



# *Nutrition from infancy to adolescence* – a health promotion perspective

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**A designated WHO Collaborating Centre  
for Health Promotion Research.**

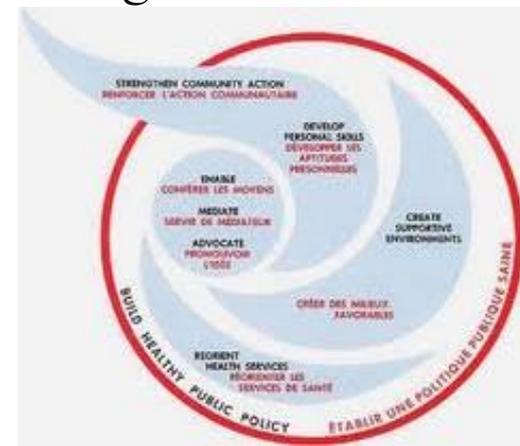


# Overview

- Children and young people
  - *dietary habits, overweight / obesity*
- Food environments
  - *School food environments*
- Body image
  - *Peers and adolescent body image / weight concerns*
- Nutrition in early years
  - *Weaning and pre-school setting*

# Health Promotion

- To enable people to increase control over and improve their health
- Address determinants of health and health inequalities
  - Create an environment so that the default option is the easy choice
  - Settings approach – such as schools/pre-schools through which action can be taken to enable healthy choices





# Why child and adolescent health?

- Young people are the driving force of society's development
  - Their ideas, creativity, motivation & energy to progress things forward
  - All related to health and well-being
  - Health and wellbeing is multi-faceted
    - Physical health, overweight, injuries, physical activity, relationships with parents, bullying, stress, sexual relationships, complaints etc.



# Strategies/policy developments

- *Health 2020 (WHO, 2012) – key strategic directions for health policy developments*
- *Healthy Ireland (DoH 2013)– a framework for improved health and wellbeing (2013-2025)*
- *European child and adolescent health strategy 2015–2020 (WHO, 2014)*
  - enable children and adolescents to realize their full potential for health, development and well-being; and
  - reduce their burden of avoidable disease and mortality
- *Supporting early childhood development*
- *Supporting growth during adolescence*



# Why child/adolescent nutrition?

- Adolescence is an important developmental life stage
- Dietary habits may also track into adulthood
  - Emphasis placed on optimising dietary habits during youth
- *CAH Strategy: Promoting healthy nutrition and physical activity through the life course*
  - the EU action plan on childhood obesity
  - the *Vienna Declaration on Nutrition and Noncommunicable Diseases in the Context of Health 2020*



# Nutrition and Irish youth

- A large proportion of children consume energy-dense, nutrient-poor foods & drinks and not enough fruit & vegetables (HBSC 2007, 2012; IUNA 2005; 2008)
- Up to 25% of primary school children and 19% of teenagers are overweight/obese (IUNA, '05; '08; '12; Layte & McCrory, '09; Williams et al., '13; Heinen et al., '14; Keane et al., 2015)
- Children's weight related to social class – age 3yrs (Williams et al., 2013)
- Diet and obesity is strongly determined by individual, social, cultural and economic factors and *physical/built environment*
  - *Availability, proximity, choice*(Morland et al 2002; Layte et al., 2011; Day et al 2011; Timperio et al 2008)



