

Consumption of fruit and vegetables: the ROUND (world map of cOnsUmption of fruit and vegetables and Nutrient Deficits) project



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BACKGROUND

In 2017, 11 million deaths and **255** million disability-adjusted life years (DALYs) were attributable to dietary risk factors, with low intake of fruits being the third highest dietary risk factor and accounting for 2 million deaths and 65 million DALYs¹. The WHO/FAO have reported convincing associations between fruit and vegetable (F&V) consumption and reduced risk of CVD, and protective association for coronary heart disease (CHD) and stroke. F&V intake is further understood to reduce the risk of some cancers.

AIMS

The aim of the ROUND project is to evaluate consumption of F&V in adults between countries and to identify, characterize, and map interactively vulnerable population groups and nutrient deficiencies, thus providing a useful tool for research and policy.

MATERIALS AND METHODS

➤ F&V AVAILABILITY (mean g/capita/day)

- **17** cluster diets food availability data (G01 – G17, based on 2002-07 Food and Agriculture Organization (FAO) Food balance sheets) for 179 countries and statistical similarities between dietary patterns for 20 food groups were included.
- **159** fruit, vegetable, legume, and starchy roots/tuber products were extracted from the International Estimated Daily Intake (IEDI)² database, which rearranged WHO Global Environment Monitoring System/Food Contamination Monitoring and Assessment Programme (GEMS/Food)³.

➤ F&V CONSUMPTION (mean g/capita/day)

- European Food Safety Authority (EFSA) chronic consumption data⁴ (all subjects, 18-64 yrs and 65-74 yrs) from **29** studies across **19** countries were included.
- USA adult and elderly consumption data were taken from the United States Department of Agriculture (U.S.D.A's) Food Intakes Converted to Retail Commodities Database (FICRCD)⁵.

➤ STATISTICAL ANALYSIS

Analyses were performed using Bayesian hierarchical models.

RESULTS

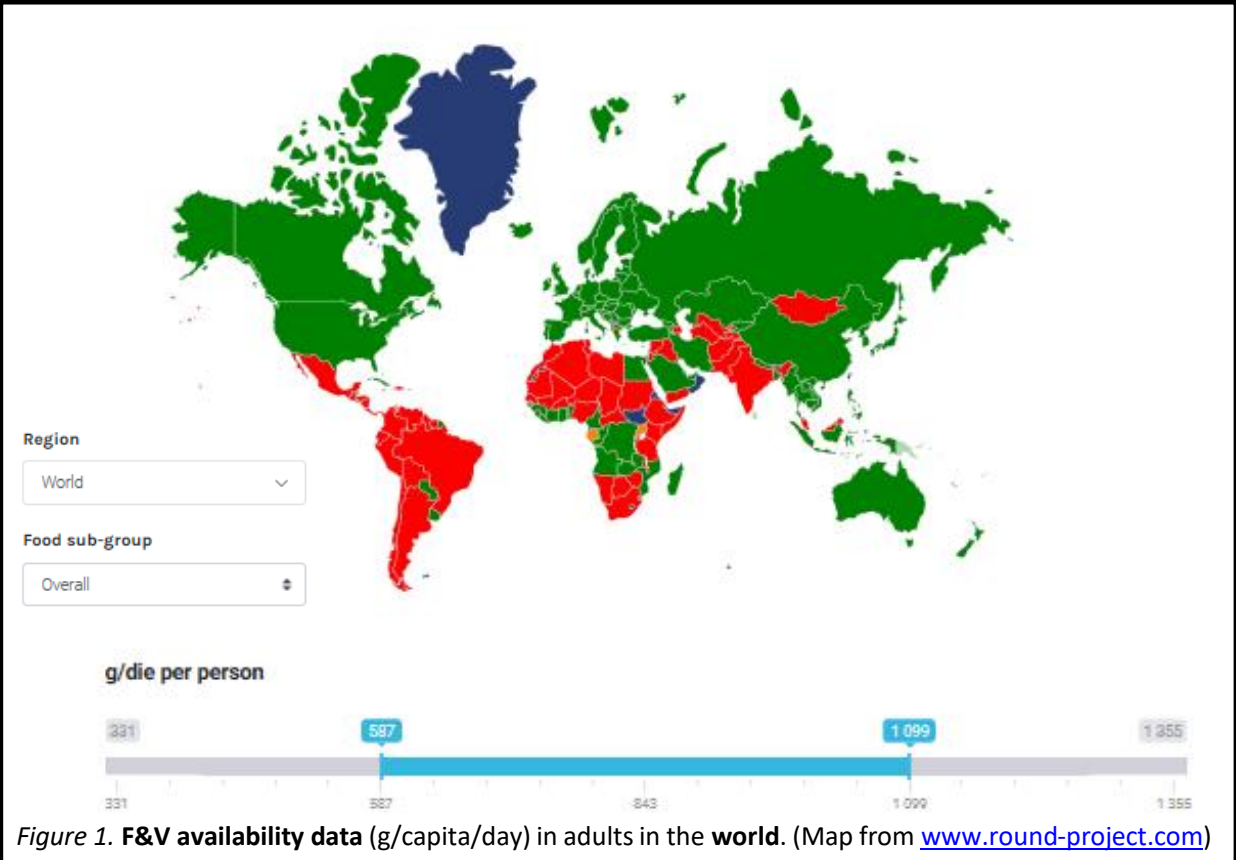


Figure 1. F&V availability data (g/capita/day) in adults in the world. (Map from www.round-project.com)

