)	66	63
9-12 p	7 (6)	7 (6)	3	2

The distribution between the categories differs between NORMO and Riksmaten adolescents for some of the food groups (Table 12). A larger proportion of the study participants in the national dietary survey reported not to eat fruit and vegetables three times a day or more often. One explanation could be that in the *Riksmaten adolescents 2016-2017,* the adolescents answered the questions themselves, but in NORMO, the parents did. The parents might better recall the actual consumption and/or they overestimate the consumption of a "good behaviour". Another explanation could be the age is different in Riksmaten and NORMO – the small children might consume more frequently. There was also a large difference in consumption of bread (wholemeal, rye, hard) and cheese between NORMO and the dietary survey. For bread, this may be due to the same reasons as mentioned for adults as well as the current trend in Sweden to eat rustic white bread (levain type). Information on cheese consumption was collected from the dietary recall, and that influence the categorization.

Table 12. Percentage distribution for each food group in the different categories in Sweden. NORMO weight data used (sex, parent's education, age (7-12 year))

	Unit	Categorisation	Points	NORMO		Riksmaten adolescents 2016-2017	
				2011	2014	Grade 5	Total
				n=499	n=500	n=1049	n=3099
Fruits and vegetables	Times per day	< 3	0	45	35	79	78
		3-4	1	39	50	16	17
		≥ 5	2	17	15	5	5
Bread (wholemeal, rye, hard)	Slices per day	< 1	0	30	25	69	71
		1-2	1	48	54	28	26
		≥ 3	2	22	21	3	3
Fish and seafood	Times per week	< 1	0	14	12	15	15
		1	1	46	42	42	43
		≥ 2	2	39	46	42	41
Candy, cakes, soft drinks, French fries	Times per week	≥ 7	0	17	23	20	27
		3-6	1	63	59	34	36
		< 3	2	20	18	36	37
Fat on bread	Type	≥ 60%	0	68	75	76	75
		≤ 40%	1	32	25	24	25
Cheese*	Times per week	≥ 4	0	38	36	15	19
		1-3	1	27	37	24	25
		≤ 1	2	34	27	60	56
Sausages*	Times per week	> 1	0	32	29	42	34
		≤ 1	1	68	71	58	66

*Estimated from food record

The correlations between the individual components of the DI and macronutrients and fruit and vegetables are shown in Table 13. The results show that the food groups included in the DI are able to indicate the intakes of saturated fat, added sugars and fibre, as intended, also for adolescents even if the correlations are weaker than for adults. The components also indicate the intake of wholegrain and fruit and vegetables. Also for adolescents, the correlation was in the "right direction" for all food groups.

Table 13. Correlation (Pearson) between dietary index per food and intake of saturated fat (SFA), added sugars, fibre, wholegrain, and fruit and vegetables, in the Swedish Riksmaten adolescents 2016-2017, in total

Food	SFA E%	Added sugars E%	Fibre g/10MJ	Wholegrain g/10MJ	Fruit & Vegetables g/day
Fruits and vegetables	-0.090**	-0.084**	0.230**	0.086**	0.321**
Bread (wholemeal, rye, hard)	-0.015	-0.116**	0.101**	0.094**	0.124*
Fish and seafood	0.024	-0.048*	0.073**	0.027	0.111**
Candy, cakes, soft drinks, French fries	0.001	-0.232**	0.157**	0.149**	0.078**
Fat on bread	-0.088**	-0.028	0.007	-0.032	0.018
Cheese	-0.225**	0.089**	-0.054*	-0.014	-0.086**
Sausages	-0.226**	0.048*	0.154**	0.023	0.089**

*p<0.05 **p<0.001

In the Riksmaten adolescents, all correlations between the total DI and the selected macronutrients, wholegrain and fruit and vegetables were significant (p<0.001), except for the correlations between DI and added sugars in grades 5 and 8 (Table 14). The correlations were similar in all grades, although strongest in grade 11. In grade 11, the results looked more like the results in adults. This means that the categorization of the population by the DI works in all grades, but best in grade 11.

Table 14. Correlation (Pearson) between Dietary index (0-12 p) and intake of saturated fat (SFA), added sugars, fibre, wholegrain and fruit and vegetables in the Swedish Riksmaten adolescents 2016-2017 in grade 5, 8, 11 and in total

	SFA E%	Added sugars E%	Fibre g/10 MJ	Wholegrain g/10MJ	Fruit & vegetables g/day
Grade 5	-0.178**	-0.087	0.208**	0.141**	0.160**
Grade 8	-0.241**	-0.068	0.216**	0.077**	0.229**
Grade 11	-0.269**	-0.195**	0.245**	0.192**	0.253**
Total	-0.230**	-0.124**	0.222**	0.140**	0.202**

**p<0.001

The mean intake from added sugars (E%), saturated fatty acids (SFA, E%), wholegrain (g/10 MJ), fibre (g/10 MJ) and fruit and vegetables (g) stratified by the three DI categories differed significantly between all groups for the adolescents in total, except for the intake of wholegrain between the middle (5-8 p) and high (9-12 p) categories (Table 15).

In the 5th grade, the differences were smaller in general, and there were no differences for the intake of SFA and wholegrain between the middle (5-8 p) and high (9-12 p) categories (Table 16).

Table 15. Mean intake of saturated fat (SFA), added sugars, fibre, wholegrain and fruit and vegetables in the different DI categories in the Swedish Riksmaten adolescents 2016-17, in total.

DI	N	SFA E%	Added sugars E%	Fibre g/10MJ	Wholegrain g/10MJ	Fruit & Vegetables g/day
0-4	827	14.3	10.8	19,6	32.7	216
5-8	1497	13.5	10.3	21.2	37.2	242
9-12	49	12.6	8.1	24.5	42.8	300

Table 16. Mean intake of saturated fat (SFA), added sugars, fibre, wholegrain and fruit and vegetables in the different DI categories in the Swedish Riksmaten adolescents 2016-17, in the 5th grade.

DI	n	SFA E%	Added sugars E%	Fibre g/10MJ	Wholegrain g/10MJ	Fruit & Vegetables g/day
0-4	227	14.1	10.2	19.7	35.4	195
5-8	484	13.5	9.9	20.9	40.9	210
9-12	20	13.8	8.1	23.3	43.8	251

Figure 3. The mean intake of saturated fat (SFA) (E %), added sugars (E %), fibre (g/10 MJ), fruit and vegetables (g/day) and wholegrain (g/10 MJ) in the three dietary index categories in the Swedish adolescents

Conclusions

In conclusion, our analyses show that the food groups included in the NORMO questionnaire is suited for estimating/categorizing the proportion in the Nordic countries having an unhealthy diet to those having a healthy diet.

The results indicate a dose-response relationship between the three categories of the DI and the intake of macronutrients and fruit and vegetables.

The correlations are generally low between food groups included in the NORMO questionnaire and nutrients. However, this is to some extent expected as the national dietary surveys is not originally intended to evaluate the NORMO questions and all questions on the different food groups is not included in the individual national dietary survey questionnaires. As described under methods several frequencies were estimated from either diet registrations or 24 hr recalls introducing uncertainties. The correlations are higher for food items like bread and fats on bread expected to naturally relate with certain macronutrients, e.g. dietary fibre and saturated fats respectively.

Moreover, the results from this evaluation showed that the proportion that were classified in the healthy diet category (9-12 points) were very small and lower than in NORMO. This may be a consequence of not all

food groups were evaluated by the true NORMO questions or that some of the components of the NORMO questions may not adequately capture healthy eating patterns in the Nordic countries. For some foods like vegetables, you may need to measure the quantities and not just frequencies, in order to capture those with a healthy diet.

The dietary index is more suitable for adults than adolescents, which are in line with the initial validation study in 2009. The validation study showed that the food questionnaire were more suited in children and adults than in adolescents.

How to improve participation rate?

Katja Borodulin, Lene Frost Andersen

Several points for potential action to improve participation have been discussed in the Nordic Monitoring Group. The points are shortly described in the box below. Points 1-4 will be the primary focus while points 5-7 are considered either too time consuming and/or too expensive to implement in a future data collection.

1) Study the paradata of the interviews, such as day of week, time of day, type of telephone line and refusals, to find an optimal successful contact.

2) Study non-participation for sex, age, education, and other relevant sub-groups and tailor the recruitment process to cover the challenging groups.

3) Enhance the recruitment process

    - ensure personal contact at some stage of recruitment
    - text messages as reminders in several occasions
    - reminder letters and call rounds
    - higher amount of phone calls
    - study refusal reasons and develop new strategies

4) Action to reduce country differences in participation rates

    - make the protocol more local by improving the domestic actors (Denmark far away)
    - study the underlying differences between companies that carry out the national interviews

5) Study the paradata of the interviews and test if webbased electronic questionnaires could work for the recognized challenging groups. This should be the very last phase after phone calls.

6) Promise personalized feedback on results (E.g. *the Danish National Survey of Diet and Physical Activity* in Denmark and *the FinHealth Profile* in Finland).

7) Provide a proper website for information, where key results from earlier rounds are made available for lay people

Main points from literature

In 2018, a simple search of recent literature (not systematically) on how to increase response rate was done. Moreover, experiences from studies in Norway and Finland on response rates were collected. Below is a summary of the most important results.