# DIETARY HABITS

Data from Health Behaviour in School-aged children (HBSC) survey



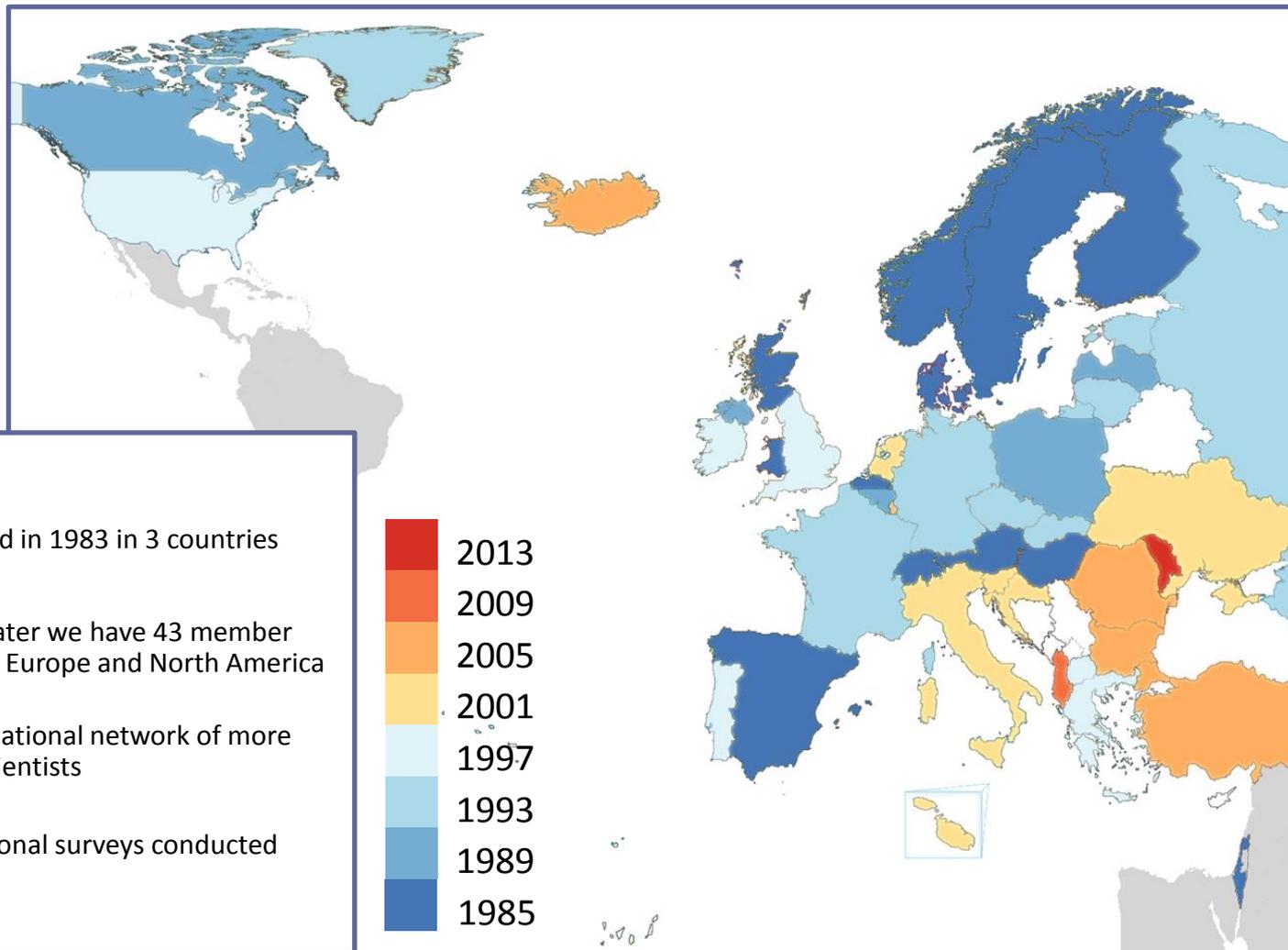
# Health behaviour in school-aged children (HBSC) study

- WHO collaborative study (43 countries/regions)
- The study aims to gain new insight into, and increase our understanding of young people's health and well-being, health behaviours and their social context
- The findings are used to inform and influence children's policy and practice at national and international levels
- The target age groups are 11, 13 and 15 years old



hbSC

# STUDY GROWTH



HBSC started in 1983 in 3 countries

3 decades later we have 43 member countries in Europe and North America

HBSC international network of more than 350 scientists

8 cross-national surveys conducted



# Conceptual framework



## Children's lives

SES:  
Gender  
Age  
Social  
Class,  
Ethnicity



### Contexts:

Family  
School  
Peers  
Locality

### Risk behaviours:

Drinking, smoking...

### Health enhancing behaviours:

Physical activity,  
leisure activity...

### Health outcomes:

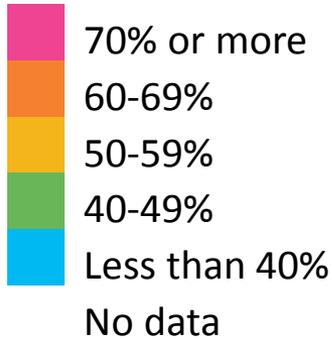
Well being  
Life satisfaction  
Self rated health

.....



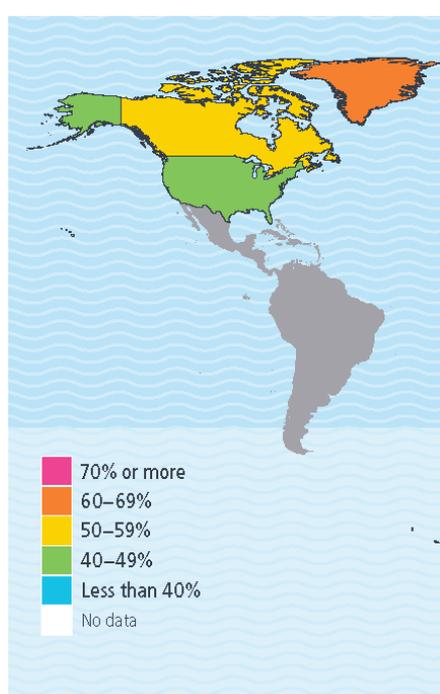
# HBSC - dietary habits

- How many days in a week and in a weekend do you have breakfast?
  - (more than a glass of milk or fruit juice)
- How many days a week do you usually eat or drink...?
  - Fruits, vegetables, sweets, soft drinks
- Daily versus less than daily

