ILSI LA collaborative research- The ELANS

Estudio Latinoamericano de Nutrición y Salud (ELANS): Food intake and physical activity patterns of Latin American Population.

ELANS

ESTUDIO LATINOAMERICANO DE NUTRICIÓN Y SALUD
LATIN AMERICAN STUDY ON NUTRITION AND HEALTH- LAHNS

On behalf of ELANS Group:

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Coordinator of the Nutrition Center- Pensi Institute- Fundação José Luiz Setúbal
Member of the Board and Coordinator of Healthy Life Style Task Force- ILSI Brazil

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Full professor- Department of Biochemistry
School of Medicine- University of Costa Rica

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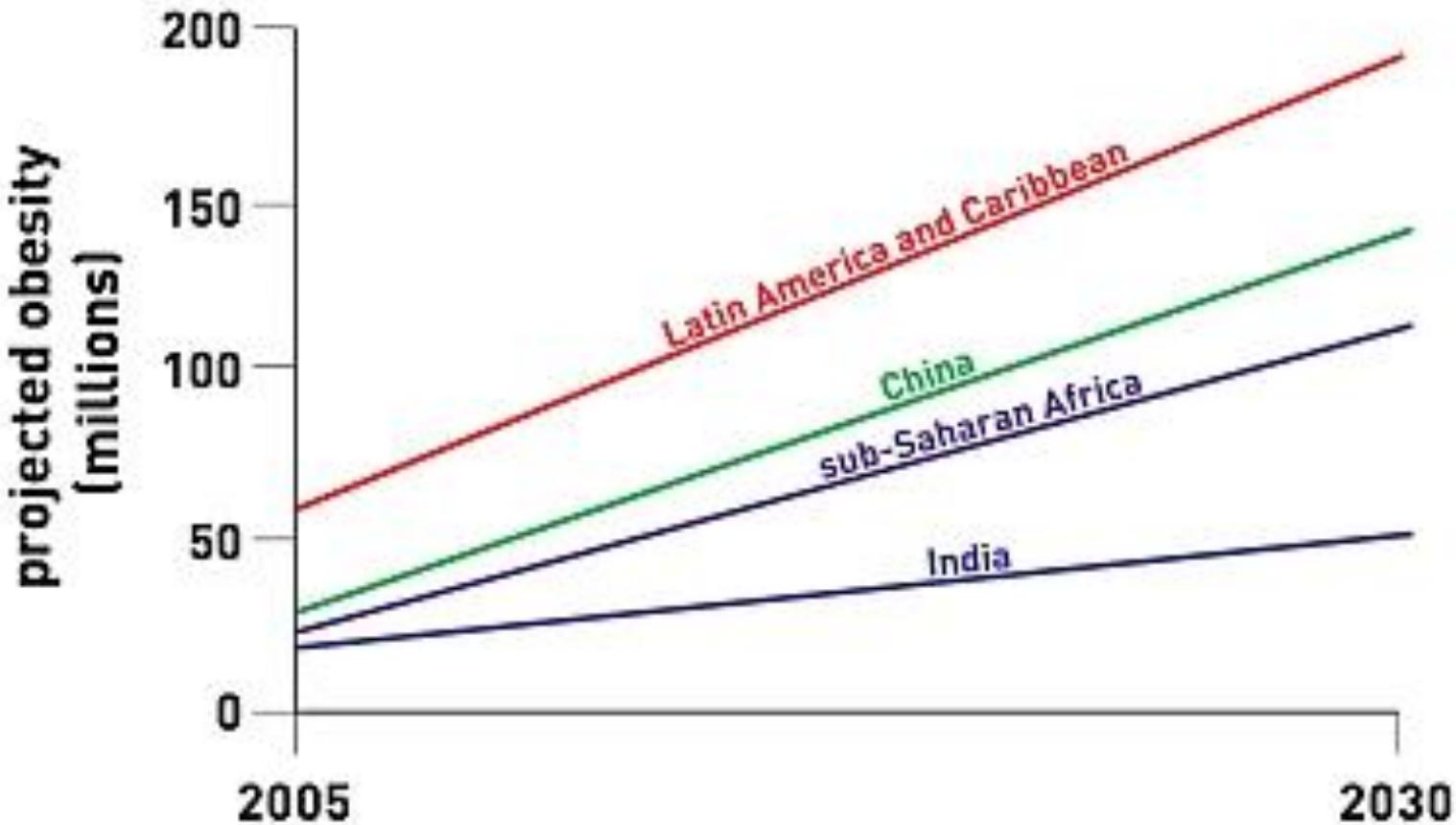
Interest Disclosure

- The ELANS is originally supported by a scientific grant from the Coca Cola Company and by grants and/or support from the Instituto Pensi/Fundação José Luiz Setúbla, ILSI Argentina, Universidad de Costa Rica, Pontificia Universidad Catolica de Chile, Pontificia Universidad Javeriana, Universidad Central de Venezuela (CENDES-UCV)/Fundación Bengoa, Universidad San Francisco de Quito, and Instituto de Investigación Nutricional de Peru.
- Publishing and communication is supported by ILSI LA and regional Latin American ILSI branches and a grant by Ferrero.

- The funders had no role in study design, data collection, analysis, the decision to publish, or the preparation of data for workshops or manuscripts.

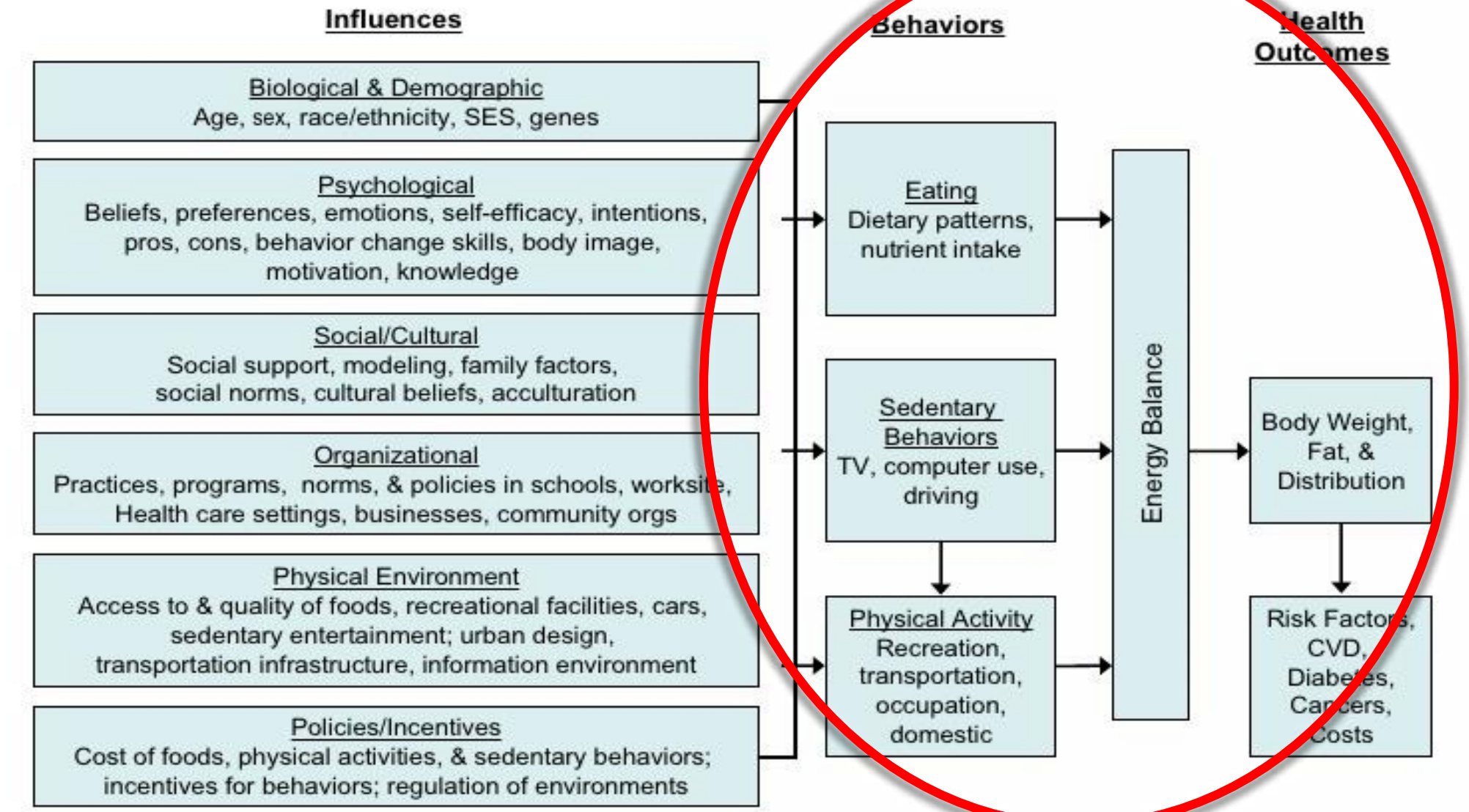
. This manuscript do represent the original idea of all authors and do not necessarily represent ILSI views.

LATIN AMERICA HAS THE WORST SCENARIOS OF OBESITY FOR COUNTRIES IN EMERGING REGIONS BY 2030.



Kelly et al., *Int J Obes* 32: 1431-37 (2008)

An Ecological Model of Diet, Physical Activity, and Obesity



ordon-Larsen. NHLBI Workshop: Predictors of Obesity, Weight Gain, Diet, and Physical Activity; August 2004, Bethesda MD

- **Lack of studies that combine nutrition and physical activity assessment in representative samples of Latin American countries.**

- Up to now, there is no Latin American study using a central standard methodology across a group of participating countries.