A Cochrane review from 2010 (Edwards et al.) examined the effect on response rate by changing appearance, length or delivery of questionnaires, use of incentives and changing reminders and follow up.

The Cochrane review identified several factors, which could significantly increase response rate for postal questionnaires; shorter questionnaire, cover letter with hand-written signature, special delivery, stamped return envelope compared to a pre-paid or franked reply envelope, contacting invitees before sending

questionnaire, follow-up contact for those not responding to initial questionnaire, providing a second questionnaire with follow-up, and SMS reminder compared to postcard reminder. The Cochrane review also identified several factors, which could significantly increase response rate for electronic questionnaires; shorter e-questionnaires, including a statement that others had responded, a more interesting topic, using non-monetary incentives, using a lottery with immediate notification of results, an offer of survey results, using a white background personalised e-questionnaires, using a simple header, using textual representation of response categories, giving a deadline, and a picture was included in an e-mail.

A paper by Short et al (2015) showed effect on response rate when sending personalised e-mail (https://www.ncbi.nlm.nih.gov/pubmed/26286486). Those receiving the personalised email were 1.5 times more likely to respond than those who received the generic email.

Sauermann & Roach (2013) (https://www.sciencedirect.com/science/article/pii/S0048733312001400) examined how to increase web survey response rates by experimenting with dynamic contact design features. The results showed that personalization increases the odds of responding by as much as 48%, while lottery incentives with a high payoff and a low chance of winning increase the odds of responding by 30%. Furthermore, changing the wording of reminders over the survey life cycle increases the odds of a response by over 30%, while changes in contact timing (day of the week or hour of the day) did not have significant benefits.

Results from Norway

Pilots from Norkost 3 (2010-2011 national dietary survey among adults, design: postal invitation, phone call to assure participation, 2 x 24 hr recalls)

In pilot 1 one of the aims was to investigate the participation rate by using different compensations; NOK 300 to all participants, 4 scratch cards to all participant, lottery of two gift cards of NOK 5000 and NOK 10 000 or no compensation to the participants. Of the total sample of 800, 15% completed the entire study. Participation rate was 17% among those who received NOK 300, 17% among the lottery group, 10% among the group who received scratch cards and 15 % among the no-compensation group (73% of participants who completed the study without compensation were women) (data not published).

Based on the results on pilot 1, an additional pilot study was conducted with the goal to increase the participation rate by using a variety of new adds; better design of information brochure, removing written consent form, calling all participants by phone after receiving information letter and offering a higher compensation for participating. Of the total sample of 400, 40% completed the first interview and 38% completed the second interview, 33% completed the survey by returning the food propensity questionnaire. Of those 33% completing both 2 x 24 hr recalls and the food propensity questionnaire the participation rate was 31% among those who were offered NOK 300 and 35% among those who were offered NOK 500 (difference not statistically significant). In both pilots, more women than men participated (data not published).

Pilot from Spedkost 3 (national dietary survey 2017 among 6 and 12 month old infants, web-based questionnaire)

Response rates were investigated in a pilot study to a national dietary survey among infants using two different incentives (gift certificate or lottery), personalization in the form of handwritten name and address vs. a printed label and mode of sending out invitations (Myhre et al, 2019).

Study of using different incentives: A total of 399 mothers participated in the study. The response rate in a group receiving a gift card of NOK 500 was significant higher (72%) than in a group being part of a lottery (two gift cards of NOK 5000 and NOK 10 000) (62%).

Study of mode of sending invitation: The response rate, among mothers with 6 months old infants (total sample n=300), was higher when using the postal (50%) compared to the e-mail invitation (43%) but the difference was not statistically significant.

Study of personalization: No difference in response rate was observed between those receiving an invitation with a handwritten name and address (68%) compared to a printed label (66%).

Statistics Norway, Levekårsundersøkelsen:

Annual survey conducted by Statistics Norway. In 2017, a nationally representative sample of 11 721 people (16 years and older) was withdrawn (11 519 of these were included). The participants had to do a PC-assisted telephone interview. The response rate was 53.6%. An email and a SMS text message were sent to the subjects with information regarding the survey. Reminders per SMS were sent to the ones who did not respond to the phone call (2 reminding SMS, after 1 and 2 weeks) and a reminding email were sent towards the end of the data collection.

Results from Finland

The National FinHealth 2017 Study (invitation to health examination, n=10000): men 64.8%, women 72.8%. This study uses pre-contact postal cards, personal phones calls and SMS text messages to improve participation. Personal Health Profiles are being sent afterwards with nice infographics.

The Finnish Regional Health and Wellbeing (ATH) Study (postal survey only, n=15000): All 47%, 75+yrs: 64%, 55-74 yrs: 62%, 20-54 yrs: 32%. This study does not take advantage of any of the above-mentioned recruitment methods. Only 2nd reminder questionnaires are being sent to invitees by post. The early results from year 2018 participation are even lower.

Statistics Finland uses paradata to understand participation/non-participation. Many of their phone interview protocols have resulted into 56-61% participation. They have included many items:

- Mixed-mode survey collection methods may work as well (either internet-based questionnaire, phone interview, postal survey). This method may reach those without telephone number or those not answering calls. Telephone on the other hand reaches those who do not have access to internet. Having electronic questionnaires along with calls may improve the participation among 25-54-year-olds. The most difficult population group of young adults was not reached better with electronic forms than traditional phone calls. The quality of answers: those responding to electronic forms responded in more details than via phone calls (this example study was on leisure time travelling). Telephone interviews give more positive answers (bias the results and their interpretation on the phenomenon).

- People may still have difficulties in understanding the meaning of questions. The wording does not make sense and the questions include words that are not familiar. This is even more pronounced among immigrants, non-native Finnish speakers.

Conclusion

Paradata, analysis of non-respondents, personal letter, SMS-reminders, exchange of experience between countries regarding how to obtain high participation rate, timing of participation (day of week/time of day) and incentives could be considered, while feedback, a homepage, and use of different modes of administering the data collection are not realistic to implement within the NORMO-budget.

Costs for a 3rd data collection

Ellen Trolle, Sisse Fagt

Earlier costs for 2nd data collection in 2014 has been 2 million DKK to the market bureau carrying out the coordination of the data collection. The market bureau carrying out the coordination of the data collection has indicated that the budget for the work connected to coordinating the data collection in the five Nordic countries was underestimated. Therefore, it is expected that costs for a 3rd data collection will be higher than the 2nd data collection.

However, if the areas of focus are expanded with the suggested new questions on fish, alcohol consumption, e-cigarettes and sleep and there also is a need for that the questionnaire covers sustainable diet, then these questions haveto be developed and incorporated into the questionnaire. The interview will thus be longer and more expensive to carry out, and the following data handling and analysis will cover more data. It will also be wise to carry out a pilot study with the revised questionnaire before a 3rd data collection is conducted.

The total costs are in total estimated to be approximately DKK 4.75 million. However, due to Covid 19, restrictions and lock down some of the market bureaus able to conduct telephone interviews might have closed parts of their business during lock down. The price estimate has to be revaluated before a tender.

Communication and use of data

Sisse Fagt, Holmfridur Thorgeirsdottir, Jeppe Matthiessen

Results from the Nordic Monitoring System have been broadly disseminated due to a great interest internationally. The project coordinators have presented data from NORMO at several scientific meetings, and have been invited to cooperate about use of data in different national and international projects. Until now, this has resulted in four reports, one working paper and six facts sheets (appendix A), five peer reviewed papers (appendix B), four posters (appendix C) and more than 15 oral presentations (appendix D).

In July 2016, the Danish coordinators had a meeting with World Health Organization (WHO), Regional Office, Copenhagen, where the Nordic Monitoring System was presented. WHO recommended several points in the communication and dissemination process of results. WHO emphasized the importance of making more policy oriented advices and choices on how to use the results in public health matters. WHO recommended to portray country-specific success stories and good experiences in public health that might inspire other countries to do the same. Specifically, WHO recommended to produce country profiles/national facts sheets and present good and bad development/status on health. Several of the advices from WHO were incorporated in the report and the following launch of the report "The Nordic Monitoring System 2011–2014: Status and development of diet, physical activity, smoking, alcohol and overweight" (Matthiessen et al, 2016).

Communication strategy at launch of main report "The Nordic Monitoring System 2011–2014: Status and development of diet, physical activity, smoking, alcohol and overweight", January 2017

The launching of the report was in Denmark split into three press releases from the National Food Institute in January and February 2017. The press releases were in both Danish and English. Drafts of the press releases were sent to the national coordinators for inspiration. In Denmark, the stories were covered by national and regional media (newspapers, radio and TV).

The first press release "More Nordic adults have an unhealthy diet" focused on the diet in the Nordic countries. The second press release "More obese adults in the Nordic region" covered physical activity and overweight. The third press release "Denmark occupies unfavourable Nordic first place for smoking and alcohol" focused on smoking and alcohol in especially Denmark and the launching of the country specific facts sheets.

The results of the report were commented in the news in all Nordic countries.

In Iceland, the press release on diet was published simultaneously as well as the releases on alcohol and tobacco, physical activity and obesity. The media coverage was good with news in newspapers, radio, and TV.

The comprehensive press releases of the report gave an excellent media coverage, with e.g. more than 240 "hits" in Danish media and several hits in international media.