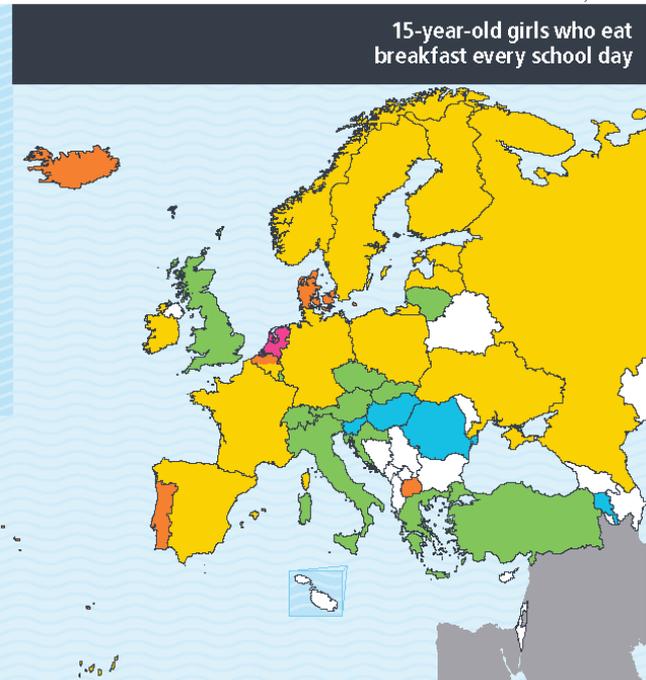
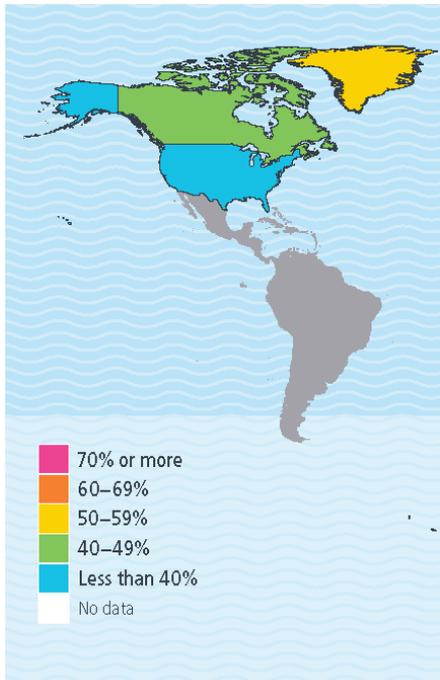


*Ireland:*  
Boys: 71%  
Girls: 59%

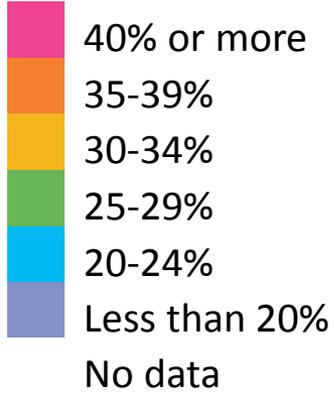
*Average:*  
Boys: 59%  
Girls: 50%



Note: HBSC teams provided disaggregated data for Belgium and the United Kingdom; these data appear in the map above.  
HBSC Survey 2009/2010

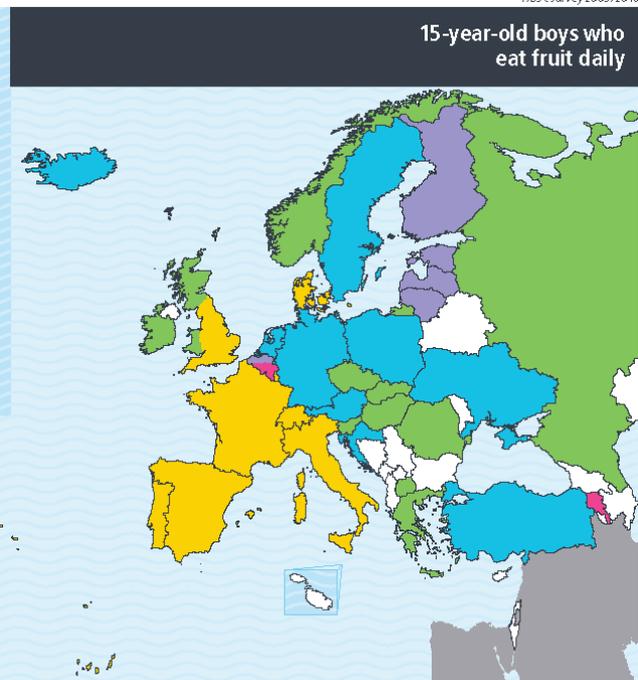
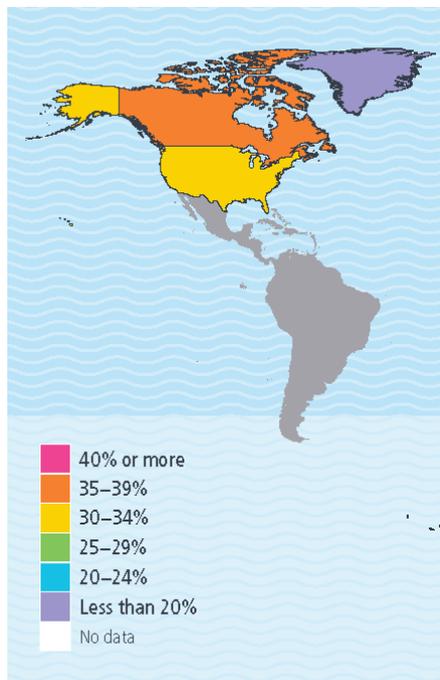