Country	Year	Sample size	Sample size that underwent dietary assessment	Method	Analysis of the dietary data
Argentina (ENNyS)	2004-2005	36,354 (aged 6 m - 5 y and women 10-49 y)	36,354	24-h Recall	Food Composition database developed for ENNyS
Brasil (POF)	2008-2009	159,941 (aged ≥ 0 y)	34,003 (aged ≥ 10 y)	Two 24-h recall	NDSR software and Food Composition database developed for POF
Colombia (ENSIN)	2008-2010	162,331 (aged 0-64 y)	17,897 (aged 5 - 64 y)	Food-Frequency Questionnaire	Qualitative (daily frequency of intake)
Chile (ENCA)	2014	4,920 (aged ≥2 y)	4,920	Quantitative Food-Frequency Questionnaire and 24-h Recall	PC-SIDE software
Ecuador (ENSANUT-ECU)	2011–2013	57,727 (aged 0-59 y)	19,932 (aged 1-59 y)	24-h Recall	PC-SIDE software
México (ENSANUT)	2012	96,031 (aged >0 y)	10,563 to 12,484 according to method used	Semi-quantitative Food Frequency and 24-h recall in 11% and 13% of sample, respectively	Food Composition database developed by National Institute of Public Health
Perú (ENINBSC)	2006	4,206 (aged ≥20 y)	4,206	24-h Recall	ANDREA software, developed by CENAN-INS
Venezuela (ESCA)	2012-2014	20.670 (aged ≥ 3 y)	6,316 aged ≥ 3 y	Diet history and food frequency questionnaire	Food Composition database developed for ESCA

Latin American Study of Nutrition and Health

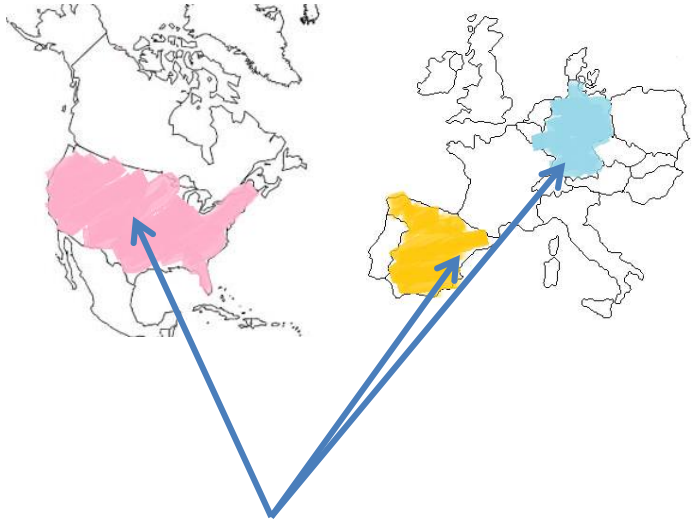
Aims

ELANS

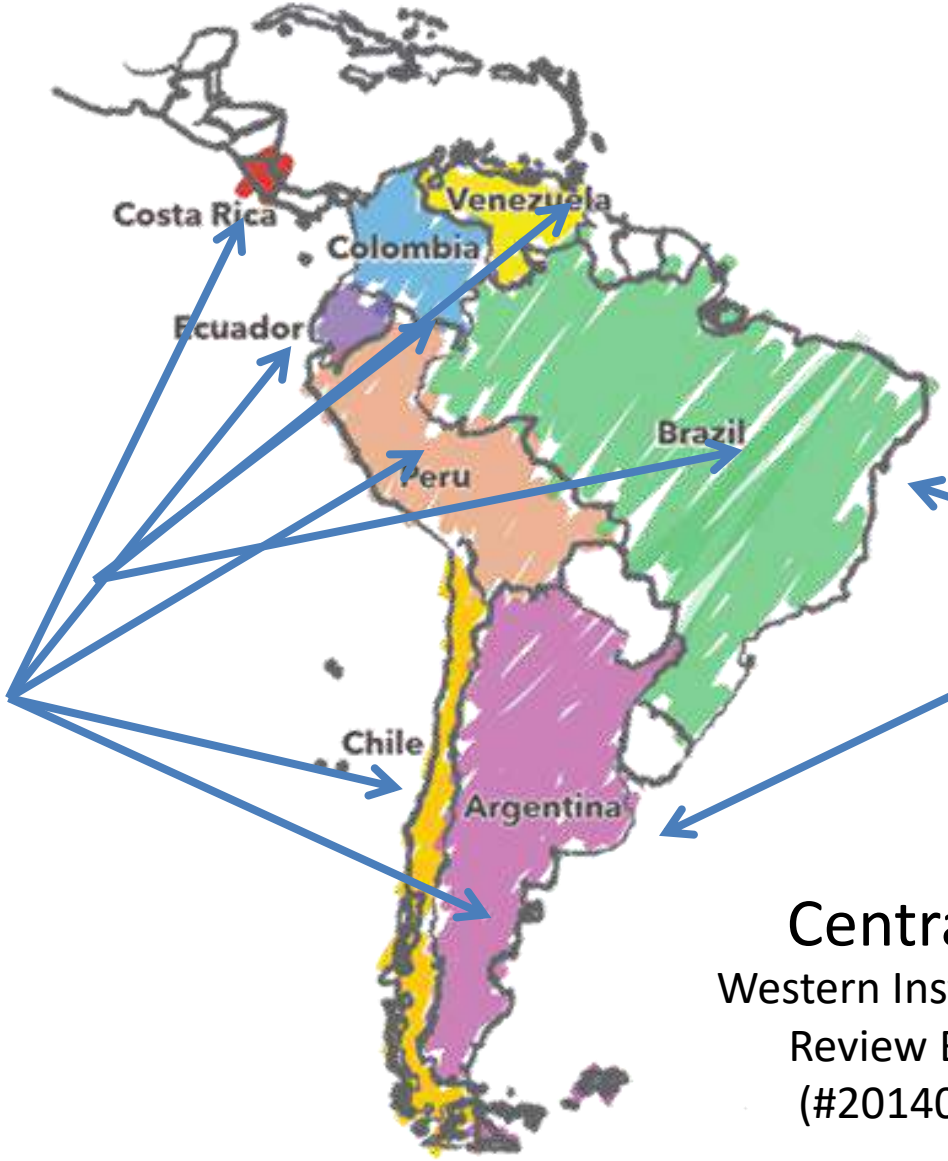
ESTUDIO LATINOAMERICANO
DE NUTRICIÓN Y SALUD

- Provide up-to-date reliable and comparable data of dietary intake, physical activity, and its association with anthropometric profile among representative urban populations of eight Latin American countries (~ 40% of the population of the Americas);
- Measure variations by region, cultural background, socioeconomic status, age and gender;
- Add new scientific-based evidence to describe the interplay among energy intake, energy expenditure, and anthropometric measurements.

ELANS work group



4 Advisors



8 PIs and Teams

2 Project manager

Central IRB
Western Institutional Review Board
(#20140605)

Local IRB

Clinical Trials
(#NCT02226627)

Overall Design and Methods

Sample:

- Total of 9,000 subjects;
- Representative sample of the urban household population of each country;
- Stratified by geographical location (only urban areas), gender, age and socioeconomic status:

15 – 19,9 years (adolescents)
20 – 34,9 years (young adults)
35 - 49,9 years (adults)
50 - 65 years (senior adults)

- Socioeconomic level (SEL): high, medium and low.

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Abstract
Background
Discussion
Declarations
References
Study protocol | Open Access | Open Peer Review
Latin American Study of Nutrition and Health (ELANS): rationale and study design
M. Fisberg, I. Kovalskys, G. Gómez, A. Rigotti, L. Y. Cortés, M. Herrera-Cuenca, M. C. Yépez, R. G. Pareja, V. Guajardo, I. Z. Zimberg, A. D. P. Chiavegatto Filho, M. Pratt, B. Koletzko, K. L. Tucker and the ELANS Study Group
BMC Public Health BMC series – open, inclusive and trusted 2016 16:93
https://doi.org/10.1186/s12889-016-2765-y | © Fisberg et al. 2016
Received: 9 July 2015 | Accepted: 21 January 2016 | Published: 30 January 2016
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Variables

INTAKE

- Two 24-hours dietary recall
- Beverage intake questionnaire

EXPENDITURE

- IPAQ-Long Questionnaire
- Accelerometry

ANTHROPOMETRY

- Body weight
- Height
- Waist, hip and neck circumferences

Dietary assessment

24-h recall

INDIVIDUAL FOOD INTAKE REGISTRY - 24-HOUR DIETARY RECALL

Name: ....

Sex: Male: 1 Female: 2

Subject code: ....

Interviewer code: ....

Interview date: ..../............../..............

Day of the week: Mo - Tu - We - Th - Fr - Sa - Su

P1.| What time did you wake up yesterday? ....

P2.| How many hours of sleep you had yesterday? ....

P3.| "What were the food and drinks that you consumed from the moment you woke up until the time you go to sleep yesterday?"

[FOR USE OF THE INTERVIEWER: register brands, spices, sugar and salt added.]

TIME	MEAL	PLACE	FOODS / BEVERAGES/ PREPARATIONS	TYPE/ METHOD OF PREPARATION	SERVING (quan Household measure

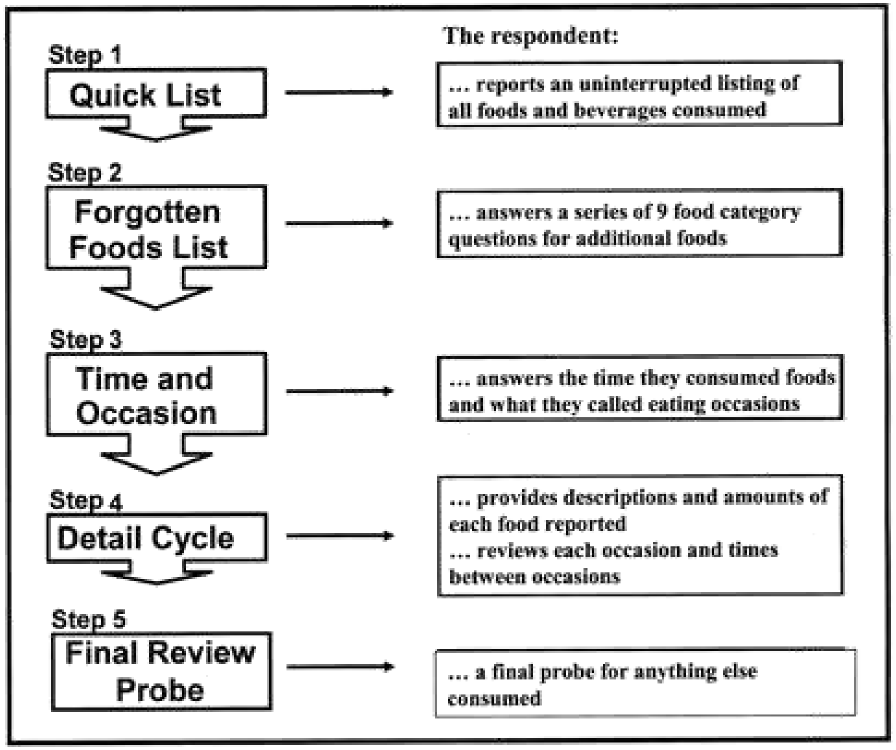
Plcae: Home, work, friends/relatives house, school/university, restaurant, travel (car, street, etc), social event

B: Breakfast L: Lunch D: Dinner S: Supper S1: Snack 1 S2: Snack 2 S3: Snack 3

R1: Recipe 1 R2: Recipe 2 R3: Recipe 3 R4: Recipe 4

Local: ....

