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F&V consumption and differences across countries

Edito

The World Health Organization has long advocated for the increased consumption of fruit, vegetables, pulses and wholegrains, and recommends that they form the central basis of a healthy diet. However, we know that many people across the world do not consume the recommended 400 grams (or 5 portions) of fruit and vegetables per day – far from it in fact. This edition of the Global Fruit and Vegetable Newsletter highlights some of the important factors underlying inadequate fruit and vegetable consumption, and draws attention to persistent inequalities within and between countries. Such inequalities in dietary intake are an important driver of inequalities in noncommunicable diseases and the epidemic of obesity.

In their paper, Lamb and Ball explore the relationship between socioeconomic position and fruit and vegetable consumption, using neighbourhood characteristics for their analysis. They find that increased fruit and vegetable consumption is generally associated with socially-advantaged neighbourhoods. This is important supplementary evidence to support previous findings that groups of lower socioeconomic status generally eat less fruit and vegetables. At the country level, Stefler finds large differences in fruit and vegetable intake between countries of east and west Europe, with reported intake much lower in Eastern Europe. This finding is consistent with data on fruit and vegetable availability, although – as the author notes – better and comparable data is needed. Combined, these papers suggest that more effort is needed to ensure fruit and vegetables are available and accessible to those who need it the most. Finally, Kremer-Sadlik and colleagues explore cultural factors influencing fruit and vegetable intake, finding that meal patterns and family dining cultures in some countries are more conducive to fruit and vegetable intake than those in others.

Collectively this issue of the Global Fruit and Vegetable Newsletter underlines the continuing need for targeted policies and interventions to promote fruit and vegetable consumption. Such action should focus on increasing the availability, affordability and acceptability of fruit and vegetables in all countries, for all population groups. The WHO European Food and Nutrition Action Plan 2015-2020 emphasised the importance of a combination of actions to promote healthier diets, including changes to food environments (i.e. in schools, supermarkets), leveraging the agricultural sector, and targeted social marketing campaigns. This newsletter has reiterated the case for action; the challenge for future editions is to dig further into the questions of "what needs to be done" and "how".

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Acknowledgement to 250 contributors since 2006

Novembre 2010 : J. Brug; L. Thornton; A. Aikenhead; R. Prattala (Impact of the environment on F&V intake)

Décembre 2010 : L Trasande; C Rowley; Z Ademi; C Reid; I Rowlands; C Wenig (Obesity costs)

Janvier 2011 : P. Barberger; T. Low Dog; TN. Akbaraly; FN. Jacka (F&V and mental health)

Février 2011: A. Martin ; ML. Frelut; N. Redmond ; M. Maillot ; F. Vieux ; J. Amiot ; N. Darmon (Better information for better behavior)

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Comparison of fruit and vegetable intakes between Eastern and Western European populations

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Cardiovascular disease (CVD) mortality rates are substantially higher in Eastern compared Western European states. Difference in the consumption of fruit and vegetables between the two regions is a potential lifestyle factor which may contribute to this health gap. Due to methodological limitations, international comparison of individual-level dietary data from national food consumption surveys across European countries is not feasible. This systematic review assessed whether previously published cross-national studies with comparable dietary data on fruit and vegetable consumption reveal any systematic differences between populations of Eastern (including Central and Eastern Europe (CEE) and the Former Soviet Union (FSU)) and Western Europe.

Study design

Studies which reported data on fruit, vegetable consumption, or carotene and vitamin C intake of adult participants from both Eastern and Western European countries were considered for inclusion in the review. Only studies which applied the same methodology for data collection and analysis in both samples were included. Quality of the studies was assessed using a modified STROBE statement, and, in order to determine the statistical significance of the retrieved comparison results, power calculations were performed.

Lower intake of fruit in Eastern countries

Twenty-two studies met the inclusion criteria. All studies with adequate statistical power reported lower intakes of fruit in Eastern European participants compared to Western Europeans. Regarding the consumption of vegetables and antioxidants the findings were less consistent.

These results are accordant with ecological-level food availability data based on food balance sheets and household budgetary surveys. For example, comparison of average fruit and vegetable supply in Eastern and Western European countries between 1970 and 2011 shows clear difference only for fruit but not for vegetables (figures 1 and 2)[1]. Using individual-level dietary data, this systematic review suggests that availability patterns are reflected in actual consumption, and that people in Eastern European countries seem to eat less fruit than Western Europeans, while the difference in vegetable intake is probably less clear-cut.