Dissemination of results after the launch of the report

After the launch of the report, the results from the Nordic Monitoring System have been cited in both newspapers, magazines and in reports. There is no tracking of media coverage of the results after the 2017 launch.

In 2017, a memo was sent to the NKMT secretariat regarding the importance of the continuation of Nordic Monitoring System and why a 3rd data collection should take place.

In 2018, results from the main report 2011-2014 was incorporated into the Nordic report "Solutions Menu. A Nordic guide to sustainable food policy" (Nordic Council of Ministers, 2018), Norden.org, published summer 2018.

During 2018-2019, it was planned to present results at the Nordic Council website "Nutrition the Nordic Way", a website with the aim of giving a snapshot of the Nordic cooperation in the field of nutrition, from strategy and monitoring, to nutritional research and consumer labeling. Highlights of the results from the Nordic Monitoring System should be presented on the website, but the results from NORMO were unfortunately never implemented on the website.

In 2019, a status note on the Nordic Monitoring System was created and sent to members of the NKMT and the Nordic Council secretariat. The status note emphasized the importance of surveillance of health behaviour and health status in the Nordic countries and concluded that a 3rd data collection would be an important tool for an overall evaluation of the Nordic Plan of Action on better health and quality of life through diet and physical activity.

The main report (Matthiessen et al, 2016) has been cited in two action plans in Iceland. It has been pointed out that Iceland has the highest consumption of sugar-rich foods and highest proportion of obese adults in the Nordic countries:

1. Action plan to reduce sugar consumption, 2019
2. Action plan for implementing excise taxes to improve public health, 2020.

Results on frequency of sugary products among children and adults in the Nordic countries have also been used in an E-paper by the National Food Institute, Technical University of Denmark in 2021 (Biltoft-Jensen et al. 2021).

Data and assessment methods

Data and assessment methods from NORMO have become more visible for a larger scientific readership as several reports and scientific papers have been published in recent years. After issuing the last NORMO-report (Matthiessen et al, 2016), an extended abstract of the report was published in *European Journal of Nutrition & Food Safety* (Matthiessen et al, 2017). The main conclusion was that the Nordic region has experienced an increase in unhealthy dietary habits, high recreational screen time and obesity prevalence among adults between 2011 and 2014, while no changes were found among children. Groups like men, 45-65-y-olds, and individual with low education may be especially relevant to target.

Diet

The full NORMO questionnaire for both children and adults is available for download on the website of the National Food Institute, Denmark (https://www.food.dtu.dk/temaer/ernaering-og-kostvaner/kostvaner-og-fysisk-aktivitet/metodeudvikling/normon). The questionnaires are available in both English and Danish versions. The Nordic Monitoring System is presented at the website.

The Nordic Monitoring System was originally planned to cover data collected in both children, adolescents and adults, but due to lack of funding and difficulties in assessing diet in adolescents, the age group 13-17 years were omitted from the monitoring system. A workshop addressing dietary assessment in adolescents held in Gothenburg December 2014 discussed different aspects of assessing diet in this age group. The results of the workshops is described briefly on the website of the Danish National Food Institute with links to the Nordic working paper on results of the workshop as well as the presentations from the workshop.

There has been interest from both national researchers and regional stakeholders (municipalities) to use the dietary and physical activity questionnaires in others surveys, as short validated dietary questionnaires are requested. As the questionnaire is downloadable without any registration, it is not possible to estimate how much the questionnaire or items from the questionnaire have been used. Different research projects and media have used the dietary results in reports and newspaper articles.

The EU funded project DEDIPAC (Determinants of Diet and Physical Activity Choice) showed interest for the Nordic Monitoring System and invited the project coordinator and a member of the working group to present the strengths of the system at a DEDIPAC meeting in Bremen, Germany in 2016. As a continuation of the DEDIPAC, the Joint Programming Initiative "A Healthy Diet for a Healthy Life" was formed and researchers of the Policy Evaluation Network (PEN) (http://www.jpi-pen.eu/) started the development of a consolidated approach by selecting and prioritizing an agreed set of indicators for physical activity, sedentary and dietary behaviours measured using harmonized instruments. The aim is ideally to suggest indicators that can be used by existing monitoring and surveillance systems. The PEN Network recognizes that Europe lacks a harmonized public health surveillance system to obtain comparable data across countries and to align national policies, action plans and recommendations to combat unhealthy diets, physical inactivity and overweight within the European region. As a representative of the Nordic Monitoring System, the project coordinator was invited to an "Expert workshop on indicator selection for policy evaluation of lifestyle interventions" in Berlin, Germany, September 2019. The aim of this workshop was as a first step to identify key indicators for health behaviour and determinants suitable for health monitoring. In 2020, the project coordinator joined an online workshop during the PEN General Assembly in October 2020, where progress on developing a short questionnaire ('screeners') for integrating prioritized indicators of health behaviour and health status into European monitoring and surveillance systems was shared. In April 2021, the project coordinator and a member of the working group had an online meeting with researchers from PEN Work Package 2 on Monitoring and surveillance and had mutual discussions on status of NORMO and PEN.

Physical activity

Cancer researchers from the Nordic countries have in collaboration with the Nordic Monitoring Group used physical activity data (MVPA, VPA[3]) from more than 16.000 adults (NORMO 2011 and 2014) to estimate the potential for cancer prevention by increasing levels of physical activity (Anderssson et al, 2019). 11.000 cancer cases could be avoided in the Nordic countries in a 30-year period, if deficit in leisure time physical activity was eliminated. This study was published in *European Journal of Cancer*.

NPAQ has been used as assessment method to monitor physical activity and compliance with the physical activity recommendations in NORMO as it covers both time and intensity. NPAQ is shorter and easier to comprehend than more extensive questionnaires, more efficient and convenient to use in large-scale monitoring surveys and when it is needed to incorporate monitoring of physical activity into ongoing surveys on other issues. In 2017, NPAQ (items on MVPA and VPA) was incorporated in *the Danish National Health Survey 2017* for the first time to assess the proportion of Danish adults aged 16+ complying with the physical activity recommendations. *The Danish National Health Survey* is the largest public health survey in Denmark with more than 180.000 participants aged 16+ and with data collection every 4th year. Furthermore, NPAQ (items on MVPA, VPA and screen time behaviour) has been incorporated in *the Danish National Survey of Diet and Physical Activity 2011-2013* with approximately 4.000 participants aged 4-75 years and will also be part of the next survey in 2020-2021. Finally, NPAQ (items on MVPA and VPA) has been incorporated in *the*

[3] MVPA: Moderate to vigorous physical activity; VPA: Vigorous physical activity

Health and Wellbeing of Icelanders 2012 with 6804 participants aged 18-84 y and in a yearly monitoring of physical activity since 2019.

The Nordic Monitoring Group carried out a validation study in 2010 before the Nordic Monitoring 2011. NPAQ was validated against accelerometry in children, adolescence and adults. Data showed that NPAQ work as intended (Fagt et al, 2012). Since then, other Nordic researchers have validated NPAQ (Danquah et al, 2018). NPAQ was validated by Danish researchers before incorporating it into *the Danish National Health Survey*. NPAQ was validated against accelerometry in adults and the study found the questionnaire to be sufficiently reliable and valid to monitor physical activity levels in the population.

NPAQ has been developed and designed for use among children (7-12 y), adolescents (13-17 y) and adults (18-65 y). However, researchers at the University of Copenhagen have validated NPAQ (items on MVPA and VPA) against steps measured with Garmin Vivofit 3 physical activity monitors among older adults (mean age 73 y) (Larsen et al, 2020). The concurrent validity of NPAQ was found to be low among older adults, as the electronically administered NPAQ did not reflect measured daily steps.

Differences in age of participants, recall frame, administration mode and validation instrument were observed in the NPAQ-validation studies.

Overweight

Data from NORMO on overweight has been published in *Current Obesity Reports* (Stockmarr et al, 2016). Results show that obesity prevalence in adults increased from 2011 to 2014, while no significant changes were found in children. Furthermore, the paper found that obesity prevention initiatives in the Nordic countries are similar, which is rooted in the transnational Nordic cooperation and comparable social structures in the Nordic Welfare States.

Conclusion

NORMO-assessment methods and data have been use in several projects, studies and surveys

- Dietary key results from NORMO have been mentioned in research projects such as the DEDIPAC study and the Policy Evaluation Network and in an Icelandic Action plan to reduce consumption of sugar-rich products.
- NORMO questions have been used in national surveys such as the *The Danish National Health Survey*. Also, regional projects on municipality level have used the questions, but use is not monitored systematically.
- Data on overweight prevalence has been used to describe obesity prevention in the Nordic countries.
- Physical activity data has been used to quantify the proportion of the cancer burden in the Nordic countries linked to insufficient levels of leisure time physical activity.
- Assessment methods such as NPAQ have been used in several ongoing large-scale population surveys such as *the Danish National Health Survey, the Danish National Survey of Diet and Physical Activity*, and *the Health and Wellbeing of Icelanders*.
- New validation studies of the NPAQ have been completed.

This highlights the value of the work done by the Nordic Monitoring group for the Nordic Council of Ministers.

References

Amcoff E, Edberg A, Enghardt Barbieri H, Lindroos AK, Nälsén C, Pearson M (2012). Riksmaten – vuxna 2010–11. Livsmedels- och näringsintag bland vuxna i Sverige. Livsmedelsverket, Uppsala.