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HBSC Survey 2009/2010

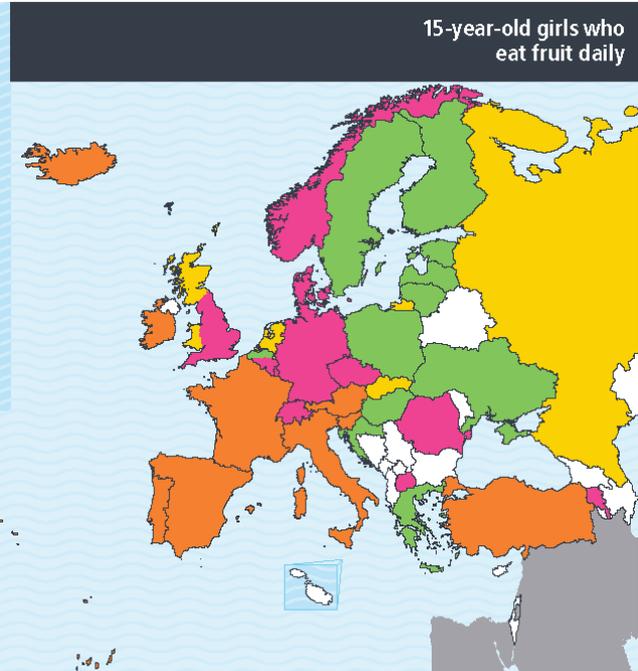
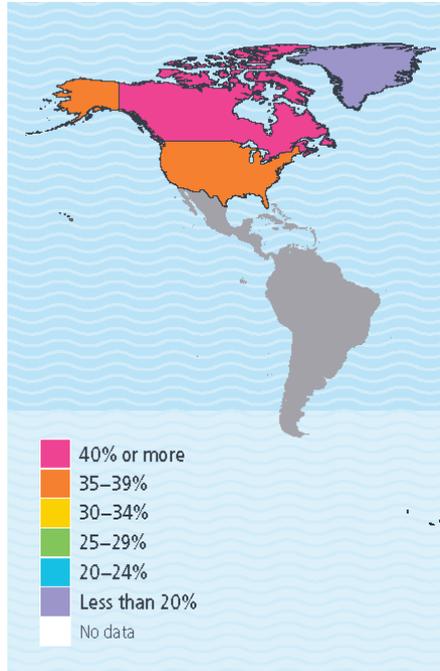


*Ireland:*  
Boys: 28%  
Girls: 35%

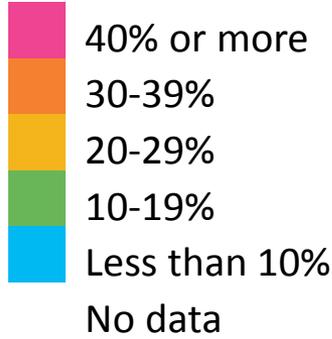
*Average:*  
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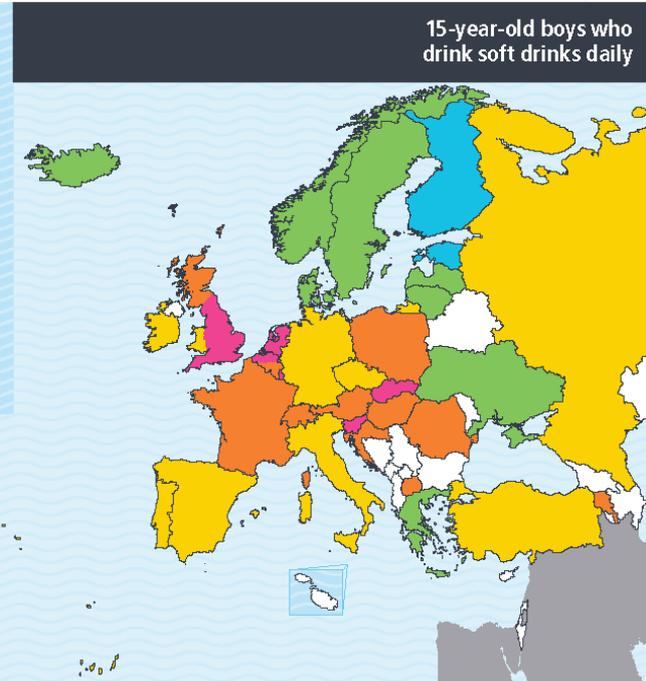
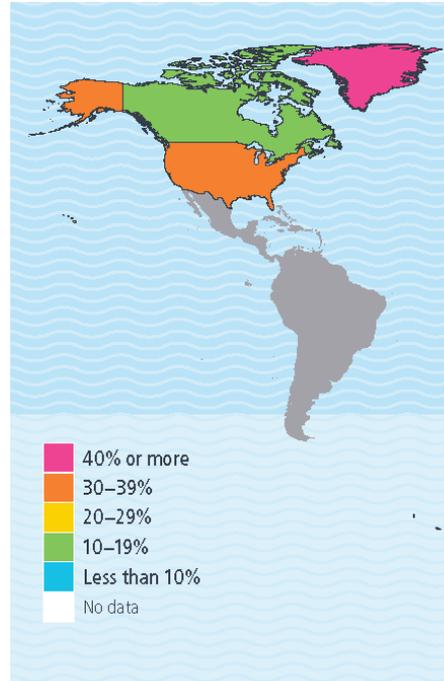