USDA 5-Step Multiple-Pass Method



Dietary assessment

Beverage intake questionnaire

FOOD FREQUENCY QUESTIONNAIRE: BEVERAGES

Name:	.....	
Sex:	**Male: 1**	**Female: 2**
Subject code:	.....	
Interviewer code:	.....	
Interview date:	/ /	

"Now the next questions are about your diet in ONE MONTH period. Thereforewould like to know how often do you drink each of the beverages on this list? "

BEVERAGES & SNACKS	How often do you eat.....? N-1-2-3-4-5-6-7-8-9-10	Unit D - W - M
NON-ALCOHOLIC BEVERAGES		
Water sparkling/still	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Flavored water		
sugar free	N-1-2-3-4-5-6-7-8-9-10	D - W - M
with sugar or fruit	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Carbonated beverages		
common (cola, lemon, etc)	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Light/Zero (cola, lemon, etc)	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Energy drinks		
isotonic (6-8%HC)	N-1-2-3-4-5-6-7-8-9-10	D - W - M
vitamin drinks	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Fruit juices		
juice powder 0% sugar	N-1-2-3-4-5-6-7-8-9-10	D - W - M
fresh fruit juice/with pulp 24%	N-1-2-3-4-5-6-7-8-9-10	D - W - M
ALCOHOLIC BEVERAGES		
Beer lager/stout	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Wine (white/red)	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Sparkling (champagne)	N-1-2-3-4-5-6-7-8-9-10	D - W - M
others: Vodka, whisky, tequila	N-1-2-3-4-5-6-7-8-9-10	D - W - M
INFUSIONS		
Mate		
Without sugar or with sweetener 0%	N-1-2-3-4-5-6-7-8-9-10	D - W - M
With sugar	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Tea		
Without sugar or with sweetener 0%	N-1-2-3-4-5-6-7-8-9-10	D - W - M
With sugar	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Coffee		
Without sugar or with sweetener 0%	N-1-2-3-4-5-6-7-8-9-10	D - W - M
With sugar	N-1-2-3-4-5-6-7-8-9-10	D - W - M
With low-fat milk	N-1-2-3-4-5-6-7-8-9-10	D - W - M
Whole milk	N-1-2-3-4-5-6-7-8-9-10	D - W - M
cappuccino	N-1-2-3-4-5-6-7-8-9-10	D - W - M

Times: N: NEVER 1: Once 2: Twice 3: 3 times ... 10: 10 times
UNIT: D: day W: week M: month
The serving will be obtain from the 24 hrs recall

Food Standardization

Nutrients **2015**, *7*, 1-x manuscripts; doi:10.3390/nu70x000x

OPEN ACCESS

nutrients

ISSN 2072-6643

www.mdpi.com/journal/nutrients

Article

Standardization of the Food Composition Database Used in the Latin American Nutrition and Health Study (ELANS)

Irina Kovalskys [1,2]*, Mauro Fisberg [3,4], Georgina Gómez [5], Attilio Rigotti [6], Lilia Yadira Cortés [7], Martha Cecilia Yépez [8], Rossina G. Pareja [9], Marianella Herrera-Cuenca [10], Ioná Z. Zimberg [11], Katherine L. Tucker [12], Berthold Koletzko [13], Michael Pratt [14], on behalf of the ELANS Study Group [‡]

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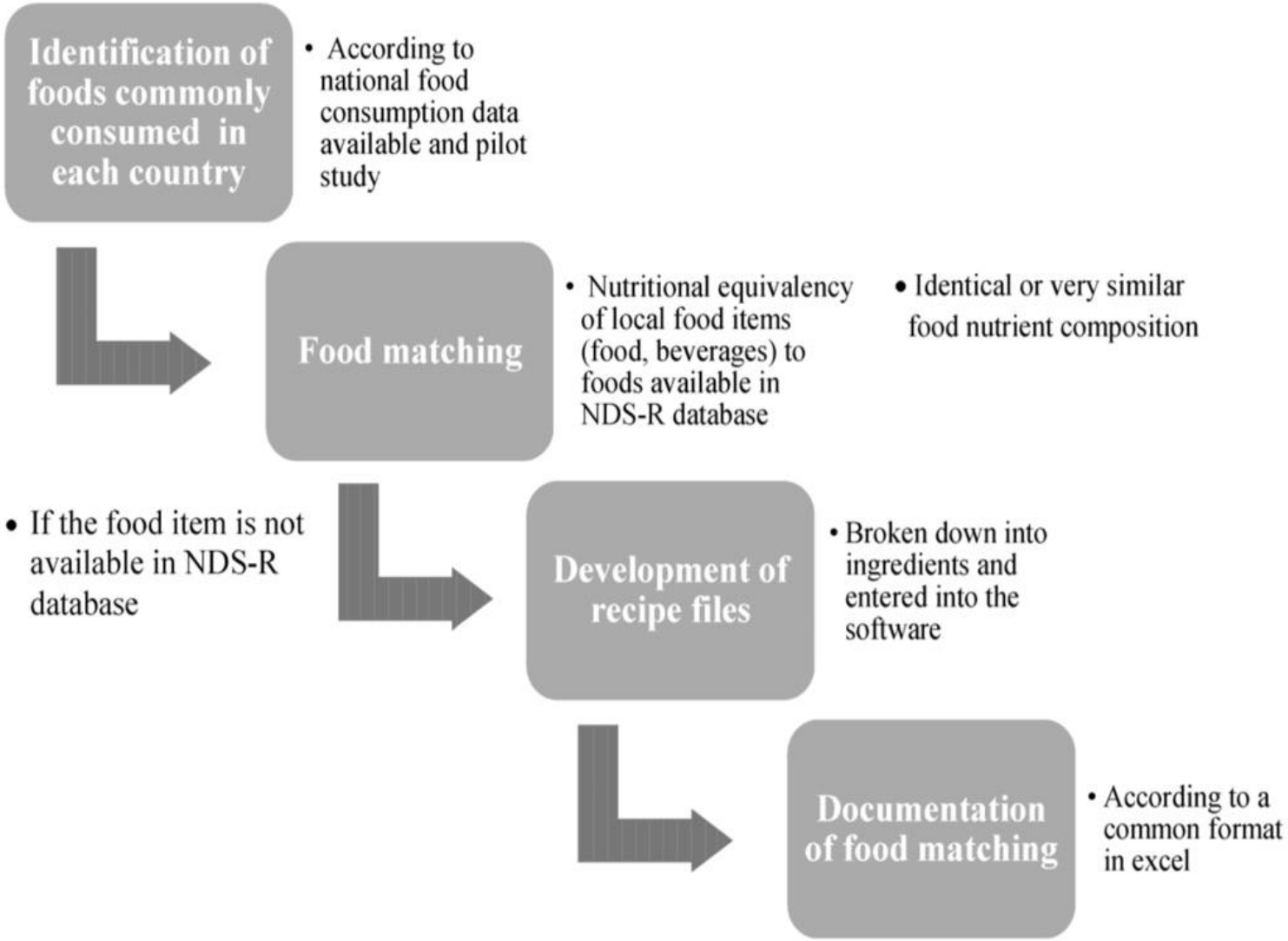
Food standardization procedures.

Nutrient and Food Group Calculation Software



UNIVERSITY OF MINNESOTA
NDSR
NUTRITION DATA SYSTEM FOR RESEARCH

Nutrition Data System for Research 2013

UNIVERSITY OF MINNESOTA
Nutrition Coordinating Center
Epidemiology and Community Health
Minneapolis, Minnesota

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Food and Drink Standarization.

By country

Country	Number of food and drink preparations			Agreement
	Food	Recipes	Total	Percentage (%)
Argentina	638	195	833	80-120
Brazil	666	495	1161	80-120
Chile	130	31	161	90-110
Costa Rica	512	235	747	90-110
Colombia	145	65	210	85-105
Ecuador	220	130	350	68-105
Peru	652	281	933	85-115
Venezuela	291	44	335	80-120

4730 total food standardized

Need to evaluate those plausible reporters- exclusion of under and over reporters

PREVIDELLI, A. N. et al.

Misreporting of energy intake in multicenter study in Latin America population: results from the Latin American Study of Nutrition and Health (ELANS). THE FASEB JOURNAL (ONLINE) , v. 31, p. 295, 2017.

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Physical activity measures-IPAQ

- Validated for physical activity in Latin America;
- The Mexican (Spanish) version of IPAQ (Salvo et al, 2014) was adapted for all countries of ELANS
- Only the sections **leisure-time** and **transport** physical activity (LTPA and TPA) were included;

Outcomes:

- Total vigorous, moderate, sedentary time in minutes/week
- Transport and Leisure time vigorous, moderate, sedentary time in minutes/week
- Differentiation by week and weekend

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Physical activity measure- Accelerometry

- 40% of the sample
- Objectively monitor physical activity and inactivity
- Accelerometer (model GT3X+, ActiGraph, Pensacola, FL, USA)
- Elasticized belt at hip level on the right mid-axillary line
- 7 days

Issues/Learnings

Planning the Conduct of Multicenter Research

- Assure standardization
- Uniformity of procedures
- Important outcome measures
- Ethical approval by international and local IRB
- Sponsor role in the study

Selection of the sites and team

- Coordinating Center and External Advisors Committee responsibility
- Cooperation between institutions
- Develop infrastructure
- Funding

Data Quality

- Preparatory meetings
- Manual of operation
- Site visits
- Technical visits to participating centers
- Close monitoring of data collection and data entry
- Inconsistency checks

Dissemination of findings

- Plan of analysis
- Plan of communication
- Plan of publication

Paho Public Health – ahead of print

Special report

Pan American Journal of Public Health

Developing a cooperative multicenter study in Latin America: Lessons learned from the Latin American Study of Nutrition and Health Project

Mauro Fisberg,[1] Irina Kovalskys,[2] Georgina Gómez Salas,[3] Rossina Gabriella Pareja Torres,[4] Martha Cecilia Yépez García,[5] Lilia Yadira Cortés Sanabria,[6] Marianella Herrera-Cuenca,[7] Attilio Rigotti,[8] Viviana Guajardo,[2] Ioná Zalcman Zimberg,[9] Agatha Nogueira Previdelli,[10] Luis A Moreno,[11] Michael Pratt,[12] Berthold Koletzko,[13] Katherine L Tucker,[14] and the ELANS Study Group[15]

Suggested citation Fisberg M, Kovalskys I, Gómez Salas G, Pareja Torres RG, Yépez García MC, Cortés Sanabria LY, et al. Developing a cooperative multicenter study in Latin America: Lessons learned from the Latin American Study of Nutrition and Health Project. Rev Panam Salud Publica. 2017;41:e111.

ABSTRACT *This report examines the challenges of conducting a multicenter, cross-sectional study of countries with diverse cultures and shares the lessons learned. The Latin American Study of Nutrition and Health (ELANS) was used as a feasibility study involving the most populous cities of eight countries in Latin America (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru, and Venezuela) in 2014–2015, about 40% of the population of the Americas. The target sample included 9 000 individuals, 15–65 years of age, and was stratified by geographic location (only urban areas), gender, age, and socioeconomic status.*

Six principal challenges were identified: team structuring and site selections; developing a single protocol; obtaining ethics approvals; completing simultaneous fieldwork; ensuring data quality