Amcoff E, Edberg A, Enghardt Barbieri H, Lindroos AK, Nälsén C, Pearson M, Warensjö Lemming E (2014). Riksmaten - vuxna 2010-11. Livsmedels- och näringsintag bland vuxna i Sverige - metodrapport, in Livsmedelsverkets rapportserie. Livsmedelsverket, Uppsala.

Andersson TM, Engholm G, Lund AQ, Lourenço S, Matthiessen J, Pukkala E, Stenbeck M, Tryggvadottir L, Weiderpass E, Storm H. Avoidable cancers in the Nordic countries – the potential impact of increased physical activity on postmenopausal breast, colon and endometrial cancer. European Journal of Cancer 2019: 110; 42-48.

Biltoft-Jensen AP, Gibbons SJ, Kørup K, Bestle SMS, Christensen BJ, Trolle E, Lassen AD, Matthiessen J (2021). Danskernes er verdensmestre i slikindkøb. E-artikel nr. 1. DTU Fødevareinstituttet

Danish Cancer Society. https://www.cancer.dk/forebyg/undga-roeg-og-rygning/e-cigaretter/tal-om-e-cigaretter/

Danish Health Authority (2010). Sundhedsstyrelsens nye udmelding vedrørende alkohol [New public health recommendation on alcohol from the Danish Health Authority. Memo in Danish]. Copenhagen: Danish Health Authority, Unit of Prevention.

Danish Health Authority (2018). The health of the Danes – the Danish National Health Survey 2017 [Report in Danish].

Danish Veterinary and Food Administration (2021): The official dietary guidelines - Good for Health and Climate. Available online: https://altomkost.dk/ (accessed on 7 January 2021). Glostrup, Ministry of food, agriculture and fisheries. Danish Veterinary and food Administration.

Danquah IH, Petersen CB, Skov SS, Tolstrup JS. Validation of the NPAQ-short - a brief questionnaire to monitor physical activity and compliance with the WHO recommendations. BMC Public Health. 2018; 18: 601

European Commission (2020). Farm to Fork Strategy – for a fair, healthy and environmentally-friendly food system. https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf

Fagt S, Andersen LF, Anderssen SA, Becker W, Borodulin K, Fogelholm M, Groth MV, Gunnarsdottir I, Helakorpi S, Kolle E, Matthiessen J, Rosenlund-Sørensen M, Simonen R, Sveinsson T, Tammelin T, Thorgeirsdottir H, Valsta L, Trolle E (2012). Nordic monitoring of diet, physical activity and overweight. Validation of indicators. TemaNord 2011: 556. Nordic Council of Ministers

Fagt S, Andersen LF, Anderssen SA, Becker W, Borodulin K, Fogelholm M, Groth MV, Gunnarsdottir I, Johansson G, Matthiessen J, Sveinsson T, Tammelin T, Thorgeirsdottir H, Valsta L, Trolle E (2009). Nordic monitoring on diet, physical activity and overweight. Part 1: Description of a common Nordic method for collecting representative data. National Food Institute. Technical University of Denmark

FAO and WHO (2019). Sustainable healthy diets – Guiding principles. Rome. https://doi.org/10.4060/CA6640EN

Jennum P, Bonke J, Clark AJ, Flyvbjerg A, Garde AH, Hermansen K, Johansen C, Møller M, Rod NH, Sjödin A, Zachariae B (2015). Søvn og sundhed. København: Vidensråd for Forebyggelse: 1-224 [Report in Danish with an English summary].

Larsen RT, Korfitsen CB, Juhl CB, Andersen HB, Langberg H, Christensen J. Concurrent Validity Between Electronically Administered Physical Activity Questionnaires and Objectively Measured Physical Activity in Danish Community–Dweeling Older Adults. Journal of Aging and Physical Activity. 2020;1-9 doi: 10.1123/japa.2020-0214.

Lassen, A.D.; Christensen, L.M.; Trolle, E. Development of a Danish Adapted Healthy Plant-Based Diet Based on the EAT-Lancet Reference Diet. Nutrients 2020, 12.

Lemming EW, Moraeus L, Petrelius Sipinen J, Lindroos AK. Riksmaten ungdom 2016-17. (2018) Livsmedelskonsumtion bland ungdomar i Sverige. Livsmedelsverket, Uppsala.

Matthiessen J, Andersen LF, Barbieri HE, Borodulin K, Knudsen VK, Kørup K, Thorgeirsdottir H, Trolle Ellen, Fagt S (2016). The Nordic Monitoring System 2011-2014. Status and development of diet, physical activity, smoking, alcohol and overweight. TemaNord 2016:561. Nordic Council of Ministers.

Matthiessen J, Andersen LF, Barbieri HE, Borodulin K, Knudsen VK, Kørup K, Thorgeirsdottir H, Trolle Ellen, Fagt S. The Nordic Monitoring of diet, physical activity, smoking, alcohol and overweight: 2011-2014 (extended abstract). European Journal of Nutrition and Food Safety 2017; 7(2): 128-130.

Meltzer HM, Brantsæter AL, Trolle E, Eneroth H, Fogelholm M, Ydersbond TA, Birgisdottir BE. Environmental Sustainability Perspectives of the Nordic Diets. Nutrient 2019, 11, 2248: doi:10.3390/ nu11092248

Ministry of Health (2019). Action plan reduce sugar consumption. https://www.stjornarradid.is/lisalib/getfile.aspx?itemid=37d28a1b-9691-11e9-9442-005056bc530c

MinIstry of Health (2020). Action plan for implementing excise taxes to improve public health. https://www.stjornarradid.is/gogn/rit-og-skyrslur/stakt-rit/2020/11/11/Adgerdaaaetlun-um-beitingu-efnahagslegra-hvata-til-eflingar-lydheilsu-Utfaerslur-starfshops-a-innleidingu/

Myhre JB, Andersen LF , Holvik K , Astrup H, Kristiansen AL. Means of increasing response rates in a Norwegian dietary survey among infants - results from a pseudo-randomized pilot study. BMC Med Res Methodol, 2019 Jul 9; 19 (1):144.

Nordic Council of Ministers (2014). Nordic Nutrition Recommendations 2012. Integrating nutrition and physical activity.5 th ed. Nord 2014:002. Copenhagen: Nordic Council of Ministers.

Nordic Council of Ministers (2018). Solutions Menu. A Nordic guide to sustainable food policy, Nordic Council of Ministers.

Nordic Council of Ministers (2019). Vision 2030. Adopted 2019. https://www.norden.org/en/declaration/our-vision-2030

Nordic Council of Ministers (2020). Cookbook for systems change – Nordic innovation strategies for sustainable food systems Nord Nordic Council of Ministers 2020. http://dx.doi.org/10.6027/nord2020-048

Pedersen AN, Christensen T, Matthiessen J, Knudsen VK, Rosenlund-Sørensen M, Biltoft-Jensen A, Hinsch HJ, Ygil KH, Kørup K, Saxholt E, Trolle E, Budtz Søndergaard, Fagt S (2015). Danskernes kostvaner 2011-2013. Hovedresultater [Report in Danish with an English summary]. National Food Institute, Technical University of Denmark.

Rasmussen LB, Andersen LF, Borodulin K, Enghardt Barbieri H, Fagt S, Matthiessen J, Sveinsson, Trolle E (2012). Nordic monitoring of diet, physical activity and overweight. First collection of data in all Nordic Countries 2011. TemaNord 2012:552. Nordic Council of Ministers.

Sepp H, Ekelund U, Becker W (2004). Enkätfrågor om kost och fysisk aktivitet bland vuxna − Underlag till urval av frågor i befolkningsinriktade enkäter. Livsmedelsverket, Uppsala.

Stockmarr A, Hejgaard T, Matthiessen J. Obesity Prevention in the Nordic Countries. Curr Obes Rep. 2016 Jun;5 (2):156-65

Swedish Food Agency (https://www.livsmedelsverket.se/matvanor-halsa--miljo/miljo/miljosmarta-matval2 (accessed on 8 March 2021)

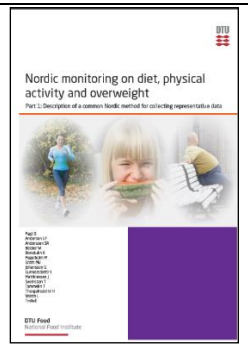
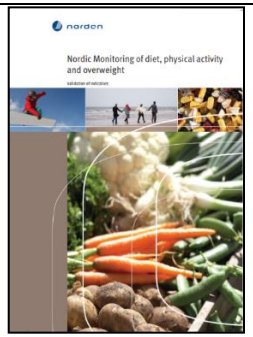
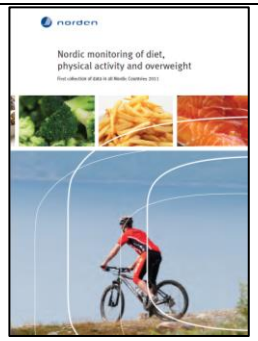
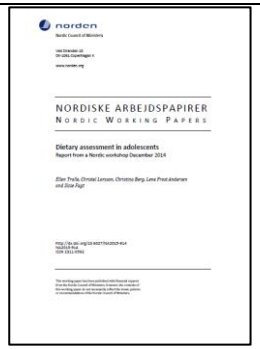
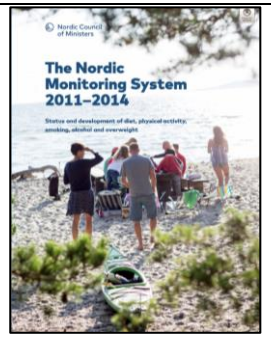
Thorgeirsdottir H, Valgeirsdottir H, Gunnarsdottir I, Gisladottir E, Gunnarsdottir BE, Thorsdottir I, Stefansdottir J, Steingrimsdottir L (2011). National dietary survey of Icelanders 2010-2011. Main findings. Directorate of Health, Icelandic Food and Veterinary Authority and Unit for Nutrition Research, University of Iceland.