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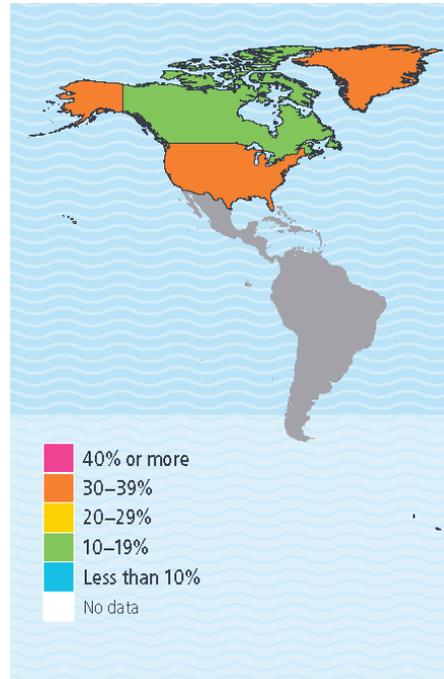


Ireland:  
Boys: 29%  
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Average:  
Boys: 28%  
Girls: 22%



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# Trends in Fruit and Vegetable consumption – EJPH, 2015

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doi:10.1093/eurpub/ckv012

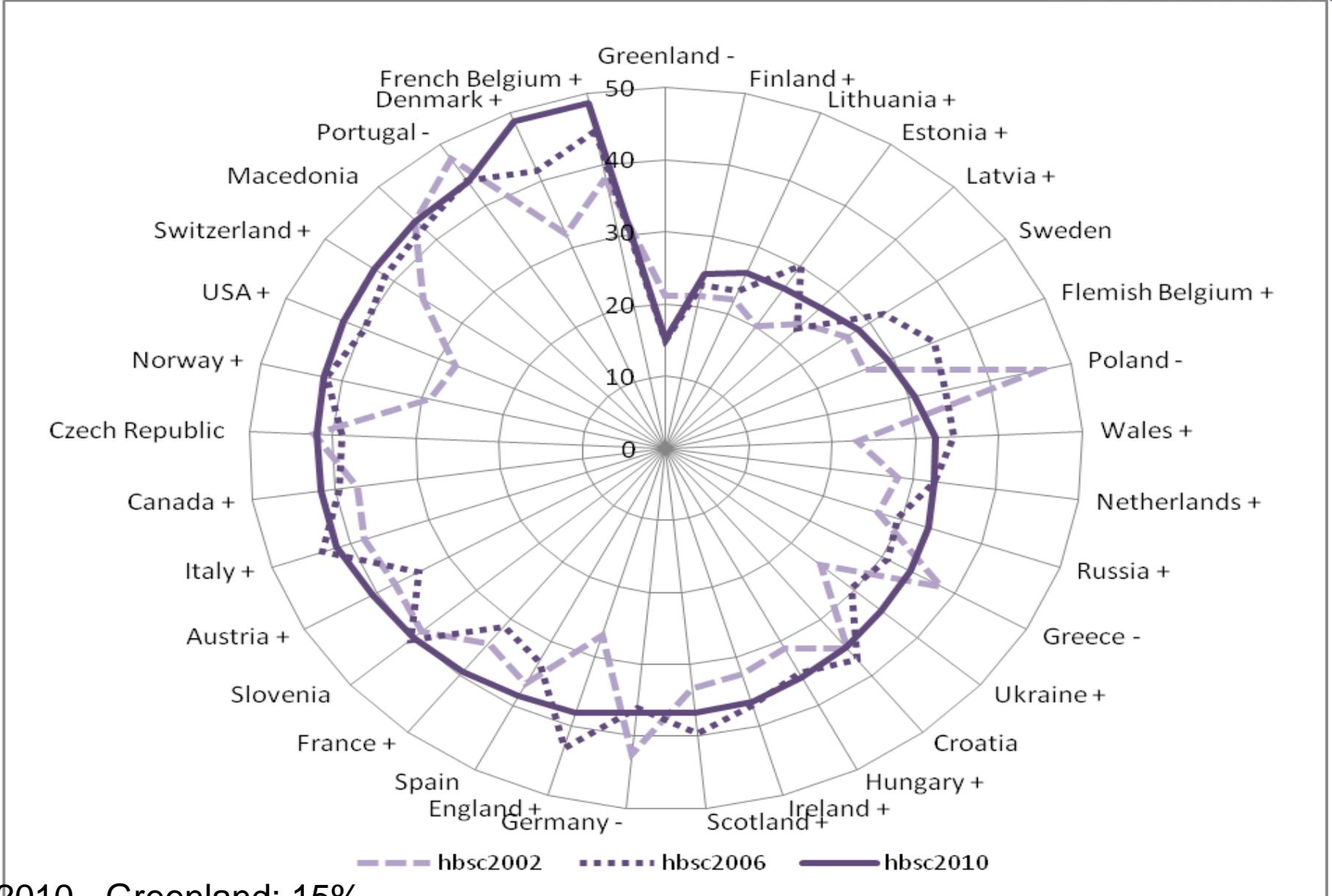
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## **Fruit and vegetable consumption trends among adolescents from 2002 to 2010 in 33 countries**