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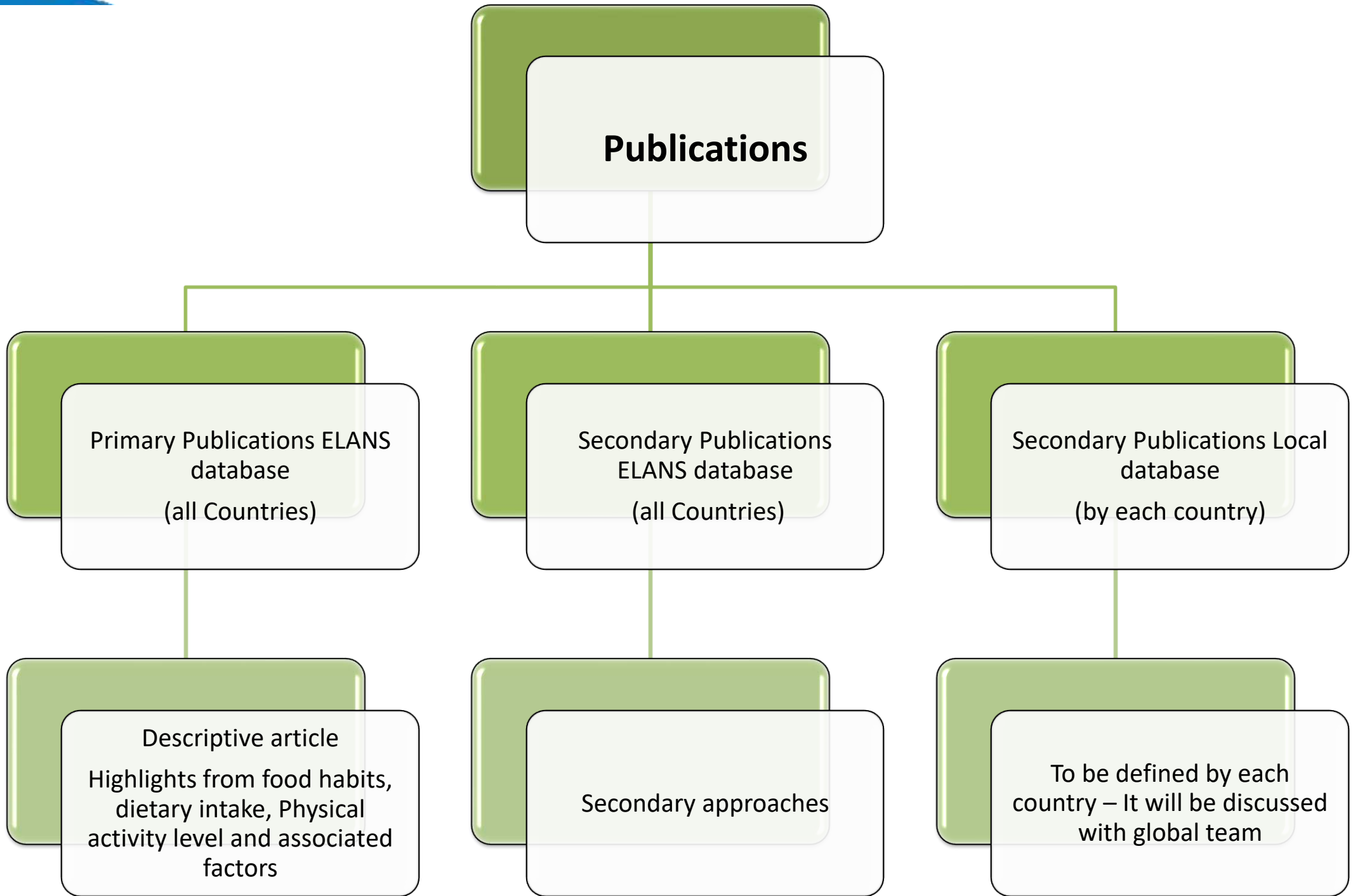
Publications
Primary Publications ELANS database
(all Countries)
Secondary Publications ELANS database
(all Countries)
Secondary Publications Local database
(by each country)
Descriptive article
Highlights from food habits, dietary intake, Physical activity level and associated factors
Secondary approaches
To be defined by each country – It will be discussed with global team

Presentations and operational items with ILSI LA and regional branches support

ELANS Applications and Future Directions

- Influence with Science based information on Public Health
  - Chronic disease prevention Programs
  - Fortification Programs
  - Drivers of Food Choice
  - Diet diversity interventions….and more

  - New data arriving from Mexico (EMANS)
  - Paraguay prospecting workshop and participation

- Answering health and also environmental questions
  - i.e. Sustainability of the LA diet?
  - Biological vs cultural preferences ?
  - Comparative data with other data basis
  - ….. many more....

- One ILSI opportunity ! LA integration of branches
  - Diet composition, recipes , potential future open data, regional workshops, political influence…

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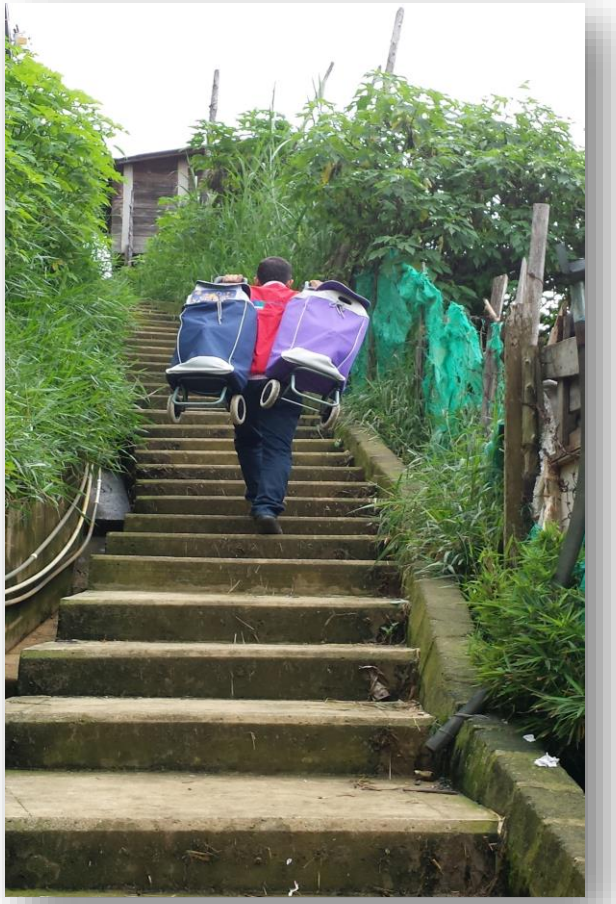
ELANS Working Group and ILSI members

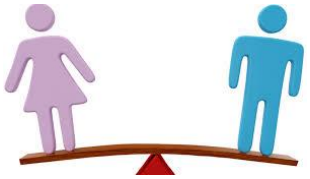
Main results and next steps



ELANS: Overall Study Sample sociodemographics

Argentina: n = 1,266
Brazil: n = 2,000
Chile: n = 879
Colombia: n = 1,230
Costa Rica: n = 798
Ecuador: n = 800
Peru: n = 1,113
Venezuela: n = 1,132

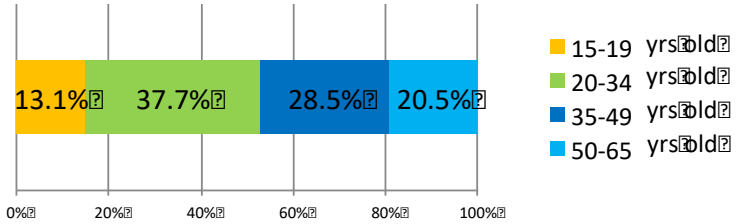
SEX



52,2%
Average age
37.0 yr old

47,8%
Average age
34.5 yr old

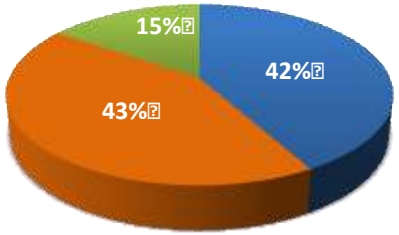
AGE DISTRIBUTION



EDUCATION

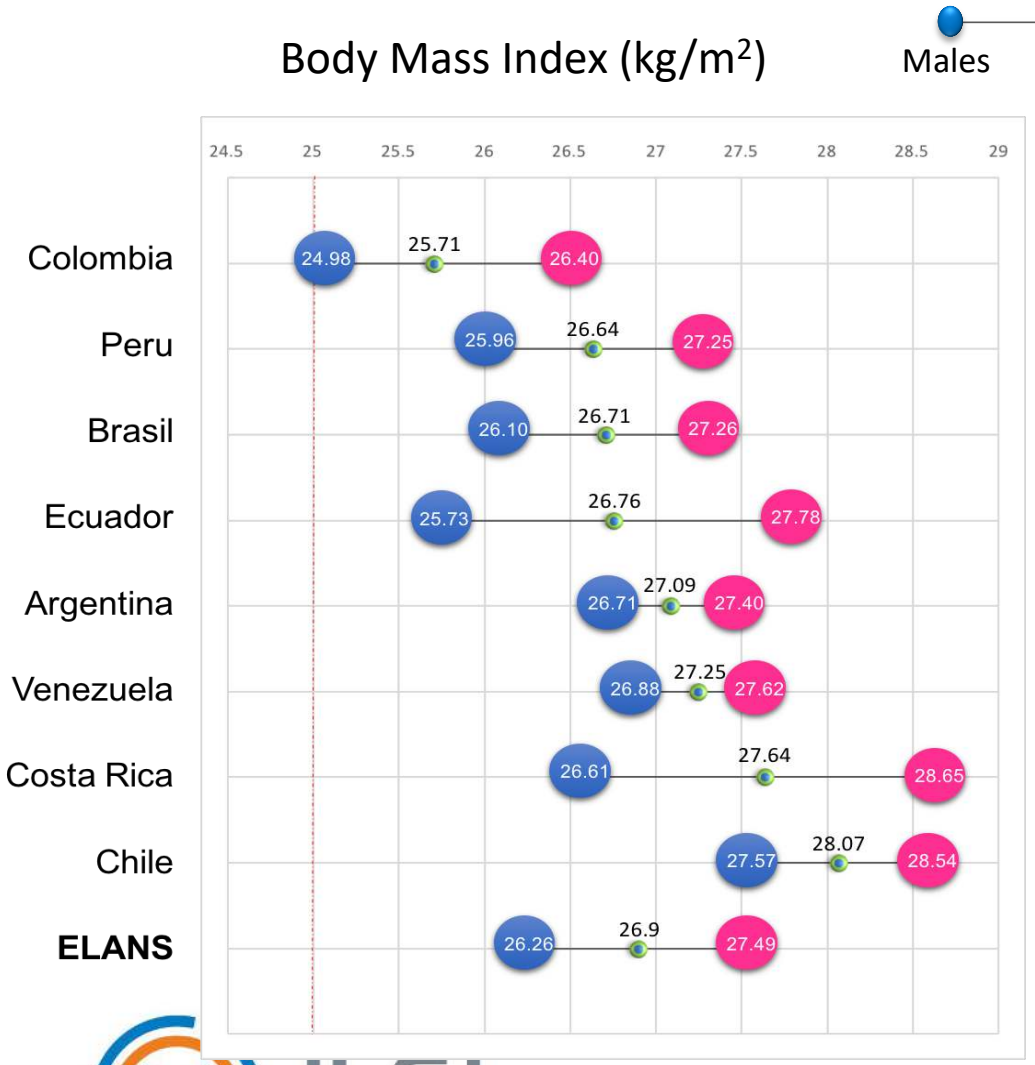
9.5% University or higher
29.2% Middle-high school
60.1% Lower school
1.2% None

SOCIOECONOMIC LEVEL (SEL)