Green indicates countries in a mean consumption/availability of F&V, red indicates countries under selected range. Near range limits color is lighter. Blue indicates countries with no data for those years.

- Availability range (Fig. 1): 587 g/capita/day - 1099 g/capita/day;
- Consumption range for Europe (Fig. 2): 413 g/capita/day - 659 g/capita/day;
- Consumption range for North America (Fig. 3): 621 g/capita/day - 759 g/capita/day.

- Mean per capita daily consumption of total fruit, vegetables (excluding starchy roots/tubers), fresh legumes, and F&V juice in Europe ranges from 261 g/d in Latvia (2008) to 552 g/d in Romania (2012), and in the U.S from 560 g/d (2005/06) to 616 g/d (2001/02);
- Mean fruit intake (excluding juice) alone ranges from 85 ± 98 g/d in Ireland (2008) to 226 ± 231 g/d in Estonia (2013);
- Mean vegetable intake (excluding juice) ranges from 62 ± 58 g/d in Sweden (1997) to 382 ± 194 g/d in Romania (2012);
- Mean F&V juice intake ranges from 6 ± 32 g/d in Romania (2012) to 223 ± 368 g/d in Germany (2007).

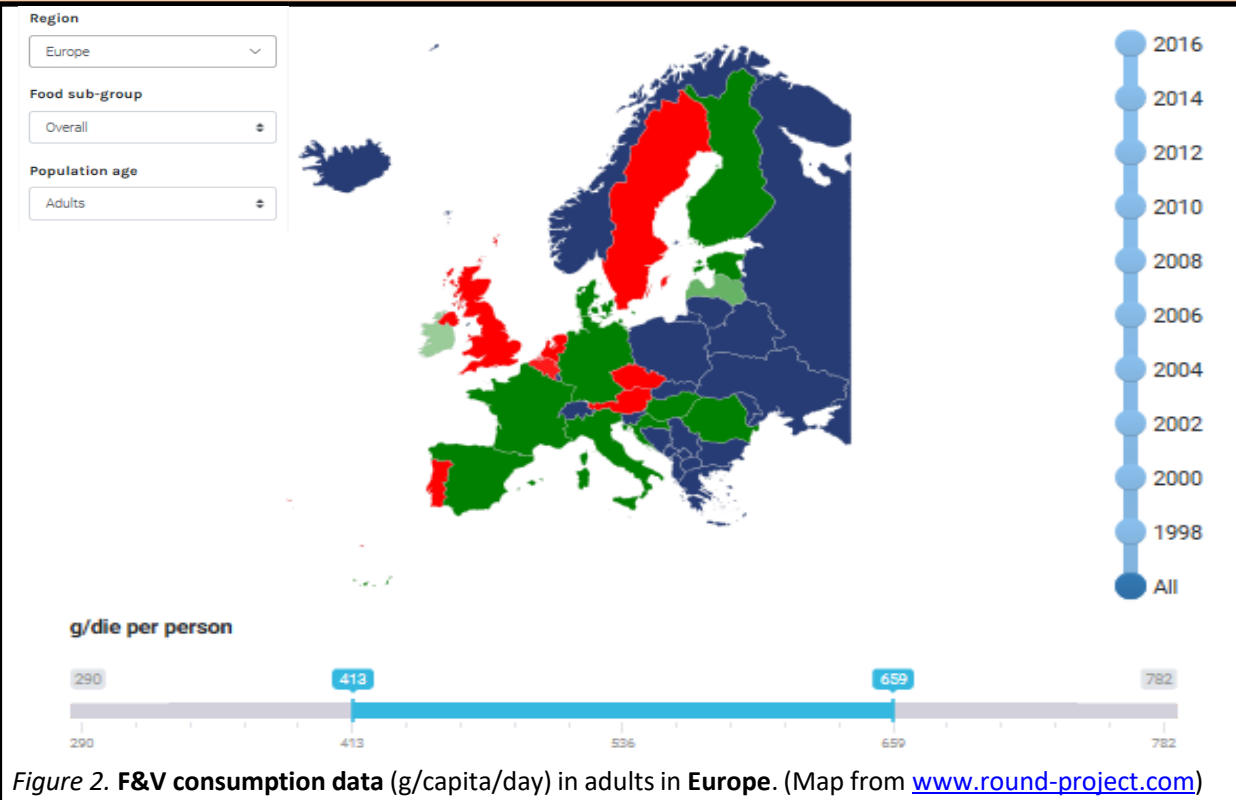


Figure 2. F&V consumption data (g/capita/day) in adults in Europe. (Map from www.round-project.com)