Increase fruit intake to reduce the risk of CVD

As inadequate consumption of fruit is suggested as a modifiable risk factor for CVD, the difference in fruit intake may contribute to the gap in CVD mortality rates between Eastern and Western Europe. Dietary interventions which aim to increase fruit intake in Eastern European countries have good potential to reduce CVD burden in the region and decrease health inequalities across Europe.

Standardised dietary data to compare food consumptions across Europe

The reviewed studies included participants from many European countries and some of them provided nationally representative food consumption data. However, as there are large differences in fruit and vegetable intakes within the Eastern and Western European regions, the reported comparisons can only be seen as pixels of a much larger picture. The complete picture will emerge only when nationally representative, comparable dietary data is available for most European countries. In fact, this is the main aim of the European Food Safety Authority's currently on-going "EU Menu" project[2].

Figure 1. Average availability of fruit in Eastern and Western European countries between 1970 and 2011 (Data source: FAOSTAT Food Balance Sheets)

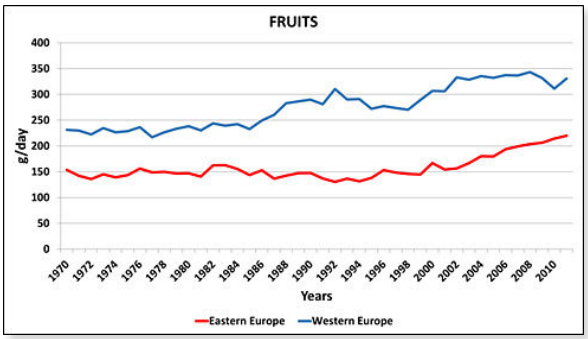
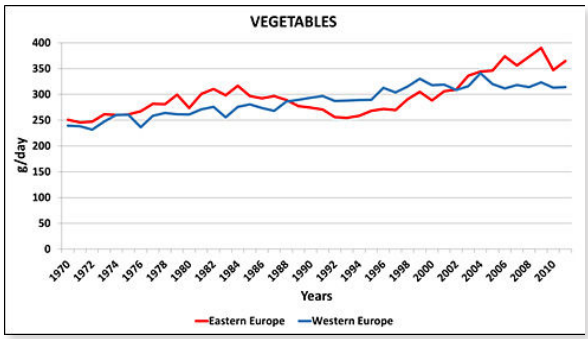


Figure 2. Average availability of vegetables in Eastern and Western European countries between 1970 and 2011 (Data source: FAOSTAT Food Balance Sheets)



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2. European Food Safety Authority (2015): EU Menu. http://www.efsa.europa.eu/en/datexfoodcdb/datexeumenu

Eating Fruits and Vegetables in U.S. and French Family Dinners

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The consumption of fruits and vegetables (F&V) is critical for the prevention of childhood obesity. Yet intervention programs to promote this have been unsuccessful[1]. They have focused on modifying individuals' behaviors, ignoring the context within which eating takes place[2].

An ethnographic study to examine families' culinary habits

This study compares the meal environment of 8 Californian and 8 French families (19 children in each locale) in order to better understand the relationship between local practices and preferences and children's consumption of fruits and vegetables. It analyzes video recorded ethnographic data collected over 2 dinners in each home (32 meals in all). The analysis of the ethnographic observations affords the examination of the families' culinary habits as culturally organized activities and parental practices that socialize children into fruit and vegetable consumption[3].

A greater exposure to F&V in French children

The French children were exposed to a greater variety of fruit (14 types) than the U.S. children (4 types). More importantly, fruit was an integral part of the French dinner; all families served fruit as the last course of the meal (14 of 16 meals) and all children ate some. Fruit appeared in only 3 U.S. homes and only 3 children were observed to eat any.

While the French children were exposed to a greater variety of vegetables than the U.S. children (33 vs. 22 types), vegetables were present in most U.S. and all French dinners. But, did vegetables have the same value and consumption patterns in both sites?

Vegetables and Meal Structure

Most of the U.S. meals (12/16) comprised a single course - all dishes were served at the same time, while all the French meals consisted of multiple (3-5) courses. The division into courses offered the French children more occasions to consume vegetables, which were offered without competition from other foods. And when served alone, children felt pressure to cooperate and eat them. In the U.S. dinners, where the dishes were served simultaneously, a child could appear collaborative, eating other foods while ignoring her vegetables.

Regular size vs small vegetable dishes

Regular size vegetable dishes were more common in the French meals (26 French, 9 U.S.) and small vegetable dishes in the U.S. meals (13 U.S., 7 French). The latter were always in competition with meat or carb dishes. Regular size vegetable dishes offered more opportunity to consume vegetables and they appeared more central to the overall meal.