Low Medium High

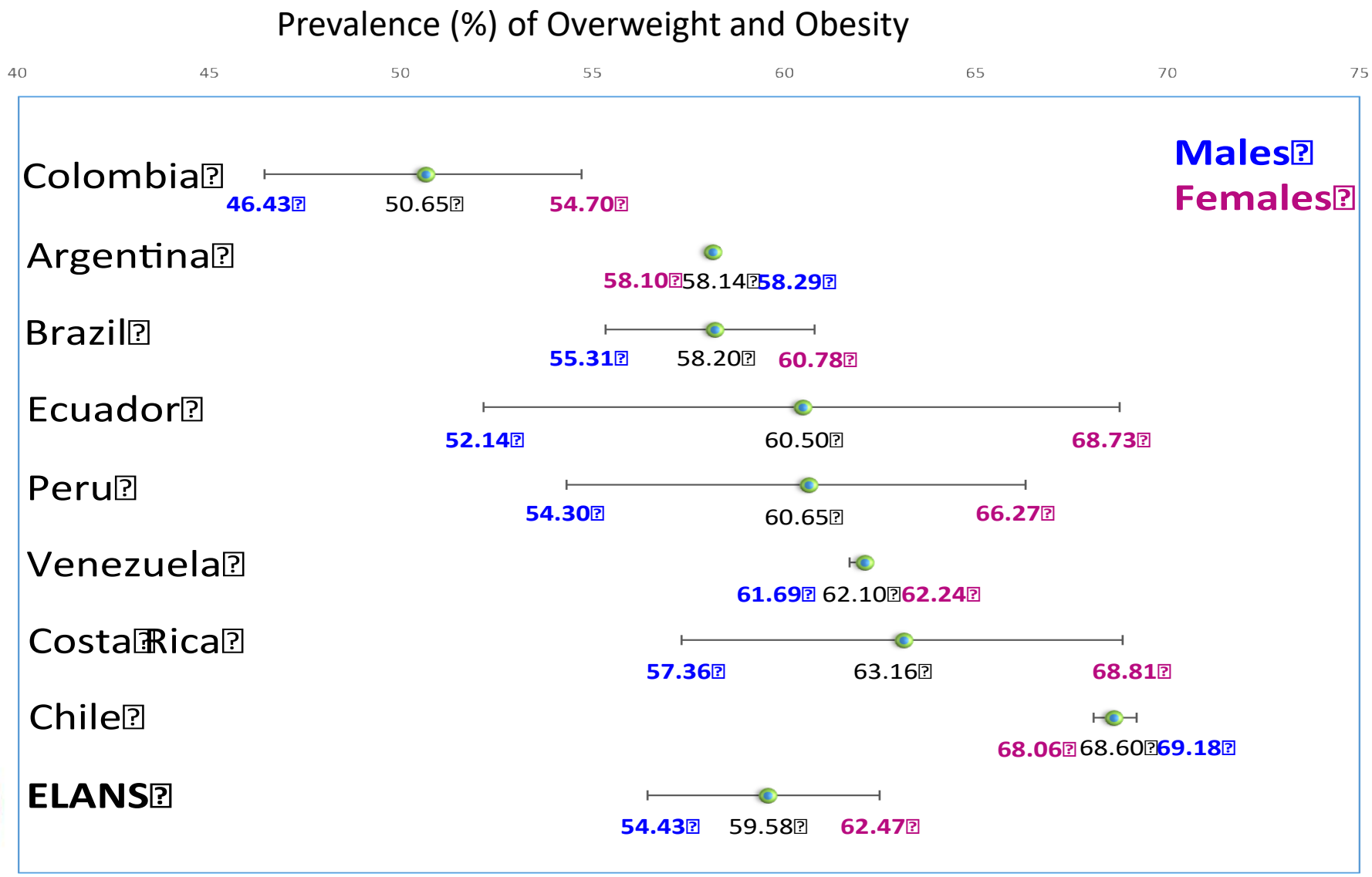
ELANS: Body Mass Index



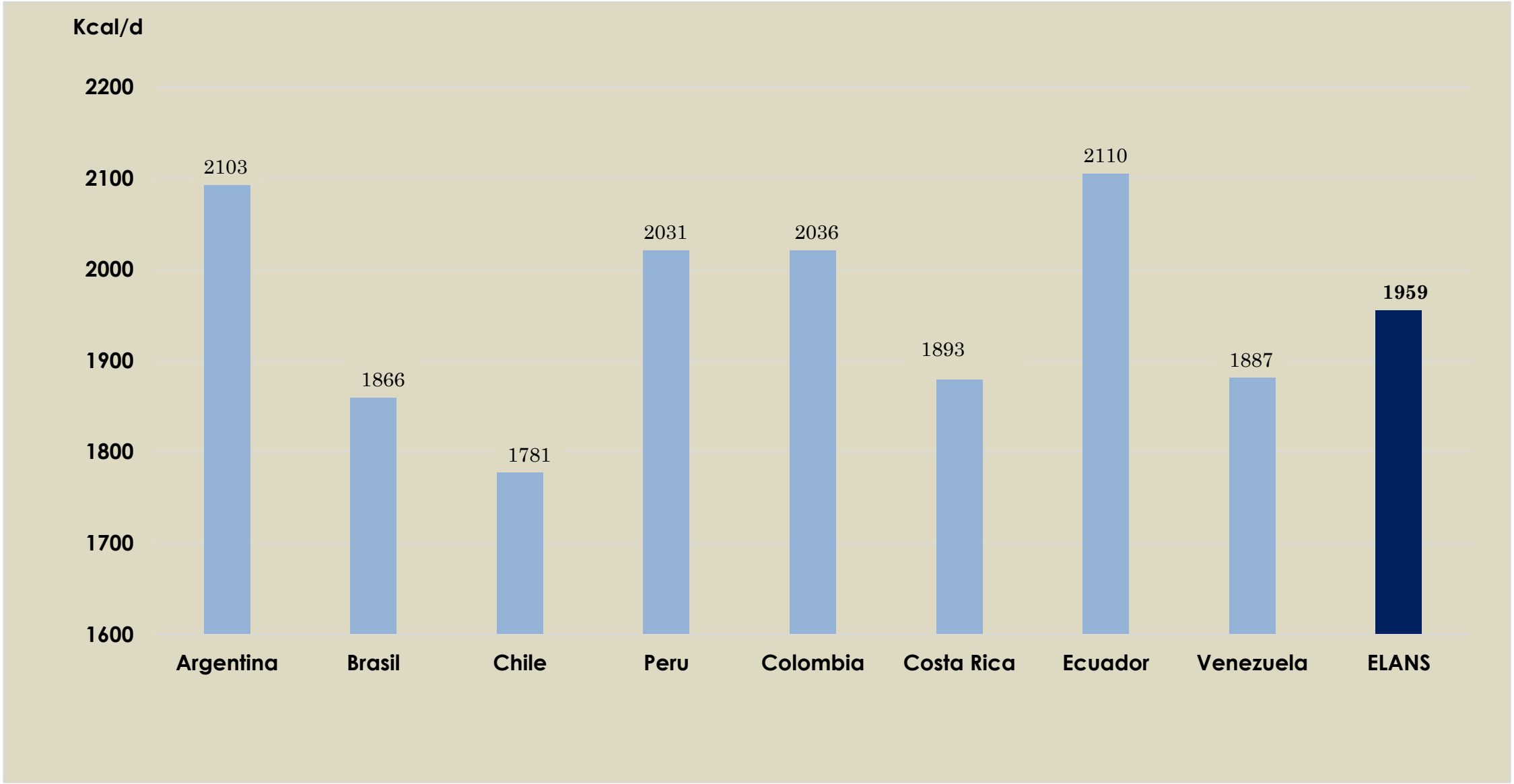
60%
Excess weight

p>0.05 between sexes among all countries

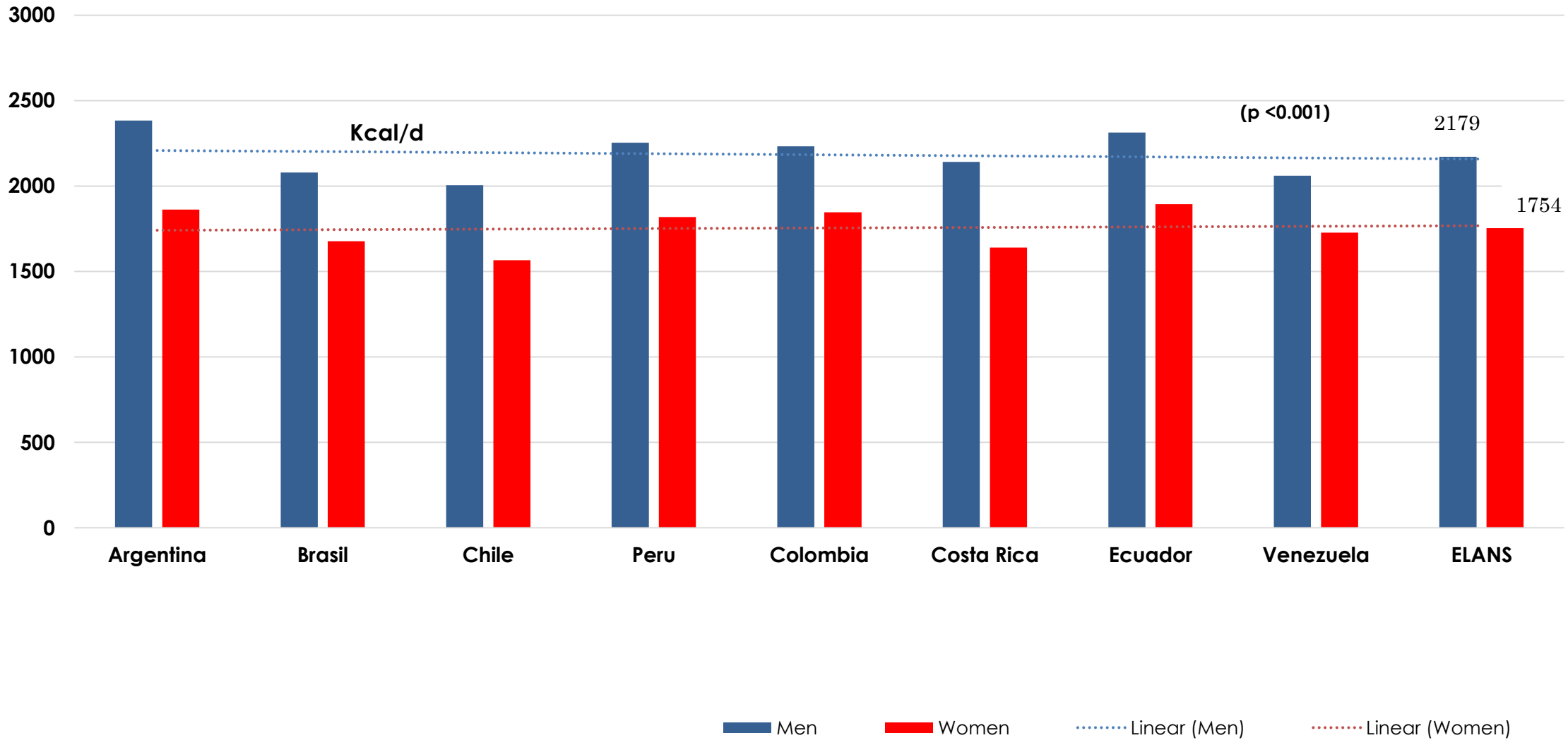
ELANS: Overweight and Obesity



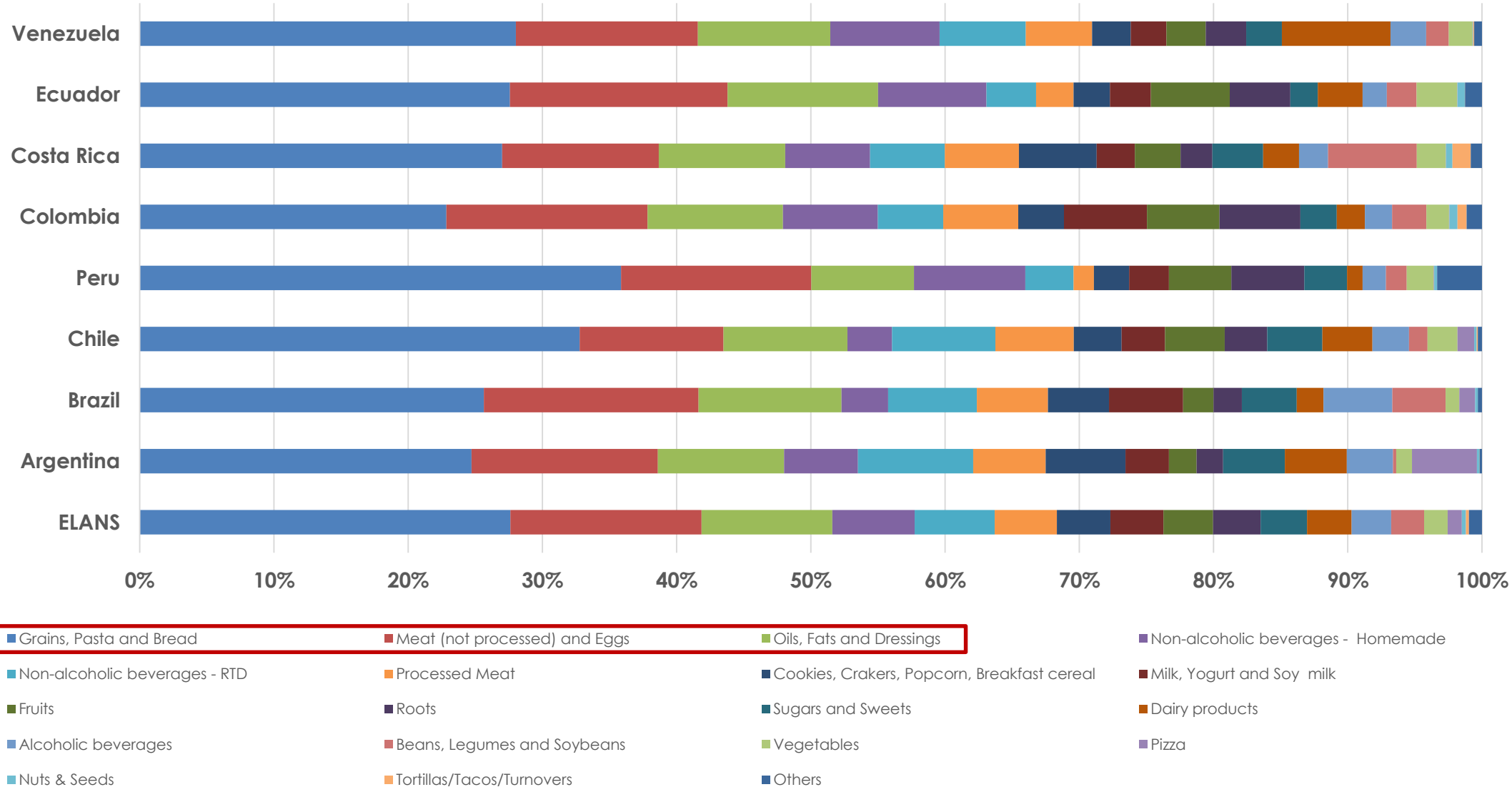