United National (2019). 17 Sustainable Development Goals for the year 2030. https://sdgs.un.org/goals

Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, Garnett T, Tilman D, DeClerck F, Wood A, Jonell M, Clark M, Gordon LJ, Fanzo J, Hawkes C, Zurayk R, Rivera JA, De Vries W, Majele Sibanda L, Afshin A, Chaudhary A, Herrero M, Agustina R, Branca F, Lartey A, Fan S, Crona B, Fox E, Bignet V, Troell M, Lindahl T, Singh S, Cornell SE, Srinath Reddy K, Narain S, Nishtar S, Murray CJL. Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet 2019; 393: 447-492.

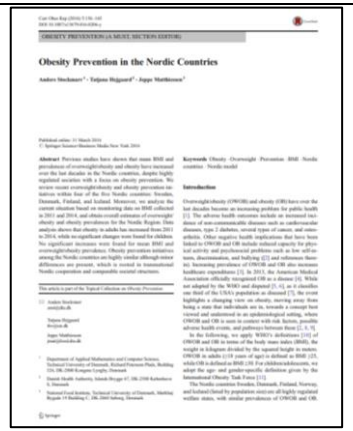
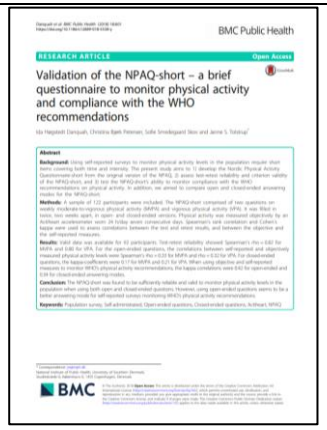
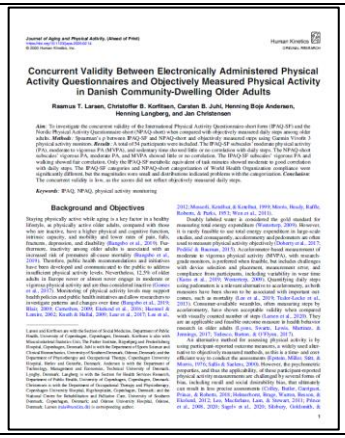
Wood A, Gordon L, Röös E, Karlsson JO, Häyhä T, Bignet V, Rydenstam T, Hård af Segerstad L, Bruckner M. Nordic food systems for improved health and sustainability. Baseline assessment to inform transformation. Stockholm Resilience Centre, Stockholm University, Report. March 2019.

Appendix A. Reports and fact sheets

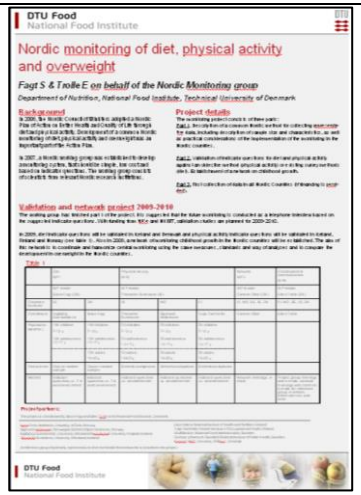
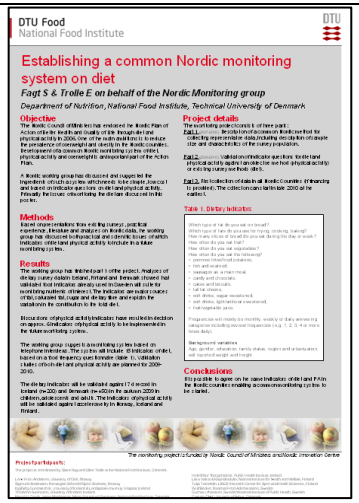
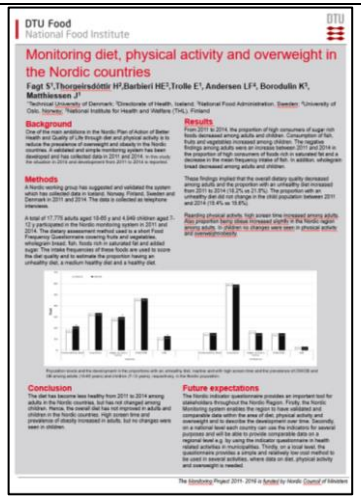
Year	2009	2012	2012	2015	2017	2017
Authors	Fagt S, Andersen LF, Anderssen S et al	Fagt S, Andersen LF, Anderssen S et al	Rasmussen LB, Andersen LB, Borodulin K et al	Trolle E , Larsson C, Berg C et al	Matthiessen J, Andersen LF, Barbieri HE et al	DTU Food
Title	Nordic monitoring of diet, physical activity and overweight. Part 1: Description of a common Nordic method or collecting representative data	Nordic monitoring of diet, physical activity and overweight. Validation of assessments methods of diet and physical activity	Nordic monitoring of diet, physical activity and overweight. First data collection 2011	Dietary assessment in adolescents: Report from a Nordic workshop December 2014	Nordic monitoring of diet, physical activity and overweight. Monitoring 2011-2014. Status and development of diet, physical activity, smoking, alcohol and overweight	Fact sheets. Nordic Region as well as participating countries
Pages	52	94	168	26	229	6
Publisher	DTU	NMR	NMR	NMR	NMR	DTU
						

Appendix B. Scientific papers

Four scientific papers and an extended abstract have been published.

Year	2016	2017	2018	2019	2020
Authors	Stockmarr A, Hejgaard T, Matthiessen J	Matthiessen J, Andersen LF, Barbieri HE et al	Danquah CB, Petersen CB, Skov SS, Tolstrup JS	Andersson TML, Engholm G, Lund AQ et al	Larsen RT, Korfitsen CB, Juhl CB et al
Title	Obesity Prevention in the Nordic Countries.	The Nordic Monitoring of diet, physical activity, smoking, alcohol and overweight: 2011-2014	Validation of the NPAQ-short - a brief questionnaire to monitor physical activity and compliance with the WHO recommendations	Avoidable cancers in the Nordic countries-the potential impact of increased physical activity on postmenopausal breast, colon and endometrial cancer	Concurrent Validity Between Electronically Administered Physical Activity Questionnaires and Objectively Measured Physical Activity in Danish Community-Dwelling Older Adults
					
Journal	Curr Obes Rep. 2016 Jun;5 (2):156-65.	European Journal of Nutrition & Food Safety. 2017, 7, 2, p. 128-130	BMC Public Health. 2018 May 8;18 (1):601.	Eur J Cancer. 2019 Mar;110:42-4 8	J Aging Phys Act. 2020 Dec 12;1-9.

Appendix C. Posters (selected)

Month and year	March 2009	September 2009	April 2011	June 2016
Authors	Fagt S, Trolle E on behalf of the Nordic Monitoring Group	Fagt S, Trolle E on behalf of the Nordic Monitoring Group	Fagt S, Trolle E on behalf of the Nordic Monitoring Group	Fagt S, Thorsgeirsdottir H, Barbieri HE et al
Title	Nordic monitoring of diet, physical activity and overweight	Establishing a common Nordic monitoring system on diet	Monitoring diet, physical activity and overweight in the Nordic Countries	Monitoring diet, physical activity and overweight in the Nordic Countries
Presented at	Nordic Conference, Reykjavik, Iceland	EFCOVAL closing conference, Utrecht, The Netherlands	Globalization Initiative, Nordic Council of Ministers, Copenhagen	Nordic Nutrition Conference, Göteborg, Sweden
				

Appendix D. Oral Presentations (selected)

Fagt S. Nordic Innovation Centre project 08066: A Nordic Monitoring system on diet, physical activity and overweight, validation of the instrument and establishing a network on monitoring childhood obesity; Nordic Young Heal, kick off meeting, Oslo/Gardermoen, March 2009

Fagt S. Nordic Monitoring. Nordic Innovation Centre Kick off conference, Reykjavik, Iceland, March 2009

Fagt S, Trolle E. Nordic Monitoring on diet, physical activity and overweight. Nordic Network for monitoring Childhood Obesity, Gøteborg, March 2009

Fagt S. Nordisk Monitorering. Nordic Monitoring on diet, physical activity and overweight. Kick off globaliseringsinitiativet, Copenhagen, august 2010

Fagt S. Development of a common tool for monitoring diet, physical activity and overweight in the Nordic countries. Nordic Nutrition Conference, Reykjavik, Iceland, June 2012

Rasmussen LB. Results from the first common Nordic Monitoring of diet, physical activity and overweight 2011. Nordic Nutrition Conference, Reykjavik, Iceland, June 2012