Carine Vereecken<sup>1</sup>, Trine P. Pedersen<sup>2</sup>, Kristiina Ojala<sup>3</sup>, Rikke Krølner<sup>4</sup>, Anna Dzielska<sup>5</sup>, Namanjeet Ahluwalia<sup>6</sup>, Mariano Giacchi<sup>7</sup>, Colette Kelly<sup>8</sup>

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*Includes data from 488,951 adolescents, aged 11, 13 and 15 years*



2010 - Greenland: 15%

2010 - Denmark, Belgium (French): 49%

# Results

- Large differences in daily FV consumption between countries
- Daily fruit consumption varied in 2010
  - 15% in Greenland to 49% in Denmark/ French Belgium
- In 2010 daily vegetable consumption varied from 20% in Estonia to 55% in Flemish Belgium.
- A significant time trend of increase in daily fruit (OR=1.22 [99% CI: 1.18-1.25]) and vegetable consumption (OR=1.20 (99% CI: 1.17-1.22)), from 2002 to 2010



# Findings

- Overall a positive trend in FV consumption was observed between 2002 and 2010
  - mainly driven by a significant increase between 2002 and 2006 and plateauing thereafter
- However, a large proportion of adolescents do not eat FV on a daily basis
- Need for a continued focus on promotion of FV consumption



# Breakfast paper – IJPH, 2009

NIH Public Access

Author Manuscript

*Int J Public Health*. Author manuscript; available in PMC 2012 July 30.

Published in final edited form as:

*Int J Public Health*. 2009 September ; 54(Suppl 2): 180–190. doi:10.1007/s00038-009-5409-5.

## **Breakfast consumption and its socio-demographic and lifestyle correlates in schoolchildren in 41 countries participating in the HBSC study**

**Carine Vereecken<sup>1</sup>, Marie Dupuy<sup>2</sup>, Mette Rasmussen<sup>3</sup>, Colette Kelly<sup>4</sup>, Tonja R. Nansel<sup>5</sup>, Haleama Al Sabbah<sup>6</sup>, Daniela Baldassari<sup>7</sup>, Marina Delgrande Jordan<sup>8</sup>, Lea Maes<sup>9</sup>, Birgit V. L. Niclasen<sup>10</sup>, Namanjeet Ahluwalia<sup>11</sup>, and HBSC Eating & Dieting Focus Group\***

*Data from 204,534 adolescents aged 11, 13 and 15.*



# Breakfast skipping among adolescents

- To investigate associations of daily breakfast consumption (DBC) with demographic and lifestyle factors in 41 countries
- DBC varied from 33 % (Greek girls) to 75 % (Portuguese boys)
- In most countries, lower DBC was noticed in girls, older adolescents, those with lower family affluence and those living in single-parent families
- DBC was positively associated with healthy lifestyle behaviours and negatively with unhealthy lifestyle behaviours
- The results indicate that DBC can serve as an indicator to identify children at risk for unhealthy lifestyle behaviours



# FOOD ENVIRONMENTS

## School food environments

are we making the healthy choice the easy choice?



# Evidence base

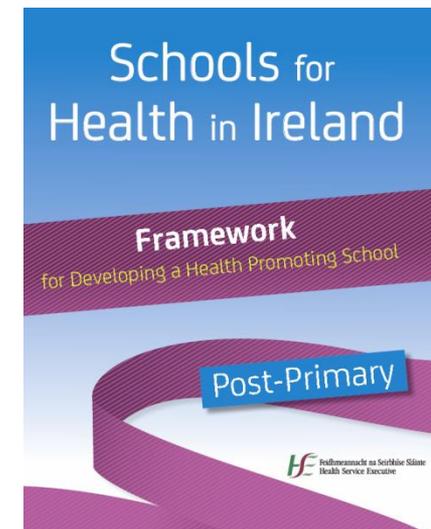
- Surge in literature since 2011 on school retail food environments
- Mostly cross-sectional studies & most focused in N. America
- Area level indicators are most common
- GIS preferred method to assess exposure
- Outcomes: Body weight, diet, purchases
- Evidence is equivocal with some evidence for effect on body weight (Williams et al 2014).



# School food environment



- *External school food environment*
  - The built environment on food choice/obesity
  - Planning regulations (Nov 2011, April 2014....)
  
- *Internal school food environment*
  - Health Promoting Schools
  - Vending machines (April 2015)



# Aim

- To characterise the food environment around post-primary schools
  - Focus on schools involved in the 2010 HBSC survey in Ireland (n=63)



# Mapping Food Environment

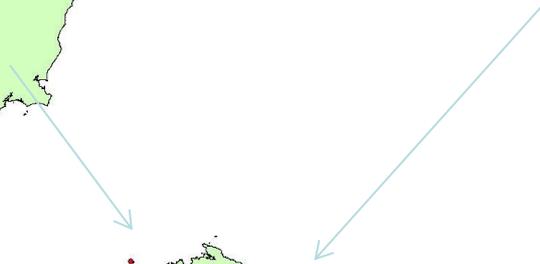
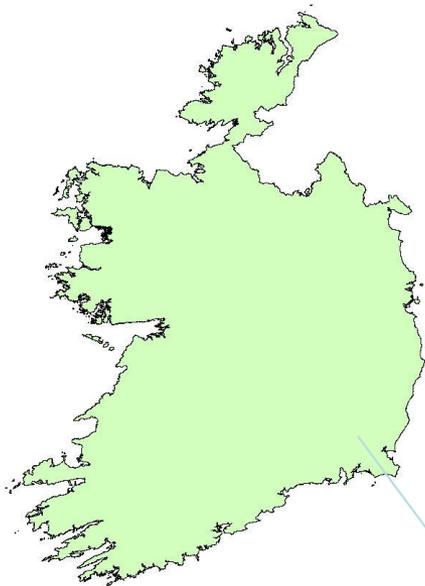