Vegetables consumption

46% of the time the U.S. children did not touch their vegetables, while only 10% of the time the French ignored them. Also, 58% of the time the French children ate the amount of vegetable expected, while only 27% of the time the U.S. children did the same. The French children ate more vegetables than the U.S. children!

Socialization of Eating

French multiple course meals socialized children to commensality. Parents encouraged talk about the pleasure of food and the importance of ingredients and quality. They modeled eating behavior and cajoled their children to taste different foods emphasizing taste ("It's super good"). American meal organization prioritized meat and carbs. Parents mostly did not serve or force their children to eat vegetables, signaling that these were optional and of lesser value. Allowing children to eat alternative "kids" foods demonstrated the belief that children eat differently than adults and that they can have autonomy and individual expressions of taste.

We have shown that local practices and preferences influence the consumption of fruit and vegetables. We propose that intervention programs consider incorporating into their recommendations suggestions for both fitting fruit and vegetables into local eating models and modifying meal organization.

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Neighbourhood socioeconomic disadvantage and fruit and vegetable consumption: a seven countries comparison

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Fruit and vegetable consumption in disadvantaged neighbourhoods

In developed countries, individuals of lower socioeconomic position (SEP; e.g. educational attainment, occupation, income), generally eat less fruit and vegetables than those of higher SEP[1]. Beyond individual SEP, the local neighbourhood environment has the potential to influence the diet of residents. Residents of more disadvantaged neighbourhoods may be more likely to eat unhealthily if they cannot access stores in which healthy produce can be purchased. While there is some evidence to suggest that fruit and vegetable consumption is lower in residents of disadvantaged neighbourhoods[2,3], findings have been mixed[4]. These inconsistencies in findings between countries may reflect true differences. However, it is difficult to directly compare existing studies due to differences in the measurement of dietary outcomes and the potential confounding variables considered in analyses.

There exist few international comparisons of diet even though studies of this nature help to determine the generalisability of findings across nations. The aim of this study was to compare associations between neighbourhood SEP and fruit and vegetable consumption of adults across seven developed countries[5]. Collating the data for this study to control all aspects of the analysis, including the treatment of the variables and adjustment of confounders, enabled a closer comparison of associations than could be determined from comparing findings from separate studies.

Study design

This study involved secondary analysis of seven cross-sectional studies: the SocioEconomic Status and Activity in Women (SESAW) study from Australia, the Edmonton Population Health Survey in Canada, the Health and Living Conditions of the Population of Eindhoven study from the Netherlands, the New Zealand Health Survey, the National Health Survey for the Lisbon Metropolitan Area in Portugal, the Greater Glasgow Health Board Health and Wellbeing survey from Scotland, and the Healthy Environments Partnership study from the USA. Fruit and vegetable consumption was, where possible, grouped to ensure comparability across studies (fruit: <2/≥2 serves per day; vegetables: <3/≥3 serves per day). In six studies neighbourhood SEP was grouped as low, medium and high; in the Netherlands, neighbourhoods were selected from low and high SEP neighbourhoods to maximise contrasts meaning medium SEP could not be examined. All analyses of the association between neighbourhood SEP and fruit and vegetable consumption adjusted for age, gender (SESAW only considered women) and level of education.

Associations between fruit and vegetable consumption and neighbourhood SEP

Observed associations were generally in the expected direction, with increased consumption associated with higher neighbourhood SEP. In the Canadian, New Zealand and Scottish studies only, there was evidence of increased fruit consumption for those residing in more advantaged neighbourhoods. Neighbourhood SEP was positively associated with vegetable consumption in the Australian, Canadian, New Zealand and Portuguese studies.

Implications

This study suggests that associations between neighbourhood SEP and fruit and vegetable intake may be context specific, indicating that it may be inappropriate to generalise the findings from one country or study context to another. Inconsistencies, although potentially due to other methodological inconsistencies across datasets outside of our control (sampling or neighbourhood definitions), could reflect cross-country differences in the social, built, economic or regulatory factors that influence fruit and vegetable provision. For example, the availability of fresh food outlets is high in both low and high SEP neighbourhoods in the Netherlands[6], while supermarkets have been found to be more common in low SEP neighbourhoods in Glasgow perhaps reflecting regulatory controls or land use costs[7] which could explain null findings shown in these studies. Future studies designed with a priori matching on important characteristics are required to confirm the observation from this study that associations are context specific, with further investigation required into the drivers of these associations to identify potential policy actions to help redress socioeconomic inequalities in diet.

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