Gunnarsdottir I. Validation of the Nordic Food Frequency Questionnaire. Reference methods and issues of comparing frequencies and portion sizes of foods consumed. Nordic Nutrition Conference, Reykjavik, Iceland, June 2012

Fagt S, Rasmussen LB. Udvikling af et fælles nordisk monitoreringssystem for kost, fysisk aktivitet og overvægt. Resultater fra første nordiske monitorering efteråret 2011. Copenhagen august 2012

Fagt S, the Nordic Monitoring Group. Monitoring of the Nordic food intake. Diet, physical activity and overweight in the Nordic countries, NNR Seminar, Copenhagen 2014

Fagt S. Results from the Danish validation study in Nordic monitoring – what do adolescents answer when they participate in a survey with FFQ? Workshop “Dietary assessment in adolescents”, Gothenburg, December 2014

Fagt S. Nordic monitoring of diet, physical activity and overweight (and smoking and alcohol). Status and development 2011-14, NKMT meeting Copenhagen March 2016

Fagt S, Matthiessen J, the Nordic Monitoring Group. Strengths of the Nordic Monitoring System. DEDIPAC Bremen, April 2016

Fagt S, the Nordic Monitoring Group. Health behaviour related to overweight & obesity in Nordic children. The Nordic Monitoring System on diet, physical activity and overweight. Nordic Conference on Public Health, Helsinki, Finland, November 2016

Fagt S. The Nordic Monitoring System. Diet, physical activity and overweight. Stakeholder meeting, DTU, Copenhagen, April 2017

Matthiessen J, the Nordic Monitoring Group. Nordic monitoring of diet, physical activity and overweight (and smoking and alcohol). Status and development 2011-14. Danish Cancer Registry, Copenhagen, May 2017

Thorgeirsdottir H. Higher levies on soft drinks – an effective way to reduce sugar intake. Symposium on research in biomedical and health sciences. University of Iceland, Reykjavik, 2017.

Appendix E. Web based information (DTU)

The Nordic monitoring System is presented at the website of the National Food Institute, Technical University of Denmark. The project is described with links to reports and questionnaires. Also, the workshop regarding dietary assessment in adolescents held in Gothenburg December 2014 is described briefly with links to the Nordic working paper on results of the workshop as well as the presentations from the workshop.

In 2009, DTU published an E-paper describing the Nordic Monitoring System. The paper is in Danish and is available at the website described above.

Appendix F. Questionnaire 2014, adults

Diet and physical activity of Nordic adults

English Master questionnaire 2014

*Date of interview*_____

Name of interviewer, identification number of repondent etc.

Q0 *Registration of the sex of the interviewed person*

Male ..... ☐1

Female ..... ☐2

Q1 A. **What is your date of birth ?**

1A Month ☐☐ 1B Year ☐☐☐☐ (19

January =01
February=02
May =03
Etc.

Q2. What is your education[1]?

Basic education ☐ 1
10 years or less

Vocational education/ Practical - Upper secondary education ☐ 2
approx. 1-3 years after Basic education

Theoretical Upper Secondary education ☐ 3
approx. 2-3 years after Basic education

Short higher education – not vocational or practical ☐ 4
approx. 1-2 years after basic or secondary education

Medium higher ☐ 5
approx. 3-4 years after secondary education

Long higher education ☐ 6
approx. 5+ years after secondary education

[1] *Combined school and further education. The education has to be completed.*

Q3. Which description explains best where you live?

(Place only one cross)

The Capital and suburb….....	☐	1
A large city (more than 50.000 inhabitants) ….....	☐	2
A city of between 20.000 – 49.999 inhabitants...	☐	3
A town between 1000 – 19.999 inhabitants.....	☐	4
Country side.....	☐	5
Do not know ….....	☐	8

Q4. Do you live together with anyone? (multiple responses possible)

1= Yes, 0=No

4.1Yes, with spouse/partner or cohabite	☐ 1=Yes, else 0
4.2 Yes, with mother/father/parents	☐ 1=Yes, else 0
4.3 Yes, with kids living at home (kids < 18 y)	☐ 1=Yes, else 0
4.4 Yes, with kids living at home (≥18 y)	☐ 1=Yes, else 0
4.5 Yes, with others	☐ 1=Yes, else 0
4.6 No I live alone	☐ 1=Yes, else 0

4.6 (Single Response only) If 4.6= 1 →go to question 6

Q5. How many people live in your household including yourself?

number of persons in the household ☐☐

(Must be at least 2)

Q6. How tall are you?

└_ _ _┘ cm.

Do not know ..... ☐ 998

Refuse ..... ☐ 997

Q7. How much do you weigh? (for pregnant women: the weight before pregnancy)

└_ _ _┘ kg.

Do not know ..... ☐ 998

Refuse ..... ☐ 997

The following questions regard what you usually eat. Please keep the last 12 months in mind when you respond to the questions. You have to keep in mind what you eat *most often*

8 What type of spread/grease do you usually put on your bread? If you use more than one kind, respond to what you use the most.

If the respondent mentions butter, ask if he/she means butter or Kærgården/similar.

If the respondent is in doubt whether she/he uses margarine or vegetable margarine, ask if the grease comes in paper wrapping or in a container (if national relevance)

1 ☐ Butter
2 ☐ Oil-butter spereads, Kærgården, Bakkedal, Marklyst, Mælkebøtte, Butter Bar
3 ☐ Vegetable margarine 60-80%
4 ☐ Low fat margarine ('Lätta', 'Becel', 38% fat)
5 ☐ 'Becel Pro-Activ'
6 ☐ Margarine 70-80%
7 ☐ Fat (pig or duck, coco)
8 ☐ Do not use spread/grease/fat on bread
98 ☐ Do not know

9 What type of fat, eg. butter, margarine or oil, do you usually use for domestic cooking? If you use more than one kind, respond regarding to what you use most.

If the respondent mentions butter, ask if he/she means butter or 'Kærgården'/ similar.

If the respondent is in doubt whether she/he uses margarine or vegetable margarine, ask if the grease comes in a paper wrapper or in a container *(if national relevance)*

01 ☐ Butter
02 ☐ Oil-butter spreads, Kærgården, Bakkedal, Marklyst, Mælkebøtte, Lurpak butter bar
03 ☐ Frying or baking margarine 70-80% fat
04 ☐ Vegetable margarine 60-80% fat
05 ☐ Fluid margarine, oil-margarine (eg 'Becel', 'Lise')
06 ☐ Oil (eg. rapeseed oil, olive oil, corn oil, sunflower oil, grapeseed oil, salad oil etc)
07 ☐ Use a mixture of oil and butter/Kærgården
08 ☐ Fat (pig, duck)
09 ☐ Do not use spread/grease/fat for cooking
10 ☐ We do not cook/prepare food in our household
11 ☐ Kasvisterolimargariinia (esim. Becel ProActivem Benecol (only Finland)
98 ☐ Do not know

10 How many slices of bread do you eat per day or per week?

Answer according to slice/piece/½ roll

Grain bread also includes wholemeal bread, full grain bread and might carry the wholegrain label. Rolls are also considered bread.

Slice/piece/½ roll

A.per day ***or*** B.per week

10.1
Rye Bread (**(Not to be asked in Sweden))**
How many slices of rye bread do you eat?
Never eat 97 |___| |___|
Do not know 98
10.1a per day
10.1b per week

10.2
White Bread or Wholegrain (not rye bread):
How many slices of whole grain bread, with grain do you eat?
|___||___|

Never eat 97
Do not know 98

10.2a per day
10.2b per week

10.3
How many slices of white bread, toastbread, ciabbata do you eat?
|___| |___|

Never eat 97
Do not know 98

10.3a per day
10.3b per week

10.4
How many slices of hard bread do you eat?
|___| |___

Never eat 97
Do not know 98

10.4a per day
10.4b per week

Code 99 if unanswered

11 How often do you eat fruit and vegetables during a day, a week or a month. If you do not eat fruit and vegetables every day, please think about how often you eat it in a week or in a month. Think about the last 12 months when you respond.

Please respond to both sub questions, but only one response (cross, X) on each row

Do not count small portions, eg. a slice of cucumber on bread, parsley as decoration, berries on cake etc.

		11.1a Times per month				11.1b Times per week						11.1c Times per day					
		<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
11.11	**How often do you eat vegetables, pulses and/or root fruits (includes fresh, frozen, canned, glass/potted etc) DO NOT COUNT POTATOES It is vegetables such as carrots, tomatoes, cucumber, broccoli, peppers, salad, beans, chick peas, lentils, beetroot, celery and parsnip.** **Try also to include dishes that have vegetables in them, such as mixed salad, mixed vegetables, fried vegetables, vegetable soup and stews.**	0 ☐	1 ☐	2 ☐	3 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
		Dont Know=8 None= 7															

11 How often do you eat fruit and vegetables during a day, a week or a month. If you do not eat fruit and vegetables every day, please think about how often you eat it in a week or in a month. Think about the last 12 months when you respond.

Please respond to both sub questions, but only one response (cross, X) on each row

Do not count small portions, eg. a slice of cucumber on bread, parsley as decoration, berries on cake etc.