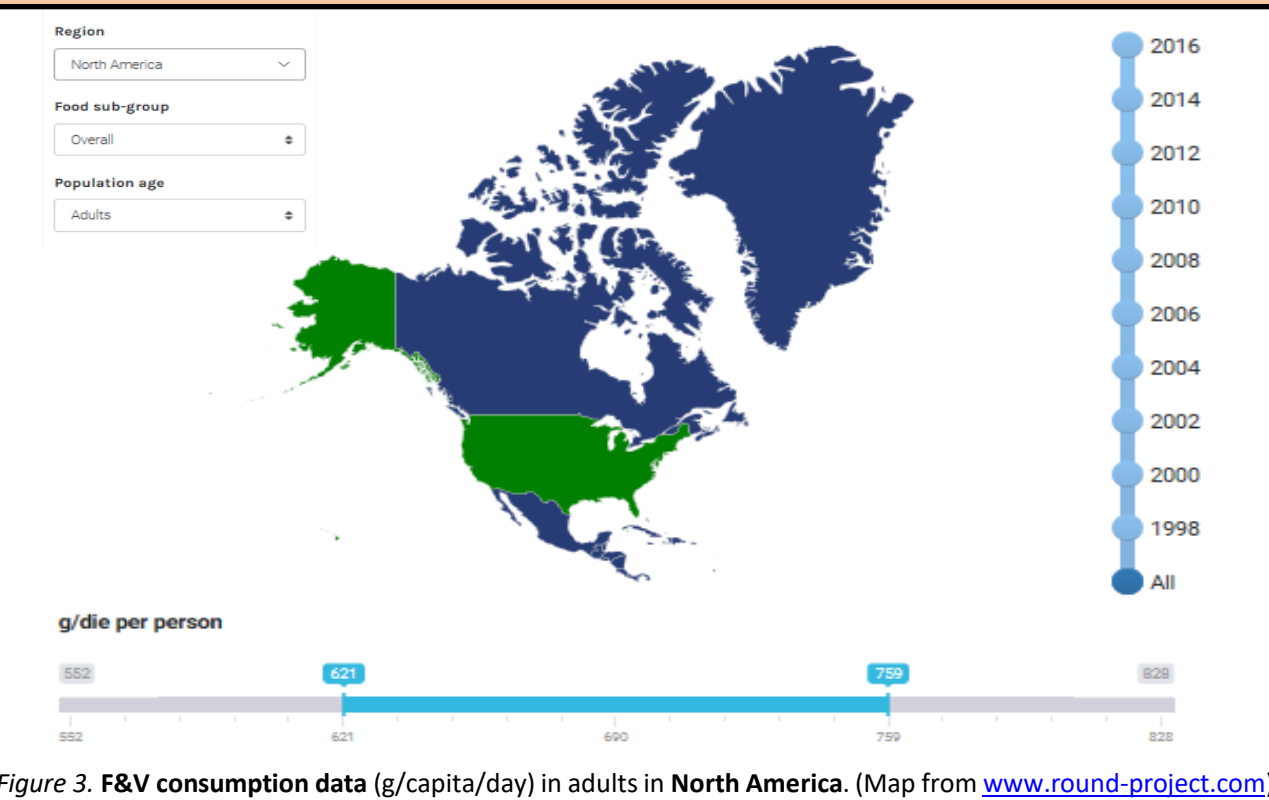


Figure 3. F&V consumption data (g/capita/day) in adults in North America. (Map from www.round-project.com)

DISCUSSION

Data on adult F&V consumption varies across countries and are often below recommended intake⁶. Identification and interactive mapping of low F&V consuming regions highlights vulnerable population groups which provides a useful tool for related research and policy.



1. GBD 2017 Diet Collaborators. Health effects of dietary risks in 195 countries, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2019
2. van der Velde-Koerts et al. 2018. GEMS International Estimated Daily Intake (IEDI) Food consumption cluster diets (version 3) [Internet]. RIVM, The Netherlands, acting as WHO Collaboration Centre.
3. World Health Organization. GEMS/Food consumption cluster diets. 2012.
4. European Food Safety Authority. The EFSA Comprehensive European Food Consumption Database.
5. United States Department of Agriculture (U.S.D.A's). Food Intakes Converted to Retail Commodities Database (FICRCD).
6. WHO CINDI Dietary health guide 2000.