Mean energy intake (Kcal/d) by country



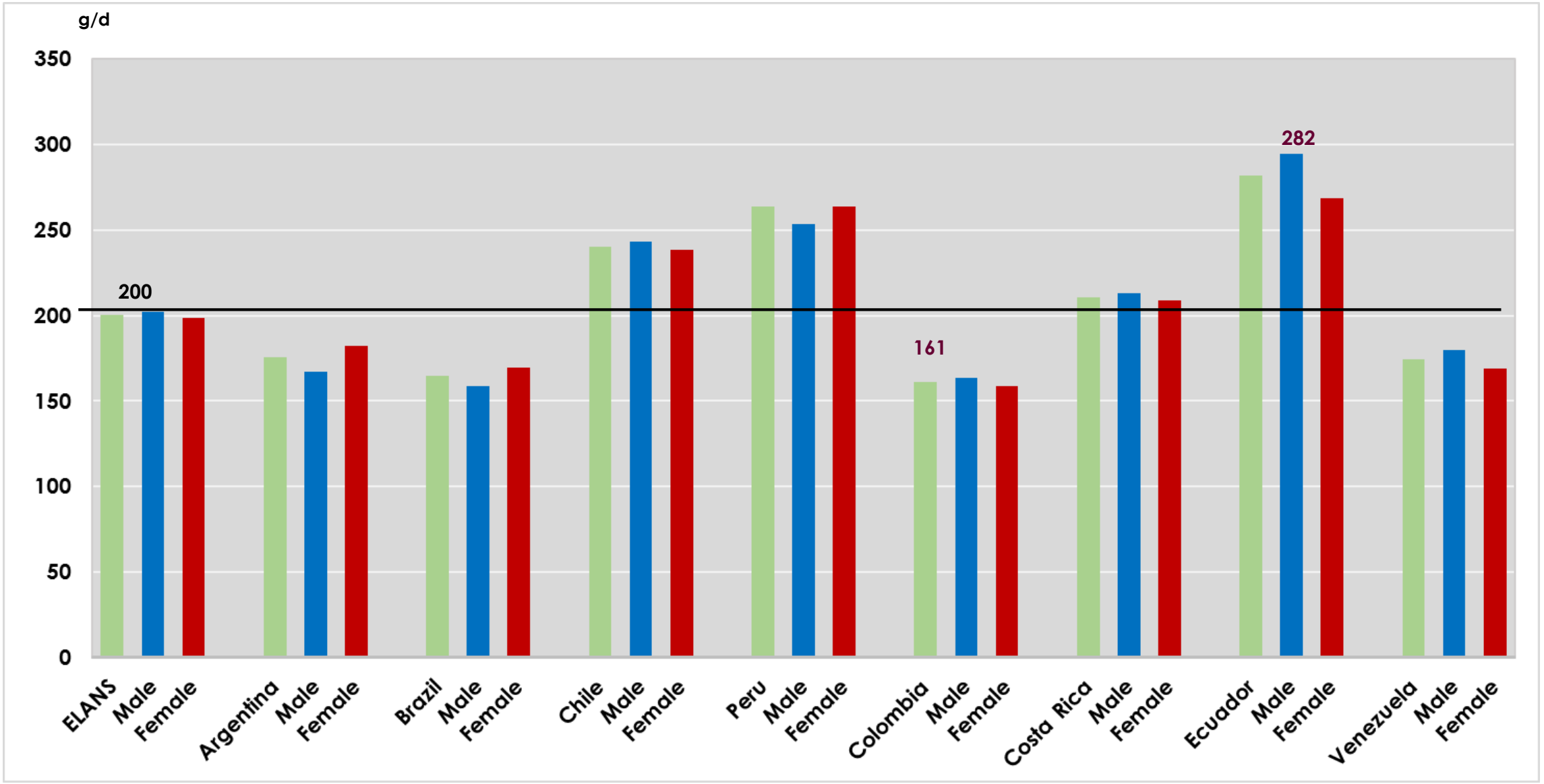
Mean energy intake (Kcal/d) by sex



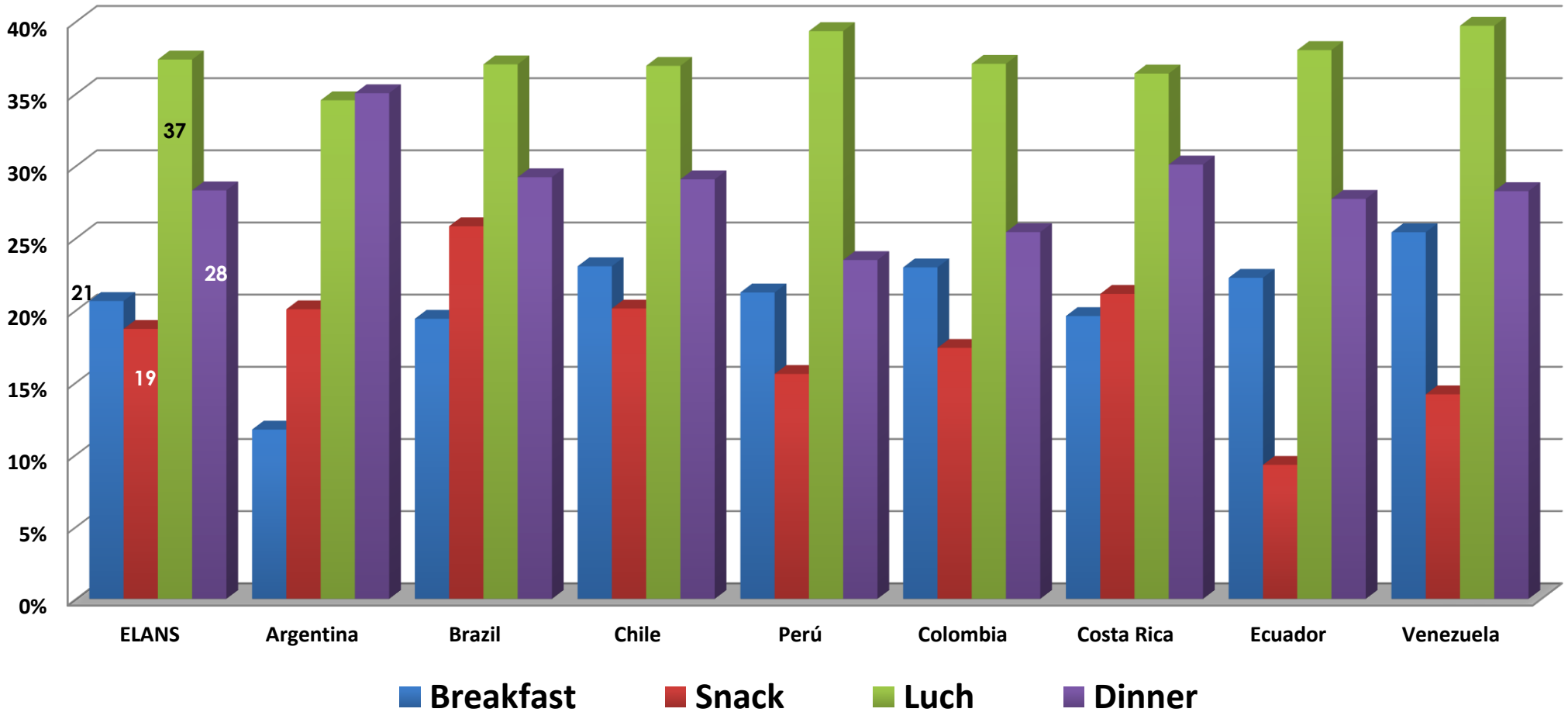
Source of energy intake (big group)



Mean fruit and vegetable intake by country and gender (g/d)