	Times per month				Times per week						Times per day					
	<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
11.2 **How often do you eat fruit and berries (includes fresh, frozen, canned, glassed/potted etc.) . Fruit and berries include: an apple, an orange, a banana, a bunch of grapes, a plate of strawberries or fruit and berries that are part of porridge, fruit stew, or fruit salad etc.**	0 ☐	1 ☐	2 ☐	3 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
	Dont Know=8 None= 7															

12 Now I will ask you how you eat and drinks a selection of food. Please consider the past 12 months when you answer these questions.

Please answer all questions, but only cross one box on each row

		A Times per month				B Times per week						C Times per day			
		<1*	1	2	3	1	2	3	4	5	6	1	2	3	4 or more
	How often do you eat/drink?	0	1	2	3	1	2	3	4	5	6	1	2	3	4
12.01	**French fries, roasted/fried potatoes**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.02	**Fish and shellfish as main course**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.03	**Sausage as a main course**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.04	**Chocolate and/or candy**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.05	**Cake, biscuits, tart etc.**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.06	**Full fat cheese (**45-60+ or 24-44% fat)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.07	**Low fat/sugar-free fizzy drinks, cordial, ice-tea, light or sugar free drinks**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.08	**Normal fizzy drinks, cordial, ice-tea**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.09	**Energy drinks, red bull, cult etc.**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.10	**Fruit juice or Vegetable Juice**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Dont Know=8
None= 7

The next questions regard your physical activity

[Comment: *The interviewer reads two to three examples of physical activities. Additional examples are in italics and if the respondents have difficulties in answering, the interviewer can add some of these additional examples on request. Generally the interviewer does not read the text in italics but can use the text as a reminder or can read it on request.]*

I am going to ask you about your physical activity during the last 7 days. Your information is important even if you have not been physically active.

13a. **Do you work, attend school or university?** 1 ☐ Yes 5 ☐ No

Filter:
If No (5) in question 13a → go to question 14

13b **Which one of the following descriptions best fits your occupation, or school hours?**
Do not include travel to and from work or school

(1) **Mostly sedentary work like office work** ☐ 1
Additional examples are cashier in a store or in a bank, and light manual work

(2) **Work that requires a lot of walking like teaching** ☐ 2
Additional examples are shop assistant, light industrial work

(3) **Work that requires a lot of walking and lifting, like a nurse** ☐ 3
Additional examples are heavy industrial work

(4) **Heavy manual labour like heavy construction** ☐ 4
Additional examples are heavy farm work, heavy forestry

[Question 14 (moderate or harder activity)]
Next, I am going to ask you about all physical activity during your leisure time and active transportation *e.g. commuting to and from work or school. include PA while running errands.* **Include all activity where the physical effort is moderate or harder, that is, you should include both moderate and vigorous activity. This kind of activity accelerates heart rate and breathing. Examples are brisk walking, running and heavy gardening.**
Additional examples are Nordic walking, bicycling, and golf; these examples can be country specific.

Q14
During the last 7 days, how much time in total did you spend in physical activity where the physical effort was moderate or harder and lasted for at least 10 min each time? Estimate to the nearest half an hour.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if physical activity is less or more than 150 min (2½ h) and if it is more or less than 300 min (5 h)

Hours..... ☐☐
Minutes..... ☐☐
DK (Dont Know) 98

[Question 15 (vigorous activity)]
Q15
Next, I am going to ask you how much of the physical activity you indicated in the last question, was vigorous. This kind of activity causes substantial increase in heart rate and sweating, as well as rapid breathing that makes it difficult to talk. Examples are running or playing soccer *Additional examples are fast bicycling, badminton or tennis, and cross–country skiing; these examples can be country specific.*

During the last 7 days, how much time in total did you spend during leisure time in vigorous physical activity that lasted for at least 10 min each time? Estimate to the nearest half hour.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if physical activity is less or more than 75 min (1 h and 15 min) and if it is more or less than 150 min (2½h)

Hours..... ☐☐
Minutes..... ☐☐
DK (Dont Know) 98

[Question 16a (Sedentary time: TV watching)]
<u>Interviewer:</u> During the last 7 days, how much time per day on average did you spend sitting and watching TV during your leisure time? Estimate it to the nearest half hour. Include videos, DVD and console games (PlayStation, Xbox, etc) played on TV screen.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours
Hours..... ☐☐
Minutes..... ☐☐
DK (Dont Know) 98

[Question 16b (Sedentary time: Computer screen time)]
During the last 7 days, how much time per day on average did you spend in front of a computer screen during your leisure-time? Estimate to the nearest half an hour. Include video-games, mobile phone games and internet use, and TV programs watched on a computer screen; include home work.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours

Hours..... ☐☐
Minutes..... ☐☐
DK (Dont Know) 98

[Question 17 (classification of leisure-time physical activity)]
Choose one of the following descriptions that best fits your leisure time activity during the last 7 days.

(1) **Reading, watching TV or other sedentary activity?** ☐1

(2) **Walking, cycling, or other forms of light exercise that lasted for at least 4 hours during the last 7 days. Include walking or cycling to and from place of work, Sunday-walking, etc**. ☐2

(3) **Participation in recreational sports, heavy gardening, etc., where the duration of the activity lasted for at least 4 hours in total during the last 7 days**. ☐3

(4) **Participation in hard training or sports competitions, regularly several times during the last 7 days.** ☐4

Question 18	**Now I will ask you how often you drink a selection of beverages. Please consider the past 12 months when you answer these questions.** Please answer all questions, but only cross one box on each row

		Never	Times per year		Times per month			Times per week						Times per day			
			1-5	6-11	1	2	3	1	2	3	4	5	6	1	2	3	4 or more
11	Beer*	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12	Wine	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13	Spirits**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

*Including cider with 4-5% alcohol content
**Including long drinks, alcopops

Question 18 **a**	**During the previous month, how many times have you had five or more units of alcohol at a single occasion?** Number of times…….. ☐

A unit of alcohol could be:
1 beer = 1 unit
1 alcopop = 1 unit
1 glass of wine = 1 unit a bottle of wine = 6 unit
1 shot of liquor or spirit = 1 unit

Question 19	**Do you <u>currently</u> smoke tobacco on a daily basis, less than daily or not at all?**			
Daily		☐	1	End section
Less than daily		☐	2	Go to 19a
Not at all		☐	3	Go to 19b
Don't know		☐	8	End section

Question 19 **a**	**Have you smoked tobacco <u>daily</u> in the past?**

Yes	☐	1	End section
No	☐	2	End section
Don't know	☐	8	End section

Question 19 **b**	**In the <u>past</u>, have you smoked tobacco on a daily basis, less than daily or not at all?**		
Daily	☐	1	
Less than daily	☐	2	
Not at all	☐	3	
Don't know	☐	8	

Question 20	**Do you <u>currently</u> use snuff on a daily basis, less than daily or not at all?** **(not relevant for Denmark)**		
Daily	☐	1	End section
Less than daily	☐	2	Go to 20a
Not at all	☐	3	Go to 20b
Don't know	☐	8	End section

Question 20**a**	**Have you used snuff <u>daily</u> in the past?** **(not relevant for Denmark)**		
Yes	☐	1	End section
No	☐	2	End section
Don't know	☐	8	End section

Question 20**b**	**In the <u>past</u>, have you used snuff on a daily basis, less than daily or not at all?** **(not relevant for Denmark)**

Daily	☐	1	
Less than daily	☐	2	
Not at all	☐	3	
Don’t know	☐	8	

Appendix G. Questionnaire 2014, children

Diet and physical activity of Nordic children
English Master questionnaire 2014

*Date of interview*_____
Name of interviewer, identification number of repondent etc.

Q0 *Registration of the sex of the interviewed person*

Male ..... ☐1

Female ..... ☐2

Q1 A. **What is your child's date of birth ?**

Q1A Month ⌊_⌋ Q1B. Year ⌊_ _ _⌋

January =01
February=02
May =03
Etc.

Q1C. What is your child's sex?
Boy ..... ☐ **1**

Girl ..... ☐ **2**

Q1C open : What is the child's pet name? Write here: _____

Q1D. Are you the child's:

Mother/Stepmother ..... ☐ **1**

Father/Stepfather ..... ☐ **2**

Other, write the relationship here: _____

B.

Q2. What is your education[1]?

Basic education ☐ 1
10 years or less

Vocational education/ Practical - Upper secondary education ☐ 2
approx. 1-3 years after Basic education

Theoretical Upper Secondary education ☐ 3
approx. 2-3 years after Basic education

Short higher education – not vocational or practical ☐ 4
approx. 1-2 years after basic or secondary education

Medium higher ☐ 5
approx. 3-4 years after secondary education

Long higher education ☐ 6
approx. 5+ years after secondary education

Q3. Which description explains best where you live?

(Place only one cross)

The Capital and suburb….....	☐	1
A large city (more than 50.000 inhabitants) ….....	☐	2
A city of between 20.000 – 49.999 inhabitants...	☐	3
A town between 1000 – 19.999 inhabitants.....	☐	4
Country side.....	☐	5
Do not know ….....	☐	8

[1] *Combined school and further education. The education has to be completed.*

Q4. Do you live together with anyone? (multiple responses possible)

1= Yes, 0=No

4.1Yes, with spouse/partner or cohabite	☐ 1=Yes, else 0
4.2 Yes, with mother/father/parents	☐ 1=Yes, else 0
4.3 Yes, with kids living at home (kids < 18 y)	☐ 1=Yes, else 0
4.4 Yes, with kids living at home (≥18 y)	☐ 1=Yes, else 0
4.5 Yes, with others	☐ 1=Yes, else 0
4.6 No I live alone	☐ 1=Yes, else 0

4.6 (Single Response only) If 4.6= 1 →go to question 6

Q5. How many people live in your household including yourself?

number of persons in the household ☐

(Must be at least 2)

Q6. How tall is your child?