- Geographic information system (GIS)
- Geo-coded HBSC post-primary schools
  - *GeoDirectory*
- 1km circular buffers
- Food businesses were mapped – *Fast food outlets, local shops, restaurants...*
- Data validation: Google Street View & reliability checks

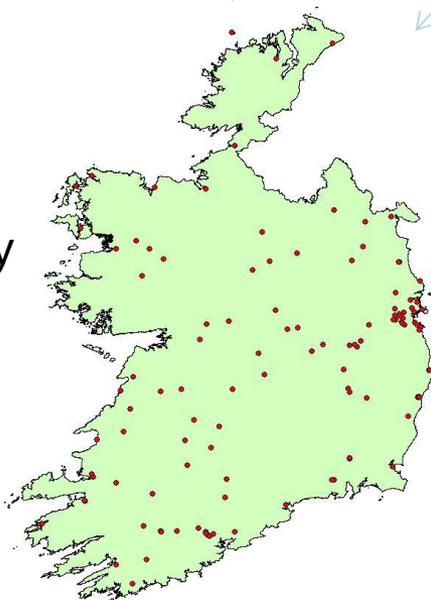


# ArcGIS 10

ED_ID	ED_NAME	County
6001	Athy East Urban	Kildare
15001	Arklow No. 1 Urban	Wicklow
15001	Arklow No. 1 Urban	Wicklow
11008	Donaghmore	Meath
29067	Balla	Mayo
29034	Deltinross	Mayo
4010	Blanchardstown-Coolmine	Fingal
18151	Boherboy	Cork County
19003	Tralee Urban	Kerry
19142	Castlesland	Kerry
18260	Midleton Rural	Cork County
18264	Mitchelstown	Cork County
12054	Mountshannon	Offaly
9027	Gransard Urban	Longford
18214	Magourney	Cork County
25001	Dungarvan No. 1 Urban	Waterford County
21013	Croom	Limerick County
3006	Clonsilla-Dunawley	Dublin City
4036	Swords-Forest	Fingal
18003	Fermoy Urban	Cork County
33006	Ballyshannon Urban	Donegal
29062	Moing na BÚ	Mayo
17071	Turners Cross A	Cork City
2071	Kilmore C	Dublin City
3002	Ballyboden	Dublin City
18218	An Slaibh Riabhach	Cork County
12078	Portarlington North	Offaly
20021	Glentworth A	Limerick City
19007	Caher	Kerry
33038	Mh an Chleasagh	Donegal
21057	Cappanore	Limerick County
27001	Bollinacree Urban	Galway County
19084	Killorglin	Kerry
6057	Ballyvaughan East	Kildare
15007	Wicklow Urban	Wicklow
18005	Macroom Urban	Cork County
3006	Clonsilla-Dunawley	Dublin City
5017	Blackrock-Williamstown	Dun Laoghaire-Rathdown
15007	Wicklow Urban	Wicklow
17070	Tramore C	Cork City
16001	Ennis No. 1 Urban	Clare
11001	Ceanntreas Múr (Kells) Urban	Meath
6071	Kildare	Kildare
17026	Ferinsterris C	Cork City



HBSC  
Post-primary  
Schools



## School characteristics

- ▶ Urban 61.9%      Rural 38.1%
- ▶ DEIS 20.6%      Non DEIS 79.4%
- ▶ Girls 17.5%      Boys 22.2%      Mixed 60.3%

# External food environment – 1km

**Mean values of food retail businesses within 1km of Irish schools (n=63)**

	Mean	Urban/rural status		
		Rural	Urban	P value
Coffee shops and sandwich bars	3.89	1.21	5.54	0.000
Restaurants	3.65	1.33	5.08	0.004
Asian and other 'ethnic' Restaurants	2.60	0.79	3.72	0.000
Fast Food outlets	4.03	1.08	5.85	0.000
Supermarkets	1.95	0.83	2.64	0.000
Local Shops	6.71	3.92	8.44	0.001
Fruit and Vegetable shops	0.73	0.13	1.10	0.000



# External food environment by gender – 1km

**Mean values of food retail businesses within 1km of Irish schools (n=63)**

	School gender			
	Girls	Boys	Mixed	P value
Coffee shops and sandwich bars	4.82	6.07	2.82	0.028
Restaurants	3.73	7.86	2.08	0.001
Asian and other 'ethnic' Restaurants	4.00	3.86	1.74	0.025
Fast Food outlets	4.91	6.57	2.84	0.088
Supermarkets	3.09	2.43	1.45	0.000
Local Shops	8.09	10.21	5.03	0.003
Fruit and Vegetable shops	1.09	1.36	0.39	0.007

# Young People's perceived school food environments

- Qualitative study to explore young people's perception of their school food environment
- 6 post-primary schools recruited
  - 2 classes per school (1 younger/1 older, aged 12 -18)
- 95 students involved (37% Boys, 63% Girls)
- One class period ~40 mins
  - Mapping exercise
  - Group discussion with topic guide



# Group discussion

- The number/quantity of food outlets close to their school
- What food environments they use
- Quality of food outlets within walking distance
- Barriers to accessing food outlets of their choice
- Food purchases
- A need for change or maintain status quo?
- Topics discussed: Price, time, taste, no brand loyalty, social aspect, access at various times, use of various outlets – petrol stations, pubs, discount stores, Chinese restaurants etc.