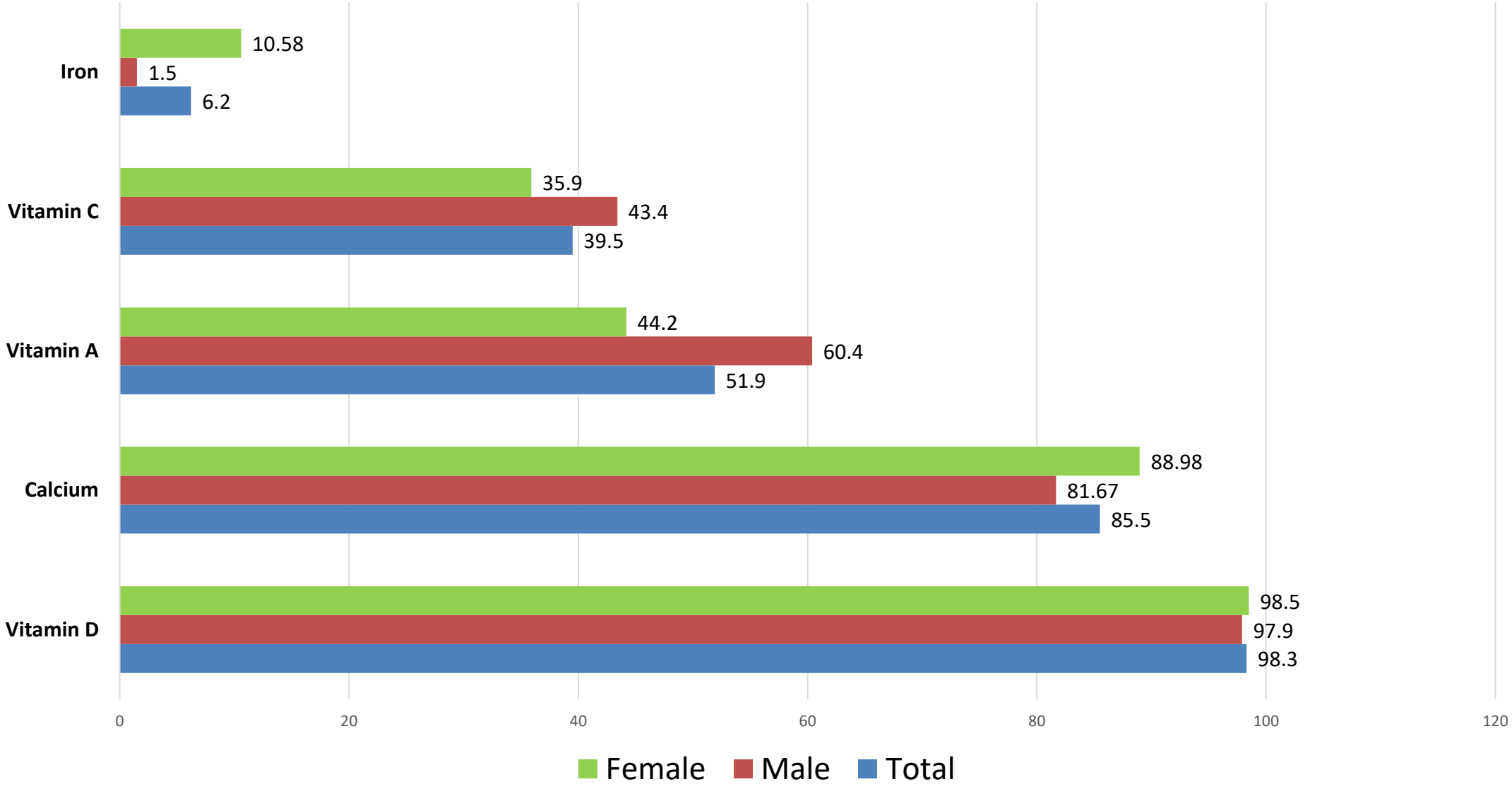


Mean percentage of energy by meal



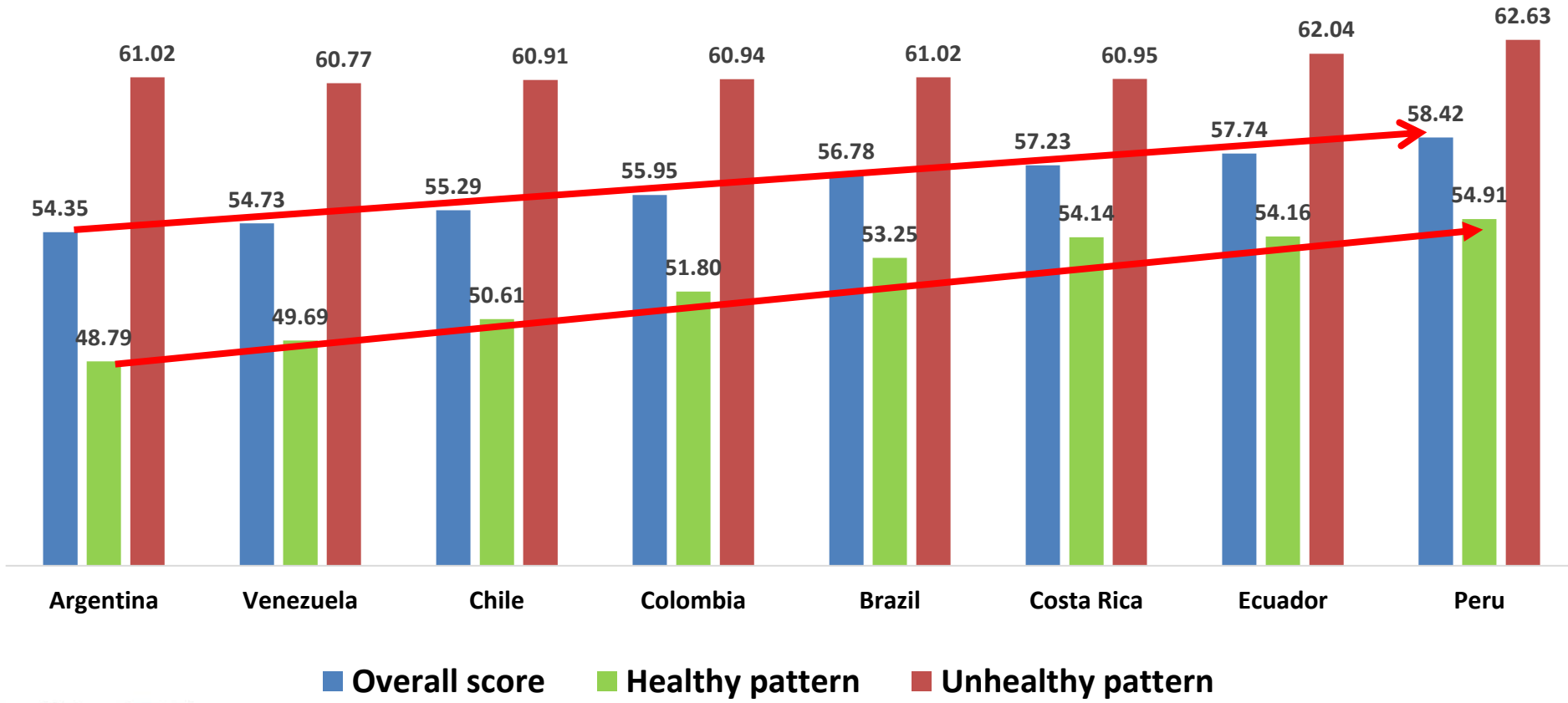
The distribution of energy throughout the day in the different meal times **does not have a homogeneous distribution among the eight countries**

Micronutrients deficiency (%)



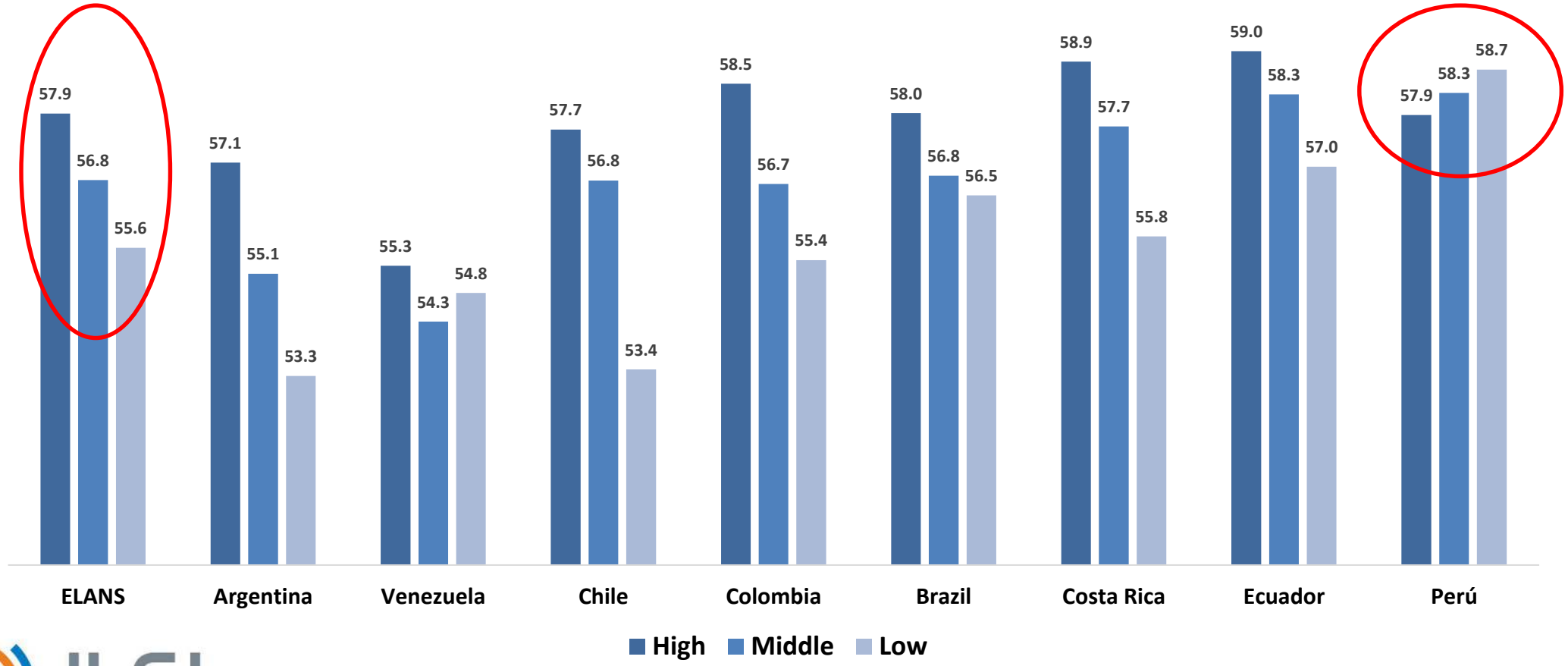
Dietary quality

Based on relatively high consumption of healthy foods and low consumption of unhealthy foods