└_ _ _┘ cm.

Do not know ..... ☐ 998

No response ..... ☐ 997

Q7. How much does your child weigh?

└_ _ _┘ kg.

Do not know ..... ☐ 998

No response ..... ☐ 997

The following questions regard what your child usually eat. Please keep the last 12 months in mind when you respond to the questions. You have to keep in mind what your child eats *most often* *(if national relevance)*

Q 8 What type of spread/grease do your child usually put on his/hers bread? If your child use more than one kind, respond to what your child uses the most.

If the respondent mentions butter, ask if he/she means butter or Kærgården/similar.

If the respondent is in doubt whether the child uses margarine or vegetable margarine, ask if the grease comes in paper wrapping or in a container

1 ☐ Butter
2 ☐ Oil-butter spreads, Kærgården, Bakkedal, Marklyst, Mælkebøtte, Butter Bar
3 ☐ Vegetable margarine 60-80%
4 ☐ Low fat margarine ('Lätta', 'Becel', 38% fat)
5 ☐ 'Becel Pro-Activ'
6 ☐ Margarine 70-80%
7 ☐ Fat (pig or duck)
8 ☐ Do not use spread/grease/fat on bread
98 ☐ Do not know

9 What type of fat, eg. butter, margarine or oil, do you usually use for domestic cooking? If you use more than one kind, respond regarding to what you use most. *(if national relevance)*

If the respondent mentions butter, ask if he/she means butter or 'Kærgården'/ similar.

If the respondent is in doubt whether she/he uses margarine or vegetable margarine, ask if the grease comes in a paper wrapper or in a container

01 ☐ Butter
02 ☐ Oil-butter spreads, Kærgården, Bakkedal, Marklyst, Mælkebøtte, Lurpak butter bar
03 ☐ Frying or baking margarine 70-80% fat
04 ☐ Vegetable margarine 60-80% fat
05 ☐ Fluid margarine, oil-margarine (eg 'Becel', 'Lise')
06 ☐ Oil (eg. rapeseed oil, olive oil, corn oil, sunflower oil, grapeseed oil, salad oil etc)
07 ☐ Use a mixture of oil and butter/Kærgården
08 ☐ Fat (pig, duck)
09 ☐ Do not use spread/grease/fat for cooking
10 ☐ We do not cook/prepare food in our household
11 ☐ Kasvisterolimargariinia (esim. Becel ProActivem Benecol (only Finland)
98 ☐ Do not know

10 How many slices of bread does your child eat per day or per week?

Answer according to slice/piece/½ roll

Grain bread also includes wholemeal bread, full grain bread and might carry the wholegrain label. Rolls are also considered bread.

Slice/piece/½ roll

per day *or* per week

Rye Bread

Q10.1

How many slices of rye bread does your child eat?

Never eat 97 |___| |___|

Do not know 98

10.1a per day

10.1b per week

White Bread or Wholegrain (not rye bread):

Q10.2

How many slices of whole grain bread, with grain does your child eat? |___| |___|

Never eat 97

Do not know 98

10.2a per day

10.2b per week

Q10.3

How many slices of white bread, toastbread, ciabbata does your child eat? |___| |___|

Never eat 97

Do not know 98

10.3a per day

10.3b per week

Q10.4

How many slices of hard bread does your child eat? |___| |___|

Never eat 97

Do not know 98

10.4a per day

10.4b per week

11 **How often does your child eat fruit and vegetables during a day, a week or a month. If your child does not eat fruit and vegetables every day, please think about how often your child eats it in a week or in a month. Think about the last 12 months when you respond.**

Please respond to both sub questions, but only one response (cross, X) on each row

Do not count small portions, eg. a slice of cucumber on bread, parsley as decoration, berries on cake etc.

		11.1a Times per month				11.1b Times per week						11.1c Times per day					
		<1	1	2	3	1	<1	1	2	3	1	1	2	3	4	5	6 or more
1	**How often does your child eat vegetables, pulses and/or root fruits (includes fresh, frozen, canned, glass/potted etc) DO NOT COUNT POTATOES It is vegetables such as carrots, tomatoes, cucumber, broccoli, peppers, salad, beans, chick peas, lentils, beetroot, celery and parsnip.** **Try also to include dishes that have vegetables in them, such as mixed salad, mixed vegetables, fried vegetables, vegetable soup and stews.**	0 ☐	1 ☐	2 ☐	3 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
		Dont Know=8 None= 7															

11 **How often does your child eat fruit and vegetables during a day, a week or a month. If your child does not eat fruit and vegetables every day, please think about how often your child eats it in a week or in a month. Think about the last 12 months when you respond.**

Please respond to both sub questions, but only one response (cross, X) on each row

Do not count small portions, eg. a slice of cucumber on bread, parsley as decoration, berries on cake etc.

		Times per month				Times per week						Times per day					
		<1	1	2	3	1	2	3	4	5	6	1	2	3	4	5	6 or more
11.2	**How often does your child eat fruit and berries (includes fresh, frozen, canned, glassed/potted etc.) . Fruit and berries include: an apple, an orange, a banana, a bunch of grapes, a plate of strawberries or fruit and berries that are part of porridge, fruit stew, or fruit salad etc.**	0 ☐	1 ☐	2 ☐	3 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
		Dont Know=8 None= 7															

12 Now I will ask you how often your child eats and drinks a selection of food. Please consider the past 12 months when you answer these questions.

Please answer all questions, but only cross one box on each row

		A Times per month				B Times per week						C Times per day			
		<1*	1	2	3	1	2	3	4	5	6	1	2	3	4 or more
	How often does your child eat/drink?	0	1	2	3	1	2	3	4	5	6	1	2	3	4
12.01	**French fries, roasted/fried potatoes**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.02	**Fish and shellfish as main course**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.03	**Sausage as a main course**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.04	**Chocolate and/or candy**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.05	**Cake, biscuits, tart etc.**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.06	**Full fat cheese** (45-60+ or 24-44% fat)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.07	**Low fat/sugar-free fizzy drinks, cordial, ice-tea, light or sugar free drinks**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.08	**Normal fizzy drinks, cordial, ice-tea**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.09	**Energy drinks, red bull, cult etc.**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.10	**Fruit juice or Vegetable Juice**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		Dont Know=8 None= 7													

The next questions regard physical activity of the child

[Comment: *The interviewer reads three examples of activity. Additional examples are in italics and if the respondents have difficulties in answering, the interviewer can add some of these additional examples on request. Generally the interviewer does not read the text in italics but can use the text as a reminder or can read it on request.*]

I am going to ask you about physical activity of your child outside school hours during the last 7 days. Your information is important even if your child has not been physically active.

[Question 13]
I am going to ask you about all physical activity during your child's leisure time and active transportation *[e.g. transportation to and from school]*. **Include all activity where the physical effort is moderate or harder that is, you should include both moderate and vigorous activity. This kind of activity accelerates heart rate and breathing. Examples are bicycle riding, football (soccer) or outdoor games.**
Additional examples are playing handball, skateboarding; these examples can be age and country specific

During the last 7 days, how much time in total did your child spend in physical activity where the physical effort was moderate or harder? Estimate to the nearest half hour.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if physical activity is less or more than 3½ hours and if it is more or less than 7 hours

Hours.....	☐☐
Minutes.....	☐☐
DK (Dont Know)	98

[Question 14a (Sedentary time, TV watching)]
During the last 7 days, how much time per day on average did your child spend sitting and watching TV in his/her leisure time? Estimate it to the nearest half hour. Include videos, DVD and console games (PlayStation, Xbox, etc) played on TV screen.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours

Hours.....	☐☐
Minutes.....	☐☐
DK (Dont Know)	98

[Question 14b (Sedentary time; Computer screen time)]
<u>Interviewer:</u> During the last 7 days, how much time per day on average did your child spend in front of a computer screen during his/her leisure-time? Estimate to the nearest half an hour. Include video-games, mobile phone games and internet use, and TV programs watched on a computer screen; include home work.
The interviewer can help the respondent to narrow down the answer to the nearest half hour. It is important to know if average time is less or more than 1 hour and if it is more or less than 2½ hours

Hours.....	☐☐
Minutes.....	☐☐
DK (Dont Know)	98

[Question 15 (classification of leisure-time physical activity)]

Choose one of the following descriptions that best fits your child's leisure time activity during the last 7 days.

(1) Reading, watching TV or other sedentary activity. ☐ 1

(2) Walking, cycling, or other forms of light exercise that lasted for at least 4 hours during the last 7 days. Include walking or cycling to and from school, active recreation, etc. *[such as skateboarding or rollerblading]*

☐ 2

(3) Participation in recreational sports [such as football or swimming], active games, etc. [such as tag], where the duration of activity lasted for at least 4 hours in total during the last 7 days.

☐ 3

(4) Participation in hard training or sports competitions, regularly several times during the last 7 days. ☐ 4