# Summary

- No published study has explored objective and perceived exposure to food outlets
- Food retailers cluster around schools
  - 75% of post-primary schools had 1+ fast food restaurants within 1 km
  - 29.7% had 5+ fast food outlets within 1km of schools
- Boys schools & urban schools – greater proportion of food businesses
- These food outlets provide ample food purchasing opportunities
- Qualitative work to provide greater understanding of youth & school food environments



# WEIGHT CONCERNS

*Weight concerns among boys*  
*Peer influences on body image*



# Weight concerns

- Dieting and body weight concerns are common among adolescents
- Less research on boys relative to girls
- Risk and protective factors may differ by gender
- HBSC 2010, n= 6,187 boys
  - 25·1 % reported a desire to lose weight (weight 'loss' concern)
  - 7·7 % reported a desire to gain weight (weight 'gain' concern).



# Weight concerns among adolescent boys

(PHN, 2015)

- Weight concerns were associated with poor self-rated health, life satisfaction and happiness, and with more frequent emotional and physical symptoms.
- In adjusted analyses, the risk of weight 'loss' concerns decreased with daily family breakfasts (OR=0.80; 95 % CI 0.66, 0.97). The risk of weight 'gain' concerns decreased with frequent family evening meals (OR=0.77; 95 % CI 0.60, 0.99).
- Ease of communication with mother was associated with a decreased risk of weight 'loss' and weight 'gain' concerns among boys (OR=0.74; 95 % CI 0.60, 0.90 and OR=0.61; 95 % CI 0.44, 0.82, respectively).
- An open father–son relationship and having a father present in the home decreased the risk of weight 'loss' concerns (OR=0.69; 95 % CI 0.57, 0.82 and OR=0.81; 95 % CI 0.67, 0.98, respectively).



# Adolescent body image

- Body image is a reported concern for Irish adolescents (O'Connell & Martin 2012)
  - 46% of 15 year old girls and 22% of 15 year old boys think they are 'too fat' (HBSC 2010)
- Negative body image linked to disordered eating, dieting, purging, laxative use etc.
- Peers received least attention in literature relative to parents and media as influencing factors
- Thus an investigation (U. Kenny PhD) into:
  - How peer relationships influence body image perceptions among adolescents in Ireland; (-/+)
  - Other factors that influence body image



# EARLY YEARS

Early infant feeding behaviours



# Infant nutrition – modifiable behaviours

- First 1000 days (conception to 2<sup>nd</sup> birthday) opportunity to shape healthier future
- Choice of infant feeding: Breast/bottle feeding
- Weaning – introduction of solid foods
  - Timing, type, variety and properties of foods offered, parental feeding practices
- Lack of advice from health care providers
- Introduction of unmodified cows' milk



# Early years (HRB ICE award)

- Designing, evaluating and implementing a complex intervention in childhood obesity
  - emphasis on early intervention for the problem of obesity and the establishment of healthy behaviour patterns early in life
  - Approach to support families with young children within primary care
- Lead PI: Prof Patricia Kearney (UCC)
  - Co-PI's NUI Galway: Dr Molly Byrne, Dr Caroline Heary, Dr Edel Doherty.....UCC, TCD
  - Collaborators: ...



# Early infant feeding

- To quantify the burden of childhood overweight and obesity in Ireland
  - Physical, psychosocial, & economic consequences
- To explore effective behaviour change techniques for early dietary interventions (sys review); what works for whom and in what circumstances
- Parental experiences (literature & qual study) of early infant feeding
- Qualitative work with healthcare staff - feasibility of an intervention
- Detailed process evaluation and economic evaluation of the intervention.



# Summary & future work

- Adolescent health
  - Diet, body image/body dissatisfaction/weight concerns
- Food environments – enabling healthier choice
- Early years nutrition
  - HRB ICE award
- Nutrition in Pre-school setting (Saintuya Dashdondog's PhD)
- Weaning practices among parents (proposal submitted to Safefood)



# Acknowledgements....

- Thank you to all children, parents, teachers and school managements
- The Department of Health
- Millennium Fund Project Grant, NUI Galway
- The HBSC National Advisory Committee
- Professor Candace Currie, International Coordinator of HBSC, University of St. Andrew's
- Professor Oddrun Samdal, Data Bank Manager, University of Bergen
- All members of the international HBSC network
  
- HBSC Ireland team in particular Mary Callaghan
  
- PhD students: Ursula Kenny and Saintuya Dashdondog



# Thank you





# Contacts

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HBSC International Website: [www.hbsc.org](http://www.hbsc.org)

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