ILSI

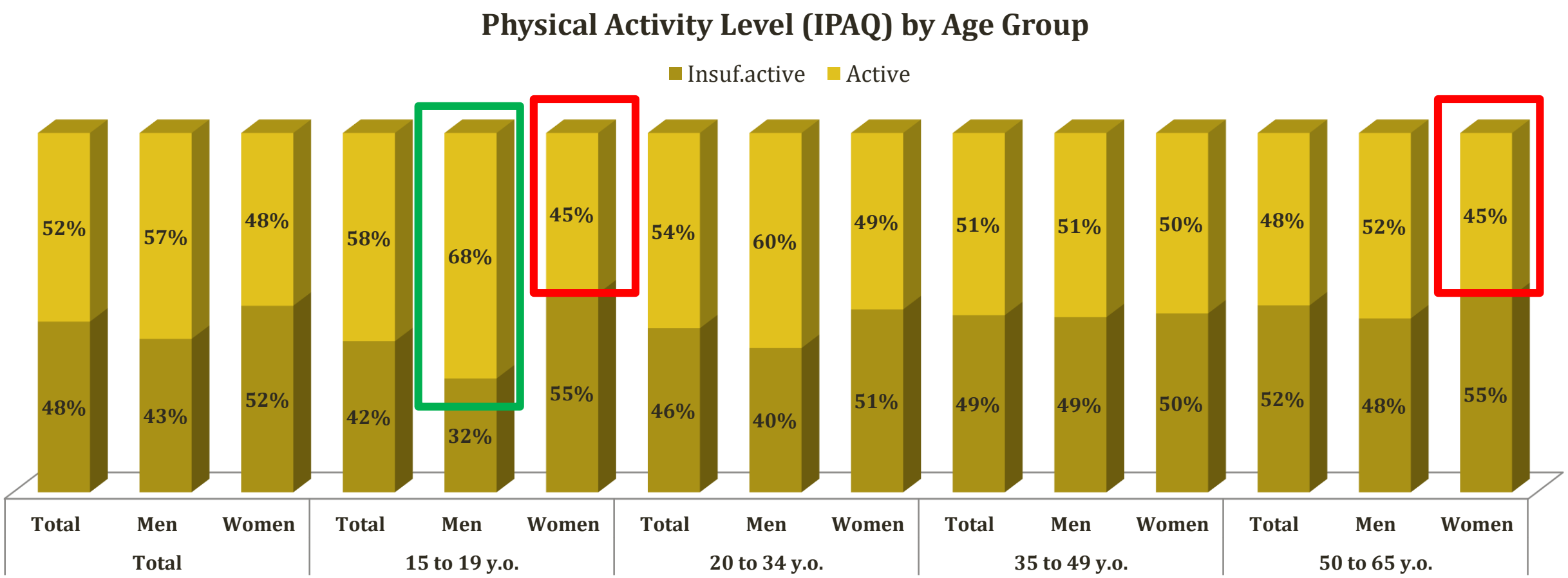
Impact of socioeconomic status



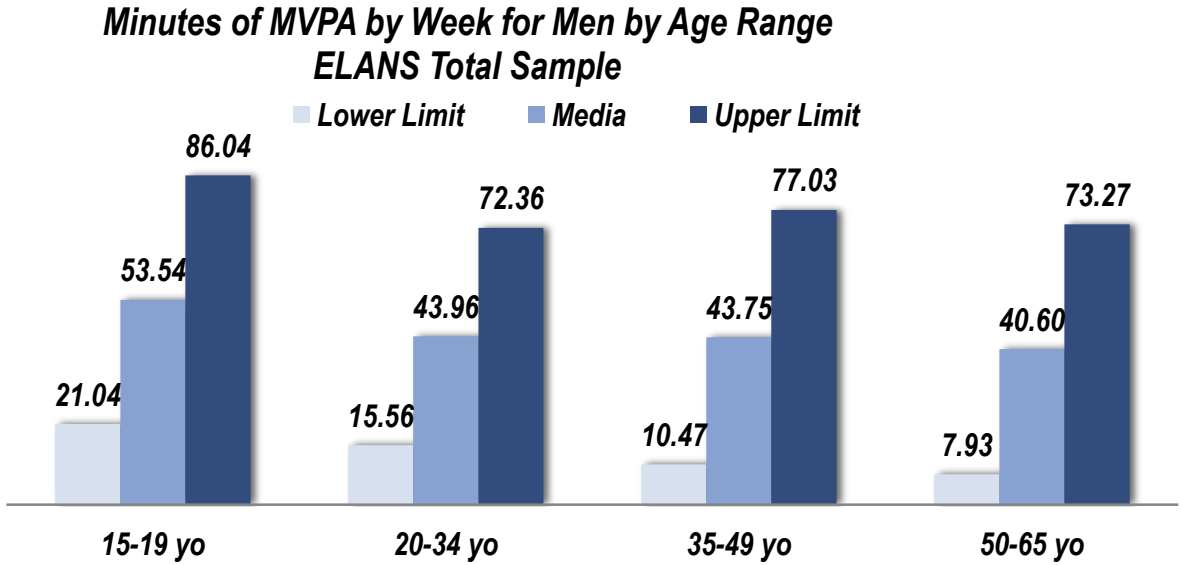
ILSI

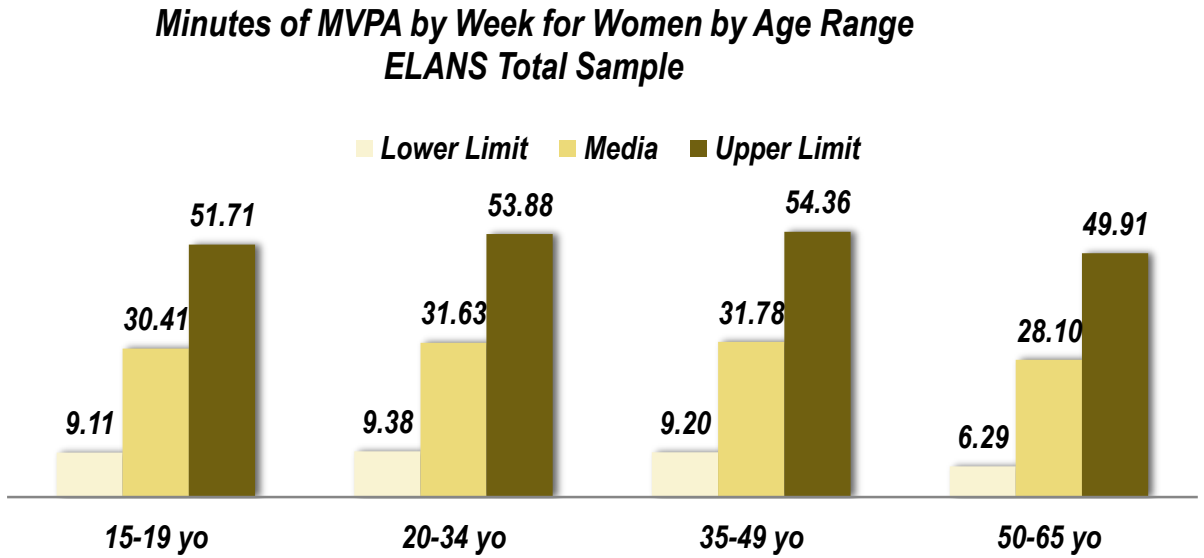
Physical Activity

Active vs Inactive (IPAQ by age and sex)



Accelerometers: MVPA (Moderate vigorous Physical Activity)



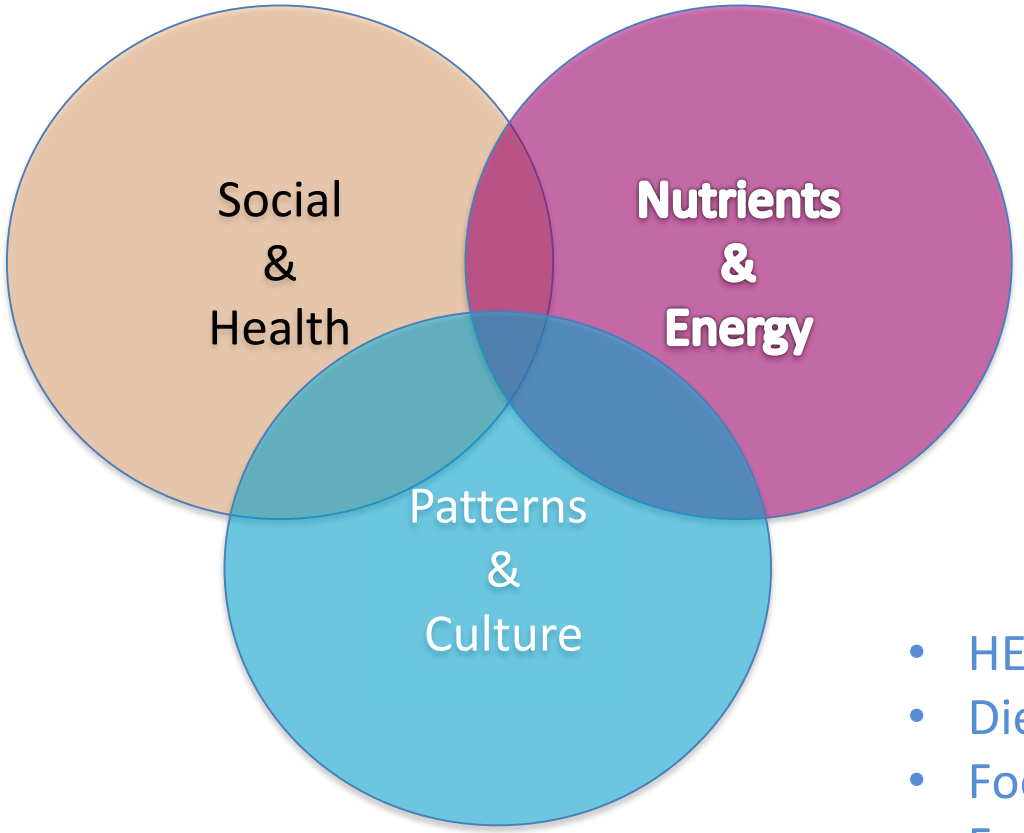


In summary

- 34.4% are obese and 60% have excess weight, with the higher rate observed in Chile and the lower in Colombia.
- Mean energy intake varies among countries, sex and age group.
- Low consumption of fruits and vegetables and other sources of micronutrients and fiber.
- High prevalence of vitamin A, calcium and vitamin D deficiency.
- Low diet quality score, that seams not to be related to social income, or nutritional status.
- Almost half of the participants were insufficiently active specially among adolescents

Other Approaches

- Individual associations with energy intake/expenditure:
  - (e.g.: gender, SEL, age, marital status, education)
- LA Costs of food supply
- Environmental and Social assoc. with weight and energy intake/expenditure:
  - (e.g.: income, violence and inequality)
- SEL, Gender or age diet associated behaviors
- Sleep time duration and obesity



- Alignment between nutrient and energy intake and dietary guidelines
- Misreporting of energy intake and associated factors
- Total added sugar consumption
- Sources of Nutrients

- HE I score Latam?
- Diet Quality Index
- Food Groups
- Food patterns
- Meals at home or outside
- Breakfast consumption
- Meal caloric density

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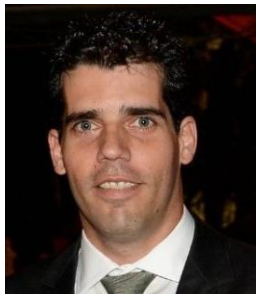

Statistical analysis

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